English in Kiribati

A historical, linguistic and sociophonetic report on a Micronesian variety

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I bukiia aaba aika a tangiraki irou

Abstract

The 33 islands of Kiribati are situated in Micronesia, in the middle of the Pacific. Contact between islanders and Europeans only began towards the end of the 18th century and has never been intense. No immediately discernible changes were introduced when the islands were eventually claimed by the British; the English language was hardly ever heard. After the Second World War, decolonisation was worked towards and considerably more attention was paid to education, particularly that of English, but progress was slow. Kiribati became independent in 1979 and English an official language to which most have positive attitudes. Moreover, instrumental motivations are commonplace: many want to learn it in order to secure local employment, to participate in international study or labour mobility programs, or to safeguard for a future that is uncertain in light of climate change issues making life on Kiribati more and more difficult. This dissertation is the first sociolinguistic report of English in Kiribati of its kind. It consists of three main parts: firstly, a historical account of how English has arrived and spread; secondly, a detailed description of features of phonetics and phonology, grammar and syntax, lexis and pragmatics, as well as of language use and linguistic attitudes; and thirdly, a sociophonetic analysis of alveolar plosives. These investigations reveal that issues in the educational system prevail and English proficiency levels remain low, that a high degree of substrate influence and parallels to other learner varieties exist, and that affrication establishes a new contrast between alveolar plosive phonemes.

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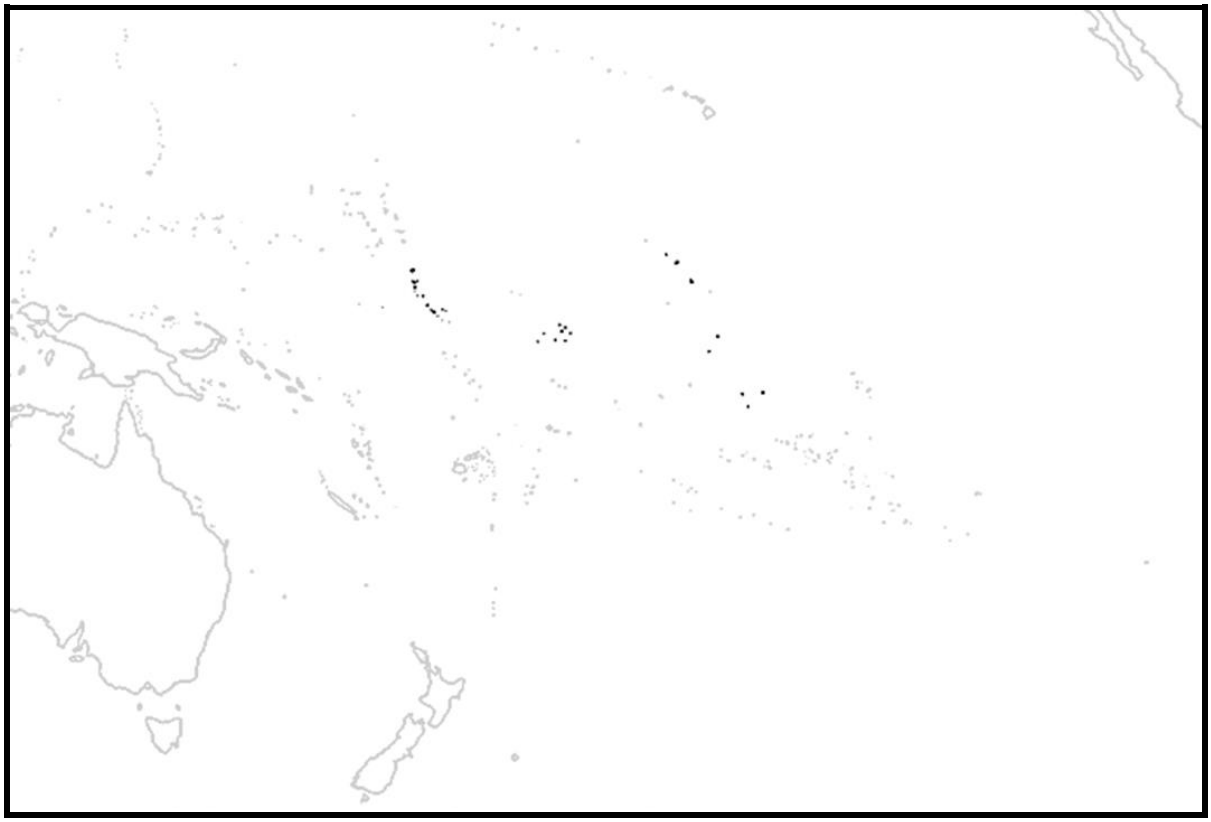

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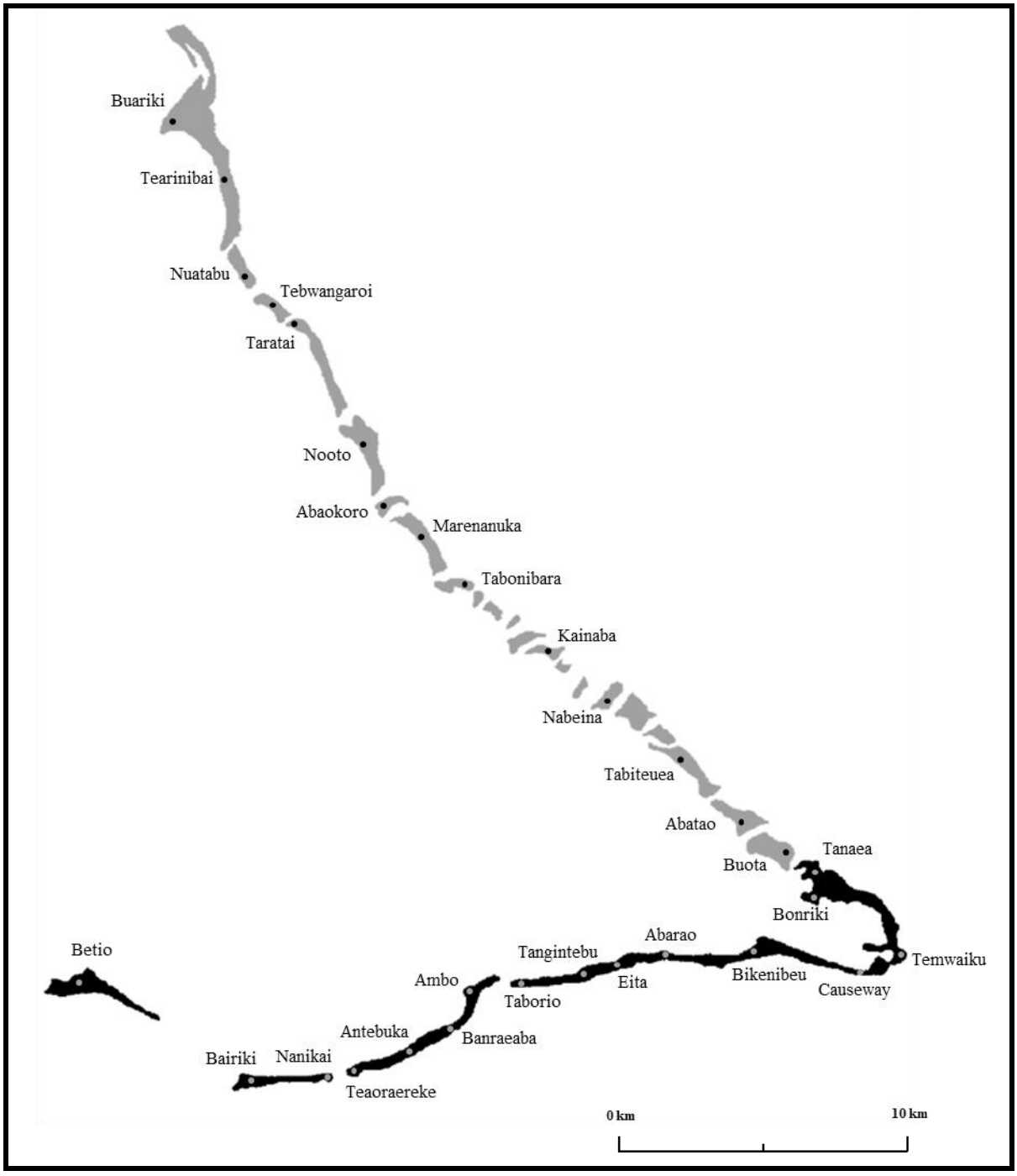

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Abbreviations

ABCFM	American Board of Commissioners for Foreign Missions
ADB	Asian Development Bank
BPC	British Phosphate Commission
CDRC	Curriculum Development and Resource Centre
DHPG	Deutsche Handels- und Plantage-Gesellschaft der Südsee-Inseln zu Hamburg
EBS	Elaine Bernachi School government school
EFL	English as a foreign language
ESL	English as a second language
EEZ	Exclusive economic zone
GIP	Gilbert Islands Protectorate
KAP	Kiribati Adaptation Program
KGV	King George V government school
KEF	Kiribati Education Framework
KEIP	Kiribati Education Improvement Program
KIT	Kiribati Institute of Technology
KiriCAN	Kiribati Climate Action Network
KPF	Kiribati Provident Fund
KTC	Kiribati Teachers College
KV20	Kiribati 20-Year Vision 2016-2036
L1	First language
L2	Second language
LMS	London Missionary Society
MoE	Kiribati Ministry of Education
MTC	Marine Training Centre
PAC	Pacific Access Category
RERF	Revenue Equalisation Reserve Fund
RSE	Recognised Seasonal Employer
SHM	Sacred Heart Mission
SPCR	South Pacific Commission Readers
SWP	Seasonal Work Program
TOE	Tate Oral English
USP	University of the South Pacific
VOT	Voice onset time

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CHAPTER 1

Introduction

The Pacific Ocean is the largest and deepest body of water in the world and consists of three regions: Melanesia, Polynesia and Micronesia. The last is comprised of over 2'000 islands which, today, are part of seven states: the Commonwealth of the Northern Mariana Islands (CNMI), the Federated States of Micronesia (FSM), Guam, Kiribati, the Marshall Islands, Nauru and Palau. All have very dissimilar histories with respect to their settlement, their colonisation, and, consequently, with respect to their current political status. The English language is an official language throughout Micronesia but, owing to the dissimilar histories, there are important differences between the individual varieties in terms of their linguistic structure as well as in terms of attitudes that the island communities have towards them. Until recently, aspects of English dialectology or sociolinguistic variation have only been investigated for Palauan English (see for instance Matsumoto & Britain, 2012, or Britain & Matsumoto, 2015), but not for any other Micronesian island. Hence, the project *English in paradise?: Emergent varieties in Micronesia* was launched in 2015 at the English Department of the University of Bern in Switzerland, under which five more varieties are being studied in great detail: the Englishes of Guam, Kiribati, Kosrae (in the FSM), Nauru, and Saipan (in the CNMI). The variety of the last Micronesian state, the Marshall Islands, is being researched by Buchstaller and Willson (2018) who are not directly engaged in the project. Besides many other forms of academic output, short descriptions for all seven varieties will be published in a monograph entitled *Micronesian Englishes* (Britain, Matsumoto, Hess, Leonhardt, and Lynch, forthcoming).

In the focus of the present dissertation is the English variety of the island nation of Kiribati. In a number of ways, Kiribati stands out from the other six Micronesian island states: it was colonised relatively late, at the end of the 19th century, while the other states had been claimed by foreign powers as early as 1521; it was only colonised by the British, while the other states have also been administered by Spain, Germany, Japan, Australia or the United States of America; and it is politically independent today, while the other states are officially in political affiliation or maintain important political ties with Australia or the US. In this dissertation, then, I take a closer look into Kiribati's history and its current situation, adopting perspectives and methodologies of English dialectology and sociolinguistic variation: I provide a detailed discussion of how the English language has been introduced, how it developed until the present day, and what its trajectory may be in the future.

A few introductory notes precede this discussion. Firstly, I present general information about Kiribati's geography, history, demography, politics and economy. Secondly, I give a short overview of how the English language has arrived and spread, as well as of the small corpus of previous literature

that provides relevant sociolinguistic insights. Thirdly, I briefly sketch out the outline of this dissertation. And finally, I make a few notes on the terminology used so as to ensure that expressions describing islands, peoples and languages are readily understood.

1.1 Introducing Kiribati

Kiribati is comprised of 33 scattered islands, located roughly where the dateline intersects the equator (see Figures M.1 and M.2 on pages xii and xiii). The islands are, with one exception, all thin and low-lying atolls with a combined land mass of only 810 square kilometres; the waters over which they are dispersed, however, are a staggering 3.5 million square kilometres. Banaba (Ocean Island) is the western-most island. It had been settled before Europeans arrived, was then exploited for phosphate mining during which the indigenous communities were removed, and is today inhabited again by only a small population. To its east are the 16 islands of the Gilbert group: Makin, Butaritari, Marakei, Abaiang, Tarawa, Maiana, Abemama, Kuria, Aranuka, Nonouti, Tabiteuea, Beru, Nikunau, Onotoa, Tamana and Arorae (from North to South). All have been continuously inhabited for a long time and today house the vast majority of Kiribati's population. Further east are the eight islands of the Phoenix group: Abariringa (Canton Island), Enderbury Island, Birnie Island, McKean Island, Rawaki (Phoenix Island), Manra (Sydney Island), Orona (Hull Island) and Nikumaroro (Gardner Island). There are indications of early settlements that had been abandoned before the Phoenix group became important once more for copra production in the 19th century and for military operations during the Second World War. A resettlement scheme was also tried in the middle of the 20th century but was later abandoned. Today, the Phoenix group is uninhabited, save for a small number of only temporary residents working on Abariringa. Finally, the eastern-most islands belong to the Line group: Teeraina (Washington Island), Tabuaeran (Fanning Island), Kiritimati (Christmas Island), Malden Island, Starbuck Island, Caroline Island, Vostok Island and Flint Island (from North to South). Similar to the Phoenix group, there are indications of abandoned settlements; the islands have been worked for pearl shell, guano and copra, and they were of military importance during the Second World War as well as for nuclear testing afterwards. Only the three islands in the North are inhabited again today, by less than 10% of Kiribati's entire population.

Within a group, many islands can be reached by boat or small airplane in a matter of a few hours. In contrast, trips from one to another group are much more difficult, owing to the vast distances. Travellers have to spend approximately one week on a ship to reach the Line from the Gilbert group, or vice versa. The much more expensive airplane journey links the two groups via Fiji, 3 hours to the south, where people often have to spend several nights before a connecting flight.

Today, Kiribati's population is 110'136 and ethnically practically homogenous; South Tarawa is the capital of the nation and houses over half the population (National Statistics Office & Ministry of Finance, 2016). Kiribati is heavily dependent on a reserve fund holding royalties from phosphate mining on Banaba which ceased just in time for political independence in 1979, as well as on foreign aid donations that amounted to 66 and 71 million US dollars in 2015 and 2016 respectively (European Commission, 2018). Among other things, medical standards are poor. Estimates based on census data suggest that the child mortality rate is 40 deaths per 1'000 births, and life expectancies are 65 for women and 60 for men with no increase since the 1990s (Secretariat of the Pacific Community et al., 2014). A more recent, more accurate analysis of recorded deaths, however, suggests even graver numbers: a child mortality rate of 51 deaths per 1'000 births and life expectancies of 63 and 55 for women and men respectively – before 2005, both measures were even worse (Carter et al., 2016). It is also worth mentioning that, due to its remoteness and poor infrastructure, Kiribati is one of the least visited countries of the world (United Nations World Tourism Organization, 2016) and, due to its topography, vulnerable to climate change effects that have an impact on the islands and their inhabitants already today (see for instance Campbell & Warrick, 2014).

1.2 Introducing English in Kiribati

Contact between Europeans and the inhabitants of the islands that were to become Kiribati began in the latter half of the 18th century and was only brief and infrequent for another hundred years. A number of languages may have been heard here and there, but not one of them can be said to have substantially changed the linguistic situation on the islands. By and large, beachcombers and missionaries learned and spoke the local language rather than to help spreading their own mother tongues. By the end of the century, the British claimed the islands of the Gilbert group without having any direct interest in them. As a result, the number of foreigners as well as the linguistic situation remained practically unaffected. The discovery and subsequent mining of phosphate on Banaba may have changed the enactment of British administration, but such developments hardly had any immediately discernible effects on the sixteen islands of the Gilbert group further east. Until the Second World War, the English language had never been widely heard, nor had it ever been a priority of the foreign missionaries or the colonial government to teach it to more than just a select few locals. British administration resumed after the war, with the new aim of preparing the islands for eventual independence. Finally, more attention was paid to education, also that of the English language. However, progress was slow, in practically all areas. The Gilbert islands, Banaba, and the 16 islands in the Phoenix and Line group became the politically independent Republic of Kiribati in 1979, and English an official language. It is today perceived as a very important language, attitudes towards it are generally overwhelmingly positive and

it is highly prominent in the educational system. In spite of everything, however, it remains a very foreign language most Kiribati islanders are not very proficient in.

Only little previous research has been conducted on English in Kiribati. Historic accounts and articles on topics other than linguistics may contain an introductory note in which it is mentioned that English has arrived with British colonisers or that it is an official language today. Less frequent are anecdotes about specific events where, due to the unfamiliarity of Gilbert islanders with the English language, translators were necessary. As of the mid-1960s, reports on education were written, which were responded to with adaptations of policies, which were in turn assessed in reports, and so on. In most cases, the information of these documents only affirm that educational progress was slow and difficult in the past and remains so to the present day, that prior policies and policy changes failed to adequately respond to the problems that existed and continue to exist, and that, as a result, educational standards and the English proficiency levels of local students as well as teachers were and remain relatively low. More specific, linguistic notes are rare. Firstly, Mowat (1972) includes a short narrative with quoted speech exemplifying how low educational standards led to low proficiencies and unintelligibility. Secondly, Pannu (1990) presents, among other things, a small collection of previously reported English phrases uttered by Gilbert islanders and summarises, on less than a page, frequently produced phonological and syntactic features. The third report is the dissertation by the same author, published in 1993, entitled *The development of English language teaching in Kiribati: A critical appraisal, with special reference to the primary level*. It has by far been the most extensive and informative description of the English language in Kiribati, not just of its education. It includes many socio-cultural and attitudinal pieces of information that are of relevance for an understanding of the linguistic situation of the Gilbert islands in the past and of Kiribati today. However, the list of phonological and syntactic features is almost identical to that of the 1990 report.

The present dissertation, then, is the first account of English in Kiribati of its kind. In addition to an assessment of historical events, policy documents and educational reports – including those of the last 25 years, between Pannu's dissertation in 1993 and today –, it entails detailed descriptions of features of phonetics and phonology, grammar and syntax, lexis and pragmatics, as well as of language use and linguistic attitudes.

1.3 Dissertation structure

This report on English in Kiribati is comprised of three main parts: a historical account, a linguistic description, and a sociophonetic analysis. In Chapter 2, I provide an overview of important historical events in as chronological an order as possible. In Sections 2.1 and 2.2, I discuss the settlement of the Gilbert islands as well as the implications of early contacts with Europeans for the island communities.

It will become apparent that only relatively little time passed between the first European explorers and heavy labour trade recruitment during which Gilbertese were exposed to other peoples, cultures and languages. At the same time, hardly any foreigners populated the islands; beachcombers often moved on again after a while, and the contingents of missionaries were small. Section 2.3 is dedicated to the beginnings of colonialism where I describe how the British were not interested in the Gilbert islands directly when they first claimed them, but were later able to exploit the islanders for work in the phosphate mining industry on Banaba. The Second World War, whose events and impacts are the topics of Section 2.4, brought a foreign conflict and foreign powers to the Gilbert islands. In its aftermath, colonial rule changed significantly and independence was worked towards. In Section 2.5, three migration schemes are discussed that also took place in the mid-20th century: the resettlement of Gilbert islanders to the Phoenix islands preceded the Second World War, the displacement of Banaba islanders immediately followed it, and the relocation of the Phoenix islanders occurred a few years later. Over the three decades following the war, the British and Americans conducted nuclear bomb tests, the colony the Gilbert islands had been a part of was divided, and political independence was achieved. These events are addressed in Section 2.6. Since educational developments are of particular importance for a report on the English language in Kiribati, they are discussed in their own right in Section 2.7. It builds on the previous parts of the chapter and entails information about Western education from its beginnings in the mid-19th century until today. It will become clear that progress has always been slow and that many existing problems are still not adequately responded to today, in spite of having been reported for decades. Finally, Section 2.8 provides current information about demography, economy, politics, climate change and migration schemes. The structure and contents of this chapter, then, describe the transition of 33 islands into a politically independent nation and shed light on past and present exploitation as well as on a struggle for prosperity in the light of geopolitical tensions and climate change issues jeopardising agricultural productivity, food sustainability, economic growth and financial prosperity.

In Chapter 3, I firstly provide relevant information about fieldwork and data collection. Subsequently, I present features of phonetics and phonology, grammar and syntax, as well as lexis and pragmatics for the Gilbertese language in Section 3.2, and for the English language in Kiribati in Section 3.3. Including both languages allows for systemic differences as well as for probable substrate influence in Kiribati English to be recognised. Together with a description of aspects of language use in Section 3.4, this chapter provides a holistic sociolinguistic profile of Kiribati, with particular focus on the English language. I close this chapter with a discussion of labels for and models of World Englishes in order to show that the English variety of Kiribati – formerly a British colony – has indeed an uncommon trajectory.

In Chapter 4, I present the findings of an in-depth investigation of alveolar plosives in Kiribati English. At the outset, in Section 4.1, I describe how 3’300 tokens were extracted from recorded conversations and annotated for social and linguistic information. I then provide the results of a first

analysis in Section 4.2 which demonstrates that I-Kiribati speakers of English realise alveolar plosives as 10 different variants. Infrequent realisations allow for an only superficial inspection. Affricated variants of alveolar plosives – [tˢ] – are evidently much more frequent and thus deserve a closer investigation; relevant literature and statistical findings are presented in Section 4.3. The most detailed analysis is then carried out on durational properties. Of particular interest is the voice onset time (VOT), the duration between the burst release and the onset of voicing on a following segment, by means of which phonemic contrasts between plosives produced in the same place of articulation can be established. Section 4.4 contains relevant literature and statistical findings. Summing up and further discussing the results of these three analyses in Section 4.5, it becomes clear that affricated variants help to establish a phonemic contrast between English ‹T› and ‹D› (why these and not other symbols are used here will be made clear). Among other things, they are frequently used, occur in virtually all phonological contexts, and have longer average VOTs than aspirated variants for virtually all speakers analysed. Moreover, the observable linguistic and especially social effects provide further interesting insights about the sociolinguistic reality of Kiribati.

1.4 Notes on terminology

The 16 islands from Makin to Arorae were once called *Tungaru*, a name that is rarely used today. Later, on account of his discoveries in the late 18th century, they were named after Captain Gilbert. Since political independence in 1979, however, the 33 islands of the Gilbert, Phoenix and Line group have been known as Kiribati. It is necessary to briefly explain how I use these and other names and expressions for islands, peoples and languages in this dissertation.

Firstly, I consciously write about the Gilbert *islands* with a lower-case first letter on the second word; and similarly Phoenix *islands*, Line *islands*, Ellice *islands*, Marshall *islands*, Solomon *islands*, and so on. This is in order to signal that I am referring to specific islands or island groups, but not necessarily to the political entities they have at some point been made into, like the Gilbert *Islands* Protectorate or the Gilbert and Ellice *Islands* Colony.

Secondly, although often referring to times before Captain Gilbert's voyage, I use the adjective *Gilbertese* as a descriptor for anything of the Gilbert islands preceding 1979. A notable exception is my use of the same term for the language spoken on the Gilbert islands of old, which is of course much the same language of today. *Kiribati*, clearly, refers to the politically independent nation; *I-Kiribati* translates to 'of Kiribati' and is commonly used as the name of to the inhabitants.

Thirdly, I use the Gilbertese names for the 33 islands of Kiribati, regardless of whether it is an older or a newer name. It is simply how I-Kiribati talk about these islands most of the time. In cases

where there are two names both of which are relatively commonly used, I sometimes give the non-Gilbertese name in brackets, like on the map on page xiii.

Two final comments concern linguistic terminologies. To begin with, I often compare or juxtapose aspects of the English variety of Kiribati to other *World Englishes*. Mesthrie and Bhatt (2008) point out that, since British English is "not generally studied within this paradigm" (p. 3), this expression may not be ideal to refer to all English varieties around the world. However, I find that their preferred alternative, *English Language Complex*,[1] makes matters unnecessarily complicated for the purposes of this dissertation. I therefore indicate here that I use the expression *World Englishes* with what is its literal meaning: to refer to Englishes of the world, without any exclusions.

As for the English language in Kiribati, I use a number of expressions interchangeably: *Kiribati English*, *English in Kiribati*, *the English variety of Kiribati*, and other similar constructions. On account of Kiribati's historical background and sociolinguistic profile that will be described in Chapters 2 and 3 respectively, I regard the expression *Kiribati English* not a good fit; in Section 3.5, I discuss relevant labels, models and terminologies in more detail and explain how I arrive at this conclusion. However, with the exception of discussions explicitly aimed at narrowly defining different terminologies like in Section 3.5, I do not see the maintaining of such a distinction elsewhere as necessary. Therefore, I use any of the above constructions to refer to the English language in Kiribati, without making subtle definitional implications.

[1] The authors use the terminology suggested by T. McArthur (2003).

CHAPTER 2

Kiribati's past, present and future

The 33 islands that would eventually become Kiribati have been discovered and re-discovered by Europeans relatively recently; more constant contact with Europeans was only established in the late 18th century. The inhabitants of these remote and isolated islands were introduced to Christianity, to trade opportunities and exploitation, and to a British ruler who was preoccupied with the mining of phosphate and otherwise largely absent. After experiencing the Second World War and subsequent nuclear tests on their own soil, the Gilbert islands are still in a state of dependency today, despite being politically independent since 1979. In the present chapter, I aim to provide an overview of these and many more relevant events in the history of the Gilbert islands, as well as of important developments in Kiribati today.

This discussion follows a quasi-chronological order, with the exception of Section 2.7 which is dedicated to Western education since its introduction in the mid-19th century: in order for it to be understood in context, its analysis requires for historical, geographical, economic, social, cultural and political aspects to be revisited.

2.1 First contacts

The following paragraphs, as well as the complementing Figure 2.1, provide an overview of how the Gilbertese islands were created according to oral tradition, how they became populated, how early contacts between the islanders and the outside world were first established, and how such contact has impacted Gilbertese island life, especially through labour trade in the 19th century. This necessitates a critical discussion of earlier accounts whose presented information has become accepted despite being inaccurate: looking into reliable descriptions and numbers allows for a more realistic assessment of how the Gilbertese islands were impacted during the first decades of foreign contact.

Figure 2.1: Important events between 1521 and 1979.

2.1.1 Creation and settlement

The Gilbert islands were once called *Tungaru*. There are many legends about their creation and the human beings that became their inhabitants.[2] Some aspects are disputed, but it seems to be agreed that the story of the Gilbertese people has its beginnings in Samoa: it is the home of Nareau who created spirits; in turn, these spirits helped him create and shape the world and ultimately became the human beings to inhabit it (see for instance Grimble, 1952, or Talu et al., 1979). This, however, only reflects that there was a recent population movement from Samoa while, despite some remaining uncertainties, linguistic as well as biological evidence indicates that the Gilbert islands were first settled 4'000 to 5'000 years ago by people from the Southeast Asian region travelling through other Micronesian islands, probably the Caroline and Marshall islands (Macdonald, 2001, p. 1;[3] Talu et al., 1979, p. 11). Samoans only reach the Gilbert islands somewhere around 1400 AD, an estimate both Grimble (1933) and Maude (1963) arrive at after talking to guardians of family trees and ancestral stories.

The inhabitants of the Gilbert islands lived off whatever the soils and the seas supplied them with. They fished in the lagoon or the ocean, and dug wells for drinking water and pits for *babai* (swamp taro). Palm trees and pandanus trees were not only further sources of food, they also provided the main building materials for huts, mats and clothes. Unsurprisingly, land became the most important and most valuable possession, like in many other Pacific societies.

The emerging island communities were either regulated by a *uea* (king) or by *unimwaane* (male village elders). Conventions were held in the *mwaneaba*, a highly-rule governed public meeting house that served multiple purposes: from celebrations and formal meetings to less organised events and every-day life. As part of both their communal rights and communal obligations, every family had their own dedicated partition of the *mwaneaba*, called *boti* (for more in-depth discussions on *mwaneaba*, see for instance Grimble, 1989, or Maude, 1980).

It is in this setting that traditions and customs were born that were to become *te katei ni Kiribati* (the Kiribati culture). Contact with the outside world may have changed many an aspect, but these traditional roots are still strong and have their place in modern Kiribati life.

[2] See Appendix A.1 for two narratives that have been passed down.
[3] Macdonald (2001) is frequently quoted here as it provides an excellent overview of historical events up to Kiribati's independence in 1979. A first version of his book was published in 1982 by the Australian National University Press.

2.1.2 Sightings and discoveries

It was not long after the Samoan arrival that Europeans sighted the first islands of what today is Kiribati. Maude and Heyen (1959) and Maude (1961) analysed a great many logbooks and other sources which allow them to reconstruct this contact history and even to rectify certain fallacies that have made it into the annals of Kiribati history – where they sometimes unfortunately remain. Therefore, the years and explorers they list do not always correspond with those of other sources (see for instance the *Historical dictionary of the discovery and exploration of the Pacific islands* by Quanchi & Robson, 2005). It is evident from the timeline presented in Figure 2.1 above that there have been two waves: a first wave of explorers sailed under the Spanish flag, between 1521 and 1606,[4] and a second wave mostly but not exclusively under the British, between 1765 and 1828. It seems quite certain that one of the Pacific islands discovered by Magellan and his crew was in fact Flint Island in the Line group, and that they therefore were the first Europeans to ever lay eyes on a Kiribati island. This was in 1521. Then, 16 years later, another seafaring crew departed from Peru and, after not finding any land in the Eastern Pacific, proceeded to kill their captain, Grijalva, sailed westward and sighted Kiritimati (Christmas Island), another Line group island, and later one island of the Gilbert group, most probably Nonouti (Maude & Heyen, 1959, pp. 294-297). It is by sheer coincidence that they passed right through the Gilbert group and only spotted one island. Maude and Heyen are confident in identifying the discoveries of a third crew in 1606 as Caroline Island in the Line group as well as Butaritari and its small neighbour Makin in the very north of the Gilbert group (pp. 310-319). The captain, Quiros, did not seem to care much about his discoveries, as is also evident from the short entry upon his sighting of Butaritari: "It was decided not to approach it nearer, as it was not convenient, and for fear of rocks" (reported in and translated by Markham, 1904, p. 287).

The seafarers under the Spanish flag, then, may have been the first Europeans to see some of the islands that would later become Kiribati, but they neither seemed very interested in them nor did they make contact with the indigenous people. First contacts with Gilbertese were in fact only established in 1765 and later by the seafarers from the second wave who, in many cases, made their discoveries, or sometimes re-discoveries, because the islands lay on new trade routes. Noteworthy are of course the routes sailed by Captain Gilbert and Captain Marshall in 1788, described in more detail by Maude (1961). Sailing in company from New South Wales to China, they spotted at least six islands.[5] Among them was Tarawa whose sighting Gilbert signalled to the second ship: "although he courteously invited Marshall to name the first islet . . . Marshall reciprocated by calling it Gilbert's island" (p. 80).

[4] The travel routes of the Spanish explorers are depicted in a map in Appendix A.2.1.
[5] These islands were Kuria and Aranuka, Tarawa and Abaiang, as well as Butaritari and Makin, leaving three islands unaccounted for: Abemama, close-by the first two islands, may or may not have been sighted; Maiana must have been passed in close proximity and only missed due to a dark and rainy night; finally, Marakei lay too far east (Maude, 1961).

At the end of the second wave of discoveries, a Russian explorer and cartographer, Adam von Krusenstern, named the entire island compound from Makin to Arorae after Captain Gilbert. The name has stuck. It is pronounced by the Gilbertese [kiɾibɛs] (see Chapter 3 for relevant linguistic discussions), hence the contemporary spelling, which now stands for a region that not only encompasses the Gilbert group but also the islands in the Phoenix and Line groups.[6]

White foreigners in the Gilbert group were given the name I-Matang, a term that deserves explaining. In the Gilbertese tradition, Matang is a sacred island. As Grimble (1952) puts it, it is "the land of heart's desire, the original fatherland, the paradise sweeter than all other paradises" (p. 41). The ancestral spirits and gods who live there are said to be fair-skinned and blue-eyed. The humans have lost their right of passage, but were promised the return of the I-Matang – literally, those from Matang. So, when the first, white-skinned Europeans arrived in the Gilberts, the islanders associated them with their ancestors from Matang.[7] The term is still very much in use today, in reference to all white people, regardless of their country of origin, as well as in reference to the non-local culture and a Westernised world.

2.1.3 Whalers, traders and beachcombers

Between 1765 and 1828, the presence of Europeans[8] in the waters of the Gilbert islands clearly grew, but Macdonald (2001) accurately summarises:

> Before the 1820s contacts between Europeans and Islanders were so brief and infrequent that those who visited the islands were more important as heralds for the future than for any changes in island life directly attributable to their presence. (p. 16)

It was only after the second wave of explorers that contacts began, very slowly, to increase in number – with the arrival of whalers, traders and beachcombers. According to the same author, about 1'000 ships called at the islands of the Gilbert group and the Ellice islands (later administered as a protectorate and colony together with the Gilbert islands and today the independent nation of Tuvalu) until 1870, most of them in the southern Gilberts where there was "a frequency of shipping and a degree of contact with foreigners *that has not been matched since*" (p. 24, my emphasis[9]). In earlier days, Gilbertese communities were regulated in such a way that made sure its members had sufficient access to resources

[6] Appendix A.2 provides a more detailed account of the two waves of discoveries.
[7] The second narrative in Appendix A.1 is a version of this legend. It is eerily similar to the biblical description of paradise and humanity's expulsion from it.
[8] As is the case with other accounts, the term 'European' is used in reference to an ethnicity rather than a continent, unless otherwise stated.
[9] This is striking not just because the southern islands of the Gilbert group had so much contact in the 19th century, but also because they have so little today.

and produce. This was ensured by a system centred around *bubuti* which translates to 'request' as well to 'demand'. Its uttering creates a social contract and requires the fulfilment of the request, while also implying reciprocity.[10] The *bubuti* system was complemented by a *tia babaire*, which is today translated as 'village chairman' but literally means 'distributor': his task was to make sure resources and produce were given to those who, at a given time, did not have enough. While contact with whalers did not do away with either the *bubuti* system or the *tia babaire*, a new form of trade along with new products and technology was introduced: in exchange for firewood and foods like coconuts, fermented or 'sour' toddy, the Gilbertese acquired iron tools such as shovels and knives, as well as chickens, pigs, dogs and tobacco. The last was a disastrous novelty. Adults and kids alike became addicted, and everything was sold at any rate; sexual intercourse as a currency for tobacco was not seldom. In the northern Gilberts, coconut oil became an important trade good.[11] This was a very lucrative business for both parties – and to this day, this industry is a very important income source for many I-Kiribati.

It is worth noting that the whalers hardly ever went ashore but conducted most of their trading business on the ships (p. 17). There were, however, a small number of seamen who asked to be discharged or simply deserted ship and set foot on the islands. Maude and Leeson (1965) state that there must have been at least 16 by 1841 and 50 in the 1860s, and that these beachcombers generally assimilated to the island customs in as many ways as possible, also for the sake of their safety (p. 401). Most of them moved on after a year or two and only few remained for longer so that there was "a constant turnover in the membership of these small European settlements, few of which ever had more than a dozen members at any given time" (Macdonald, 2001, p. 21).

Vice versa, there were Gilbertese islanders who served on board whaling vessels. They acquired cultural knowledge and even English, little though it may have been, so that they became cultural and linguistic mediators upon returning. Their wondrous stories were told in the village *mwaneaba* and, among other things, helped to generate a desire for learning English (Pannu, 1993, pp. 55-56; Talu et al., 1979, p. 32).

2.1.4 Labour trade in the 19th century

By 1870, when whalers had virtually disappeared (Macdonald, 2001, p. 16), other seafaring crews had already arrived, with the intent to take Gilbert islanders as labourers to overseas farms, mines and

[10] The *bubuti* system worked very well when all that the Gilbertese had could be produced from their natural environment. It is more problematic to apply this system now with non-natural goods, but it is still in practice and part of the Kiribati culture today.
[11] Coconut oil is the produce of dried coconut flesh. At early stages, the I-Kiribati sold the finished product, but for many years now, they have been selling off the dried flesh, which is called copra.

plantations. Especially at first, as early as 1847, many were hunted down like game, threatened with arms, raided at night or after their canoes had been forcefully capsized, lured on ships on the pretence of trade opportunities and then driven off either immediately or after they had fallen asleep, kidnapped, or made deceitful and false promises to, of bibles, religious instruction, or simply food (Macdonald, 2001, pp. 58-59). There are many reasons to believe that later, however, the Gilbertese were willing to work overseas, despite the rather harsh conditions in the new destinations. To start with, they could not possibly fully understand what they signed up for and felt "a desire to escape local warfare or communal obligations, a sense of adventure or wanderlust, a desire to earn money with which to acquire the products of Western technology" (Munro & Firth, 1987, p. 27). The readiness of Gilbertese to leave and work overseas also becomes apparent when taking into consideration that it provided them with an alternative to even harsher conditions on their home islands where there were droughts and, paradoxically, "torrential rains" destroying palms and crops (p. 28) – of course the promise of food does not fail to lure many away from their home islands where a great number died of starvation in this period. Famine, then, was also one of the reasons why Gilbert islanders often went overseas as entire families: survival would have been even more difficult for women and children had they been left back (Macdonald, 2001, pp. 60-61); moreover, women and children were attractive labourers as their transport and work costs were much lower than those for men (Bedford, Macdonald, & Munro, 1980, p. 219). As presented in Table 2.1, the principal destinations where Gilbert islanders were brought to during the labour trade years between 1847 and 1895 were Fiji, Samoa and later Hawaii, which are relatively close-by, while others were also transported as far as Central and South America, Australia, or even Réunion to the east of Madagascar.

Munro and Firth (1987) set the number of adult Gilbertese who participated in this trade, voluntarily or not, at around 9'400; including children and others who never made an appearance on official documents, Macdonald (2001) raises this estimation to some 10'500. Both numbers, however, represent absences rather than individuals: there were a few Gilbertese who served on two or even three separate occasions. When considering the demographic information available for this period, a substantial population decline is suggested: early sources provide population numbers as high as 54'000, while later ones from the end of the labour trade are as low as 25'000. In her critical article, N. McArthur (1970) points out that conclusions of that kind are not uncommon for islands whose populations were only guessed "based at best on the circumference of the island, and perhaps the numbers of people who flocked to the beach to see the wondrous foreign ships" (p. 1099); but more often than not, such conclusions are erroneous. This is also the case for the Gilbert islands. Bedford, Macdonald and Munro (1980) reanalyse the available accounts and propose that its population in 1860 cannot have been substantially bigger than 35'000; accounts for later years are much more accurate. There is, then, still a population decline of approximately 10'000 over almost half a century, but that is clearly not as much as earlier, invalid sources suggest. It is worth noting, however, that the population decline in the Gilberts is not solely due to the labour trade: Bedford et al. also investigate other, local

Table 2.1: Labour migration of adult Gilbertese between 1847 and 1895; numbers represent terms served.
(Source: Munro & Firth, 1987, p. 25.)

Destination	**Year(s)**	**Gilbertese**
New South Wales	1847	22
Réunion	1857	51
Peru	1863	312
Fiji	1866-1895	2'398
Samoa	1867-1895	ca. 2'500
Tahiti	1867-1885	889
Hawaii	1877-1887	ca. 2'000
Central America	1890-1892	ca. 1'000
Line Group	1890	90
Queensland	1895	155
Total	*1847-1895*	*ca. 9'400*

factors such as mortality, fertility, diseases, warfare and the abovementioned droughts, and arrive at the conclusion that "the net loss from labour migration probably did not exceed 5'000 and may have been substantially less" (p. 227). What remains is the fact that a rather large fraction of the Gilbertese population participated in the labour trade, and that a large fraction of participants did not return.

Towards the end of the 19th century, the labour trade in the Gilbert islands became increasingly restricted due to regulations imposed by a new colonial ruler. How this political change was announced and implemented, as well as how labour migration continued in the 20th century, will be outlined in Section 2.3.

2.2 Early missionaries

Before investigating political developments, the work of missionaries in the Gilbert islands is discussed, as their arrival coincides with the early phases of the labour trade during the 19th-century. Missionaries played an important role in the Gilberts. In contrast to temporary visitors like whalers, traders, beachcombers and others who spent a finite amount of time on the islands, Christianity and foreigners who came to promote it eventually gained a foothold and remained. Besides religious services, secular education was introduced and languages other than Gilbertese served as medium of instruction. Peculiarly, however, English was not prioritised, at least not by early missionaries.

2.2.1 American Board of Commissioners for Foreign Missions (ABCFM)

The Protestant American Board of Commissioners for Foreign Missions (ABCFM) announced its presence in 1852 when their Micronesia tour brought them to the northern island of Butaritari. With a trader acting as interpreter, they made their purpose known. Three years later, the ABCFM sent a crew back in order to scout the most convenient island. The choice fell on Abaiang due to its proximity to other populous islands, and in 1857, Hiram Bingham arrived. Over the course of the next few decades, Hawaiian missionaries were sent to most of the northern and central Gilbert islands, as far as Tabiteuea, and worked under his supervision for the most part, until 1917 when the ABCFM withdrew.

There are many reasons why the ABCFM was not successful. Failure was imminent, for instance, because of the way the missionaries chose to approach the communities. In one, maybe two visits, Bingham would introduce the mission to an island community, as well as the missionary who was to be stationed there (Rennie, 1985, p. 118). In order to gain a foothold and reach as many people as possible, the local leaders were approached. However, on most northern and central islands, local leadership was fought over by chiefs, and association with one leader meant disassociation from others. Therefore, consciously or not, the ABCFM picked sides in their choosing a leader. The southern islands did not present the same obstacles as communities were led by councils of village elders, but these islands were largely ignored by the mission (see for instance Werber, 2011, p. 106, for an overview of the political form of leadership on the individual Gilbert islands). Hence, the missionaries often found themselves in difficult positions, even in the midst of wars,[12] and the potential membership of a Protestant church was already limited.

The motives of the relatively few who showed interest in Christianity were also not exactly those the mission sought after: while the poor, the landless and the women accepted it because they found hope and love in it, others would simply regard this novel religion as an addition to their own and the Christian god as one that was similar to their many other *anti* (gods or spirits); often, too, islanders turned to it in the hope of victory in war, or because they "viewed the laws emanating from missionary teaching as a viable alternative to war in ordering and controlling . . . people" (Rennie, 1985, pp. 113-114). Consequently, the islanders were only moderately enthusiastic about adopting a new religion and only showed little interest in it.

There was more interest as far as secular education is concerned. Both Macdonald (2001, p. 35) and Rennie (1985, p. 58) report of chiefs who expressed their desire to gain new knowledge, even to learn the English language. In one case, a chief even began the construction of a non-missionary school (Rennie, 1985, p. 235). Bingham, however, paid more attention to his linguistic work than to teaching

[12] Abaiang was itself divided and at war with its surrounding islands, mostly Tarawa to the south. The assessment of the ABCFM that there was or would be an established leader was wrong and there could not have been a "more inappropriate place" for them to select (Rennie, 1985, p. 44).

– or preaching for that matter –, cared little about children and their schooling (p. 229), acted in accordance with ABCFM mission aims by only teaching in the local language (p. 213) and, when criticised, went so far as to write:

> I do not think it at all probable that English will ever be generally read or spoken by the Gilbertese. Their islands are such wretched abodes for human beings that white men will never go to dwell in numbers among them. (Reported in Rennie, 1985, p. 298)

Had Bingham or the ABCFM as a whole decided to focus on education earlier, their mission work may have been more successful. In fact, the school that was built on Abaiang in 1871 would eventually also substantially increase the attendance of services. Bingham seemed to have been much more of a scholar with an obsession for translation work; teaching, preaching and the supervision of his Hawaiian missionary staff came after. On the one hand, he published a bible dictionary, concordance and various commentaries by 1895 (p. 289), and printed eight editions of a completely translated bible before his death in 1908 (p. 289). On the other hand, he refused to produce shortened, simplified and illustrated bible stories, material that was highly successful for the Sacred Heart Mission (discussed below), until 1906 when it was already too late. Bingham is well remembered today for being the first missionary in the Gilbert islands.[13] In reality, however, he had very little direct and immediate influence on Christianisation. His principal contribution is a bible translation, a Gilbertese writing system, and a Gilbertese dictionary – albeit not the first to be published. Moreover, these linguistic achievements have greatly and for a long time supported the work of all missions present in the Gilbert islands, as well as that of colonial administrators (Pannu, 1993, pp. 40-41).

On the whole, the ABCFM was a failure in the Gilbert islands. The ways it attempted to gain a foothold were problematic, to say the least. Only in Butaritari and in Tabiteuea was there some, short-lived, success. In the former, the political situation was more favourable than on other war-torn islands as there was one, well-established king. In the latter, the two Hawaiian missionaries not only found local tensions when they arrived there, they themselves took to arms and opted for, as Macdonald (2001) puts it, "conversion by the sword" (p. 37). In 1880, they led their followers on a "crusade" (p. 38) against other villages where the *Tioba* (Jehova) cult was predominant, and massacred hundreds of people. The exact number of deaths is uncertain: Macdonald reports two estimates, one of at least 373, the second of at least 600 (p. 38); Rennie (1985) also speaks of approximately 600 (p. 192), Talu et al. (1979) of more than 1'000 (p. 56). What is certain, however, is that only very few indeed were spared.

Besides problematic or even outright horrific attempts to gain a foothold on the islands, the ABCFM's lack of success can further be explained by its religious teachings that were seemingly incompatible with the pre-existing island culture, and by the neglect of secular education for which there was interest among the islanders. By the 1890s, there was not enough money, manpower or

[13] See Appendix A.3 for Bingham's memorial on Abaiang.

success. Rennie (1985) poignantly states: "the mission was doomed" (p. 284). In 1917, the ABCFM transferred their work to the London Missionary Society (LMS) and withdrew from the Gilbert islands. Christianisation had not been achieved. However, the mission helped to introduce new religions. Even more, it helped to introduce other Western ideas and ideals as well as literacy, and it surely had certain impacts on the social and political structure of Gilbertese culture: as a direct result of the contact between missionaries and islanders, courts, juries and policemen have been appointed, laws created, fines introduced, roads built, and the first steps in the direction of more centralised as well as unifying structures taken. Such novelties and changes may not have affected all islands and some may have been short-lived, yet they have had a first introduction and a first application.

2.2.2 London Missionary Society (LMS)

The second Protestant mission, the London Missionary Society (LMS), entered the GEIC only through chance. A teacher from the Cook Islands drifted to Nukulaelae in the Ellice group where he remained for several months until pleading for further teachers (Macdonald, 2001, p. 40). In 1865, LMS staff arrived in the Ellice group. Expansion to the Gilbert islands followed in 1871, and mission stations were established on Beru, Nikunau, Tamana and Arorae, the southern-most islands of the Gilbert group, until 1875. Most pastors were Samoans. Their European supervisors generally only frequented the islands as visitors and it was not until 1900 that a first of them settled on Beru and built the mission's headquarters (Sabatier, 1977, p. 185)

Like the ABCFM, the LMS, too, experienced language difficulties and had to overcome problems posed by conservative political structures that were often not entirely stable as well as by the absence of a centralised authority; they, too, were outsiders and unable to offer material benefits otherwise inaccessible to locals (Macdonald, 2001, p. 42). Gaining a foothold was not easy and usually necessitated that pastors sought "the protection of island authorities and a degree of community tolerance" (p. 45). But before long, the LMS was well-established and began to transform all aspects of Gilbertese life in substantial ways. The new was introduced, and the old was done away with: shrines and totems were destroyed, skulls and other relics buried; in their stead, Sabbath needed to be observed, and church attendance became mandatory at least on some islands; dancing was banned "unless words and gestures had been cleansed and approved by the pastor" (p. 45). The mission also attacked traditional forms of marriage and sexual relations that did not conform to Christianity. Gradually, the LMS manoeuvred itself into a position where it had more power than the village chiefs and started to instantiate new laws, punishments and the policemen to carry them out. Macdonald summarises that "as a matter of policy the LMS tried to make its churches the centre for all village activities" (p. 44).

As far as education is concerned, the LMS played an important role in establishing a basic level of literacy on the southern Gilbert islands that were beyond the reach of the ABCFM. Very early on, there were classes held for one or two hours every day except on Sundays. Doubtlessly, the LMS was more active and efficient than the ABCFM in pursuing educational goals, but it also had the advantage of relying on the biblical works already translated and prepared by Bingham and his fellowship. Otherwise, however, the language of church and school was Samoan (Macdonald, 2001, p. 42). After the headquarters of the mission had been established on Beru in 1900, there were highly successful schools for boys, girls and primary teachers whose attendees came not only from Beru but also other islands (Sabatier, 1977, p. 251). There was also a radio station and a printing press (later used for the mission's quarterly magazine).

In contrast to the ABCFM, the LMS was rapidly expanding so that by 1890 it was a "virtually unchallenged power" (Macdonald, 2001, p. 49). The southern islands had, by that time, more contact with whalers and recruiters (as discussed in Sections 2.1.3 and 2.1.4) which resulted in fewer obstacles that had to be overcome. Another reason for this success was certainly that the form of Christianity arriving in the Gilberts was an already modified version as it was taught by Samoan pastors (p. 42). It was more conform to the traditional values of Gilbertese societies than more European forms that perhaps the ABCFM tried to promote. However, the introduction of Protestant Christianity through both missions transformed Gilbertese life to a great extent. Even though acknowledging that many traditional beliefs and lifestyles prevailed alongside those of a new religion, Macdonald describes these changes as a "social revolution" (p. 49).

2.2.3 Sacred Heart Mission (SHM)

Catholicism was first introduced to the Gilbert islands before 1880, through islanders returning from their labour terms overseas as catechists. Since 1883, two such returners made repeated requests for a priest, but it took until May 1888 that the first three missionaries of the Sacred Heart Mission (SHM) landed on Nonouti. In the meantime, however, they had remarkable success, with 560 baptisms and around 600 students (Sabatier, 1977, p. 168). No time was lost. Expansion on Nonouti as well as to other islands happened within only a few months. Father Sabatier (1977), of the SHM, reports that by 1894 the mission had already gained a foothold on six islands and baptised 5'300 people, by 1915 had expanded its influence to all islands except Tamana and Arorae in the very south of the group, and that by the late 1930s, when he wrote his book, 38'622 people had been baptised, approximately half of the Gilbertese population was Catholic, and almost all islands had a cement church – paid for through the islanders whose contribution was about a year's worth of income (p. 290).

However, the SHM had to face issues similar to the missions arriving in the Gilbert islands before them. They, too, suffered from a lack of finances or personnel especially in their earlier years so that there were periods for several islands where only visits were possible instead of having a missionary stationed there. Travelling and communicating was no less an issue, as the first mission ship was only acquired in 1938. However, the Catholic mission had an added difficulty as it arrived as a rival to the Protestant faith and was therefore often greeted with hostility and opposition. There were insults and threats, and on Beru, the LMS even went as far as to spread the rumour that the Catholic missionaries were cannibals (Sabatier, 1977, p. 245). When the Gilbert islands became a British protectorate in 1892 (see Section 2.3.2), conditions further worsened with the active interference of Resident Commissioner Campbell who would have liked to restrict Catholicism to limited parts of only five islands (p. 318). He put many obstacles in the way of the SHM and forbade or tried to prevent their landing on an island. On Nikunau, he outright banned Catholicism, confiscated their houses, closed their schools and sent them away (p. 236); on Tabiteuea, he secretly ordered the destruction of a Catholic church (p. 319); on Maiana, he had a young boy publicly flogged for going to a Catholic school against his father's wishes (p. 283); on Marakei and Onotoa, he forbade people to support the missionaries or to convert and had those imprisoned who disobeyed (pp. 319-320). Until 1909, not one SHM church was effectively registered.

In spite of the many obstacles posed by the Protestants and a young government, the SHM expanded quickly. One reason for this success was the mission's focus on education. From the outset, classes were just as much a part of the daily structure as prayers. Sabatier (1977) describes that formal instruction served as a means to an end as it could lead to material profits as well as prestige: he says there was a "mad stampede for knowledge" (p. 186). The many schools that were established by the SHM were generally gender-separated unless there was a lack of personnel. With regards to catechism which aimed at producing locals capable of instructing other locals in religion, the SHM adopted an aggressive approach indeed, as is evident from Sabatier's metaphor where the recruiting process is likened to the turning of "cannons recently seized from the enemy against them" (p. 299). For both children and catechists, the language of instruction was Gilbertese. About the latter, Sabatier writes:

> They were given only the merest trace of English. These men, aged between twenty and fifty years, would not successfully master a foreign language. They would only teach in Gilbertese. This small race of people need to keep their own fine language, for from it comes much of their personality, charm and happiness. It would be a crime to remove it – and to what purpose? (p. 302)

It is noteworthy that, although expressed in a seemingly much warmer tone, this quote is eerily similar to Bingham's assessment of the uselessness of the English language in the Gilbert islands. It is in accordance with this stance, then, that the mission generally only produced books and other materials in Gilbertese.

Other reasons for the relative attractiveness of Catholicism are found in the nature of the missionaries in comparison to their Protestant counterparts. Firstly, while the Samoan LMS pastors became known for their avarice and luxurious lifestyles, the SHM missionaries were perceived as generous on account of their willingness to pay for their food and building materials as well as their giving gifts (Macdonald, 2001, p. 51); they were also more tolerant with regards to customary lifestyles and morals (p. 52). Furthermore, their religious instruction often invited relaxed discussions and active participation, allowed for sitting or lying comfortably, and included the telling of stories, biblical or other (Sabatier, 1977, p. 186).

The arrival of early missions in the Gilberts meant increasing contact with foreigners and introduced Western beliefs, values, and education. As discussed, English was not at all a language that was prioritised by the missionaries, but many among the Gilbertese recognised its usefulness and felt the desire to learn it:

> The islanders were showing a degree of maturity in their judgements towards the utility of the foreign language. Perhaps they were foreseeing more contact with the Europeans which would benefit their communities in furthering trade links, job opportunities on ships abroad and some employment at home with the Missions and the resident traders, if they acquired a sufficient competence in English. (Pannu, 1993, p. 59)

Unfortunately, however, it was not until after the Second World War that different stances were taken and the teaching of the English language became a priority.

2.2.4 Excursus: The Swords of Gabriel

Protestants and Catholics in the Gilbert islands were rivals ever since they came in contact with one another. To some degree, these rivalries prevail to this day. However, possibly the most peculiar clash of these two Christian confessions took place on Onotoa in 1930.

The events were recorded by Maude (1967) who, at that time, was District Officer; he would later become Resident Commissioner. Maude reports that, apparently as a result of a rather trivial issue over trading rules, the predominantly Protestant population of Onotoa became hostile towards its Catholic Island Magistrate. An LMS pastor proceeded to gather his fellowship around him, to conduct religious rituals that reached from usual acts such as praying and singing, to more unusual praying in cemeteries at night, dream-interpreting and faith-healing. He claimed to have been chosen by God as a prophet and soon predicted the end of the world. On the prophesised day, July 15, almost the entire population of Onotoa was assembled around him with only sceptics, the aged, the infirm and Catholics

staying in their villages. The end of the world did not come. Neither did it on July 29. On both occasions, either he or others received signs that sinners, Catholics and especially the Island Magistrate were to blame. In the meantime, people experienced pains and fits. One woman became known as Jesus Christ the Sufferer who could sense sins being committed; another became known as Jesus Christ the Forgiver, who had the power to forgive those who came forth and confessed and so released the Sufferer from her pains. More curious events followed. On one occasion, people otherwise ignorant of the English language began to speak it fluently, some only momentarily, others for an entire two days. Then, people saw lights and images and could identify the Swords of Gabriel in them. Consequently, three men became known as the Swords of Gabriel and commanded a group of 20 soldiers who dressed in red *be* (light towels worn as skirts) and marched in military formation; the female counterpart consisted of the two Jesus Christs leading about 60 so-called sheep. Soon, people started to die but could be resurrected by the singing of the sheep or through the power of the leading LMS pastor who, by then, was called prophet or God. On August 5, when the end of the world was finally to come and land had been cleared for New Jerusalem or Paradise, the sect was again disappointed. A few days later, God (the pastor) headed "a procession consisting of seven mission pastors and teachers, three Swords of Gabriel, 14 soldiers, about 40 sheep, and three Jesus Christs" (p. 126) to the Magistrate's office. When he was not struck down dead after formulaic attacks, the Magistrate was physically hit and a fight broke out. While the Magistrate was effectively injured, the Protestant leader remained unharmed, nevertheless it was called out that he had died and that the Catholics were to pay. And pay they did. Not only were people injured, two were even beaten to death. Those who got away hid with relatives. Another 39 fled to neighbouring Tabiteuea in canoes during the night. On August 13, two days after this incident, the Catholics were advised to assemble and to convert to Protestantism, else they should be dealt with by the Swords. On the same day, however, Maude and his colleagues who had been called for help arrived on Onotoa. Not left with a chance to prepare, order was restored rather quickly. The fanatic movement was fading, although there were still incidents of apparitions, of tidal waves being prophesised that would sweep away the Catholics and government officials alike, and of people dying and being resurrected; one person continued to talk to God (not the pastor) by means of a crude wireless station.

Maude (1967) identifies the many similarities to other fanatic movements that there certainly are, but according to his judgment, the events occurring on Onotoa were not introduced from outside the island but arose spontaneously (p. 134). He concludes his report with the prediction that the movement would have transformed into

> a nativistic sect outside the orthodox [LMS] communion, combining transferred and modernized elements of traditional beliefs and institutions with a basic Christianity, and very possibly adding a varying degree of hostility towards the European administration and its local native collaborators. (p. 136)

In the aftermath, a judicial entry was made serving as a step of precaution that events such as these may not repeat themselves on Onotoa.

2.3 British rule

The abovementioned historical events brought the Gilbertese in contact with a previously unknown world with previously unknown peoples, cultures, religions and languages. It is worth noting, however, that even as late as around 1892, when the British raised their flag on the islands of the Gilbert group, there were reports of only very few foreign residents. These were only better or worse estimates which ranged from 15 to 77 (reported in Pannu 1993, p. 56), yet they strongly suggest that permanent on-island contact was relatively rare. It will become apparent from this section, addressing the beginnings of British administration, that there were not many immediate changes in that respect. Until the Second World War, the British showed only very little and very partial interest in the Gilbert islands and did not encourage British nationals to settle there. Indeed, their attention focussed primarily on phosphate mining on Banaba (Ocean Island) that led to a second iteration of labour trade.

2.3.1 British interest in the Gilbert islands

That the Gilbert islands eventually fell under British rule was very much connected to labour trade in the 19th century (discussed in Section 2.1.4 above) and slowly announced by events such as the passing of certain legislature which increased British control in the Pacific territory, over the trade and in general. The *Pacific Islander Protection Act* of 1872, for instance, not only sought to, as Macdonald (2001) states, "remove abuses from the labour trade" (p. 64), it also ensured that the British government could financially profit from the licenses it declared to be a requirement for British seafarers if they participated in the trade: one license was 500 pounds. Similarly, the *Western Pacific Order* of 1877 included claims of British jurisdiction over a number of island compounds, including the Gilbert islands, as well as other islands "not being within the jurisdiction of any civilized Power" (p. 874). While this also meant that British nationals moving or residing in the territory thusly described fell under the responsibility of a High Commissioner, the indigenous population was not explicitly included. The same holds true for the *Treaty between Great Britain and Germany relating to the Demarcation of the Spheres of Influence* of 1886.[14] The Gilbert islands happened to fall within the Western Pacific as

[14] See Appendix A.4 for a digitised version of the treaty document.

defined by the 1877 order as well as within the British sphere of influence as defined by the 1886 treaty, probably very much unbeknownst to the indigenous island communities. In fact, a lack of means to enforce the implications of regulations such as the ones listed here only caused "little discernible change in the reality of naval justice" (Macdonald, 2001, p. 64).

The Gilbert islands received attention in their own right in the years leading up to 1892. In 1888, the presence of American traders who became strong competitors led German traders to petition their home government to annex the Gilberts, but their request was refused in light of the 1886 agreement (Macdonald, 2001, p. 67). A similar attempt was made by the Deutsche Handels- und Plantagen-Gesellschaft der Südsee-Inseln zu Hamburg (DHPG)[15] which took over the plantations from J. C. Godeffroy & Sohn, another German firm. Not only were nearly all of the Gilbert labourers who were brought to Samoa employed by Godeffroy & Sohn, they also made up 30 to 40% and at peak times as much as 67% of that workforce (Munro & Firth, 1987, p. 24). Thus, both Godeffroy & Sohn and later the DHPG heavily relied on Gilbertese labour trade workers, so much so that the latter felt threatened when it became known that an American trader persuaded the king of Butaritari to travel to San Francisco and ask the US government for protection – over all of the Gilbert islands, not just the one he ruled over (Macdonald, 2001, p. 67). Consequently, the DHPG pressed their home government to ask Britain to declare a protectorate instead. Britain was reluctant, however, and concerned about the implications of costs and permanence, but since they were anxious to form an alliance with Germany against the French in Egypt, since there was a necessity to act in accordance with the 1886 agreement, and since leaving Germany to incorporate the Gilberts could not be permitted, the British protectorate was officially declared in 1892.

To sum up and re-emphasise, there are at least four key factors that can be identified which are responsible for Britain's declaration of official administration over the Gilbert islands: firstly, there were interests and efforts of a few American and German individuals; secondly, this resulted in pressure by the German government on the British; thirdly, the establishment of a protectorate served the purpose of not harming the alliance Britain had with Germany and was in need of at the other end of the world; and fourthly, the declaring of a protectorate rather than to opt for annexation implied lower costs and less supervision and left more room to withdraw again later. The British did not have a substantial interest in the Gilbert islands themselves:

> There were no plantations to protect, no labour recruiting of any consequence to maintain or regulate, and no problems of disorder which might otherwise have invited imperial intervention. The group was strategically unimportant. (Munro & Firth, 1986, pp. 63-65)

Likewise, no noteworthy reaction followed the entering of German war ships in the group after the 1886 agreement, or their destroying of canoes and capturing of chiefs (Werber, 2011, p. 95).

[15] Translates to: German trading and plantation company of the islands of the south-seas at Hamburg.

2.3.2 The Gilbert Islands Protectorate (GIP)

To begin with, what was a British protectorate? In his book, Johnston (1973) describes how this question was tossed and turned in the later years of the 19th century, especially but not exclusively in the Colonial and Foreign Offices. Many protectorates had already been proclaimed long before the various issues connected with this political form had been addressed and settled. Whether British jurisdiction would only affect British subjects or whether it would extend to people from other colonial powers or indeed indigenous communities was among the most important questions that was still unanswered by 1892, at least as far as Pacific colonies were concerned.[16] Only in an 1894 Order in Council which was legally approved a year later was it settled that all persons within a protectorate, regardless of their origin, fall under its jurisdiction – "but there was still the practical, administrative injunction to avoid interference as much as possible" (p. 255). What these legal ramifications mean and how the Gilbert islands were affected locally is discussed in the remainder of this section.

As far as the labour trade is concerned, the early years as a British protectorate may only have brought little change in terms of recruiting, but there were crucial developments on working conditions, especially in DHPG-owned plantations. With their new rights, the workers often complained against the harsh treatment by their overseers. Tensions started to rise between the foreign offices of Britain and Germany; the DHPG repeatedly motioned their government to ask Britain to put the Gilbertese under the control of the German consul in Samoa, while the British consul repeatedly advised for a ban on labour trade recruiting in response to the conditions on the DHPG's plantations (Munro & Firth, 1987). The labour trade ceased in 1896. A new period of labour migration, however, was already on the horizon (see Section 2.3.4).

It was Captain Davis who was tasked with declaring the protectorate on the Gilbert islands themselves. On May 27, 1892, he read out the official declaration and hoisted the flag of the British Empire for the first time, on the island of Abemama, and went on to do the same on the other islands of the group.[17] Additionally, he undertook several acts that had a direct influence on the island communities, acts that were oftentimes corrective of prior developments: he collected and banned fire arms and ammunition (reportedly on request by local leaders in some cases), banned liquor and card games, set up regulations concerning trade as well as penalty systems, and punished or deported troublemakers; but he also interfered in wars and declared certain chiefs involved as the single official leader of their respective island (Werber, 2011, pp. 101-103). By the end of the year, the Union Jack

[16] Concepts of protectorates or other forms of administration for colonies in the Pacific were different from those in Africa: the latter were regarded more civilised, less savage, while it was argued for the former that "it was too hard – almost impossible – to find anyone competent with whom a British official could deal" (Johnston, 1973, p. 155).

[17] This event is remembered as the coming of the flag; see also Appendix A.5.1 for a digitised version of Davis' proclamation in Abemama, as well as Appendix A.5.2 for a picture of a plate commemorating the proclamation in Taratai, Tarawa.

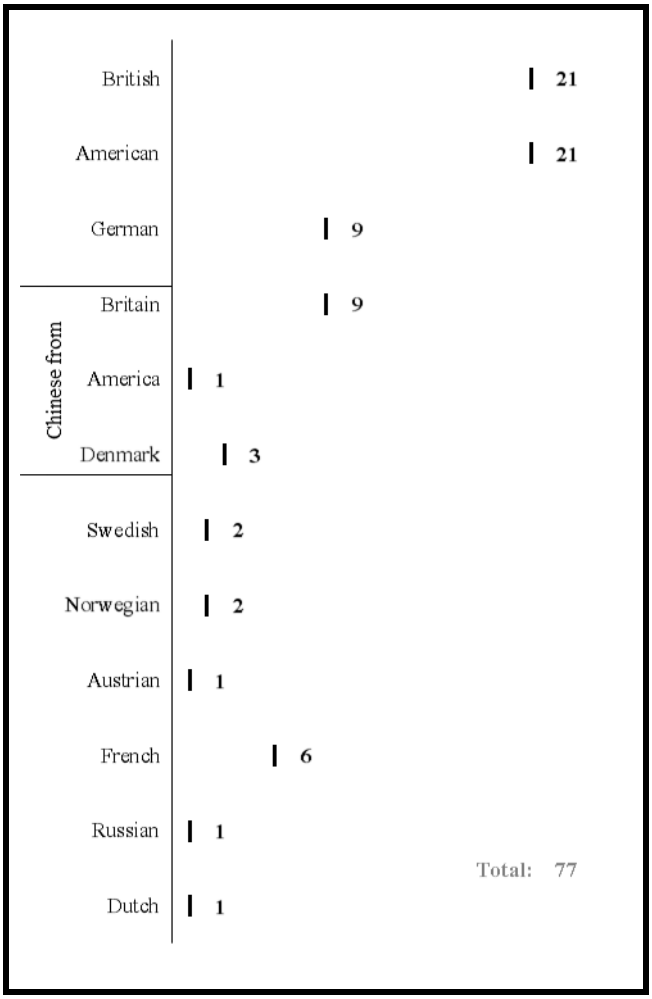

Figure 2.2: Foreigners in the Gilbert islands by 1892.
(Source: Davis 1892, reported in Pannu, 1990, p. 21.)

was raised on all the islands within the British sphere of influence, with the exception of Banaba (Munro & Firth, 1986, p. 67) which, ironically, became the very centre of interest and attention for almost a century only shortly after.

While, previously, reports of foreigners focussed on a few islands only or were constituted of estimates of questionable accuracy, Davis toured the entire Gilbert group enabling him to provide a more reliable count of foreigners at the time the protectorate was proclaimed: 77 (reported in Pannu, 1990, p. 21). As presented in Figure 2.2, most of them were British, American, German, Chinese or French. They were distributed across all 16 Gilbert islands.

In the meantime, the High Commissioner for the Western Pacific, John Thurston, managed for the British to extend the protectorate over the Ellice islands, south of the Gilberts; they were technically separate protectorates but treated as one, "for administrative convenience" (Munro & Firth, 1986, p.

63). Moreover, he was allowed to appoint a Resident Commissioner under the condition that the salary and other expenses be covered from local revenue; no staff or transport were included in this arrangement (Macdonald, 2001, p. 70). Thurston endowed Charles Swayne with the position. During 1893 and 1895, they were both involved in the establishment of a political system which served the islanders and was in accordance with their traditional forms of life and government. There was to be as little intervention as possible, but when needed to be carried out only in an advisory fashion and in the best interest of the islanders. House and village designs were modified, and roads built. Also, new roles were created: Island Magistrates, policemen, and scribes who were responsible for island funds. Magistrates were supposed to work alongside and with traditional leaders, either *uea* (kings) or *unimwaane* (male village elders); the latter were now called *kaubure* (councillors). However, with the powers vested in them, the Magistrates effectively replaced these traditional leaders at the top of political hierarchy. Macdonald (2001) argues, therefore, that their introduction had been "the structural change that was to have the greatest long-term effect" (p. 78). Owing to the difficulties of implementing these novel protectorate policies as well as due to droughts, it was only by 1895 that the new administration became financially self-sustaining.

Enter Swayne's successor, William Campbell. His visions and methods were quite different, and his accomplishments truly sobering. He was an autocrat "armed with an unshakeable conviction that he alone knew what was best for the Gilbertese and Ellice Islanders" (Macdonald, 2001, p. 91); he refused to act on orders given to him by the High Commissioner and generally abused the lax supervision, and he centralised government by employing Europeans rather than locals and by directly controlling Island Magistrates who he officially placed over the councillors. The list of laws and regulations he enforced include the following:[18]

> No. 2 People allowing their children to go naked are to be punished
> No. 3 It is forbidden to commit a nuisance in the town, or the lee-beach, or in the bush
> No. 4 If a man and a woman want to get married, they are first to see the Magistrate; and shall not be married until three months afterwards
> No. 6 Begging is forbidden – '*bubuti'*
> No. 7 It is forbidden for people to walk about after 9 p.m. They are to remain in their own houses
> No. 15 All persons wishing to travel are to make application [*sic*] to the Court for permit . . .
> No. 16 It is forbidden for natives to visit the hospital
> No. 17 Card playing is forbidden
> No. 18 If a person has his house in a dirty condition, he is to be fined
> No. 22 It is forbidden for people to visit [an]other village for the purpose of dancing, except on public holidays
>
> (cited in Werber, 2011, p. 154; adapted spelling)

[18] The entire list with an indication of penalties is given in Appendix A.6.

It is worth pointing out, firstly, that *bubuti* is not simply "begging" as stated in No. 6, but is part of a reciprocity-implying sharing system which ensured that resources and food were fairly distributed within a community, as already mentioned previously, and secondly, that the travel restrictions do not just relate to movements in and out of the Gilbert and Ellice island group, but very much also to movements within. Besides the implementation of such questionable laws, Campbell actively interfered with the missionaries and took a rather anti-Catholic stance. As has been discussed in Section 2.2.3, he not only made it difficult for the SHM to expand, but also ordered church destructions, public floggings, and the imprisonment of Catholics or those who sought to convert. Campbell was transferred to Tonga in 1908 and shortly after removed from office, but his legacy was continued until the 1930s through agents he had already installed.[19]

Besides Campbell's enforcement of a foreign system of political and social order, the early years under foreign rule did not introduce big changes. Having had little direct interest in the islands when proclaiming the protectorate, the British subsequently had little interest in time- or money-consuming governance. Macdonald (2001) labels their administration style a "policy of minimal development" where the focus lied on quiet and order rather than on providing benefits for the local communities (p. 114). For example, with the exception of Banaba where phosphate was mined from 1900 onwards (see Section 2.3.4), "there were no medical services until 1904; there was no government ship until 1909, no government contribution to schools until 1913" (p. 112).

2.3.3 The Gilbert and Ellice Islands Colony (GEIC)

As of 1912, the discussion was taken up as to whether the Western Pacific territories belonging to the British are to be brought within one legal jurisdiction instead of being administered in diverse ways which led to "jurisdictional anomalies" (McIntyre, 2012, pp. 137-138). Accordingly, the Gilbert and Ellice Islands Protectorate was formally declared the Gilbert and Ellice Islands Colony (GEIC) on November 10, 1915.[20] Banaba and the northern Line islands were added in 1916, with Kiritimati (Christmas Island) following in 1919, and eight of the Phoenix islands in 1937.[21]

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[19] One of Campbell's District Officers was George Murdoch who was in charge of Abemama, Kuria, Aranuka, Nonouti and Tabiteuea. Werber (2011) reports from one of his interviews with Gilbertese islanders that, because of the impacts he had on island politics and social life, he is remembered as a dictator (p. 150).

[20] In the official *Gilbert and Ellice Islands Order in Council, 1915*, this declaration is prefaced by a statement that alleges more than just agreement by the islanders: "the Native Governments of the said Islands have expressed their desire that these Islands should be annexed to, and should henceforth form part of, His Majesty's Dominions" (p. 655).

[21] From 1916 to 1926, Tokelau was also part of the GEIC; it was afterwards transferred to New Zealand, whose dependent territory it still is today (McIntyre, 2012, p. 138). There seem to be no indications that Gilbert and Ellice islanders were in direct contact with Tokelauans, nor that their mutual time as a colony had any noteworthy impact of any sort. Therefore, the connection with Tokelau was almost entirely one that existed on paper.

With regards to the relationship between government and indigenous populations, the transition from a protectorate into a colony meant relatively little change. The latter were already living under the conditions created by Campbell, the second Resident Commissioner; at least as a colony, "policy had at last caught up with practice" (Munro & Firth, 1986, p. 69). Depending on who was High Commissioner, Resident Commissioner or other official, there were more or fewer acts and regulations seeking to ameliorate the conditions for the indigenous communities. For instance, a government ship was acquired, only to be sold again; or, five District Magistrates (later District Officers) for the support of the Resident Commissioner were introduced, only to be reduced again by two (Macdonald, 2001, p. 117) – this number eventually rose, albeit slowly, until it stagnated at around 16 between the mid-1920s and the Second World War (Pannu, 1993, p. 66).

During these early years of the colony, Arthur Grimble played an important role, especially for the Gilbert islands, first as District Officer and later, between 1926 and 1933, as Resident Commissioner. He seemed to have had his own, romanticised visions of administration for the island communities; he, too, treated the indigenous communities in a paternalistic and autocratic fashion, and advocated the intrusive regulations that were introduced by Campbell. Also as a result of his involvement in the affairs surrounding phosphate mining on Banaba, he received a lot of criticism. However, it is possible that these rather negative depictions do not do him justice. John Smith, Governor of the colony before the Gilbert and Ellice islands separated and became independent, remains convinced that Grimble acted in the best interest of the Banaba communities, that his efforts were misinterpreted and that he simply became "a convenient scapegoat" (J. Smith, 2011, p. 156); phosphate mining on Banaba is discussed in more detail in Section 2.3.4 below. That Grimble had a great interest and fondness of the people who, essentially, he tried to protect is evident from the literary legacy he left behind: beautiful books *A pattern of islands* (1952) and *Return to the islands* (1957), as well as many academic articles.

According to Macdonald (2001), the years between Grimble's departure and the outbreak of the Second World War in the Pacific "mark a real turning point in the history of the Colony" (p. 123). He describes the practice of government under previous agents as authoritarian in structure and as insistent on conformity, which had steadily been "eroding the indigenous capacity for self-rule" (p. 137); in contrast, the new generation of colonial staff, including young District Officers such as Maude, were concerned with changes and regulations that were in the interest and for the benefit of the islanders rather than in line with British empire policy (p. 137).

With regards to the relationship between Gilbert and Ellice islanders, who were of different ethnicities, dissimilar cultures, and spoke mutually unintelligible languages, the establishment of the colony meant closer contact. Together with a continued lack of supervision of the same governmental and cultural policies that had been superimposed onto them, the colonial period allowed for ethnic tensions to be created and to persist until the partition in the 1970s; more discussion on this topic follows in Sections 2.6.2 and 2.6.3.

2.3.4 Labour trade in the 20th century

The British had only just assumed control over the Gilbert islands when they imposed restrictions on the labour trade. Ongoing recruitment to Queensland, Samoa and Fiji was halted, and the only destinations where labourers were allowed to be brought to were Teeraina (Washington Island) and Tabuaeran (Fanning Island), two Line islands which were eventually integrated into the protectorate in 1916, as well as Banaba (Ocean Island) to the west of the Gilbert group. From 1900 onward, Banaba was exploited for phosphate through a firm that later became the British Phosphate Commission (BPC). In this section, the focus lies on labour migration and economic implications for the GEIC; further details about phosphate mining are given in Section 2.5.2 below, where attention is paid to the mistreatment and eventual displacement of the local communities of Banaba.

Shlomowitz and Munro (1992) provide data on recruitment in the Line islands as well as for the phosphate mining on Banaba and Nauru. They quote that the available GEIC workforce in the early 20th century was calculated to be approximately 1'500 men, of a population of almost 30'000. Effectively, around 400 worked on coconut plantations on Teeraina and Tabuaeran. Many more were recruited for the phosphate industry on Banaba and Nauru. The former employed a workforce that averaged at about 1'000 until the Second World War; it consisted mainly of Chinese labourers while there were only a few dozen GEIC workers. On Banaba, total employment numbers were very similar, but here, the biggest fraction was constituted by recruits from the GEIC: between the beginning of the century and the Second World War, an average of approximately 600 Gilbert and Ellice islanders worked there every year. After 1920, the second largest group of recruits were Chinese. Occasionally, racial tensions flared up between them and the Gilbertese which, after several attacks and riots, resulted in the separation of the two groups, not only but also by means of fences. While labour regulations did exist, Macdonald (2001) states that many of them "had been ignored by the Government and the BPC because each considered that their enforcement was the responsibility of the other" (p. 119).

Similar to the labour trade of the 19th century (discussed in Section 2.1.4 above), most Gilbertese came from the southern islands where droughts occurred more often and recruitment was an alternative to famine and death. In comparison, however, the proportion of labourers from more northern islands has grown, although no recruitment was allowed on Abemama, Kuria and Aranuka as they were considered to be underpopulated.

As for the duties of GEIC recruits on the phosphate islands Banaba and Nauru, Shlomowitz and Munro (1992) report that most male islanders were responsible for transporting the mineral in small vessels to the big company trading ships and, when the ships had left, work in the phosphate fields. Many travelled with their wives who were employed as domestic servants for the European staff. GEIC labourers were employed for one to two years a term, but many ended up completing several terms with intermediate periods back on their home islands. Asian recruits, on the other hand, were usually

employed for three years and mostly worked as mechanics and builders. Only their unskilled were sent to the fields. This racial segregation, Shlomowitz and Munro point out, was not due to maliciousness but rather a result of the Pacific islanders' lack of experience with machinery (p. 113).

Pannu (1993) reports that, on average, 100 BPC staff were stationed on Banaba, together with their families (pp. 65-66). Being there for short periods only and without social or financial incentives, these Europeans did not make any attempt to learn their labourers' languages. Therefore, communication between them and the Gilbertese islanders must have taken place in English. Pannu concludes that the BPC played an important role for the spread of English and that Banaba was "a significant centre in the provision of linguistic contact" (p. 65).

That the Gilbert group fell under British rule was, in many ways, rather coincidental. While the islands served as a source of labour recruits, they were not turned into plantation colonies – except Banaba, to the west of the group –, and while a few influential empire representatives were dispatched to them, they were most definitely not turned into settlement colonies either. The British owned the Gilbert islands much more than they administered them until and, as the next section shows, also very much during the Second World War.

2.4 Second World War

Remote as they may be, being situated in the middle of the Pacific meant that the Gilbert islands also found themselves in the middle of the Second World War. While in many accounts the conflict between the fighting powers is at the centre of attention, McQuarrie (2012) adopts a focus that reaches beyond combat events and includes the experiences of the indigenous populations. By drawing on this source in particular, I attempt to provide a short overview of the events occurring on and around the Gilbert islands during the Second World War as well as their effects on the islanders and the colony. It is of particular importance, from linguistic and other standpoints, that the Gilbertese came in contact with coast-watchers from New Zealand who promoted the English language, with occupiers who brought with them the Japanese language, and with Americans who provided lucrative trade opportunities and altogether more appealing alternatives to British rule; many foreigners that had previously been in the colony were either killed or deported, or were evacuated earlier so that at one point, the only Europeans still present were but a few SHM missionaries.

2.4.1 The early years of the war

In the years leading up to the war, the islands in the Phoenix and Line group attracted more attention. They had been inhabited in the past, as is evidenced by traces of wells and tombs, and more recently, guano and copra plantations had been worked there (Sabatier, 1977, p. 350). In 1936 and 1937, several of the islands were claimed by the Americans and the British. Subsequently, the British established a radio communications station on Abariringa (Canton Island), and in 1937 and 1938, there were two New Zealander expeditions carrying out recognition work for commercial sea- and airplane bases. Following an agreement with Britain and Australia in 1939, the New Zealanders also reconstructed the radio station on Tabuaeran (Fanning Island) in the Line group, deployed contingents of armed troops and started fortifications – this included the crafting of fake naval guns made of palm trees, a tactic later also used by the Japanese.

The beginning of the war also marked the beginning of coast-watching in the Gilbert islands (as well as elsewhere). Islanders were to report sightings of ships and planes to the Island Magistrate who reported to the District Officer who finally reported to the colony headquarters on Banaba (McQuarrie, 2012, p. 33). Since, however, only three islands in the Gilbert group had had the means to carry out these reporting duties, there was a significant upgrade in mid-1941. McQuarrie (2012) reports that a total of 58 people were employed as coast-watchers on 15 islands: 30 radio operators and soldiers from New Zealand, and 28 local radio operators.[22] Pannu (1993) states that the deployment of these coast-watchers led to "the most significant and far-reaching contact with the English language" up to that point (p. 66). Although there were only 30, and no more than three on an island, he argues that their influence was felt throughout the atolls as there was close contact between them and the Gilbertese which led to the introduction of novel habits, products, clothes and also – native – accent (p. 67).

At first, coast-watchers looked out for German raiders which were "fitted out as cruisers but masqueraded as harmless merchant vessels, flying the Japanese flag before Japan entered the war" (McQuarrie, 2012, p. 33). Not only was this tactic already applied in the First World War, when a German raider flying the French flag destroyed the radio station on Tabuaeran, it would also be how the first violent push of the Second World War in the Pacific islands would be carried out. In December 1940, three German ships, not flying any flag, attacked five vessels of the BPC around Nauru. They imprisoned who they did not kill, destroyed radio equipment, sank the ships, and finally even took Nauru under fire; a land attack was planned but abandoned due to bad weather (pp. 45-49). The Germans had 10 such ships operating worldwide between 1940 and 1942 (p. 33).

Preparations for war were in progress. The Australian government sent a small and poorly equipped infantry force to Banaba and Nauru in February 1941 before evacuating Australian and New

[22] See Appendix A.7.1 for a detailed list of coast-watching activities in the GEIC.

Zealander women and children by July; the coast-watching scheme was upgraded (as discussed above); moreover, the US military entered the GEIC in October and started establishing bases and airfields on Kiritimati and Abariringa. On December 7, 1941, the Japanese attacked Pearl Harbor. Only six hours later, a single Japanese plane dropped bombs on Banaba, and the next day, another three followed. There were no casualties, but the second attack hit the commission's residency. Similar attacks also took place on Nauru

The capturing of Tarawa and Butaritari was initiated on December 9. The Japanese sent two destroyers to Tarawa, where they attacked the few canoes, boats and ships they found in the lagoon, swept the islands[23] and rounded up the few Europeans who missed their transport on December 3 and were still waiting for evacuation: "as part of a government scheme to evacuate missionaries and government officials and their wives to Australia, the Sacred Heart Mission schooner Santa Teretia had been collecting nuns from the outer islands when the Japanese arrived" (McQuarrie, 2012, p. 61); a total of 25 missionaries who were detained together with women of mixed ethnicity (half-European). There were no casualties besides two inmates of a mental hospital who were shot. The Japanese read out and later hung up a proclamation which also stated that there was no enmity towards the Gilbertese people and that they would be sufficiently protected.[24] They took 10 GEIC sailors with them when they left for Butaritari only one day after the attack, but returned regularly for inspections.

Another contingent of Japanese arrived at Butaritari with three ships, two of which destroyers, and immediately started constructing a seaplane base. From their landing point, they proceeded to the other islets of the atoll as well as to Makin, captured the coast-watchers, other Europeans and seven Chinese family heads. The Chinese were released again, unharmed, but the seven Europeans were later brought to Jaluit in the Marshall islands where they met up with a coast-watcher from Abaiang who had been captured on Christmas Eve. From there, they were brought to Yokohama and became the first prisoners of war to reach Japan; being treated relatively well for the sake of propaganda at first, they were later moved to a war camp which they survived (McQuarrie, 2012, pp. 69-72).

2.4.2 American and Japanese attacks

The first attack on Butaritari seemed not to have had great effects on the indigenous communities. Their relationship with the Japanese was relatively good, probably also due to favourable arrangements of two Japanese who had married Butaritari women and lived there prior to the war. The Japanese remained at their first landing point, so that it was relatively easy to avoid them by moving to more

[23] On the islet of Betio, a landing party of approximately 200 men formed a line and proceeded to march through the entire islet (McQuarrie, 2012, p. 57).
[24] See Appendix A.7.2 for a digitised version of this declaration.

remote parts. Owing to their nationalities, a French and a German priest, too, lived "generally unmolested" (McQuarrie, 2012, p. 74). However, more violent times lay ahead. The US military began to fight the Japanese in the waters, in the air, and on the soil of the GEIC. Their first attack – in the Pacific in general – was against the Marshall islands and Butaritari in January 1942. In August, they returned to Butaritari, with 222 troops in a submarine. Some locals decided to help and guide the Americans; others chose to warn the 73 Japanese stationed there, who promptly requested reinforcements. In the subsequent battle, the Japanese lost two planes, a ship, and approximately 150 men; the Americans had 29 casualties and left nine behind. Later, the Japanese retaliated by bombing Keuea village, an attack which wounded 30 Gilbertese and killed 48 – Keuea is 15 kilometres away from the first battle ground and none of the inhabitants were involved in the American attack. The Japanese reclaimed Butaritari a few days later, strengthened it, and went on to capture Maiana, Abemama, Kuria, Nonouti, Beru and Tamana by the end of September (Banaba and Nauru were attacked, too; these events are described in more detail below). The New Zealander coast-watchers of these islands were rounded up; in Kuria, thousands of trees were burnt down until they came out of hiding (pp. 108-114). On October 15, the Japanese executed and burnt 17 coast-watchers and five European civilians, including a 30-year-old man who is believed to have had some medical training and, seeing the two European doctors escape, chose to stay behind (pp. 81-82). A day later, the nine American soldiers that were left behind in Butaritari were captured and beheaded, too. With these executions, the only Europeans alive were SHM missionaries; since most of them came from countries with allied or neutral relations to Japan (France, Germany and Switzerland) and since their Roman Catholic faith established an association to Italy, "leaving the Catholics alone made good propaganda" (p. 120).

From around the same time until mid-1943, the Japanese contingents in their already existing bases were massively enlarged, so that by July almost 5'000 troops were stationed on Betio islet (Tarawa) alone: 2'624 were troops, the rest labourers, mostly Koreans (McQuarrie, 2012, p. 123). The whole of Betio was turned into a fort, with bunkers, barricades, trenches, tanks and weaponry until it "bristled with guns" (p. 115); an airfield with two landing strips was built, too. Some Gilbertese were also forced to work with no compensation besides a little food; a number of senior students from the King George V school that the Japanese closed down worked as interpreters and guides.

The Americans, too, were pushing forward. They had had airstrips in Kiritimati and Abariringa since the outbreak of the war in the Pacific, took over Tabuaeran in April 1942 with 141 troops for an uneventful two years (McQuarrie, 2012, p. 31), and constructed a further airstrip on Baker Island in the Phoenix group (not incorporated in the GEIC) in September 1943. They also advanced from the south as they built up a stronghold on Funafuti in the Ellice islands. Occupying it in October 1942, the Americans collected a vast amount of military on the island and in its vicinity over the course of a year: the result was an enormous task force of approximately 2'000 troops and 350 planes on the island, and another 20'000 troops in over 200 ships including carriers, cruisers and destroyers in the waters

surrounding it – there were "more ships than Funafuti had seen in the past 20 years combined, and larger ones than had ever been seen there" (p. 114).

With both powers expanding aggressively in 1942 and 1943 which brought them ever closer to one another, there were numerous attacks between the Japanese based on Tarawa and the Americans based on the Ellice islands as well as Abariringa and later Baker Island in the Phoenix group. Without doubt, the culmination of these attacks was Operation Galvanic. After Betio was bombed and strafed daily from November 14, 1943, onwards which halved the Japanese contingent of 5'000 men, almost the entire military force that was gathering at Funafuti launched an attack on November 20: 18'600 Americans fought in the infamous Battle for Tarawa (McQuarrie, 2012, p. 148). Short-sightedly, however, the Americans chose a neap-tide day in spite of all warnings. It was an arbitrary date, set "not by nautical men, but by politicians" (p. 151). Moreover, decades later, it was calculated that on that very day the moon's orbit was at the apogee (p. 151) – the choice could not have been worse. Consequently, landing on Betio proved very difficult for men and vehicles several of which were completely stuck on the reef. Communication failures posed an additional problem: firstly, many mobile radios took water damage, and secondly, the battleship that was supposed to be the communications hub of the operation suffered from a faulty connection to the land troop every time it fired a salvo (pp. 153-154). Once anticipated to last a day, the battle on Betio only ended after 72 hours. Over the following few days, the Americans proceeded to chase down the remaining Japanese soldiers who had evacuated to more remote parts of the island, in fact, to the northern-most tip of Tarawa which is as far away from Betio as is possible. There, the last 165 Japanese were fought. In the entire Battle for Tarawa, approximately 1'100 died and 2'300 were wounded on the American side; on the Japanese side, approximately 4'700 died while only 17 troops and 129 Korean labourers survived.[25]

Operation Galvanic also included attacks on Abemama and Butaritari. On the night of November 20, four destroyers, a battleship and a submarine chaser arrived at Abemama where 68 troops landed. They encountered some 25 Japanese. After a shoot-out killing one American and wounding another, the Japanese position was shelled by sea; all Japanese were either killed in action or committed suicide (McQuarrie, 2012, pp. 156-158). In Butaritari, the approximately 534 Japanese lightly armed soldiers faced plane bombardment, naval gun shelling, 13 tanks and 6'472 troops. Nevertheless, the fight lasted four days. All but two Japanese were killed, while the Americans suffered 66 fatalities and 100 were wounded. Offshore, a Japanese submarine sunk an American aircraft carrier and killed its 644 crew (pp. 158-162).

[25] Only approximations are used here since the many sources list different numbers (see for instance Macdonald, 2001, p. 154, McQuarrie, 2012, p. 150, D. Wright, 2000, p. 93, or Talu et al., 1979, pp. 94-95). One reason for dissimilarities is because it often remains unclear whether the term 'Battle for Tarawa' denotes only the first attack on Betio or all events taking place on Tarawa during Operation Galvanic, in other words, also the smaller and, from a military perspective, less significant fights in other parts of the island; therefore, it is often not specified which casualties are included or excluded in reports.

The American superiority in the GEIC was established with Operation Galvanic and the Japanese were pushed back. Butaritari, Tarawa and Abemama were developed into air and naval bases, and used for attacks against the Japanese strongholds in the Marshall islands. The Japanese, on the other hand, only launched one subsequent attack on an island in the Gilbert group: they bombed Abemama early in 1944.

2.4.3 Banaba and Nauru during the war

Banaba and Nauru, too, were heavily affected during the war. The former had a small armed force consisting of 37 Europeans (mostly Australians) and a detachment of 15 Gilbertese and Ellice islanders already before any acts of military aggression in the Pacific had taken place (McQuarrie, 2012, p. 51). Nauru was only reinforced in early 1941, in the aftermath of an attack by German raiders (discussed in Section 2.4.1). The raider attack was also incentive for the evacuation of Australian and New Zealander women and children from both BPC islands which was completed by July 1941 (p. 52). Both islands were then attacked only hours after Pearl Harbor, and again on August 22, 1942. On Banaba, the majority of Europeans and Chinese workers had already been gone for half a year by then; however, "no attempt was made to evacuate any of the Pacific island workers" (p. 102). When the Japanese landed on August 26, they found only six Europeans who stayed back voluntarily (p. 103). Banaba was then heavily fortified, at the expense of one of four local villages which was completely destroyed, along with much vegetation. The conditions for those trapped worsened as time went on. There were shortages of food and water, and not only did 130 die of malnutrition or related conditions, the Japanese also took food away by force, executed two Gilbertese when they attempted the same, and there were incidents of abuse and rape; as for the six Europeans, they all either died of illness or may even have been murdered (pp. 105-107). Another gruesome event is described by one of the survivors interviewed by McQuarrie:

> The Japanese built a fence out on the reef, where they expected an American landing. Two prisoners . . . were sent out to test this fence. They were dressed up in military uniforms, like Americans, wore boots. They were told to climb over the fence but when they touched it they were electrocuted. They were buried in the graveyard, a single grave. (pp. 106-107)

In July and August 1943, almost 2'000 Gilbertese and Ellice Islanders were removed from Banaba: approximately 400 were shipped to Tarawa, 750 to Nauru, and 771 were found alive in Kusaie (today Kosrae) after the war; only 150 young male islanders remained on Banaba and had to work for the Japanese (p. 107). The conditions in Nauru were similarly terrible. There were food and water shortages, ill-treatment and executions by the Japanese, too. Unlike Banaba, Nauru was also regularly

attacked by the Americans since April 1943. Consequently, there were many deaths; most of the Nauruan casualties, however, occurred in Truk, where 1'200 of them were sent to and where over a third of them died (pp. 193-194).

In May 1944, the American military dropped leaflets on several Micronesian islands that were still under Japanese control, including Banaba and Nauru. They did, however, not achieve surrender. A second time, leaflets were dropped when, almost an entire month after Japan had formally surrendered on September 2, 1945, there were still Japanese contingents on these islands. When Banaba was finally liberated, it was found that between 100 and 160 Gilbertese men were executed – evidently after Japan's capitulation! There were only two survivors: one managed to flee in a canoe and was found adrift near New Guinea (his six friends had died during the journey), and another survived the executions on Banaba and hid for over three months (McQuarrie, 2012, pp. 187-191). Were it not for them, this war crime would probably not have been uncovered.

When the war ended, 250 Banaba islanders were on Kusaie, 346 on Nauru and 107 in Tarawa (McQuarrie, 2012, pp. 194-195). Their home island had been destroyed by the war and, arguably even more, by the BPC in the four decades leading up to it. They were relocated to Rabi, Fiji, in December 1945, as will be discussed in more detail in the Section 2.5.2.

2.4.4 A foreign war on Gilbertese ground

The Second World War affected the Gilbertese in various ways. Many of their islands were bombed, or in some cases, burnt. Moreover, there were many instances where they were made to put their lives on the line. For example, the Americans sent them out to an unidentified ship off Tabuaeran in October 1941 at a time when German raiders under no flag or a false flag were known to operate also in Micronesia (McQuarrie, 2012, p. 30); or they were abused, raped, or outright sent to their deaths when forced to test electric fences during Japanese occupation on Banaba (discussed above). Gilbertese were also killed during attacks between the Japanese and the Americans on several islands, and many starved, died in accidents or were executed. McQuarrie (2012) presents the following estimates: approximately 730 Gilbertese died, another 321 were wounded; moreover, 60'000 trees and 2'000 *babai* (taro) pits were cleared for airfields on Butaritari, Tarawa and Abemama alone (pp. 197-198) – these numbers exclude events like bombings, shellings, or the burning of vegetation on Kuria to capture the coast-watchers. During 1947 and 1948, compensation was paid to landowners for every tree they could replant, but none was ever given for loss of other personal property (pp. 199-200).

The Gilbertese found themselves in a war that was not theirs. Many chose to move to unoccupied parts of the islands. This, of course, was not always possible or did not necessarily guarantee safety. However, there were a few who involved themselves more actively, by helping either the

Japanese or the Americans – without previous experiences with either, how does one pick a side in a foreign war that is happening on one's own ground for no apparent reason? When, for instance, the 222 American soldiers landed on Butaritari, some chose to guide them, others to warn the Japanese; and during the Battle for Tarawa, Gilbertese did not only help carry the equipment of the Americans, they also brought them water and attended to their wounded during the fight, and dug graves for the killed Japanese afterwards.

The Second World War, however, also brought the Gilbertese in closer contact with foreigners in arguably more positive ways. Japanese, Americans, and, at smaller levels, New Zealanders provided a different experience not only to more peaceful times but also to British administration. The Americans, not being their official ruler, had a much less paternalistic relationship with the indigenous communities, were generous with food and medicine, and gave them labour and trading possibilities the likes of which were unprecedented. Gilbertese were employed in great numbers and on almost all islands, for construction work, laundry, handicrafts and other purposes; the Americans often ordered thousands of items, for instance sleeping mats for their troops, and paid well (McQuarrie, 2012, p. 180). It is unsurprising that at least some Gilbertese developed a desire to be administered by the US government and even organised a petition to be sent to Washington; however, "thereafter apparently nothing was heard of it" (p. 180). Interestingly, the Americans themselves made similar appeals at different points in time: firstly, they did not recognise the British claim over Abariringa and placed it under their own jurisdiction for over a year before signing an agreement for joint administration for 50 years with Britain in 1939 (p. 13); secondly, and only shortly after the 1939 agreement, they made claims over 25 other islands in the GEIC (pp. 13-14); and thirdly, the question of sovereignty was again picked up towards the end of the war when the Americans tried to keep those islands with already established US bases as well as exclusive rights for a military base on Tarawa for 99 years (pp. 200-201). The last Americans were withdrawn in 1948, yet claims were not formally dropped until the 1970s (p. 201).

In contrast, British officials had all been evacuated. British administration only resumed with the arrival of the new Resident Commissioner after the Battle for Tarawa in 1943; he was stationed in Tarawa rather than Banaba. The GEIC Labour Corps was quickly formed and, albeit officially a British unit, consisted mainly of New Zealander officers. By 1945, it had bases on Butaritari, Tarawa and Abemama and employed over 1'500 men, some of whom worked overseas (McQuarrie, 2012, p. 170). Regaining colonial control over the GEIC took its time; more on the post-war period will be discussed in the following section.

It is worth mentioning that there are still certain remainders of the Second World War.[26] Besides official memorials, there are several big naval guns as well as numerous bunkers, shelters, and remains of military vehicles, including tanks, to be found on Betio. Since they have never been disposed of and since there has been a massive population influx, the inhabitants of Betio often live in very close

[26] See Appendix A.7.3 for pictures.

proximity to such wrecks. Moreover, vehicles and bodies have been found by accident decades after the war, and the exposure of mines during storms was "quite common" (J. Smith, 2011, p. 166). The period of such post-war discoveries is still on-going. The American organisation History Flight, actively searching burial sites, had successes in 2008, 2010, and most recently in 2015 (History Flight, n.d.; McQuarrie, 2012, pp. 212-214). Under these circumstances, it is not very surprising that posters are still hung up today that advise people to get in touch with the organisation when coming across bones, bombs and grenades (see also Appendix A.7.3).

2.5 Migration schemes of the mid-20th century

The Second World War marked the transition between two vastly distinct periods: Britain's loose administration style had come to an end, and decolonisation, self-sustainability, self-regulation, and independence were worked towards. Overlapping with both periods yet presenting somewhat independent chapters of Gilbertese history are three migration schemes taking place in the mid-20th century: chronologically, the first scheme aimed at resettling inhabitants from the southern Gilbert group to the Phoenix islands in the 1930s, the second scheme achieved the displacement of Banaba's indigenous communities following the war, and the third scheme was a revision of the Phoenix islands project which resulted in relocation to the Solomon islands. These population movements were an important factor on the path to independence of the Gilbert islands, and are relevant for the understanding of demographic issues the independent republic faces today.

2.5.1 Resettlement to the Phoenix islands

Contact with foreigners led to increasing population pressures, especially on the southern Gilbert islands. New, more effective medicine became available and helped reduce infant mortality rates. Later, the colonial government took various steps to support this development. Moreover, government and mission taxes were introduced that would no longer allow islanders to use their own produce as currency for the novelties they wanted to purchase, or as food. Therefore, while population numbers were increasing, food availability was decreasing. It is worth noting, however, that Maude (1952) assumes the islands had reached their optimal population density much earlier, "by 1840, if not long before" (p. 65). Consequently, plans for migration were made as early as 1931; the subsequent undertakings were in fact led by Maude, who worked as District Officer and later Resident Commissioner. The new habitats were to be coral islands with similar climates and would preferably allow for British jurisdiction

to continue, "for the Gilbertese strenuously declined to consider any migration project which involved a change of allegiance" (p. 66). The choice fell on the Phoenix islands which were declared a new district of the GEIC shortly before the first visit. It is important to note that there may have been alternative or additional motives underlying the resettlement scheme. A trans-Pacific airline route was anticipated and could render the Phoenix islands an important refuelling stop. Colonisation of this uninhabited territory would substantially increase chances of being able to claim them and capitalise.[27] Thus, it is possible that the British saw a chance to secure both a humanitarian and political goal at the same time (Knudson, 1977, p. 207).

In 1936, it was finally recommended that the Phoenix islands should be officially investigated for migration purposes. Maude proceeded to visit islands in the south of the Gilbert group as well as the north of the Ellice group during the following year. He held meetings with the local communities in order to explain the aims of the expedition and recruit a team of island delegates. He comments that the idea of the undertaking stirred much excitement but that more cautious islanders had been chosen as delegates rather than those "particularly prepossessed in favour of the scheme even prior to its launch" (Maude, 1952, p. 68).

The Phoenix group was visited during October 1937, its islands christened – with local names – and scouted. Upon returning, the delegates were enthusiastic for the most part, so much so that a great number of islanders immediately packed their belongings in order to be ready for departure. The scheme was approved a few months later.

Once again, Maude toured the islands and called further meetings in which the islanders showed great interest: on Nonouti, the first island, Maude estimates that he spoke in front of a thousand islanders (Maude, 1952, p. 80). Among other things, he explained that volunteers would see their current lands be divided among relatives, that only toil and hardship could be expected while those who stayed back may achieve prosperity in the meantime. This did not discourage many. In Nonouti, about half of the listeners stood up immediately. From them, two notoriously poor families were selected so as to give them a chance on personal prosperity. They were told to be ready within two hours – it did not take them that long. Of the 10 people leaving, only one woman showed a tendency to tears:

> She was sternly rebuked by the Native Magistrate of the island, who observed that 'this is no time for weeping. This is a time for brave thoughts and brave deeds'. Yet one wonders how many Europeans, leaving all that was near and dear forever – at two hours' notice – would have kept smiling faces? (p. 81)

Further recruiting took place on Beru, Nikunau, Onotoa, Tamana and Arorae – Maude gives no indication as to why no Ellice islanders had been included after the investigative visit. As was the case

[27] The Phoenix islands were uninhabited (again) at the time of their discovery by Western seafarers. They had then been put under British protection during 1889 and 1892 on account of British subjects having economic interests in them, only to be gradually abandoned over the following decades. When the islands were investigated for the Gilbertese resettlement scheme, they had just been inhabited again by 45 temporary workers, some of them employed by the British government (Maude, 1952).

previously, selection was based on poverty levels. However, Knudson (1977) points out that some concealed how much they really owned so as to be eligible to take part in an adventure (p. 209).

In late 1938, a pioneer party consisting of 61 islanders set sail for the Phoenix group: 23 men, 13 women, and 25 children. They were brought to Nikumaroro (Gardner Island), Orona (Hull Island) and Manra (Sydney Island), and work began immediately. Land was demarcated for government buildings, *mwaneaba*, hospitals, stores, churches, schools, teacher's houses, post offices and recreation areas. Lands were allotted to the pioneers – a process that is highly rule-governed in Gilbertese traditions and thus could not be done hastily within the resettlement scheme where everything had to be started anew. Maude (1952) describes the agreement that was reached:

> to give two pieces of land, each containing approximately 25 bearing coconut trees, to every adult, whether male or female; one land to be near the Government station and anchorage. To each child were granted two pieces of unplanted bush land, each 25 fathoms square, on condition that the parents cleared and planted the lands within 5 years of their taking possession. (p. 82)

Similarly new and unusual was the arrangement of the *boti*, a family's partition in the *mwaneaba*. Apparently, the discussion lasted for several days until it was suggested that "each household should be assigned a spot with no one being allowed to occupy the location he had been accustomed to in the Gilberts" (Knudson, 1977, p. 2010). Moreover, the Phoenix islands were not entirely identical to the Gilberts in terms of flora and fauna. The ground water proved too saline for *babai* (taro) pits and pandanus could not be introduced successfully either, at least not at first (Knudson, 1977, p. 210). There were also new types of fish and settlers had to learn that not all of them were edible (see Section 2.5.4 for further discussion).

Further settlement parties were brought to the Phoenix group in 1939 and 1940, allowing the new island communities to grow to over 700 residents; over 1'000 lands were demarcated (Maude, 1952, p. 88). In 1941, an airbase was built on Abariringa (Canton Island); other non-military facilities and people followed. This allowed settlers to make some money, through the sale of handicrafts, through employment as domestic servants, or through work in the fishing company, the island hotel, or the military and airline facilities (Knudson, 1977, p. 212) – opportunities that were, and to some extent still are, lacking on the southern Gilbert islands. Until the late 1940s, the resettlement scheme seemed to be a great success, not only from the point of view of the administrators: there were no requests for repatriation.

2.5.2 Displacement of the Banaba islanders

Banaba (Ocean Island) is relatively far away from the islands in the Gilbert group, but Gilbertese "by race, language and tradition" (Sabatier, 1977, p. 293). However, it has taken its own course in history. The 78 years of phosphate mining on Banaba had a massive direct impact on its inhabitants, and more subtle and indirect consequences for the other islands of the colony. From the beginning, in the year 1900, when Banaba was not yet part of the protectorate, the islanders had been treated in a grossly disrespectful fashion. The initial agreement allowing the Pacific Islands Company[28] to start mining had been accepted and put into effect even though it became known that the interpreter was not competent enough to convey its vague implications and that the king and the chief who signed on behalf of the entire island had no authority to do so.[29] Unhampered, the company swiftly went on to import labourers, to develop the industry, and to press the British government to formally annex the island which eventually happened in September 1901 – Banaba fell under the jurisdiction of the same Resident Commissioner, in other words, it became part of the Gilbert and Ellice Island Protectorate and later Colony. Soon, new land had to be acquired, which was done illegally, by means of workarounds, or in a deceitful manner, for instance with demarcations and measurements that were taken very sloppily and always to the disadvantage of the seller. To better control the mining business, the headquarters of the protectorate were moved to Banaba, as a consequence of which the other islands were neglected until after the Second World War. The islanders of Banaba and rightful owners of the land – if not in a legal, then in a moral sense – were given rights by some and deprived of them by others, and slowly saw their island being worked away. One time they would be given full ownership over their lands including what it bears, another time told that they only owned the surface, or even nothing at all. Grimble, too, played his part: according to Macdonald (2001), he "cajoled, intrigued and threatened" (p. 105) to achieve that the mining company's interest could be realised. They made countless complaints, but it took until 1931 for the first – and last – lands settlement to be conducted (Sigrah & King, 2001, p. 225). They also made an appeal directly to the secretary of state a year later, but before there was a response, the mining company had already occupied the lands (Macdonald, 2001, p. 109). Similarly, the land agreement formalised in 1913 states that all worked out lands must be replanted and returned to the original owners; neither has ever happened (Sigrah & King, 2001, p. 227).

Mining on Banaba was a highly lucrative undertaking from the company's point of view: in 1933, their facilities on tiny Banaba as well as on not much larger Nauru contributed an estimated 7% of the world's phosphate production (Ellis, 1936, pp. 300-301); almost 18 million tonnes of phosphate were exported from Banaba, over 41 million tonnes from Nauru (Williams & Macdonald, 1985, p. 564);

[28] In 1902, the Pacific Islands Company (PIC) became a subsidiary of the Pacific Phosphate Company (PPC), which in turn was bought by the governments of Britain, Australia and New Zealand in 1920: the PPC became part of the British Phosphate Commission (BPC) who also controlled the phosphate industry on Nauru.
[29] See Appendix A.8.1 for a digitised version, as well as A.8.2 for a map of Banaba, and A.8.3 for pictures.

96% of these exports was brought to Australia, New Zealand and the United Kingdom (pp. 564-565) where it was used to fertilise the soil and thus served to help feed the British empire. Ironically, those islanders who signed up for labour in the phosphate mines often did so because they were suffering from droughts and famine on their home islands, which were officially under British administration.

The company could generally act without hindrance, and oftentimes even with the support of the British government. The welfare of the land or the people was grossly neglected. It is shocking that, as early as 1908, it was regarded an inevitability that the indigenous population would eventually have to move (Macdonald, 2001, pp. 99-100), not just by company officials but also by certain High Commissioners in office during that period: the industry was to be prioritised, eventual resettlement to be accepted (p. 104). Sigrah and King (2001) describe how, in order to finance this fate, a provident fund was put in place in 1931 which accumulated a tiny share of the huge profits the mining company made (pp. 240-241). They further report how, already by 1940, the islanders had been offered two Fijian islands: Wakaya and subsequently Rabi (also spelled Rambi); the Banaba islanders preferred the former for their new home, but the High Commissioner did not. During the Second World War, Banaba was attacked by the Japanese; foreigners evacuated; the indigenous were captured, tortured and abused; most were brought to Tarawa, Nauru, and Kosrae; some workers were left behind, there were mass executions two days after the end of the war, only two survived (pp. 245-257). The British Phosphate Commission (BPC), as the mining company was called by then,[30] was planning rehabilitation, but Sigrah and King leave no doubt about whose interests they had in mind: "This term 'rehabilitation' did not mean replanting mined out areas; far from it, it meant rebuilding mining operations . . . as soon as the war was over" (p. 244).

After the war, it took several months until the Banaba islanders were reunited on Tarawa where they were temporarily housed (J. Smith, 2011, p. 132). On December 15, 1945, the entire native population of Banaba – 703 people, together with 300 Gilbertese who had married into the communities or were invited by them – landed on Rabi, an island quite dissimilar from their home in terms of ecological, political and social environment. In his report on this historic event, Silverman (1962) also states that the GEIC government had given the exiled communities "a two-year option of staying on Rabi and making it their permanent home" or returning to the land of their ancestors, but that there was overwhelming consensus to stay (p. 430). It is not surprising that they did not want to, once again, take up the battle against the BPC that has never been in their favour since it had begun, or to see their island being wasted even more. The Banaba islanders were uprooted.

The photographs that were originally shown to the Banaba islanders did not reflect the neglected state they found Rabi in when they arrived (McQuarrie, 2012, p. 195). There were no houses, canoes or gardens, no schools or books, no clinics or medically trained personnel. It was a difficult start for the uprooted communities. Many became sick when eating fish they did not know was poisonous,

[30] See Footnote 28.

some even died in the first winter (p. 196). They slowly acclimatised, however, re-created the villages from their home island, grew in numbers and, after initially being restricted to the confines of Rabi by the local authorities (p. 196), began to move more freely in their new home away from home.

2.5.3 Relocation to the Solomon islands

The resettlement scheme under which southern Gilbertese were brought to the Phoenix islands, described in Section 2.5.1 above, was not as successful as the early years seemed to promise. The new settlements that were founded on Nikumaroro (Gardner Island), Orona (Hull Island) and Manra (Sydney Island) in 1938 were very prosperous at first, but during the late 1940s there were several years of low rainfall and droughts that made life there more difficult. Moreover, the settlers felt that, while their new homes were a healthy place to live, they had little prospect for development and offered no opportunities (Knudson, 1977, p. 214). Elder leaders of Manra therefore sent representatives to Tarawa in the early 1950s to request relocation.

As before, the colonial government proceeded to find a new place. Knudson (1977) reports that return to the Gilbert islands was "clearly out of the question" (p. 214). Instead, the Solomon islands were considered: they were then a British protectorate and underpopulated which made accommodation for the Gilbertese more easy – so it was felt. As before, there was a first visit with island representatives in order for them to be able to see the new sites prior to actual relocation. Representatives from the Gilbert islands were also included, since it was hoped that ongoing population pressures in the group could be alleviated with a new scheme.

The party was brought to the least populous part of the Solomons. The island representatives expressed a preference for places that resembled their coral island homelands and finally selected Titiana Point on Ghizo island as their new home (Knudson, 1977, p. 215). At that time, Ghizo consisted of three settlements: two Melanesian villages, and Gizo town, the administrative centre of the respective district located only 3 kilometres away from Titiana Point.

In September 1955, the first 30 islanders settled in their new home (Knudson, 1977, p. 218). They cleared tropical forest, planted gardens and orchards, and built a *mwaneaba*. Within the first three years, further groups arrived and the community was expanding. So much so that nearly all the available space had been filled. When it was decided that all settlers from Manra were to be relocated, a second village had to be started. The move, which took place in September 1958, brought the community to approximately 500 people; some of these new arrivals came from the Gilbert group rather than the Phoenix group (p. 219).

Upon relocation followed dispersion. Some Gilbertese went to Honiara, for school- or work-related reasons. Many others secured jobs in Gizo and some moved there. By then, Gizo was with

around 200 inhabitants still small but culturally surprisingly diverse with a "European community . . . a sizeable Chinese community . . . a heterogeneous Melanesian community . . . a sprinkling of Polynesians . . . a few Fijians and also some Japanese" (Knudson, 1977, p. 217). There were intermarriages, too, which further contributed to dispersion. Lastly, the government undertook steps of land allocation in the early 1960s. Firstly, it finally distributed the 4 acres of land that were promised to each household, but in such a way that many were being placed far away from Titiana; and secondly, it allocated land at Kamaleai Point, on a different island (p. 224).[31] Effectively, this created two separate communities which developed in different ways: the Kamaleai community was primarily Catholic and led a more subsistence-based lifestyle, whereas in Titiana, there were more opportunities to secure paid jobs.

Up to the early 1960s, only Manra islanders had been relocated while the other two colonised islands in the Phoenix group continued to prosper. This changed when the group experienced a drought in 1963 and the colonial government decided to also move Nikumaroro and Orona settlers. According to Cochrane (1970), who was an official working on the respective relocation scheme, the decision "was influenced by the severity of the drought and by the fact that people had been living in the Phoenix group for only about thirty years" (p. 123). However, Macdonald (1970) argues that the islands had "clearly recovered" when its inhabitants were moved in January 1964 (p. 175). Moreover, rather than to relocate them to Titiana or other settlements that had been established in the meantime, the islanders from Nikumaroro and Orona were brought to Wagina, yet another island in the Solomons. They brought the total number of people relocated to the Solomon islands to some 1'400 (p. 175).

Through the years, the relocated Gilbertese islanders dispersed into different parts and underwent processes of adaptation to their new surroundings. In his article, Knudson (1977) gives insights into several political, cultural and social aspects where developments were apparent. Politically, the relocated Gilbertese communities are not only under a different government than in the Gilberts, their own councils were also not nearly as autonomous either. While village elders may have retained the respect that comes with their position, their influence was becoming weaker. Culturally and socially, there was growing contact with other ethnicities. Such ties were initially neither strong nor were there hostilities, but the Gilbertese became more rooted to their new environment and less connected with their ancestral home islands. New lifestyles have emerged. Relatively soon, fishing had become less common, while gardening or wage employment was on the rise. Households, too, became smaller and more often consisted of nuclear family only. Knudson concludes his article stating that Gilbertese customs have changed insofar as "the younger members . . . are certain to find that their cultural traditions provide guidelines but not necessarily solutions to the new situations they will face" (p. 241).

[31] Chronologically, the allocation of land at Kamaleai Point came before the government distributed plots to individual households. Therefore, Kamaleai was included in the land distribution scheme, pulling even more Gilbert islanders away from Titiana.

There do not seem to be any strong ties between the communities in the Solomon islands and the Gilbert islands any longer.

2.5.4 Excursus: Food

Following a discussion of migration, resettlement, displacement and relocation, it is perhaps a good point in time to present more information on the importance of the island and the sea, particularly with respect to how essential they are for food sustainability. This brief excursus will show how simple – not easy – life and survival has been in the past and still is today.

Before the Gilberts were frequented by Europeans, their inhabitants were completely dependent on what the islands and the seas had to offer. The freshwater lenses 2 to 3 metres below ground provided drinking water, and the sap or 'toddy' of the palm tree another potable source. There were no indigenous land mammals in the Gilbert islands and relatively limited availability of edible fruit and vegetables (see for instance F. R. Thomas, 2003). Unsurprisingly, life on the Pacific atoll islands that are now known as Kiribati was geared towards the sea where the tides indicate the daily structure: low tides when the sun is high allow for the collection of mussels which surface in the shallow waters a few hundred metres out in the lagoon; low tides after the sun has set are ideal for the catching of crabs and prawns, also on the lagoon-side; high tides during the night bring fish to the razor-sharp rocks close to the beach on the ocean-side.

It is also not surprising that Gilbert islanders who arrived in the Phoenix group and on Rabi during the migration schemes of the mid-20th century were initially trying to work the ocean – the same ocean – like they were used to. For the former, Maude (1952) writes that the waters "teemed with fish" (p. 74): "the fish were so plentiful and unaccustomed to man that they were literally scooped out of the water by hand" (p. 75). However, as already mentioned in the previous sections, old habits could not simply be transferred:

> On coral islands certain of the reef fish tend to be poisonous for portions of the year, the types of fish and times during which they are poisonous changing from island to island. In the Gilberts, of course, these periods are well known to the local inhabitants, but when they reached the Phoenix they had to learn afresh by bitter experience what fish could be eaten and when. (p. 84)

Rabi, too, offered different fish whose consumption even killed some of the newly arrived (McQuarrie, 2012, p. 196).

Among other things, the early years of contact brought new mammals to the islands. Macdonald (2001) provides a short list: poultry, cats, and dogs, the last of which were plentiful and occasionally eaten; ducks, goats and even fowls, too, were briefly introduced but were either eaten before having

bred, or killed out of superstition (p. 17). In the Phoenix islands, rabbits were found some of which were brought to the Gilberts only to be devoured by dogs (Maude, 1952, pp. 76-77).

With increased contact and trade today, the I-Kiribati have access, albeit on some islands very limited, to a lot more edible and potable sources. Many of these can be stored for much longer periods than previously available foods, owing to air-tight packaging, conservation substances, or, but to a much lesser degree, refrigerated containers. The imported foods most commonly consumed today include rice (in 18-kilogram bags), instant noodles (in small plastic bags), and canned dishes such as ham or pork. With regards to animals, cats and dogs are still plentiful and usually stick around the same groups of houses and people; chickens roam the islands freely; pigs are also very wide-spread and sometimes also free-roaming, sometimes held in small fences built from various bits and pieces of scrap metal, and sometimes held by means of a rope with one end tight to a leg, the other to a tree.

It is undoubtedly also worth noting that many aspects of traditional life have hardly changed. On the outer islands, virtually everybody has access to well water and uses it on a daily basis, for drinking, cooking or washing; rain water is only an alternative for those who have a container to collect it, or live close enough to a public water tank; in many households, there are people in charge of cutting toddy; and, like in the past, every-day life is very much geared towards the tides of the sea, for the collecting of mussels or the catching of prawns, crabs or fish.

2.6 Towards independence

Voluntarily or not, the Gilbert islands took their first steps towards independence during the Second World War. It brought them in closer contact with foreign peoples and cultures, which introduced novelties of many different kinds. For instance, the coast-watching schemes meant that many islands and many indigenous people profited from radio communication installations, and the Bairiki Wireless Training School that was established on Tarawa during the war continued to train local students afterwards. The islands of the GEIC became better connected to one another as well as to the rest of the world. There were also means of establishing air services throughout the Pacific. Owing to lacking potential customers and rather large distances, however, commercial services only started in 1966 when Fiji Airways began to call at Tarawa – up to this day, they are still one of only three airlines that offer international connections (to either Tarawa in the Gilbert group or Kiritimati in the Line group). Furthermore, as described in the previous section, there was increased contact with New Zealanders many of whom were stationed in the GEIC as coast-watchers, as well as Americans who arrived in much greater numbers; there were times where up to 8’000 troops were stationed on Butaritari, Tarawa and Abemama (McQuarrie, 2012, p. 183), and US employment possibilities existed in almost the entire Gilbert group. As a result, the islanders developed a greater confidence in “speaking English, dealing

with foreigners and handling money matters" (p. 203). By late 1943, when the new British Resident Commissioner arrived in Tarawa, the paternalistic style of administration could not be continued. Changes were due and came in various forms. A new *Policy and administration after the war* was issued by the High Commission on October 1944, which sought to give control back to the indigenous communities. It stated that local governments should be reinstated in ways more analogous to pre-colony times, and that foreign interference should only come when necessary and only with the aim of achieving self-control (reported in McQuarrie, 2012, pp. 203-204). Also, the Resident Commission was moved to Tarawa; it was to concern itself less with the British Phosphate Commission (BPC) on Banaba and more with education and health in the entire colony (pp. 202-203). Changes of this kind were not only corrective of previously imposed restrictions on political and social reality in the GEIC, they also paved the way towards independence – for both the Gilbert and the Ellice islands. The foundation for a transition towards independence was laid. It would, however, take more than three decades until the end of the GEIC.

The following sections cover historic events that occurred between the Second World War and 1979. They include a description of nuclear bomb testing in the colonial territory, poignantly revealing the GEIC's silent oppression in the theatre of world politics, as well as an overview of events that led up to the independence of both the Gilbert and Ellice islands.

2.6.1 Nuclear bomb tests

France, Britain and the United States conducted nuclear tests in the Pacific as early as 1946. The British detonated their first atomic bombs in the Australian desert. The Australian government rejected hydrogen bomb tests due to safety concerns, however, so "empty" spaces had to be found elsewhere. Consequently, a base was established on Kiritimati (Christmas Island) and its existing airstrip upgraded to allow the landing of heavy aircraft. Three tests were conducted on (relatively) nearby Malden Island in 1957. By then, the Americans had made early successes which put them ahead of other powers and allowed them to prepare a call for a moratorium on nuclear tests (Simon & Robison, 1997, p. 258). Under these circumstances, the British felt their time running out and, in "imperial folly", rushed to proceed with their operations (Maclellan, 2005, p. 364). Therefore, the six tests that followed in 1958 were conducted on Kiritimati rather than on Malden; this saved both time and money (p. 25). Approximately 20'000 British, 500 New Zealanders and 300 Fijians were involved in the British nuclear operation in the Line group (p. 24). It was halted when the United States began their moratorium on October 31, 1958. The Soviet Union, however, resumed testing only three years later. The Americans followed suit. Disregarding their own call, they, too, conducted a further operation and detonated 39 bombs in 1962. Of these tests, 15 took place in the Marshall islands, the other 24 in the vicinity of

Kiritimati, which had to be borrowed from the British government (Ruff, 2015, p. 778). Over 28'000 people participated in the American operation (Berkhouse et al., 1983, p. 3).

Only a limited amount of information is available about these nuclear tests with regards to health and environmental impacts as well as to the involvement of and consequences for the Gilbertese population. In his article for the International Review of the Red Cross, Ruff (2015) investigates otherwise grossly neglected humanitarian implications. For the lack of information, he blatantly states that "comprehensive evidence of the nature and extent of environmental and health effects of nuclear weapons testing was often not collected, incomplete, neglected or systematically covered up" (p. 808).

During both the British and American operations in the Line islands, Gilbertese people were present and had to suffer from indirect as well as direct impacts. Berkhouse et al. (1983) mention that some 400 plantation workers were living in two local villages on Kiritimati (p. 31), and Maclellan (2015) refers to another 260 islanders who were brought in to work for the British personnel (p. 30). The latter author also reports on different stances that were taken with regards to the indigenous population. There was, for instance, a trading company that was established in the Gilbert islands since the 19th century whose functionaries urged the British government to pay sufficient attention to plantation workers and properties in Teeraina (Washington Island) and Tabuaeran (Fanning Island), also in the Line group (pp. 27-30). The British as well as other agents, however, treated the indigenous communities with much disregard. For instance, the British artificially constructed the nuclear danger zone around Kiritimati in such a manner that nearby islands, among them Teeraina and Tabuaeran, were excluded and could thus be neglected (p. 30). Another example relates to the radiation threshold for such "primitive people" as the Gilbertese which was set about 15 times higher than what was permitted for other personnel at that time (Oulton, 1956, quoted in Maclellan, 2015, p. 29). Furthermore, Maclellan cites a formerly top-secret document where it is stated that, with regards to nuclear tests, "only very slight health hazard to people would arise, and that only to primitive peoples" (p. 29). As for the question about how to deal with locals during tests, the Resident Commissioner saw no need for intervention at all, arguing that, if the island was safe for service personnel, it would also be safe enough for the Gilbertese (p. 30). In fact, during the British operation almost all islanders were evacuated to Tabuaeran for three months for some of the early tests but were returned for the later ones (p. 31).

An account of a survivor, reported in Tuvanavau-Salabula, Namoce, and Maclellan (1999), serves as a final example of how Gilbertese were treated during nuclear testing on Kiritimati. Sui Kiritome narrates how she and other islanders were taken aboard a ship and kept under deck with movies as entertainment. Moments after the blast, they were invited to watch the spectacle, but unlike the military personnel, they were not given any protective clothing. Black rain fell. Sui Kiritome provides the following description of the events:

> Some time [*sic*] after the test, something happened to my head and face. Every time when I combed my hair, I was losing strands of my hair and something like burns developed on my face, scalp and parts of my shoulder. My face was the worst affected because I was looking up at the black cloud from the

> blast which was directly above us when the light shower fell on my face. . . . the burn mark on my face remained. The mark remains on my face till today. It has been on my face for the last forty years or so now. (p. 61)

Sui Kiritome was pregnant at that time. At least two of her children also suffered from medical issues.

The environmental impacts of nuclear tests were of course devastating, too. Even though all bombs were intended to detonate in the air, which was supposed to reduce local impact, Malden was contaminated as a result of all three tests in its vicinity. In Kiritimati, too, there was at least one bomb that, due to its detonation at an altitude lower than expected, led to a huge contaminated area and to fallout reaching the island. Unfortunately, damage was facilitated because the Line islands, being atolls, are made up of fragile reefs and of soil that allows for significant uptake of radioactive material in plants (Simon & Bouville, 2002, p. 721). Furthermore, it has been hypothesised that radioactivity was introduced into the food chain and posed an increased health risk to humans (Pearce et al., 1990, p. 1165). More evidence regarding both environmental and health impacts can be gathered from the clean-up works after each test. These included the disposing of thousands of birds which were maimed, blinded or killed, as well as the dumping of contaminated waste into the ocean; clean-up was often the responsibility of Fijians who were not supplied with protective gear (Maclellan, 2015, p. 32). Due to a lack of adequate documentation, however, an accurate assessment of environmental and health impacts is hardly possible. Simon and Bouville (2002) have attempted to report on radiation doses to people near test sites and provide the following summary:

> There is little or no information available on exposures of the public or of civilian test personnel at Christmas and Malden Island, although United Kingdom, New Zealand, and Fijian veterans of those tests have reported many types of medical problems that they believe were caused by radiation exposures from the tests. (p. 718)

While rather little information is available to begin with, only a small fraction provides insights into the impact on the indigenous communities and their exploited homes. Moreover, individual pieces of evidence are often rejected by others with more power. For instance, the book entitled *Britain and the H-Bomb* (2001) states that radioactive contamination at Kiritimati and Malden was minimal and thus stands in contradiction to most of the accounts quoted in this section – this particular book was written in close collaboration with the British Ministry of Defence, and, although authored by Arnold, the copyrights are held by the ministry. Under such circumstances, then, it is unsurprising that no nation conducting nuclear tests saw themselves forced to provide compensation to people beyond their own borders (Ruff, 2015, p. 782).

The Americans eventually lost interest in Kiritimati and had abandoned it by 1969. Most facilities were dismantled, others converted for the islanders to use. Vehicles were also left behind. They were either offered for civilian use, too, or deposited off-shore to form a jetty. The legacy of nuclear testing also includes a huge amount of waste, much of it contaminated. Clean-up works only

started in 2005. By then, the facilities and vehicles had mostly been ignored and deteriorated, the jetty had washed away but the wrecks were still there, and the islanders had built their homes not only in close proximity to abandoned waste but had also used some of it as building materials (see for instance Steadman, 2006, or Kerr, 2009). The clean-up project attempted to not only deal with the nuclear waste, but also to provide benefits for the local communities while doing so. As Steadman (2006) reports, job fairs were organised and 30 locals were hired as drivers and labourers; presentations were held in the local *mwaneaba*; books, stationary supplies and sports goods were imported for the islanders; a hotel was expanded and renovated; and restaurant and hotelier staff of the entire island received food hygiene training. Steadman further notes that, instead of being governed by far away Tarawa in the Gilbert group, the island had its own voice for the first time and involvement in negotiating their own affairs has been greatly appreciated by the communities (pp. 6-7).

Exploited between 1957 and 1962 for nuclear tests, it took half a century for the waste left on Kiritimati to be disposed of properly. Even though the British government had rather seen it deposited in landfills on the island, a memorandum with the government of Kiribati forced them to remove it (Kerr, 2009, pp. 6-7).

2.6.2 Division of the colony

McIntyre (2012) argues that what led to the separation of the Gilbert and Ellice islands was neither anti-colonialist ideology nor liberal constitutionalism on the part of the British who firmly discounted the idea of letting go of their colonies and abstained from signing the United Nations' declaration on decolonisation of 1960. Regarding the GEIC specifically, early post-war investigations suggested that administration through a civilised power is imperative lest the islands should "relapse into primitive savagery" (reported in McIntyre, 2012, p. 139). Even later on, when other territories of the British empire had achieved independence and when discussions and preparations were ongoing elsewhere, the focus of the responsible government office was on Europe, North America and defence, while those outside these fields were regarded as "odds and sods" (reported in McIntyre, 2012, p. 141).

There were internal drivers that ultimately led to separation, very importantly the different experiences Gilbert and Ellice islanders made in their mutual time as a colony. To begin with, in establishing the GEIC, the British forced together two ethnically, culturally and linguistically distinct peoples but "nothing was done to foster a common identity" (McIntyre, 2012, p. 138). Geographically, the Polynesian Ellice islanders were soon at a disadvantage as institutions and services began to be centralised to Tarawa: governmental headquarters, institutions for secondary and higher education as well as the colony's hospital were all located there. On the other hand, education in the Ellice group benefitted from a very influential headmaster and, unlike in the Gilbert group, did not suffer

interruptions during the Second World War (education will be discussed in more detail in Section 2.7). As a consequence, Ellice islanders secured disproportionately more scholarships and civil service positions than the Gilbertese: J. Smith (2011) reports for the year 1972 that there were about 7'000 Ellice islanders against 42'000 Gilbertese (p. 114), in other words they only made up one sixth of the GEIC population, yet they held a third of government jobs and were a third of the merchant seamen as well as a third of the working force at Banaba (Ocean Island) for the British Phosphate Commission (BPC). Macdonald (1970) points out that the Gilbertese islanders' striving for unity through equality and conformity – a concept that can be subsumed under the term *booraoi* (Autio, 2010) – may have worked towards this imbalance (p. 145).

Racial differences grew increasingly problematic as political development was achieved. Every two years from 1956 to 1963, colony conferences were held, with island council representatives, mission representatives, three civil servants and the Resident Commissioner. The expatriates left after their input so as not to inhibit or further influence discussions among the Gilbertese leaders (McIntyre, 2014, p. 198). In 1963, a conventional constitution was authorised. It instantiated an executive and an advisory council which served under the Resident Commissioner. Towards the end of the decade, the desire for internal self-government and separation from the High Commission was made clear; a status of free association with the British Empire was to be retained (p. 200). A new constitution was only ratified in 1970, but it introduced important changes: separation from the High Commission was achieved, the colony fell under the supervision of a governor, and a Gilbertese islander became 'Leader of Government Business' (McIntyre, 2012, p. 140). Ellice islanders felt increasingly threatened. Centralisation to Tarawa had, for some two decades already, required them to move and to adopt another language, and they feared that their culture, language and identity would disappear with continued intermarriage and with Gilbertese islanders holding leadership offices. Consequently, they voiced a plea for separation. The Gilbertese, who disliked how the Ellice islanders kept securing disproportionately more civil service jobs on their turf and how they were granted two ministry positions as per the new constitution, welcomed the prospect. After all, "about all the two peoples have in common is fifty years of British rule and for many years that was hardly apparent" (J. Smith, 2011, p. 115).

The possibility of separation was investigated and discussed in the early 1970s and officials of the British government paid several visits to the Ellice group. In 1973, concrete demands came forth: separation in 1974 and, among other things, half of the colony's phosphate revenue fund (see Section 2.8.2 for more discussion), funding for a secondary school, guaranteed continued employment on Banaba and the transfer of Kiritimati (Christmas Island) in the Line group (McIntyre, 2014, p. 206). It was made clear, however, that none of these demands would be met but that the Ellice islanders would only be granted one ship. John Smith, governor of the GEIC between 1973 and 1978, sheds light on the underlying motives of the British government:

> My aim, accepted by the FCO [Foreign and Commonwealth Office], was to try and ensure that the Gilberts was the stronger for separation and better able

> to become self-sufficient. The Ellice would inevitably have to rely on grant-in-aid but the objective for the UK should be to have responsibility for one pensioner rather than two. (p. 118)

Supported by the UN Committee of 24, a special committee overseeing decolonisation processes world-wide, a major educational programme was launched throughout the entire Ellice group in order to ensure the conditions for separation were properly understood; J. Smith (2011) comments that this was not always done without difficulties since abstract concepts such as colonialism do not easily translate linguistically or culturally (pp. 119-121). A referendum was held in August and September of 1974. It sent a very clear signal: the Ellice islanders voted 3'799 to 293 in favour of separation, in a poll that drew 88% of the entire population (McIntyre, 2014, p. 208). A few weeks later, in November, a separation committee was formed. It was decided that, once separated from the GEIC, the Ellice islands were to be called Tuvalu (eight standing together). Separation was achieved on October 1, 1975 and the new administration took office at the beginning of the new year.

Independence was to follow soon after. In February 1978, a delegation of 19 people travelled to London for a constitutional conference where it was decided that Tuvalu would remain a British dependency with the Queen as head of state represented by a governor. Financial aid was granted, too, in the form of a special development fund for coping with problems arising from the separation, development aid for 1978 until 1980, and budgetary aid for 1979 until 1980 (McIntyre, 2014, p. 214). No provisions were made with respect to the phosphate revenue fund. The Tuvaluans felt that they came out of the colony empty-handed and were "disaffected . . . by their treatment in London, especially the contrast with the fulsome hospitality they offered visitors to the islands, that the Polynesian gifts they brought were bestowed on the hotel porter" (p. 214).

Tuvalu became independent on October 1, 1978. No Royal Navy vessel was sent to the celebrations, and Princess Margaret who was supposed to represent the Queen was flown to Australia with influenza one day prior. In her stead, Tom Layng read out the Queen's message. McIntyre (2014) reports that, during his stay, Layng also stated that Tuvalu could either be equipped with modern infrastructure or it could continue in traditional fashions with "happy smiling natives living in leaf huts and lavalavas [light towels worn as skirts]" (p. 215), or that, "if a country wants to run its own affairs, and is happier doing this 'badly' than having it done more expertly by others then a colonial power should not stand in its way" (p. 215).

2.6.3 Independence of the Gilbert islands

There had already been many colonies that became independent, in the Pacific and elsewhere. For the Gilbert islands, too, independence in some form or another had long been anticipated, especially after

the appointment of a governor and other governmental changes, as described in the previous section. It was to be achieved only shortly after the division of the GEIC, and could have coincided with that of the former Ellice islands, but was delayed mostly due to ongoing disputes, legal and other, with the Banaba (Ocean Island) communities.

The Banaba islanders that were brought to the Fijian island of Rabi in 1945 (discussed in Section 2.5.2) had grown to approximately 2'400 people by the 1970s (McIntyre, 2014, p. 216). Since 1947, former Banaba landowners had received 15% of the phosphate profits while the rest went to the colonial government (J. Smith, 2011, p. 134). The Banaba islanders undertook many attempts to receive more phosphate royalties, to sue the British Phosphate Commission (BPC) for breach of replanting requirements, to be granted the right to return to their home island, to gain independence in free association with either Fiji or the Gilbert islands, or to gain full political independence. It is worth noting that the Banaba islanders also claimed to be a people different from those in the Gilbert group, in terms of race and language. Such claims stand on weak grounds. J. Smith (2011) repeats Grimble's suggestion that Banaba islanders were as distinct from Gilbert islanders as the Cornish were from the English, and notes that their own language had long disappeared (p. 135). He further takes the following position: "while remoteness and small numbers encouraged the survival of distinct cultural patterns, it can be argued that there was a sense of Gilbertese homogeneity, including Banaba, long before the British arrived" (p. 136).

In 1968, Nauru achieved independence as well as ownership of the local phosphate industry which (in)famously allowed it to temporarily become the richest nation in the world in terms of income per capita. A few years later, it was clear that the Ellice islands, too, were on a path towards independence. Aspiring to secure the same fate for themselves, the Banaba islanders once more petitioned for separation and independence in 1974.

Only a month after Tuvalu achieved separation in 1975, the Gilbertese called for constitutional conferences in 1976 and internal self-government by the end of the year. How to achieve a beneficial agreement with respect to the phosphate industry as well as the royalties it yielded was now a question that both the islanders of the Gilbert group and the Banaba islanders on Rabi aimed to answer rapidly. Despite certain tensions between them, the two groups did not find it difficult to work on this issue together. As J. Smith (2011) argues, "the common ground between the Gilbertese and Banabans is dislike of the BPC and belief in past exploitation" (p. 151). Their collaboration resulted in a plea that was sent to London. It contained the following passage:

> We [the islanders of the Gilbert group] and the Banabans are concerned for the future well-being of our respective peoples when the phosphate mining on Ocean Island is exhausted in two to three years' time. We also recognise that the beneficiaries have been in the main the partner governments that comprise the British Phosphate Commissioners. We strongly feel that the partner governments have a deep moral obligation towards both of us for our future economic survival as a people. (Reported in J. Smith, 2011, p. 150)

Therefore, the plea continues, negotiations were to be commenced without further delay.

Preparations for internal self-government were well under way. In March 1976, Governor Smith arranged for seminars to be held whose aim it was to "engender confidence that the Gilbertese were perfectly capable of working out what they wanted in a constitution" (J. Smith, 2011, p. 184). A variety of existing options were discussed in order to hone in on possible solutions that might suit the local profile. Furthermore, Smith made short radio announcements that were broadcast every weekday for four weeks in order to explain the relevant questions and processes (p. 184). To support the discussions it aimed to stimulate, it was requested that he provided some sort of written material. He therefore compiled a list of 52 questions that addressed various topics relevant for a colony on the verge of achieving independence (see Appendix A.9). It was agreed that the draft constitution should be simple in structure and language with the text available in Gilbertese (McIntyre, 2014, p. 225).

In July 1976, informal constitutional talks took place in London. It was unusually hot so that Governor Smith arranged for the meeting to be moved to St. James' Park: "jackets, ties and shoes were quickly discarded as we sat island style under the shade of a plane tree" (J. Smith, 2011, p. 152). It was decided that internal self-government of the Gilbert islands was to begin on November 1, 1976. However, the Banaba islanders were still striving for separation and so causing delays. It was announced in December that, in compensation for the breaches of replanting requirements by the BPC, the Banaba islanders were to receive 11'000 Australian dollars, a rather derisory sum in comparison to 1.25 million dollars that were offered for a settlement out of court (p. 155). This did not yet conclude their legal dispute. Internal self-government had to be postponed. However, Governor Smith acted as if it had come into effect on the date it was scheduled to and ceased to attend the council of ministers in order to encourage the Gilbert islanders in their striving for eventual independence (McIntyre, 2014, p. 226). Internal self-government became a reality on January 1, 1977.

In April and May 1977, a public constitutional convention was held. Besides the audience, it consisted of 165 discussants: ministers, various members of island and village councils, as well as representatives from churches, social clubs, and so on; there was only one expatriate who had previously led the abovementioned seminars and whose role in the convention was to answer questions and explain issues but not to make any recommendations (J. Smith, 2011, p. 186). McIntyre (2014) claims that the convention was the largest gathering in Gilbertese history (p. 227). Albeit not intended for such use, the convention insisted that Smith's list was a formal agenda: the 52 questions on it, and only those questions, were to be discussed. Very transparently, Smith states the following:

> I could fairly be accused of having unduly influenced the outcome [of the convention]. . . . The Convention has been criticised in Kiribati for being 'benevolent manipulation', on the grounds that the list of questions I had provided were leading questions to which 'unsophisticated islanders' reactions' could be anticipated. I can understand that criticism. (J. Smith, 2011, p. 186).

The convention produced a short and simple report that was to assist in the drafting of constitutional proposals. It comprised 30 paragraphs covering the name of the country, citizenship, legislature, executive, public service, police, judiciary, control and audit of public finance, fundamental human rights, and membership of the United Nations (p. 186).

Coinciding with these events, the Banaba islanders were made an ex gratia compensation offer of 10 million Australian dollars shortly after the convention had ended: it came with the condition that no appeals against the High Court judgements and no further claims would be made (J. Smith, 2011, p. 159).

The Gilbert islands prepared for their first general elections that were held in February 1978. Ieremia Tabai became president elect. He was only 27 years old at that time, went to college and university in New Zealand and obtained a commerce degree, had previously worked as treasury civil servant and was married to an Ellice islander (McIntyre, 2014, p. 227).

Since the Banaba islanders were eager to achieve separation before the Gilbert islands became independent, they saw their time running out. In November 1978, decisions were made: in a constitutional conference in London, it was ruled that separation would not be approved. The Banaba representatives were enraged and most walked out during the announcement. In their absence, the new constitution was approved. Furthermore, the following financial settlements were made: development aid of 15.5 million British pounds for four years; budgetary aid of 9.1 million Australian dollars; continuing technical cooperation; and additional support in emergencies and natural disasters (McIntyre, 2014, p. 231). The Banaba islanders were approached once more: they had yet to accept the 10 million Australian dollars that were offered to them in 1977 and they were now made an additional offer of 1 million British pounds for development aid on Rabi (pp. 231-232). Their response came promptly:

> [We] came half-way across the world mandated by our people to ask the British Government to right many wrongs we have suffered since the beginning of the century by a single act of reparation, namely the separation of our beloved homeland from the Gilberts Colony and its return to us. You . . . seem to think that our compliance with your constitutional proposals can be bought with money. Can you not understand that there is no sum that can right the wrongs you and your predecessors have inflicted upon a small and defenceless people? . . . What we find particularly distressing is that the simple truth that our land is basic to our identity as a people has been put to the British Government over and over again . . . This is no way for Britain to take its departure from the Pacific. All that you will succeed in doing is leaving behind a heritage of bitterness and disunity. (Reported in McIntyre, 2014, p. 232)

The disputes were carried over into 1979. In March, meetings were held with Gilbert and Banaba islanders, as well as other parties where propositions were made that the Banaba communities would be given a substantial measure of self-government (McIntyre, 2014, p. 232). The Banaba islanders declined; separation was to come first. In May, it was suggested that Banaba could become an

associate state of the new nation (p. 235). That, too, was declined; separation was to come first. In May, the Banaba islanders made a last effort and pleaded for a compact of free association that granted them self-government (p. 236). It was not accepted. They finally announced, in June, not to lodge an appeal in the High Court but to look towards the future. Thus, they requested for an economic survey of Banaba be made, expressed interest in accepting the ex gratia 10 million Australian dollars and 1 million British pounds, and asked for further aid towards infrastructure (p. 236).

The Gilbert islands celebrated their independence day on July 12, 1979. As per the agreements reached in the 1976 convention, they became a republic with a president and a single chamber parliament comprising 35 members and representing all inhabited islands, including Banaba (McIntyre, 2014, p. 227). The roles of both the head of government and head of state were vested in the president, which meant that, unlike in the case of Tuvalu, no political association with Britain would be retained. The Gilbert islands became Kiribati. The name is a change in type face more than anything as it is an orthographic representation of the islanders pronunciation of Gilbert: [kiɾibɛs].

2.6.4 Closing cases

There were a few issues that had not been resolved before Kiribati became independent. These include questions of sovereignty, the elimination of phosphate exports as a source of income, and continued tensions with the Banaba (Ocean Island) communities.

Territorial questions with regards to the Phoenix and Line islands were still open by 1979, but were fortunately addressed soon after. As mentioned in Section 2.4.4, the Americans signed an agreement with the British for joint administration of Abariringa (Canton Island) and also Enderbury Island for 50 years in 1939 and made claims on further islands. Abariringa was strategically important during the Second World War, was used as a space-tracking station and weather reporting base until 1967, and as a missile monitoring base between 1970 and 1976 (McIntyre, 2014, p. 223). Forfeiting the 50-year agreement, the Americans renounced most of their claims: in a treaty of friendship signed in September 1979, they recognised Kiribati's sovereignty over Abariringa and Enderbury, as well as Orona (Hull Island), Manra (Sydney Island), Nikumaroro (Gardner Island), Rawaki (Phoenix Island) and McKean Island in the Phoenix group, and Kiritimati (Christmas Island), Malden Island, Starbuck Island, Flint Island, Vostok Island and Caroline Island in the Line group; in a similar treaty half a year earlier, they had already recognised Tuvalu's sovereignty over four of their eight islands. In turn, Kiribati agreed to consult the Americans in case it considered allowing a third party to have access to their islands for military purposes (van Trease, 1993, pp. 5-6).

What also followed independence with only a short delay was, unfortunately, the depletion of the phosphate reserves on Banaba. Exports ceased on November 25, 1979 (McIntyre, 2014, p. 231),

eliminating what had provided more than half of the Gilbert islands' income (van Trease, 1993, p. 21). Even though anticipated and even though further aid was made available, this sudden change posed and still poses huge problems for such a young new nation with so many geographical, economic and financial difficulties (further discussion follows in Section 2.8 below).

As regards the Banaba communities, they only gradually became more involved in the political system they were, or had to be, part of. It was not until 1981 that they finally accepted the ex gratia 10 million Australian dollars (J. Smith, 2011, p. 159), and not until many years later, "when death or retirement had removed all the principal actors from the scene", that relations were restored and use was made of their seat in the parliament or other provisions safeguarding their rights (p. 161).

I close this section covering the period between the Second World War and independence by briefly addressing the topic of national identity. Van Trease (1993) argues that cultural differences including traditional and political variations had existed between the islands but the many political events that preceded Kiribati's independence had allowed for a single national identity to emerge (p. 5); due to their displacement and relocation history, the Gilbertese living in the Solomons or on Rabi are perhaps an exception. By no means, however, does this mean that individual islands have become less important or less valued entities. On the contrary. When I-Kiribati are asked where they are from, they frequently list not only the island they were born on, but also the islands of their mother and father as their home islands, even if they themselves had never set foot on them. Through lineage, they are traditionally and legally entitled to belong to these islands and thus to a sense of belonging. Political independence has hardly changed that. Through granting the I-Kiribati the rights to negotiate and shape their own nation, it has allowed for a strong sense of nationhood to emerge and exist alongside, rather than in replacement of, identities linked to individual islands.

2.7 Educational developments throughout the years

In the present section, I describe how education, specifically English language education, has been carried out throughout the years and how current models have emerged. This analysis necessarily leads to discussions of geographical, economic, social, cultural and political factors. Therefore, the description of educational developments necessitates the revisiting of many historical events that have been addressed before.

It is fortunate that I am able to rely here on the doctoral thesis by Pannu, published in 1993, on the educational system of Kiribati; if not otherwise stated, the information given below can be found in his dissertation. It has by far been the largest and most substantial publication on the English language

in Kiribati. Beside it, there are only a few smaller educational reports – many of which are cited in Pannu's dissertation. Moreover, having a snapshot of some aspects of Kiribati's linguistic situation from over two decades ago makes apparent in what ways the educational sector has and has not changed or progressed.

In order to understand how Kiribati's education system has developed since independence, it is necessary to look into colonial achievements in this sector and to determine what Kiribati has been left with when transitioning into a new, independent nation. Therefore, I begin this section with an overview of relevant contributions, or the lack thereof, by the missions and the government before the Second World War; this is followed by a discussion on the post-war period, during which different stances towards education were taken, and on developments between independence in 1979 and today. Finally, I dedicate a section to issues and obstacles that were responsible for the only slow progress in the past, as well as to a critical appraisal of current approaches which make apparent that many old and known issues are still prevalent today and not adequately responded to.

2.7.1 Early approaches

Education before the Second World War was almost entirely a responsibility of the missions. As described in Section 2.2, neither the American Board of Commissioners for Foreign Missions (ABCFM), nor the successive London Missionary Society (LMS) or the Sacred Heart Mission (SHM) foresaw increased contact between the Gilbertese and foreigners, hence they did not foresee the need for English competence. Their focus was clearly on the teaching of other contents, mostly but not only religious, carried out in the Gilbertese language – or Samoan, but not English. The ABCFM, under Bingham, believed there to be "no time for teaching English" (reported in Rennie, 1985, p. 208), the LMS "did not think that the Gilbertese mind can absorb the complexities of English and learn through the medium of English" (as stated by Pannu, 1993, p. 72), and the SHM, in a likewise condescending manner, argued that "it would be a crime to submit this happy little race to overmuch intellectual discipline" in general (Sabatier, 1977, p. 305). Accordingly, all missions shared a policy which promoted the Gilbertese language for the teaching of all subjects at all levels, and even for internal communication among themselves. For a long time, they remain "vehemently opposed" to the introduction of English as a subject (Pannu, 1993, p. 60). By 1912, there were some signs which hinted towards a change when the SHM expected the arrival of another English missionary who was supposed to teach English, but it was not until the 1920s, when somewhat different stances were taken, that this became reality – yet, English was only an optional subject. It took another decade until English was taken up into the curricula of the four central schools that had been established by then – yet again, it was only taught as an optional subject and only for the upper forms, as the missions "did not wish to

digress from their supreme objective of mission and church work" (p. 68). The standard remained very weak and reached only an elementary level "due to the non-availability of English teachers and the inadequate background and training of the native teachers" (p. 73).

Due to the lack of interest of the British government in the Gilbert islands and the GEIC, there were but a handful of officials present: at first, there was only the Resident Commissioner himself; later, District Officers were employed so that the number of colonial staff rose to, and more or less remained at, 16 between the mid-1920s and the outbreak of the Second World War (Pannu, 1993, p. 66). Accordingly, that same government did very little for the colony's educational development. On the contrary, their sometimes ludicrous laws put obstacles in the way of the missions' (educational) expansion. Its early contributions towards progress in education began in 1898 when five schools were started. However, it was the local government bodies and not the colonial administration that were in charge of them, and essentially, these secular schools duplicated the work of mission schools; the scheme was "gradually abandoned" (p. 27). Further governmental contributions did not come until 1913 when mission education was subsidised. An education department was established in 1920, with a single official in charge.

Soon, however, there were more and more government-affiliated positions that needed to be filled and thus an increasing demand for trained Gilbertese who had some competence of the English language. For this reason, the colonial government opened the King George V (KGV) school in Bairiki, Tarawa, in 1922,[32] and a similar school in the Ellice islands in 1924. Each had the capacity to accommodate 60 students, boys only. They were post-primary schools and English was a subject as well as the language of instruction since their inception, and the teachers were native speakers of English. These developments were an important sign for the Gilbertese people, as English suddenly became more than a mere vernacular, but a language that could be learnt: Pannu (1993) notes that English "was no longer a language in the air, or a language of oral communication alone, people could learn to read, write and speak it as well" (p. 28). Elsewhere, however, he remarks about the two government schools that "the standard of overall education, including that of English, remained at a very low level indeed" (p. 73).

There was little collaboration between the government and the missions besides financial assistance. In the 1930s, however, there was a noteworthy yet short-lived scheme of cooperation. Its goal was the improvement of village schools – from which the government-run post-primaries could profit – and it implied teacher training as well as the adaptation of schools to local conditions and needs. The LMS and the SHM already had teacher training schools in place, since 1901 and 1914 respectively; the government had to transform a wing of the KGV first. After only four years, the scheme was abandoned in 1934 when the SHM withdrew, for financial and other unspecified reasons – Pannu (1993) suspects that there might have been too much government interference (p. 39). Only 35 mission teachers

[32] The school was built in 1922 and named KGV in 1925.

were retrained. Impressively, 1'200 children had benefitted from these teachers by 1936, representing about 25% of all school children (p. 29). However, the number of students learning English, while increasing, was only 263, or 3.8% (p. 74). Moreover, the standard of English education remained low for several reasons. To begin with, the teachers' proficiency levels were very low indeed because, as reported earlier in Section 2.2, previous training at the mission centres only equipped them with "the merest trace of English" (Sabatier, 1977, p. 302). Accordingly, these levels could not be raised as much as was intended, due to a shortage of funds and teacher trainers. Furthermore, as teacher training had no effect on the curricula of a village school, English remained an optional subject, it was not the medium of instruction, and cultural barriers were not done away with either (more discussion on the last issue follows below).

Shortly before the Second World War, there were approximately 80 European missionaries in the GEIC (Pannu, 1993, p. 64). In spite of their low number, in spite of their policies to use the Gilbertese language for communication with locals as well as for internal correspondence, and even in spite of many missionaries not being native speakers of English, Pannu gives them credit for bringing the English language closer to the Gilbertese islanders, on account of constant contact (p. 64). As for the government, it had made attendance in mission schools compulsory, which was "neither enforceable nor enforced" (pp. 75-76), while only running four schools by itself: a post-primary boarding school on Tarawa (KGV) and one in the Ellice group, and, on Banaba, a primary school and a European school. The principal – if not sole – interest of the colonial administration was the filling of a few jobs. That is, much like the mission policies, it strongly disfavoured the promotion of the English language in the GEIC. Grimble argued, in the protective but also rather paternalistic manner which he is known for (see also Section 2.3.3), that more positive stances may "inspire the natives with ambitions which they could never fulfil, and thus become the potential cause of political unrest" (reported in Macdonald, 1971, p. 77). Consequently, governmental contribution, both towards the missions and towards mass education, was kept "at the lowest possible" (Pannu, 1993, p. 30). It is noteworthy that, in contrast to policies of the missions and the government, the islanders saw and probably foresaw the benefits of speaking English and showed a desire to learn it (as addressed previously in Section 2.2).

The Second World War had devastating effects on the educational system of the Gilbert islands. It has been described above in Section 2.4 how Europeans had been evacuated and how many of those who chose to remain or did not get away in time were killed by the Japanese. Many village schools stopped functioning after a while, because there were hardly any missionaries left or because there were food shortages. Of course, the war also had several more direct effects on education. On Butaritari and Tarawa, schools were "simply obliterated" or "put an end to" (Pannu, 1993, p. 25). The KGV was closed down, too. Many of its students found themselves forced to work as guides, interpreters and manual labourers for the Japanese (McQuarrie, 2012, p. 117). Where schools were left intact, the English language was forbidden and Japanese introduced instead; this was also the case on the phosphate islands Banaba and Nauru. Teaching the Japanese language was, among other reasons, an attempt to create

loyalty towards Japan (p. 193). In November 1943, the Americans captured the Gilbert islands and locals were employed as labourers or engaged in intense trading (see Section 2.4.4). While having many positive effects, these arrangements were also partly responsible for the delayed re-opening of schools on Tarawa, Butaritari and Abemama (Pannu, 1993, p. 67).

2.7.2 Post-war developments

Numerous reports and policies were issued once the war had ended. Many projects were initiated as a consequence; most, however, only to little avail. Below, I provide an overview of relevant historical events, legislature and their significance with respect to development in primary and secondary education, as well as technical, vocational and teacher training, in as chronological an order as possible.

Already during war time, as early as 1943, the GEIC's future path was sketched out. The High Commissioner at that time famously stated that the islands were to be regarded as "native territory" and self-government through the islanders to be worked towards; European intervention was only justifiable if it served as a means to that end (reported in Pannu, 1993, pp. 78-79). Localisation, in other words, the transfer of offices and services to the Gilbertese and Ellice islanders, was also aimed at in the area of education. Moreover, it was to be achieved as quickly as possible since the filling of government jobs and thus self-government as a whole depended on it. Macdonald (1971) reports:

> It was agreed that a cooperative teacher-training venture with the missions would be commenced as soon as possible; that the Government should enter the field of primary education; that post-primary education should be expanded; and that, until the Colony was able to provide its own facilities for post-primary and more advanced secondary education, selected pupils should be sent to Fiji and New Zealand for further education. (p. 159)

First steps towards these goals were undertaken with the 1946 *Ten Year Plan of reconstruction and development and welfare* aiming to rehabilitate the colony from the effects of the war. While this was to be achieved with only as little money as necessary, a third of the plan's total budget was allocated to education (Pannu, 1993, p. 80). However, the same High Commission which promoted the goal of self-government took a pre-war stance that was based on the assumption that "any temptation to perform good works should be tempered by the realisation that development would generate expensive expectations" (reported in Macdonald, 2001, p. 172). Therefore, it hindered development in that it controlled, to some degree, the spending of the plan's money. For several years, for instance, it did not advertise the posts the GEIC had created in 1946 for two additional education officers, so that the colony had to proceed with the only two that it already had (Macdonald, 1971, p. 160, 2001, p. 170). Furthermore, the stance taken by the High Commission permitted only 10 primary schools to be built – five in the Gilbert and five in the Ellice group – and plans to establish schools on outer islands or a

secondary school for girls, complementing the KGV model for boys, were deemed unduly ambitious (Macdonald, 1971, p. 161). According to Talu (1993), only the small number of people that the government felt could be employed were provided primary education (p. 238), which explains why there were not more than 10 schools. Yet, the government had finally entered the field of primary education.

Rather than work towards a better educational system within the colony, the High Commission much preferred sending students overseas. Under a scheme of scholarships beginning in 1945, male students were sent to Fiji for post-primary education. The undertaking proved rather unsuccessful: the rejection rate was as high as 63% (Macdonald, 1971, p. 160), on academic and disciplinary grounds (Macdonald, 2001, p. 170). After 1948, recruitment halted and the last returnees were back home by 1952 (Macdonald, 1971, p. 160). Only 106 GEIC islanders profited from the scheme (reported in Pannu, 1993, p. 82). There are also linguistic reasons for this failure, as students were "ill equipped" for instruction in an English-speaking environment (p. 80; see also Macdonald, 2001, p. 170). On the other hand, the experience left them "with language skills relatively far superior to those possessed by pupils who remained in the Gilberts" (Pannu, 1993, p. 82). Similarly, GEIC islanders who received medical training in Fiji became a new class of educated Gilbertese upon returning to their home islands after three to five years (p. 69). Not only were they able to support their communities as trained nurses and dressers, they also offered other islanders more language contact possibilities with their increased English proficiency. Moreover, having become aware of the importance of learning and speaking English themselves, they helped reinforcing the status of the English language for others and encouraged family members to go to such schools that promoted it (pp. 69-70).

Similarly, teacher training did not only take place within the colony. An emergency teacher training class was held at a temporary school on Abemama in 1947 with a small group of eight male trainees only half of which were appointed as teachers a year later (Pannu, 1993, p. 123). Subsequently, in 1948, a cooperative scheme was officially inaugurated: the government laid down instructions, contents and timetables, while the missions were responsible for carrying out the courses which took four years to complete. Gilbertese was the language of instruction, English only a subject. Another year after, a further scheme was introduced which consisted of sending students to Fiji and "a few with higher achievements" to New Zealand (p. 124). Although being underprepared for these courses, especially since they were held in the English language, they returned to the colony with better English proficiency levels than the locally trained staff and thus received more important roles. By 1955, the scheme had ended. A total of 14 graduates from courses held in Fiji had started teaching (p. 124). Finally, in 1952, a few teachers were sent to New Zealand in order to upgrade their teaching and English language skills. This scheme came to a halt in 1959 and benefitted only eight teachers (p. 124).

Under Michael Bernacchi, Resident Commissioner between 1952 and 1961, major developments with regards to basic as well as educational infrastructure were initiated within the colony itself: these include shipping services, medical facilities, high school projects and advancements in the

areas of technical, vocational and teacher training. Since, however, infrastructure and services were mostly concentrated on Tarawa – effectively the capital island of the GEIC as the Resident Commission was moved there after the war – these developments initiated urbanisation movements and overcrowding which have led to various issues that are still prevalent today.

During Bernacchi's term, the KGV school was rebuilt and reopened. This took place in 1953, only after the abovementioned Fiji scheme had ended. Its new site was Bikenibeu, South Tarawa, rather than Bairiki. Beginning in 1956, secondary education was for the first time offered within the realms of the colony, albeit still only for boys; the previously existing post-primary courses were only aimed at bringing students up to the standards required for secondary education – in Fiji.

By 1955, there were 258 schools in the Gilbert group (reported in Pannu, 1993, p. 102). The six advanced schools operated by the LMS and SHM only offered post-primary education "with very weak or no English at all" (p. 99). In the same year, the GEIC's first education ordinance was enacted. It included the following propositions: the constitution of an education advisory committee, the recognition of all non-government schools, and compulsory attendance (reported in Pannu, 1993, p. 83). As such, the ordinance did not make linguistic policy. However, Pannu argues that, in its wake, an increasing bias towards teaching English was emerging (p. 84).

Another achievement was the inauguration of a teacher training institution (a wing of the KGV) in 1956, after some experimental one-year courses were carried out in the previous two years with a total of seven participants (Pannu, 1993, p. 123). Teacher education had become regular rather than interim, as well as local, so that no more trainees were sent to Fiji. However, only six students were taken initially, of which five graduated after the first year. Intake was raised in 1958, but only to nine (pp. 125-126). Between 1959 and 1964, the institution expanded into the Tarawa Teachers College (TTC)[33] with its own premises and facilities, allowing for more trainees to be taught. Pannu states in his 1993 publication that all new graduates had been employed in government schools (p. 126).

1959 marked the year in which government-funded secondary education for girls commenced, with the establishment of the Elaine Bernacchi School (EBS), named after the Resident Commissioner's wife.[34] The KGV and EBS eventually became coeducational in 1974.

In the early 1960s, a few other schemes were started, for the training of students as well as teachers. Pannu (1993) reports that, by 1965, "the total number of students and trainees was 70 in all fields, including six teachers in the U.K., one teacher in Fiji, and one teacher in Australia" (p. 124). Their time abroad and immersion in an English-speaking environment did not only benefit their linguistic skills, but also boosted the importance and status of the English language in the colony.

[33] The institution is today known as Kiribati Teachers College (KTC).
[34] The school was built in 1959 and named EBS in 1960.

In 1962, a private English school opened in Bairiki that was later taken over by the government. It was in great demand by expatriates as well as I-Kiribati families who had positive attitudes towards the English language and were affluent enough to pay the school fees (Pannu, 1993, pp. 84-85).

In 1964, the LMS declared that it would withdraw from primary education. It also stopped providing secular education for teachers at its training school. This led to the collaboration of the government with the SHM, the inception of a national education system, and the consolidation of schools (Pannu, 1993, pp. 85-86).

In the same year, two reports on education, including adult and social, were issued. Moreover, officials began to voice their support for the English language in the colony; even suggestions for its use as a lingua franca were made (Pannu, 1993, p. 94). Subsequently, in 1965, a first comprehensive statement on education was finally issued for the GEIC, in the form of a memorandum. Among other things, it mandated that teacher training be considerably improved, that primary education be a six-year course, and, formulating explicit language policy for a first time, that English be the medium of instruction (reported in Pannu, 1993, p. 86). The TTC promptly extended its course from two years to three and raised its intake from 30 to 60 (p. 126). Furthermore, a one-year emergency teacher training programme was held in 1967. However, it equipped its graduates with only limited qualifications (Grade V; see Section 2.7.4 below).

Complementing the EBS, the SHM opened a secondary school for girls in 1967. It is noteworthy that these early girls' schools were clearly focussed on educating their students as wives and mothers (Pannu, 1993, p. 100); the EBS was even built in close proximity to the hospital and the TTC "so that if girls were to develop aspirations outside of the home then it would be in the related areas of nursing or teaching" (Burnett, 2002, p.19). By the same year, both missions had established three secondary schools in total at which they offered courses up to Form III. The KGV and EBS remained the only schools to also offer IV and V.

Mowat paid a visit to the GEIC in 1967 which informed his subsequent 1972 report on *Oral English in the primary schools of the Gilbert and Ellice Islands*. By that time, English had become a subject at both government and mission schools. However, Mowat remarks the following:

> English was being taught in the primary schools, but it was being taught as a dead language. The children could not speak it and they could not understand it when it was spoken. . . . The level was not merely not what has been called 'uncomfortable intelligibility'. It was 'uncomfortable unintelligibility'. (p. 95)

It is apparent that new stances or policies emerging in the post-war era did not yet yield satisfying results.

Also in 1967, a specialist teacher of English from New Zealand arrived in the colony for the purpose of teaching English to adults, but returned a year later without being replaced (Pannu, 1993, p. 240).

Funded by the governments of Australia, New Zealand, the UK and the USA, the University of the South Pacific (USP) came into being in 1968 with its first campus site being Suva, Fiji. In the first year, three Gilbertese students were sent there, for a preliminary course. Up until independence in 1979, this number rose to a still small 47 (reported in Pannu, 1993, p. 102). Graduates were promptly absorbed by various government departments where English was the working language.

In 1969, the colonial government was able to organise three in-service training courses "for selected teachers" (Pannu, 1993, p. 131). They, too, were supported, financially and otherwise, through overseas donors and included a refresher course in English teaching.

After further reports and reviews towards the end of the decade which addressed the low numbers of graduates from secondary schools as well as various issues relating to expansion of services, a policy paper was issued in 1970 which Pannu (1993) deems "a remarkable carbon copy" of its predecessor (p. 91). Yet another report was promptly drafted which responded, highly critically, to the failure to investigate resources, the concentration of services on South Tarawa, the production of low-quality graduates, and the failure to match policies with staffing requirements (p. 91). An amendment thus also followed quickly: the 1970 review of education policy specified that primary education be a nine-year course – which was achieved by 1973 – and that the output of secondary schools was not only to be increased but also improved (reported in Pannu, 1993, p. 92).

As a consequence of some early legislative action, different stances towards technical education were taken. Previously, the BPC on Banaba offered apprenticeship training, primarily geared towards the skills necessary for the mining industry. However, such education was only of limited use, since trainees entered and left with poor English proficiency levels: "the teaching of English . . . was, for some unexplained reason, excluded from the course, even though English was the only language of communication between B.P.C. management and workforce" (Pannu, 1993, p. 105). Some 130 islanders benefited from this scheme (p. 105). There were a few government departments, too, that offered technical education. Some degree of English instruction for occupational purposes was involved, but only respective employees could profit. In 1967, the Marine Training School (MTS)[35] was established on Betio, Tarawa, providing courses for seamen that proved profitable for islanders and the colonial economy alike. Only three years after its inception, the school had a few hundred trainees annually. Not only did they take general and specific English courses, they were also able to put them into practice when securing employment in environments where English served as a lingua franca. Therefore, with respect to both high employment chances and the practically guaranteed application of linguistic skills, marine training was highly successful and stands out from the many other schemes. Another addition to technical education was the Tarawa Technical Institute (TTI)[36] that came into being

[35] Today known as Marine Training Centre (MTC).
[36] The institution was first named Vocational Training Centre, then Vocational Training Unit; today, it is known as the Kiribati Institute of Technology (KIT).

in 1972. In order to meet the increasing demand for technical and administrative staff – with improved knowledge of English –, the institute offered various courses and subjects including specialised English for seamen, clerks, mechanics and nurses (reported in Pannu, 1993, p. 106).

The TTC offered several courses in the early 1970s, many of which were supported by foreign contributors including the United Nations Development Programme. Among them were a one-year course similar to the emergency programme held in 1967 and a two-year course leading to more advanced qualifications (Grade III; see Section 2.7.4 below); both were further revised in 1974 and extended by a year each (Pannu, 1993, p. 127). Some of the shorter courses were only two to three weeks long and took place during school vacations. English was the language of instruction.

In 1972, a curriculum development unit was established at the TTC whose aims included the design, production and distribution of syllabus contents, as well as the provision of a teachers' centre (Pannu, 1993, p. 221). However, the unit had only limited success: the teachers' centre had been active at first but decayed so much that it had practically ceased to exist by 1979; with respect to English materials, it was largely preoccupied with the production of replacement syllabuses, timetables and instructions for teachers; the distribution system was often not well organised and breakdowns of reprographic equipment in the absence of technicians caused backlogs; limited funds meant that some materials could never be printed (p. 222). Pannu writes that, by 1993, the original functions of the curriculum development unit had almost become extinct (p. 223).

In 1974, a decade after the LMS withdrew from teacher training, the SHM left, too. Their teacher school had been in operation since 1938, but its qualifications never recognised by the government. With this withdrawal, the TTC was now the colony's only teacher training institution.

In 1975, a ministerial review led to a further education policy. Besides reiterating that primary education be compulsory – a desire that, although widely shared among the Gilbertese, was generally not backed by foreign government officials previously (see for instance Hindson, 1982; or Burnett, 2002, p. 20) –, it envisaged that it also became free by 1980. Under the provision of flexibility and discretion, it was recommended that English be taught from Form I and used as the medium of instruction as of Form IV. Furthermore, a community high school scheme was to be implemented. Its goal was to respond to the high number of school leavers, especially in the rural areas, who had very little chance of securing a place at a secondary school and subsequent employment with a salary. Thus, the courses of the community high schools were more practically oriented, comprised reduced academic content, and so aimed at equipping students with skills needed in their own communities. In benefitting both students and the local, rural communities they belong to, it was also hoped that urbanisation to South Tarawa could be discouraged. Thus, the curriculum included: English, Gilbertese, religious education, mathematics, commerce, home economics, agriculture, environmental studies, community skills, cultural arts, sports, and technical subjects like canoe and house building as well as motor maintenance (Pannu, 1993, p. 203). That English played an important role as a subject in its own right and as the language of instruction of other subjects helped to promote its status among teachers, students

and communities. With funding from Australia and Britain, four pilot schools were established in 1977, on Makin, Maiana, Tabiteuea North and Tamana – nicely distributed in the Gilbert group so as to be in reasonable proximity from any one island. Unfortunately, this scheme was similarly unsuccessful and short-lived as many others that came before it: after only four years, it was abandoned in 1980; only a few hundred students were able to benefit.[37] It seems that the scheme was too hastily drafted and implemented. Hindson (1985) reports that much confusion about the purpose of the community high schools vis-à-vis the other post-primary institutions was prevalent before and throughout their short existence and that a " 'community' aspect of the schools never really developed" (p. 151); recommendations for a "vigorous programme aimed at educating the public on the purpose and nature" (p. 147) of these schools have reportedly not been followed up. Moreover, it certainly was not ideal that dedicated foreign aid contributions were only made available after the scheme had already been started and that the required equipment and materials were not fully distributed and set up in time either (Hindson, 1982, p. 6).

One year after the 1975 policy, a further education ordinance stressed the importance of the English language for higher education and training obtainable overseas, in Australia, New Zealand, or even Britain. Not only did English serve as a screening tool for potential candidates, a high standard was simply a prerequisite for the educational and social environments selected students were sent to. Within the colony, the Tarawa Technical Institute offered three special courses in 1978, "for the improvement of general English", of which 193 islanders benefitted (Pannu, 1993, p. 106).

Eight years after the USP came into being, the GEIC opened its own branch in 1976. Similar to early developments in teacher training, amenities of the KGV school were used before proper facilities were built in 1978 (University of the South Pacific, 2017).

While various steps towards better education had been taken, results were still far from satisfying by the time Kiribati achieved political independence in 1979. That is also true for English language instruction. Pannu himself published a report in 1977, where he states that English should be treated as a special subject and not be taught by untrained and thus unqualified teachers whose own command of English was far from adequate (reported in his 1993 dissertation, p. 97). Elsewhere, however, he presents figures which indicate that the above developments did lead to some positive results, too: 130 tradesmen had been trained by the BPC by 1965, 2'219 seamen had received English tuition between 1967 and 1979, and 196 government employees attended English language courses at the Technical Institute in 1979 (p. 240).

[37] The total numbers of pupils were as follows: 168 in 1977, 256 in 1978, 527 in 1979, and 414 in 1980 (reported in Pannu, 1993, p. 203).

2.7.3 Post-independence developments

In the early years of the independent nation of Kiribati, the rapid succession of schemes and policies continued. Already in 1980, a further education policy was drafted. Primary education was to consist of a nine-year programme starting at age 6, where English was a school subject from Class 1 and the medium of instruction in most subjects by Class 4 (reported in Pannu, 1993, pp. 169-170). It was considered one of the three important subjects, besides mathematics and Gilbertese, as well as the most important of the three subjects that was tested in the entrance examination for secondary education, besides mathematics and general ability (pp. 170-172). There was considerable pressure on primary school teachers to see their students advance which, due to the bias of the test towards English and mathematics, resulted in other subjects being neglected. However, there were simply not enough places at secondary schools, so that in the early years of independence only a mere 10% of approximately 3'000 candidates could be accepted, or even less (reported in Pannu, 1993, p. 171). Moreover, despite the directives in the 1980 policy and the pressure that followed from it, "English is not used as the medium of instruction with any degree of acceptable enthusiasm, and Kiribatese is used often as late as 5-9 Class levels" (p. 172).

Only two years later, in 1982, a subsequent policy introduced important changes in Kiribati's educational system geared towards equal chances on higher education for all children rather than just a select few who were lucky enough to be trained at the KGV. Teachers were to be retrained and upgraded, at the TTC or overseas. Progress, however, was very slow since these plans depended largely on foreign aid which was of limited availability. Less dire was the accomplishment of compulsory primary education in all of Kiribati which was accomplished in 1987 (Pannu, 1993, p. 112). Moreover, it had been free since the early 1980s on all islands except South Tarawa.

The TTC kept amending their programme and offering courses so that teachers with only poor qualifications could be upgraded. The in-service programme was also well under way: during 1977 and 1986, there were 18 courses and workshops, on Tarawa as well as on outer islands, each conducted by six to eight expatriate teachers. It is estimated that at least 75% of Gilbertese primary school teachers attended (Pannu, 1993, p. 133). These courses were important for a number of reasons. To begin with, not only could participants improve their own English skills, the importance of English as the medium of instruction for almost all subjects was also emphasised. The courses further allowed for the exploration of newer methodologies and materials; beginning in 1984, there have also been workshops on the teaching of the Gilbertese language, an area that has been neglected previously. And very importantly, the courses and workshops featured tasks dedicated to the development of curricula and involved 25 local teachers, in other words, at least some of those who would eventually have to teach under their frameworks as well as help to develop them without substantial foreign assistance in the

politically independent Kiribati (more discussion about locally produced materials follows in the next section).

With respect to regular teacher training, the TTC made progress and slowly started producing qualified graduates in sufficient numbers, allowing for further expansion of courses, in duration and thus also content (Pannu, 1993, p. 113). Furthermore, it offered courses for the Diploma for Overseas Teachers of English (DOTE) as of 1984. This undertaking, however, was less successful than the abovementioned courses and workshops. The high examination fees, the requirement to attend on Saturdays and during vacations, as well as the lacking increments upon completion of the courses made them not very appealing. They were discontinued in 1987; there were only 15 attendees, of whom only three passed (pp. 139-141).

Since the early 1990s, there have been rather drastic changes that address language teaching in Kiribati more pragmatically. Gilbertese has received much greater attention and English is introduced more slowly, more gradually, and with more comprehensible structures and guidelines for teachers. The government also introduced a not unproblematic attempt to extend universal education beyond the primary level and into junior secondary school (JSS) levels: previous issues relating to lack of funding and adequately qualified staff, among others, became even worse which led to a temporary suspension of the scheme by mission-led schools (Burnett, 2013, p. 2). The JSS levels remain an integral part of Kiribati's educational system until today.

Since 2011, education is supported through the Kiribati Education Improvement Program (KEIP) which is primarily funded by Australia and locally also led by Australians. Some of the changes which it is at least in part responsible for include the founding of the Kiribati Education Framework (KEF) which, as the leading office of the KEIP, provides technical advice and funds to the national Ministry of Education (MoE), the rebuilding and modernising of primary schools across South Tarawa, as well as the development of curricula, syllabuses and testing tools together with local agencies such as the Curriculum Development and Resource Centre (CDRC). Moreover, it has created roles like that of the island education coordinators and district education officers who provide much needed support to teachers after their pre-service training at the Kiribati Teachers College (KTC; formerly TTC), crucially also on the outer islands (see for instance Department of Foreign Affairs and Trade (Australia), 2016); these roles are filled by I-Kiribati rather than foreign advisers.

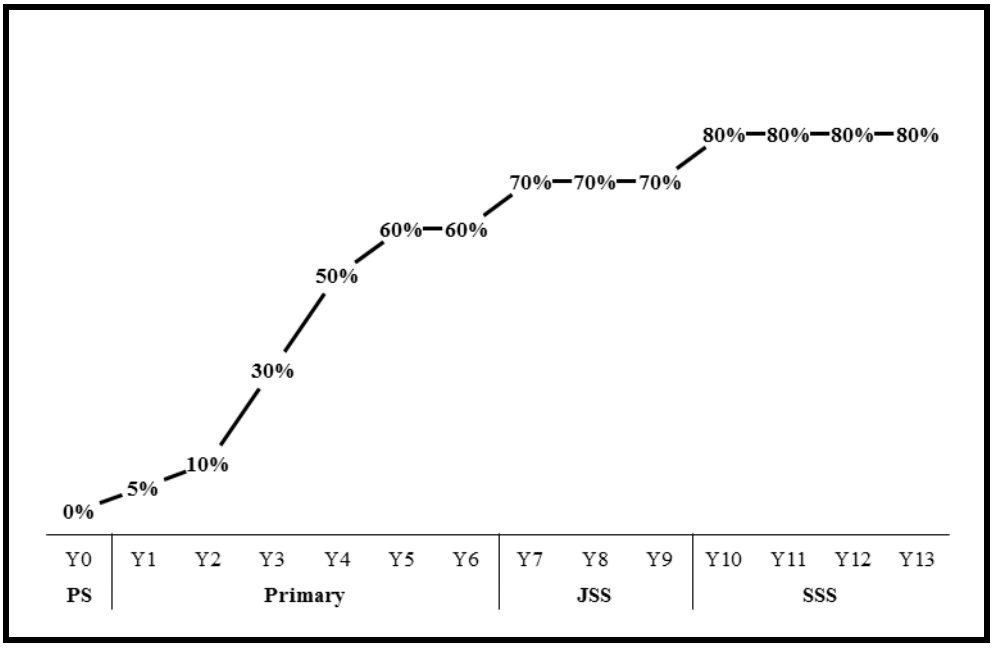


Figure 2.3: Percentages of English according to the *Two Languages Interaction Model*. PS: pre-school; Primary: primary school; JSS: junior secondary school; SSS: senior secondary school. (Source: Ministry of Education, 2012.)

Furthermore, the KEIP has developed what is Kiribati's current education policy. Accordingly, education in Kiribati is now structured as follows: pre-primary (1 year), primary school (Classes 1 to 6), junior secondary school (JSS; Forms 1 to 3), and senior secondary school (SSS; Forms 4 to 7). Attendance up to Form 3 is compulsory and free of charge; afterwards, only a limited number of students with the best test results are financially supported through the government. As laid out in the *National Curriculum and Assessment Framework* (Ministry of Education, 2012), Kiribati is now following a *Two languages Interaction Model* which mandates how the Gilbertese and English languages are supposed to be implemented into classroom teaching: as visualised in Figure 2.3, pre-school is in Gilbertese only, but starting with the first year of primary school, students come in contact with the English language and are gradually more exposed to it as they progress; by the time they attend junior secondary school, English has become the medium of instruction. Similar models have long been in use in bilingual contexts elsewhere in the world. In comparison to policies and similar provisions of the past, the current guidelines are somewhat better structured and annotated, but remain relatively vague. Moreover, the discrepancy between policies and practices is still a prevalent issue, and one that is not addressed as properly as it should be (see section 2.7.4 for more discussion).

Statistics published by the Ministry of Education (MoE) in 2014 show that, during recent years, there have been approximately 27'000 students and 1'300 teachers in 140 schools. Student enrolment has averaged at around 15'500 at primary school level, 6'500 at JSS level, and 4'700 at SSS level. In

secondary schools, there are more female than male students, an imbalance that increases with each level. A gender-skew is also found for teachers, over two thirds of whom are female. The average class sizes vary from 26 at the primary to 16 at the secondary level, but due to the urbanisation problems, the teacher-to-student ratio in South Tarawa skyrockets to 1:35 (Ministry of Education, 2017, p. 26).

Today, I-Kiribati students have access to four local tertiary institutions that provide higher education as well as technical and vocational training. Firstly, Kiribati has its own University of the South Pacific (USP) campus whose expansion was completed in late 2015. While more courses can now be offered locally – through face-to-face teaching or indeed through video conferences with teachers who sit elsewhere –, it is still commonplace for students to leave for Fiji or other USP campuses across the region. In 2016, 825 I-Kiribati full-time students were recorded, while the local campus only accommodated 502 students (University of the South Pacific, 2016, p. 18-19). The government tries to provide financial support: the total grant money in 2016 was approximately 375'000 Australian dollars (p. 105). This investment seems to pay off well as about 80% of all I-Kiribati university graduates are absorbed by the government itself or by government-owned companies (University of the South Pacific, 2017). It is also important to note, however, that there is a high attrition rate among I-Kiribati students "mainly because of inadequate English skills" (reported in Burnett, 2013, p. 3). The second tertiary institution is the Kiribati Institute of Technology (KIT) which offers short-courses and two-year courses in accounting, business, information technology, electro technology, construction, mechanics, plumbing, nursing and community services, with English language modules that are obligatory for all full-time students. Some 200 students annually graduate from KIT with internationally recognised qualifications (Kiribati Institute of Technology, n.d.). Thirdly, the Marine Training Centre (MTC) offers a variety of short courses in partnership with various international fishing or merchant firms, many of which are German, such as Hamburg Süd. Not only do partners support the MTC financially and with teaching staff, they also guarantee employment upon successful completion of the programme. Fourthly and finally, the Kiribati Teacher College (KTC) provides pre-service and in-service courses and thus continues to strive for higher educational standards in Kiribati. There are two in-service courses: the Teacher Professional Development programme which aims to support in-service teachers with the implementation of new curricula, and the Kiribati English Language programme which seeks to raise teachers' English proficiency levels (Ministry of Education, n.d.).

While the drop-out rate at all levels is already considerable, particularly after Form 3, only about a quarter of those who reach and complete Form 7 advance to the USP, KIT, MTC and KTC annually (Ministry of Education, 2017, p. 26). It is important to note that, today, it is generally only at these institutions that I-Kiribati receive good English language teaching. Therefore, while English language skills are a prerequisite only in some cases, they are almost always a result of the courses that are offered at these tertiary institutions.

From the developments described in this and the previous sections, it is apparent that, with regards to English language education in the Gilbert islands as well as of course to other aspects, there have been two distinct periods separated by the Second World War. Prior to it, the teaching of the English language had very low priority for missions and the colonial administration. The latter only began to show interest when there arose the need for a few locals with some proficiency in English to fill a few jobs, for the government itself or for the British Phosphate Commission on Banaba (Ocean Island); hence, the King Geroge V (KGV) school was opened where English was a key component of the curriculum. After the war, however, different stances were taken so that the English language could become rather prominent, in spite of proficiency levels or actual use. Pannu (1993) reports that, by the 1990s, English had become not only a subject but also the language of instruction in all schools and tertiary institutions, and the language of communication as far as possible (p. 243). While more moderate and more appropriate models have been implemented since, it is still true today that English is a very prominent language. Its use within school grounds is not only promoted but also prescribed by regulations – at least in principle – and is in that way foreshadowing the linguistic frameworks of tertiary institutions and prestigious jobs where English is applied a lot. It is important to note, however, that Pannu's following assessment is also still applicable today: English is more often used in its written form and much less frequently spoken (p. 244).

2.7.4 Historical and prevailing issues

It is already apparent from the above discussion, that several factors are accountable for the slow progress in the educational sector, of the Gilbert islands under colonial administration as well as of Kiribati, the independent nation. This section addresses the following eight issues in more detail: 1) finances, 2) distances, 3) infrastructure, 4) inadequate training, 5) deployment of expertise, 6) teaching materials, 7) cultural factors, and 8) policy-making. It will become obvious, that many aspects of these issues are indeed interconnected.

The first problem relates to the fact that there have, at no stage, been enough funds to bring about educational progress quickly and efficiently. For far too long, the colonial government did not intend to make any funds available since colonies were supposed to be self-supporting (Pannu, 1993, p. 75). The 1946 *Ten Year Plan of reconstruction and development and welfare* may suggest that different stances towards colonial development were taken. However, even then, the improving of social services that was inherent to the plan was supposed to be achieved only "so far as this can be done without too great recurrent expenditure" (reported in Pannu, 1993, p. 75). Unsurprisingly, then, there were still insufficient funds for the ambitious expansion projects and the high output numbers of educational institutions that were recommended in the many policies and reviews of the 1960s and

onwards. Political stances towards expenditure on the education system may have changed over time, towards independence and beyond, but Kiribati remains a very poor country. Today, the urgent problem is less one that relates to financial restriction – how much is necessary? –, but rather one that relates to financial capability – how much is possible?

A second problem which has always made educational progress difficult and slow is quite simply the fact that the 16 Gilbert islands are spread over so vast an area. Travelling and communicating have been and, to only a slightly lesser degree, still are activities that are time-, money- and manpower-consuming. Even once more attention was paid to educational development, it was a Herculean task to coordinate, implement and inspect changes across all islands with otherwise so limited resources. The government had, for instance, only acquired a colony-own ship vessel in the late 1950s so that more regular visits were possible; however, Pannu (1993) states that such inspections were usually carried out "on an annual basis or as the need may arise, by Assistant Education Officers who enjoy only a very low professional status due to lower salaries and lack of appropriate qualifications and training" so that their reports and recommendations were often considered questionable and unreliable, "particularly in the areas of language evaluation and assessment" (pp. 155-156). Similarly, only very few teachers could ever travel from their own islands to attend in-service courses so long as they were confined to Tarawa. It is very clear, then, that the vast distances alone pose huge obstacles. Arguably, they have become even bigger an issue today since I-Kiribati have also settled islands outside the Gilbert group.

A third issue relates to infrastructure. With regards to the 1965 memorandum, Pannu (1993) notes that the educational infrastructure in the colony was simply not there to efficiently work towards the ambitious goals that were lined out: primary education of six years with English as the medium of instruction from Class 1 (p. 88). In 1977, a third of 392 classrooms were still of temporary construction, another third were in need of repair or replacement, and most were lacking in furniture and equipment (reported in Pannu, 1993, p. 93). A good 10 years later, the situation has only gotten worse, with half of all classrooms being non-permanent, and 83% in need of reconstruction or "huge maintenance"; moreover, storage facilities for school materials "virtually do not exist" (reported in Pannu, 1993, p. 232). This issue, too, is by no means of the past. Also today, the majority of primary schools are built with local materials that require regular maintenance.[38] Moreover, even at secondary school level, it is not uncommon that classrooms are entirely empty and do not have desks or chairs for students or teachers.

Fourthly, and perhaps most importantly for the study at hand, it has always been a huge challenge to train teachers and equip them with qualifications adequate to their profession. After the Second World War, the English language received an immense boost and was supposed to be a subject

[38] South Tarawa is an exception, but only since very recently: under the Kiribati Education Improvement Program (KEIP), all primary schools in South Tarawa have been rebuilt with permanent building materials (see also Section 2.7.3).

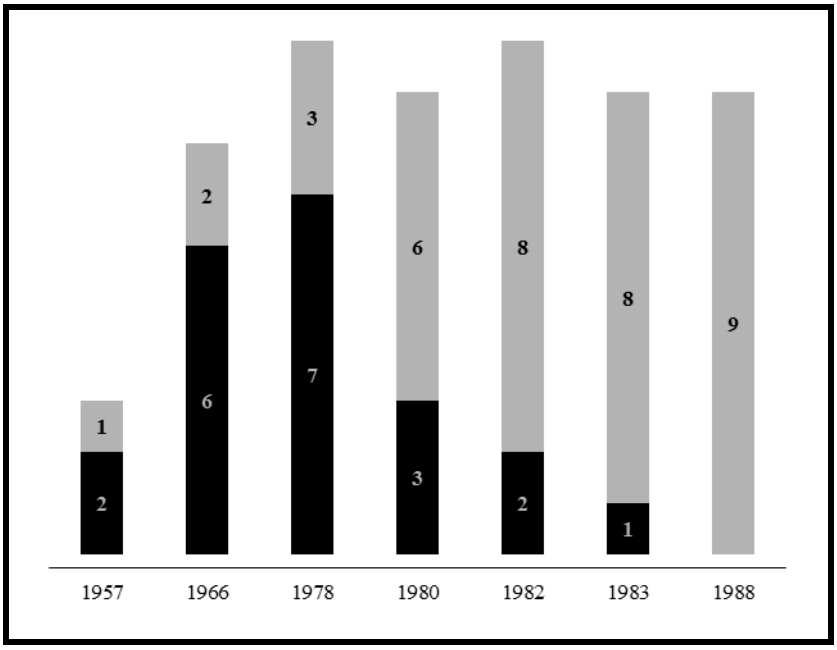


Figure 2.4: Staff at the teacher training college. Black: expatriates; grey: Gilbertese. (Reported in Pannu, 1993, p. 148.)

as well as a medium of instruction already at primary school level. However, the vast majority of teachers were not trained well enough and were insufficiently proficient in the English language to carry out the responsibilities they were suddenly given. Unsurprisingly, already the earliest reports stated that policies were not implemented or that, when they were, students did not develop satisfactory English proficiency levels (reported in Pannu, 1993, p. 168).

There were then numerous policies and schemes aiming to improve educational standards in various ways. As described in the previous section, the teacher training institution was inaugurated in 1956 and many courses were offered in order to better prepare new teachers for their tasks. Additionally, there were upgrade courses for those who had already gone into service but had not had the chance of attending preparatory courses. Problems in making teacher training accessible to all are of course related to the abovementioned financial and geographical issues. However, even those who were trained through the Tarawa Teachers College (TTC), in some form or another, could often only gain very little.

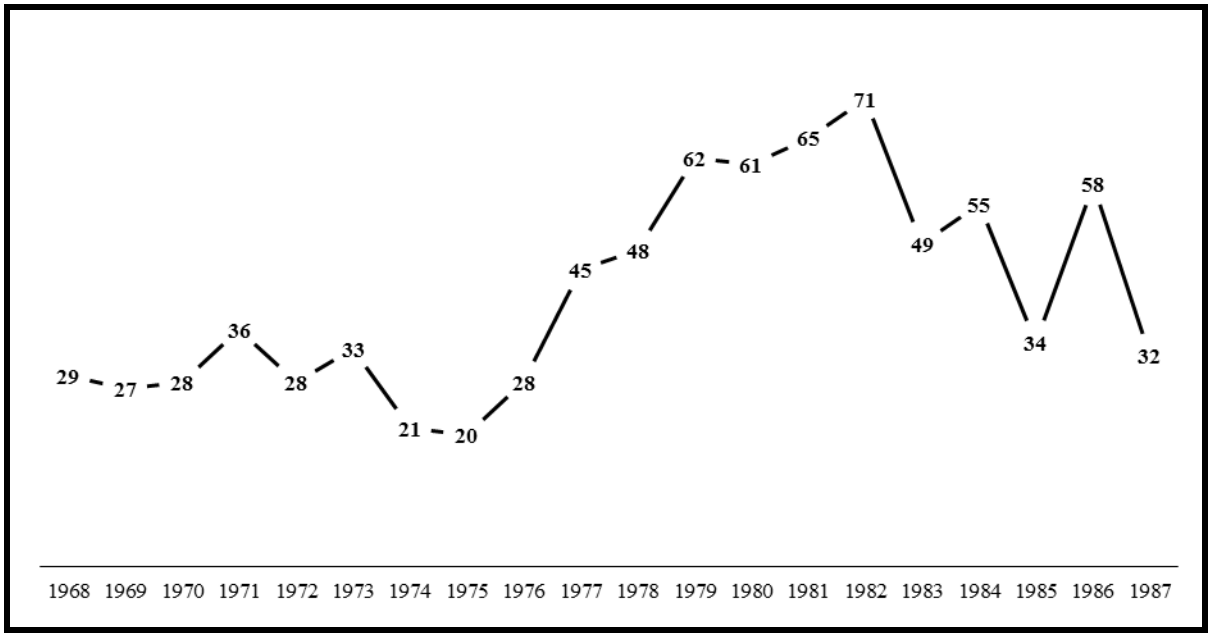


Figure 2.5: Annual number of graduates from the teacher training college.
(Reported in Pannu, 1993, p. 128.)

As Figure 2.4 shows, there were always only very few teacher trainers and, by 1980, most of them were Gilbertese rather than expatriates who were native speakers of English. Pannu (1993) remarks how language practices at the college have shifted away from what had every opportunity of being a linguistically immersive site: in contrast to earlier conduct, there had developed a tendency to use Gilbertese as the language of communication and English was only retained for the recording of minutes; quite simply, "the English language environment within which T.T.C. staff activities were conducted, was being gradually removed" (pp. 148-149). Furthermore, a lot of expertise has disappeared together with the expatriate staff. Pannu reports the following:

> Although all the local staff members at the Tarawa Teachers College in 1987 had 1-3 months overseas attachment in Fiji or Australia, still over 60% of the academic staff were underqualified, i.e., not having even the minimum of academic qualification of a Diploma in Education. (p. 162)

Some of these problems could be alleviated over recent years. There are again collaborations with expatriates, even linguistics professors, and teacher training is carried out by adequately trained staff: the college itself trains primary school and JSS teachers, while SSS teachers receive training from graduate teachers of the USP and other tertiary institutions in the region (Ministry of Education, 2017, pp. 25-26). However, problems relating to finances, geography, as well as the number and educational background of staff remain.

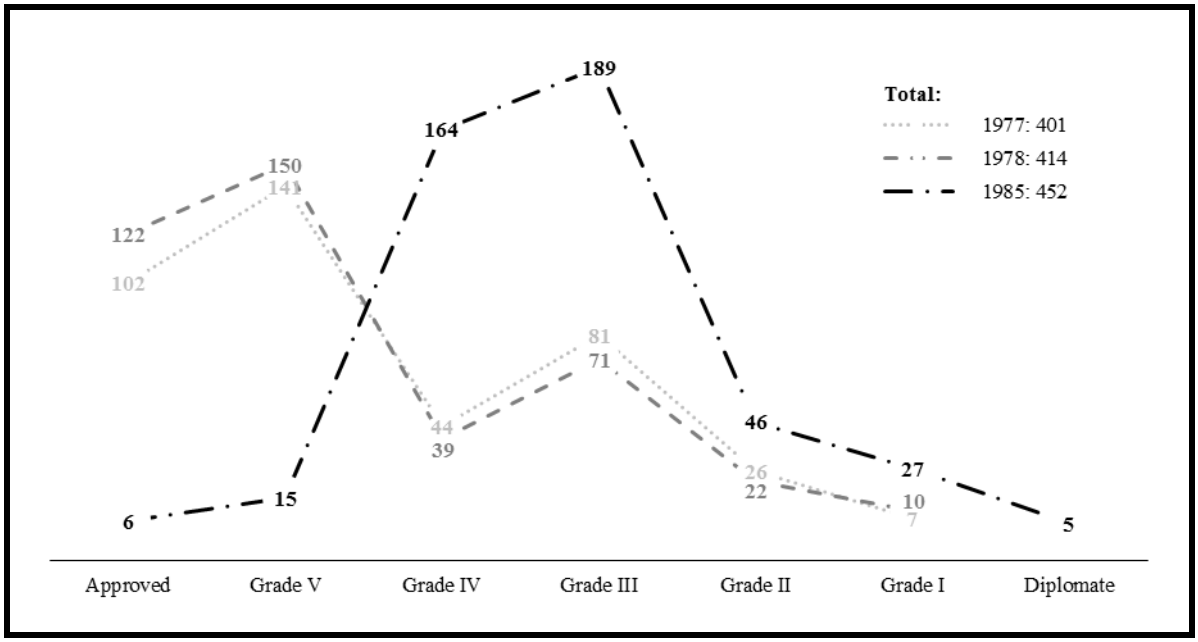


Figure 2.6: Teacher qualifications around political independence in 1979. Light-grey, dotted: 1977; dark-grey, dashed: 1978; black, dash-dotted: 1985.
(Reported in Pannu, 1993.)

Another factor that influenced the quality of teacher training is not found with the staff but with the students of the TTC. Pannu (1993) states that, in the earlier years, the basic entry qualifications to attend teacher training courses were largely below Form III and barely attracted any Form V leavers; furthermore, with the government taking the reins in the educational sector, the many mission-trained teachers "who had hardly received primary standard education" were all also absorbed by the college where they were retrained (p. 137).

In spite of the many policies, ambitious goals and various courses, the impact of teacher training was moderate, with the exception perhaps of a number of successful workshops between 1977 and 1986 (mentioned in Section 2.7.4 above). As shown in Figure 2.5, the regular output of the TTC was between 20 and 36 until shortly before independence, and peaked at 71 afterwards. How effective and successful teacher training was becomes clear when looking into reports from 1977, 1978 and 1985, in other words, shortly before and shortly after Kiribati achieved independence. By then, teachers were required to have completed Form V as well as a two-year training course in order to be fully qualified. However, as is apparent from Figure 2.6, even after over three decades, only few had sufficient qualifications: a big fraction of the teaching staff was constituted by approved teachers (AT) who were "completely untrained" and thus not qualified at all (Pannu, 1993, p. 93). Furthermore, the lowest qualification, Grade V, implied only partial training that resulted from the completion of short courses. No training or only little training meant that AT and Grade V teachers had only little English language education

themselves, yet they were required, as per the education policies, to teach it. By 1985, many of them had been upgraded (in Figure 2.6, this is apparent from the shift of the bulk of the curve from the left to the middle); however, 110 teachers had not had secondary education and Pannu remarks, with respect to these upgrade courses, that "samples of their spoken and written English make it doubtful whether any significant improvement in their academic competence of the language had occurred" (p. 138).

There were not only problems with the poorly qualified. Unfortunately, the best trained teachers holding Grade I and II qualifications were very often not employed as teachers but had other, administrative responsibilities (Pannu, 1993, p. 137); or they did not remain in the education sector but decided to make use of their training and secure jobs with a better pay or pursue political goals in a country that was actively localising government structures and striving for independence (p. 92).

Qualification requirements have hardly changed since the late 1990s: Form 5 for primary school and JSS teachers, Form 7 (not 5) for SSS teachers, and the completion of a two-year training course. However, a consultation draft for the *Kiribati 20-Year Vision 2016-2036* (or *KV20* for short; see Section 2.8.2 for more details), the agenda of the current administration, shows that, between 2013 and 2016, the minimum requirements were only met by about 90% at primary school level, 80% at JSS level, and 60% at SSS level; moreover, while most qualified primary school and JSS teachers also completed the appropriate teacher training course, only about 30% of all SSS teachers held certifications (Ministry of Education, 2017, pp. 25-26).

With historically challenging conditions jeopardising the educational standards at the TTC, it is unsurprising that the standards at primary and secondary schools remained at a relatively low level, too. Even after the numerous, relatively successful courses between 1977 and 1986, from which so many a teacher profited, conditions could hardly be ameliorated, as is apparent from the sobering conclusion that Pannu (1993) draws:

> The situation in some schools on some islands is so acute that a newly qualified teacher might have to teach English (and other subjects through the use of English medium) to three or even more classes of different levels at the same time. (p. 136)

Elsewhere he reinforces that large classes were not uncommon, and composite classes virtually the norm on the outer islands (p. 154), since many schools only had an entitlement of one teacher (p. 233). These problems extend well beyond independence.

It follows that students were generally never exposed to high quality education, taught through proficiently spoken English. Unsurprisingly many teachers had low morale since they were not – could not – be trained adequately to comply with the ambitious goals of the various policies, had to work in very trying conditions, and often alone and in isolation. There were always only few materials teachers could use in order to support classroom activities and to make learning easier for students. As will be discussed in more detail below, school supplies of all kinds have always been scarce, teacher guides or handbooks did often not even exist, educational radio broadcasts and audio equipment were a luxury,

and schoolbooks for the students had to be shared and could not be written in so that they could be reused.

A fifth problem, which is related to that of underqualified teachers, concerns the deployment of the expertise that was in fact available. While educational standards of local teachers were generally rather low as there had always been financial, geographical, and institutional problems, there did exist a number of relatively highly trained teachers carrying out "excellent teaching" (Pannu, 1993, p. 150), especially as of 1970, when there were graduates returning from training in Australia, New Zealand or the United Kingdom (pp. 158-159). Unfortunately, however, these teachers were unevenly distributed across the inhabited islands: between 1986 and 1987, 27 of 67 teachers with such overseas qualifications were employed on South Tarawa (reported in Pannu, 1993, p. 159).

At least with regards to English language education, expatriate staff also provided valuable expertise in the past. At the level of primary education, expatriate involvement remained weak, but Sabatier (1977) states that a contingent of the Sacred Heart Mission (SHM) was constituted by Australian sisters who were responsible for teaching (pp. 308-309). Besides a few dozen native speakers of English, primary education largely remained in the hands of local teachers who were suffering from the abovementioned problems and were often not equipped with sufficient qualifications. In contrast, almost all secondary education and teacher training was carried out by expatriates, except for the subjects Gilbertese and religion, until 1987 when there were more local teachers with relatively high qualifications so that respective positions could be localised (Pannu, 1993, p. 147). By the 1970s, there was in fact "a constant and never-ending flow of regional and international experts and consultants" (p. 62) who not only provided expertise but also increased contact and exposure possibilities. As has been described above, the TTC had expatriate staff members, from its inception until the mid-1980s, and the numerous courses it offered between 1977 and 1986 were held by Australian specialists, too. Unfortunately, the impact of expatriates did generally not extend beyond South Tarawa where they were based, and the short periods of employment resulted not only in frequent personnel changes but was also a contributing factor on the often unsatisfactory outcomes (p. 99).

Between 1973 and the mid-2000s, almost 500 Peace Corps volunteers served in Kiribati and made important contributions to education, as well as other domains (Peace Corps Online, 2007). Unlike other foreigners, they were very deliberately distributed to the outer islands. However, even those who engaged in educational activities did not necessarily teach English nor did they provide locals with chances to speak it: at the beginning of their term, they were first taught the Gilbertese language. Indeed, many seem to have assimilated not just linguistically but also culturally. With regards to those who did teach English, Pannu (1993) remarks that they were often inexperienced and their service thus "not always fruitful" (p. 258). Furthermore, he argues, Peace Corps (and other) volunteers are not addressing underlying educational problems but can only offer a short-term relief (p. 258).

Nowadays, the Kiribati Education Improvement Program (KEIP) and its leading office, the Kiribati Education Framework (KEF), too, are comprised of many mostly Australian technical advisers.

As has been discussed above, the program and its expatriate staff have brought about a lot of development. However, there is room for criticism. To begin with, many final decisions for the Ministry of Education (MoE) are made at the KEF, given that the former is financially dependent on the latter. This vastly restricts the freedom and flexibility of exclusively national planning and instead makes the MoE subject to international interference, for the better or worse. Moreover, the KEIP has failed to undertake what are simply essential studies at the classroom level, and thus failed to recognise how policies are and are not implemented, or which problems that are experienced by teachers and students contribute to such incomplete implementation. Yet, the KEIP rolled out a new policy. As per its predecessor, students were to be exposed to the English language from Class 1 and to a comparatively high degree; the current *Two Languages Interaction Model* mandates a lower exposure at earlier years and that English become the language of instruction only at junior secondary level (see previous section). Tests apparently revealed that the two policies resulted in almost identical English literacy rates, which is interpreted as a sign of success for the new model: a later yet better introduction of English which allows for a steeper learning curve, in comparison to an earlier introduction with considerably less improvement over time. Could practically identical literacy rates also mean that, while policy papers have changed, practices at the classroom level have stayed the same? The head of the KEIP as well as other staff concede that this might in fact be the case (personal correspondence). Failure to conduct surveys at the classroom level does not allow for these and similar questions to be answered. Then, there could still be better coordination between individual projects and, while more expensive and more difficult, a better inclusion of the outer islands rather than the centralisation of projects and services on South Tarawa. As is, however, only South Tarawa schools are modernised; only some schools receive new tablets to support classroom teaching, a project that runs in connection to the KEIP but is a later and more independent addition to it; and projects from other agents such as the Kiribati campus of the University of the South Pacific (USP), the Kiribati Institute of Technology (KIT), the Marine Training Centre (MTC), the UNICEF, the Kiribati Red Cross, other NGOs, or simply individuals coming to Kiribati for a short amount of time to conduct various workshops in a select few venues are in most cases not at all or only loosely connected to or coordinated with the KEIP. Impacts often remain restricted to small and confined localities where only few people benefit, while little – too little – systemic improvements affecting education in all of Kiribati are achieved. It is unfortunate that the problems listed here are prevalent today in spite of having been known and reported in education reviews for decades.

The type and availability of teaching materials constitute a sixth issue. To begin with, a lot of use was made of the 15 books of the Tate Oral English (TOE) course since 1966. It was designed for Maori children in the Cook Islands but was claimed to be suitable for other Pacific territories, too. Indeed, it was used widely, including in the Gilbert islands, for a number of reasons: many Pacific islands were under British colonial administration, the TOE books were readily and cheaply available, and there were no convenient alternatives or the means to create them (Pannu, 1993, pp. 174-175).

Unfortunately, there are quite a few problems with the TOE, mostly with respect to the proposed methodologies, relatability, and, once again, teacher qualifications.

The TOE aimed at learning through activity. However, there was a clear bias towards repetition and drill methodologies. Pannu (1993) argues that this resulted not only in little meaningful communication or in the development of respective skills, it also instilled the fear of making mistakes and so discouraged students from active participation (p. 182); furthermore, there is little recycling but "an underlying assumption that once an item or a structure is presented, it has been 'learned' " (p. 179). Similarly, Burnett (2013) concludes that, under the TOE, students were "passive receivers of literacy understandings" and offered "a range of mechanical text interpreting skills divorced from the socio-cultural purposes of language use" (p. 6).

Besides problematic teaching methodologies, the TOE contents were very remote from a Gilbertese context and thus only little relatable – to both teachers and students. It was beyond the capacity of the former to create meaningful situations that would facilitate comprehension for the latter (Pannu, 1993, p. 181). The TOE provided insufficient exposure to language in use, even though, for most pupils at that time, it was the only source of learning it (p. 184).

Allegedly, the TOE materials were designed so as to be useful for inexperienced and newly trained teachers. However, they encouraged such teachers to memorise lessons rather than to understand language items and teaching strategies, thus often rendering their lessons "utterly ineffective" (Pannu, 1993, pp. 183-184). Moreover, the rigid organisation into lessons and books not only presupposed equally rigid learning processes for successful implementation (p. 193), it also immensely restricted the freedom of the teachers which was most certainly not practical for the teaching of composite classes that were so common. Unsurprisingly, then, teachers as well as teacher trainers voiced their dissatisfaction and opposition on numerous occasions (p. 182). However, with hardly any viable alternative available, a great number of teachers simply opted for the prescribed repetition drills. This was especially common among teachers without adequate training and resulted in their students "repeating the pattern without relating to meaning in real or realistic contexts" (p. 187). An example of a drill exercise geared towards the pronunciation of plosives is provided in Table 2.2.

In 1993, when Pannu wrote his dissertation surveying English language education in Kiribati, the TOE material was still in use without significant modifications, and without the teacher handbooks specifically written for each textbook – which did exist (p. 186). By today, more locally produced material is available, as will be discussed below.

The South Pacific Commission Readers (SPCR) were designed to be used as a complement to the TOE. Consequently, they were controlled and organised in a similarly strict manner and thus brought with them similar flaws. Additionally, Pannu (1993) criticises the small print-type, the word list that was put at the end of the book instead of in the vicinity of new units, the small and colourless illustrations, as well as illustrations of objects that are not relatable in a Pacific island setting, as for instance that of a horse (pp. 197-198).

Table 2.2: Pronunciation drill for the teaching and learning of plosives. (Reported in Pannu, 1993, p. 319.)

p	**b**	**t**	**d**	**s**	**z**
pill	bill	to	do	rice	rise
pen	Ben	ten	den	bus	buzz
peg	beg	tie	die	dice	dies
pat	bat	tip	dip	sause	sores
pay	bay	tin	din	ice	eyes
peak	beak	trip	drip	pace	pages
pear	bear	tear	dear	loose	lose
pack	back				
pin	bin				

The SPCR also included pre-reading materials for Classes 1 and 2, which consisted of activity kits, workbooks and flip books, and were supposed to develop the foundations required for more formal activities in subsequent classes, such as reading and writing in English. As regards these materials, Pannu (1993) provides a more positive assessment:

> The S.P.C. Pre-reading course is well produced. It is accompanied by a well-illustrated Teachers' Handbook giving clear instructions for teachers to follow. The accompanying children's workbooks and flip books are in bold print and colourful, and easy for children to work from. (p. 190)

Unfortunately, as with other SPCR readers, the pre-reading materials have been produced irregularly and were always in short supply. As a result, children often had to share books (p. 197) and were not allowed to write in them so that they could be reused by other classes (p. 190). Furthermore, they could only be effectively distributed in 1981, but even when finally made available they were only used "in an extremely limited manner" (p. 192).

It is worth noting that, with the exception of the intermediate readers used in Class 7 for which teachers' guides were locally produced only in 1983, all SPCR materials were always accompanied by handbooks. However, some teachers used them, others did not; some handbooks had been lost after a few years or locked away for fear of losing them (Pannu, 1993, p. 190).

Other English language materials in use were the Longman Structural Readers at Class 7 and 8 levels. They required classroom interactions to be focused on reading and understanding rather than speaking and practicing; moreover, they come with only little illustration. The texts themselves were also hardly suitable for a Pacific island setting: such unrelatable titles like 'Kidnapped', 'Silas Narner', 'Seven Greek Tales', 'Stories from the Arab World', or 'The Prisoner of Zenda' made it nigh impossible for teachers or students to relate, which rendered these materials even more difficult to understand and

work with. In short, the Longman readers were too advanced, linguistically and culturally. Pannu (1993) quotes a teacher commenting that students were able to read the books but not to understand what they read (p. 201).

Pannu (1993) concludes that the abovementioned materials could be used effectively and successfully "only by well-educated, adequately trained and competent teachers of English" (p. 198). Hence, that most teachers were hesitant towards new materials and new methodologies is justified: most did not have adequate qualifications to begin with and little to no training for their use in the classroom was provided for them. Similarly, most students were never given the chance to comprehend what they were being taught and thus never given a fair chance to develop satisfactory language skills.

In January 1981, Australian partners and the USP offered a five-year English Writing Workshop with the aim of providing sufficient new materials and support for teachers to feel confident in their introduction in the classroom (Pannu, 1993, pp. 209-210). Locally produced textbooks were first used in 1983 and were deemed so successful that they soon became the primary teaching material, with the SPCR as recommended supplements and the TOE dropped altogether. Inherently, while overseas editors were involved at some stages, the workshop prepared I-Kiribati staff for more independent production of local curriculum materials and finally introduced more proximity between the developers of materials and the teachers who had to use them eventually; 25 local teachers were directly involved (p. 133).

Teachers could profit from the accompanying materials that included suggested instruction methodologies. Moreover, in contrast to the TOE, the local units were structured so that it was possible to divide students into groups of different levels: the teacher could then cater to weaker students, while the more advanced group could work on extension materials (Pannu, 1993, p. 215).

Besides better instruction and classroom organisation, students could profit from textbooks that were finally relatable, as exercises, pictures and stories relate to the Kiribati setting: units are entitled 'Copra cutting', 'Storm at sea', 'The story of Nei Ai', 'Travelling from Maiana to Tamana', 'Traditional and national dress', 'Communication in Kiribati', 'The Police Force in Kiribati, 'National elections', and so on (Pannu, 1993, pp. 211-213). Focus was clearly taken away from mindless drills and was instead put on "reading for meaning" (p. 214). The locally produced textbooks were designed to make students "more responsive, to take more initiatives and make decisions, and in doing so they are free to use their linguistic skills in their communication strategies" (p. 218).

It is also relevant to mention here that the education department tried to offer reading materials for school libraries as early as 1950 when a collection of simple booklets were acquired. They were in the English language, and only a few could be translated into Gilbertese, as their production was hindered by the limited number of printing presses as well as their breaking down (Pannu, 1993, p. 223). In 1973 and 1980, attempts were made to establish small library units on all islands in the Gilbert group and, respectively, to equip each school with books (p. 224). However, besides problems relating to the insufficient training of teachers and low proficiency levels of their students, the installation of

school libraries were relatively unsuccessful endeavours, also due to the unavailability of adequate storage facilities (p. 190) as well as due to the harsh natural conditions that spoiled the books or meant that they were locked away and became inaccessible (p. 224).

Similarly, a school broadcasting service was created to support education in the Gilbert islands. Pannu (1993) reports that the main objectives of broadcasts were the general provision of a rich variety of programmes and materials, and the assistance of English language teaching in particular: "They can provide the best opportunity for children on all islands to hear good English pronunciation, stress and intonation. These broadcasts could equally be useful for improving the teachers' own pronunciation" (p. 225). However, until the late 1970s, no school had access to a radio set. In 1978 and 1982, Japan and Canada respectively provided equipment to all schools, but by 1986, 80% was out of order and beyond repair for various reasons (p. 226). Moreover, teachers were once again not properly instructed and could not make full use of the broadcasting service, even if they had functional equipment at their disposal. By the early 1990s, about an hour of radio school broadcasts each day were aired for the purposes of English language education by the early 1990s (p. 241). However, at least with respect to the earlier services, Pannu deems it "inconceivable that school broadcasts in English have had any significant teaching or reinforcing impact on children" (p. 226).

A seventh problem concerns cultural factors that inhibit the teaching, learning and speaking of the English language, all of which are still prevalent today. To begin with, classroom situations were relatively recent introductions, the closest traditional equivalent to which may be formal meetings in a *mwaneaba*; consequently, classroom teaching commonly ended up being conducted in a very formal manner and did not foster participation much (Pannu, 1993, pp. 150-151). This inhibited novel methodologies from being implemented enthusiastically and efficiently (see also Burnett, 2013, p. 9). Likewise, there had not been books or libraries, let alone radios or other equipment, nor had there been any known custom that would have facilitated their handling, maintaining and storing. Therefore, it was necessary to provide instructions and training in the use of all novelties; as has been discussed in this section, such requirements were hardly ever satisfactorily met.

Furthermore, contact situations with English speaking foreigners are and always have been very rare indeed, especially on the outer islands. Thus, English is "not a functional language" (Pannu, 1993, p. 226) but one that is experienced almost exclusively in the classroom – where, at least in the past, active participation was not often elicited. In 1993, Pannu writes that there was no intrinsic or social compulsion for I-Kiribati to speak English among themselves (p. 163). This had not been different before, and has not changed much after. English has been and still is a very foreign language in Kiribati.

Besides that, many I-Kiribati are inhibited to speak English because they are fearful of making mistakes or of violating cultural norms. The former results in shyness or embarrassment when it is spoken and in laughter when it is heard. The latter is more complex. Fundamental to the Gilbertese culture is the principle of *booraoi*, unity through equality and conformity (Autio, 2010). To be ambitious or show superiority over others in a society where age and, to a much lesser degree, sex are indicative

of authority is a violation of this cultural norm; there is the justified fear that speaking English, too, may be perceived as an act of superiority and therefore as impolite (Pannu, 1993, p. 256). As a result, I-Kiribati are drawn to opt for their vernacular regardless of their English proficiency levels. This holds true even for teachers, many of whom feel uncomfortable and unconfident, especially if their own training was minimal and faith in new methodologies is lost: they then often disregard regulations, give instructions in Gilbertese and so, as Pannu suspects, condition students to simply wait for translations (p. 230); or they disregard recommendations, follow old books like the TOE materials and revert back to meaningless repetitions and drills (p. 229). Similarly, when the expatriate staff of the TTC had left, the linguistic norms at the college changed and English was spoken less, even though the local staff was proficient enough (see above for more detail).

It is worth noting that, in this respect, cultural change may be in progress and these cultural barriers are perhaps not being removed but moved. English has become an even more prominent language, regardless of actual use or inhibitors thereof. It is an integral constituent of the curricula at all higher education facilities: the University of the South Pacific (USP), the Kiribati Institute of Technology (KIT), the Marine Training Centre (MTC), and the Kiribati Teachers' College (KTC). Thanks to more highly qualified staff and better course structures altogether, students at these institutions are encouraged to actively use the English language and can clearly and more immediately perceive its usefulness, not only for a specific course but for their future professions, too. It seems that, at least in the context of higher education facilities, as well as in the professions they lead to, cultural barriers affect the speaking of the English language much less. This is maybe all the more true because these rather more modern institutions and professions are farther removed from more traditional settings that, say, village meetings or family celebrations provide.

Finally, an eighth big issue relates to policy-making. As discussed earlier, the colonial government only provided a few elusive statements but no well-articulated policy on education before the Second World War, for reasons that have already partly been addressed: no funds were made available, there was not enough qualified personnel, the vast distances between the islands posed travel difficulties, administrative priorities lay elsewhere, and education was simply not thought necessary (Pannu, 1993, pp. 74-75).[39] In spite of more progressive stances being promised, in spite of proposals being put forward by the missions, and in spite of demands being made by the Gilbertese, it was not until 1965 that the first coherent government policy was issued which was then rather rapidly followed by a second iteration in 1970. However, no investigation into types and availabilities of resources had been conducted in either case, so that these early policies with their already rather vaguely formulated aims could hardly be implemented.

[39] Pannu also mentions that no educational demands were forthcoming from the Gilbertese. However, it is worth noting that, perhaps only with regards to education undertaken by the missions, the locals did show interest – more so than their teachers (see Section 2.7.1 above for more discussion).

Subsequently, numerous policies and schemes as well as reports and reviews were proposed which required a lot of actions to be taken in short time while only ever resulting in little progress in the educational sector. There were many problems regarding the initiation, coordination and staffing of individual projects, as poignantly summarised by Pannu (1993):

> [Numerous] projects have either been initiated by the expatriate staff working for Kiribati, or have been suggested by visiting foreign experts or aid donors. In either case, the projects were prepared and hastily implemented without genuine and sufficient local involvement in their preparation and without proper needs analysis. Local users (teachers, teacher trainers and students) and administrators do not really feel themselves as an integral part of the whole exercise. Hence half-hearted implementation. (p. 259).

Indeed, the various issues that local teachers have with the many new tasks and responsibilities they saw themselves confronted with – teaching large composite classes, through the English language as the medium of instruction, with non-relatable textbooks or other materials they never received training on, where there are several cultural barriers – were hardly ever adequately addressed or hardly ever led to improvements in later policies. Unfortunately, without any tradition of formal education from before colonial times, there was no viable choice but to accept what was imported, "often on a piecemeal basis" (p. 256): this is simply what the Gilbertese had been "conditioned to accept" (p. 265) and is further promoted by the desire not to upset colleagues even if it led to a bad decision (p. 248). Pannu thus concludes that, under these circumstances, foreign assistance was vital for language teaching in Kiribati (p. 252), in spite of some blatant issues it brought with it.

In 2002, Burnett repeated many a criticism already voiced by Pannu. He states that, although there had developed a rhetoric of inclusion and the injection of funds, "the colonial order of things remained intact" (p. 16) and teachers, parents and students were still not recognised enough in the decision-making process that will affect the educational system and thus themselves (p. 21). He further mentions that mismatches between policies and actual practices remain an on-going problem (p.14-15) and the outer islands do not receive sufficient attention due to an "urban bias" (p. 15).[40]

The discussed issues relating to finances, distances, infrastructure, inadequate training, deployment of expertise, teaching materials, cultural factors, and policy-making have come to light over the years; moreover, most have existed for a long time and been explicitly reported in numerous reviews and other forms of critical appraisal. Unfortunately, however, many of these issues are still prevalent in Kiribati's educational system that is largely controlled by the Kiribati Education Improvement Program (KEIP) today. For example, infrastructure, projects and services by and large remain centralised on South Tarawa. Improving educational standards by investing more into the development of the outer islands

[40] Burnett repeats these and more claims in a subsequent article published in 2005.

seems very reasonable; Burnett (2013), too, acknowledges this link. Also, yet another education policy has been introduced arguably much too hastily. Virtually no assessment of prior practices and issues at the classroom level has been done that would allow for the monitoring of developments in terms of teaching and learning standards – or, more fundamental yet, for the addressing of particular problems experienced in the classroom. The only notable survey was conducted in 2009 (see for instance Burnett, 2013, p. 3-4), but its aim was to assess the English proficiency levels of primary school teachers rather than classroom practices and experiences. Virtually nobody knows how to interpret a certain percentage of the English language at a given school level as mandated by the new policy: in a meeting in late 2018 that I could attend, nobody of the large audience made up of Kiribati Education Framework (KEF), Curriculum Development and Resources Centre (CDRC) and Ministry of Education (MoE) members knew their intended meaning; that is, not even those expatriate officials who are responsible for the creation of the new policy or those ministry officials that are being presented with and put in charge of it! So far, insufficient advice with regards to the implementation of the new policy has been given, a task that falls to the MoE.

While undoubtedly many laudable achievements such as the rebuilding and modernising of schools on South Tarawa have been made through the support and supervision of the KEIP, it is possible that some of its projects will result in only short-lived improvements or prove to be failures altogether, for much the same reasons so many others in Kiribati's history have failed, too. Launching in 2011 and originally scheduled for a duration of nine years, the KEIP has been extended. It is likely that assignment terms of expatriate staff will generally remain relatively short and that therefore turn-over rates will remain high; it is also likely that many new short- and long-term projects will be added in the future for which local offices and educators will have fewer and fewer reasons to embrace with enthusiasm. It is clearly long overdue that attempts to achieve improvements in education in Kiribati acknowledge past mistakes and recognise prevailing issues, by properly reading the literature that already exists and by adequately assessing how education is actually carried out – before the creation and introduction of new products.[41]

2.7.5 Excursus: Missions, religions and education

I-Kiribati have a strong sense of community: with respect to the country, the island, the village, the village part, the household and the family they are part of. In addition to place-related communities, many other social groups are organised which bring together people who share an interest, hobby,

[41] It is very unfortunate, indeed, that other development sectors receiving expatriate support are exposed to similar issues: projects follow one another often in rapid succession and too many of them are implemented without proper assessment of needs, problems or lessons learned in the past.

activity, and last but not least, a religious affiliation. The last has been the cause of tensions in the past (see also section 2.2), and can still be today.

On a linguistically interesting note, early missionaries applied slightly different orthographies in their codification of the Gilbertese language which has become an issue that has not yet been resolved: it is still disputed whether to distinguish [bæ] versus [ba] and [mæ] versus [ma] by means of a ‹w› or an apostrophe following the consonant, or not to distinguish it at all.

Similar to many other places especially in the Pacific, Kiribati has become some sort of a wild playground for religious streams. Today, there are groups of Baha'i, Jehova's Witnesses, Muslims, Seventh Day Adventists and Latter Day Saints, more commonly known as Mormons; like elsewhere, the last is expanding aggressively, and buys and fences off land wherever possible. I believe that one reason for the success of religious streams on many Pacific islands and elsewhere lies in the fact that these places have got in contact with non-Pacific people only relatively recently. Kiribati has had more extensive contact since around 1800 with the first missionaries arriving after 1850 and expanding their region of influence until the end of the century. Under these circumstances, the arrival of new religious streams becomes almost a normality; it must be difficult to identify one as more legitimate than another. Elsewhere, Christianity, Islam or Hinduism have a much longer history, and through it perceived historicity and legitimacy even for people who do not consider themselves religious; other streams that only emerged in the 19th century – the same time the first missionaries began arriving in Kiribati – are generally viewed with much scepticism, especially in light of other sources of information such as judicial records that demonstrate, for instance, that the founding father of the Mormons was a criminal who was arrested several dozen times for various cases of fraud and other offences.

Be it as it may, many of the abovementioned religious streams have important responsibilities for education in Kiribati today, much like in the past. To begin with, pre-primary education is provided by church groups and other community-based groups; government-supported development of services is only in its very early stages, but under way. All primary education is provided by the government, but there is again substantial involvement by the religious streams at JSS and SSS level. Some 4'800 students were enrolled in non-government schools in 2014: 61% in Catholic schools, 22% in Protestant schools, 12% in Mormon schools, and 4% in Seventh Day Adventists schools (Ministry of Education, 2014, p. 30).

2.8 The Republic of Kiribati today

The Republic of Kiribati is comprised of 33 islands. Their combined 810 square kilometres of land area is positively miniscule in comparison to the 3.5 million square kilometres of water over which they are dispersed. Banaba (Ocean Island), the western-most island, houses only few inhabitants, many of whom

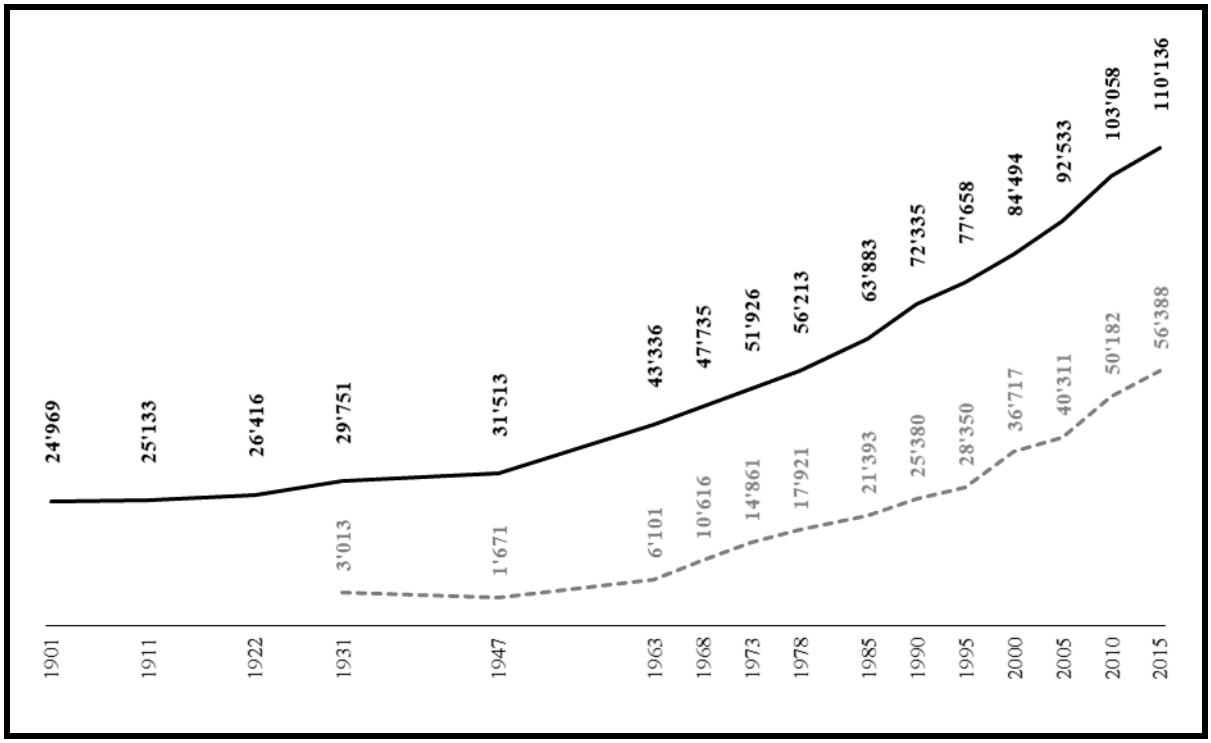


Figure 2.7: Population growth. Black, solid: total population; grey, dashed: South Tarawa population. (Source: National Statistics Office & Ministry of Finance, 2016; Shlomowitz & Munro, 1992, p. 109.)

have close ties to the original communities who had been displaced to Rabi, Fiji (Office of te Beretitenti, 2012b, p. 4). Similarly, three of eight Phoenix islands had been settled under a migration scheme in the middle of the 20th century; the scheme was unsuccessful and the settlers were relocated. Today, only Abariringa (Canton Island) is inhabited, by workers such as meteorologists who remain there only temporarily. A further eight islands are located in the Line group further east, of which only Teeraina (Washington Island), Tabuaeran (Fanning Island), and Kiritimati (Christmas Island) are populated. These three islands house less than 10% of Kiribati's population, even though the last mentioned is bigger than all other inhabited islands combined. Over 90% of all residents, then, live on the 16 islands in the Gilbert group, all of which had already been inhabited before the arrival of Europeans.

Kiribati is independent since 1979. However, as is discussed in the present section, the nation faces huge challenges with respect to demography, economy, climate change, and national as well as international politics. After the depletion of phosphate reserves and the disappearance of the most important source of income, and after British administration had left the colony with very little resources – because it both did not and could not provide the means for development –, Kiribati may have become politically independent but remains dependent in various other ways.

2.8.1 Demographic profile

110'136 people and 17'772 households are registered in the 2015 census (National Statistics Office & Ministry of Finance, 2016, p. 32). As presented in Figure 2.7, there has been a rapid population increase from approximately 30'000 since the Second World War. It becomes apparent how massive urbanisation movements have been: the population growth of South Tarawa since 1947 represents a striking 70% of that of the entire nation; between 2005 and 2010 even 94%. More than half of Kiribati's population lives on South Tarawa where, as a consequence, the population density is incredibly high: in the municipality of Betio, there are a staggering 10'377 people per square kilometre – almost identical with New York City –, in the rest of South Tarawa, 2'722; the average of all outer islands is at 152, considerably lower.[42]

As a result of this very unbalanced population distribution, there are stark differences between more traditional and more modern lifestyles. On the outer islands, few possibilities exist to get a permanent job with a regular salary. Most people rely on fish, coconut, *babai* (taro) and other vegetables. A widespread activity by which a little money can be made is copra production: in recent years, the government paid 1 Australian dollar per kilogram; the new administration doubled the price. With this income, I-Kiribati living on the outer islands are able to buy rice and other imported foods that have become popular (see also Section 2.5.4). A completely non-monetary and self-sustained lifestyle is not preferred by many, but definitely possible as some members of the communities demonstrate. Also, there are rather few facilities and amenities that elsewhere would be regarded as fundamental necessities. People live in small and simple huts that are primarily made from natural building materials, without walls, windows or doors. They get water from wells or, but to a lesser degree, from public water tanks; private water tanks are not very common. For medical treatment, a village may – or may not – have a nurse with a limited stock of medicine; in more serious cases, people need to be evacuated to South Tarawa by plane, which can take days. Most villages have a small primary school, while secondary schools are bigger but fewer so that many students need to travel rather far on overcrowded school trucks that, given the simple roads, offer a slow, uncomfortable and bumpy ride.

In South Tarawa, on the other hand, urbanisation has led to such a high population density that an entirely traditional lifestyle has simply become impossible: there is too little space for *babai* pits and too few trees to provide enough food or natural building materials. Consequently, South Tarawa residents are much more dependent on cash income to buy these necessities. In fact, many people from outer islands, especially from North Tarawa, can now make a little profit by selling thatch or the like in South Tarawa. However, South Tarawa is also the site of the only two hospitals, the only power plant,

[42] The southern islets of Tarawa are comprised of two municipalities, that of Betio and that of South Tarawa. While censuses and other official documents often provide separate numbers and figures, no such distinction is made in the current as well as the following paragraphs: in many ways except in terms of administration, Betio is like any other islet of South Tarawa.

the only international airport and the only international harbour in the Gilbert group. There is a newly finished concrete road connecting all islets for quick commutes, also on the many private bus services. Moreover, it is where virtually all governmental institutions and business headquarters are located. It is the nation's capital island.

Population pressure has been a problem in the Gilbert group for decades. It has been described above how early resettlement schemes led to the relocation of people from the southern islands, and that overpopulation to South Tarawa was anticipated after infrastructures and services began to be centralised there after the Second World War. For much the same reasons, relocation to the Line islands has been actively encouraged by the government since independence was achieved, and a formal policy with the related directives was created in 2005 (Office of te Beretitenti, 2012c, p. 2). As a result, Gilbert islanders have migrated to Kiritimati (Christmas Island), Tabuaeran (Fanning Island), and Teeraina (Washington Island). There had been a few hundred inhabitants on these three islands for some time, for instance copra plantation workers, but the resettlement schemes caused a considerable population increase: from 2'115 before independence to 10'483 by 2015 (Office of te Beretitenti, 2012c, p. 2, 2012d, p. 4, 2012e, p. 3; National Statistics Office & Ministry of Finance, 2016, p. 31). Kiritimati is now the third most populous island, with 6'456 inhabitants. The government could not finalise land leases in time, so that overcrowding issues in the already existing communities have been reported (Office of te Beretitenti, 2012c, p. 5), but Kiritimati has the capacity to house many more islanders: with its 388 square kilometres of land area, it is 10 times bigger than the second largest island (Tabiteuea), and bigger than all other inhabited Kiribati islands combined – it is the largest coral atoll in the world.

Finally, Kiribati's population is almost homogenous, as visualised in Figure 2.8: on 107'957 ethnically I-Kiribati,[43] there are only 2'179 foreigners (National Statistics Office & Ministry of Finance, 2016, p. 52). Moreover, two thirds of them reside on South Tarawa. On the outer island, there are only a handful to a few dozen; on Arorae, the southern-most island of the Gilbert group, there are none at all. The role and impact of foreigners will be discussed further below.

[43] This number includes 1'974 people of mixed ethnicities.

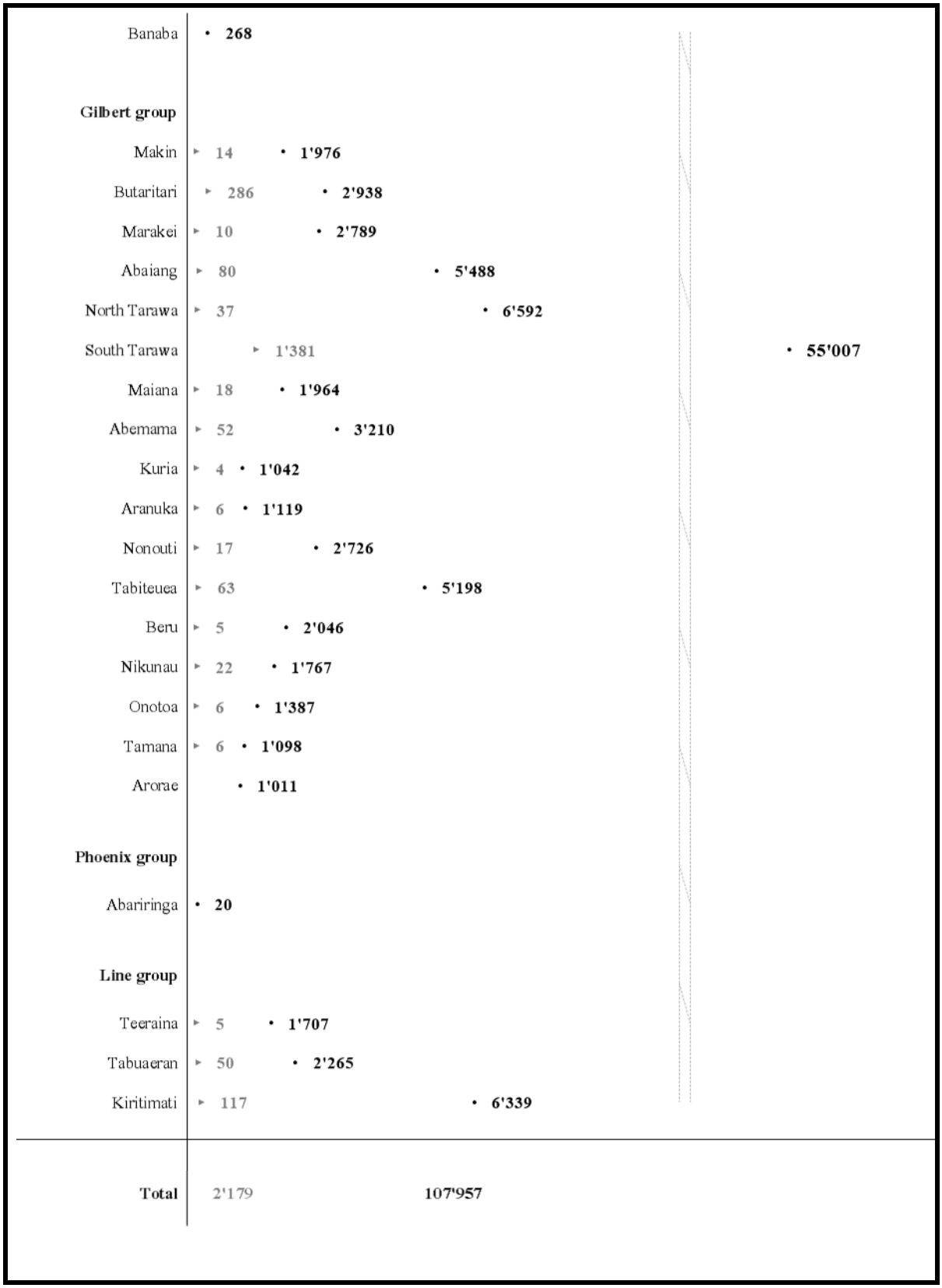


Figure 2.8: Population distribution. Black, dots: I-Kiribati; grey, triangles: other ethnicities.
(Source: National Statistics Office & Ministry of Finance, 2016.)

2.8.2 Economy and politics

Among other things, the following financial sources are both of economic and political relevance: the Revenue Equalisation Reserve Fund (RERF), a remnant of the phosphate mining business; the Kiribati Provident Fund (KPF) pension scheme; licences that are sold to international companies for the fishing within Kiribati's exclusive economic zone (EEZ); the few export opportunities that consist mainly of fish and coconut products; remitted money that is earned by Kiribati seamen; and the highly important foreign aid donations. This brief overview reveals how limited Kiribati's economic opportunities are, especially in comparison to the substantial developmental needs.

Kiribati finances itself mostly through the Revenue Equalisation Reserve Fund (RERF). It was established in 1956, in order "to hold royalties from phosphate mining in trust for the I-Kiribati, anticipating the depletion of the deposits" (International Monetary Fund, 2001, p. 11). The fund held an initial sum of just over half a million Australian dollars but had accumulated almost 70 million by the time Kiribati became independent (Toatu, 1993, p. 186). As illustrated in Figure 2.9, its growth has continued so that its most recent balance stood at well over 900 million (International Monetary Fund, 2016, p. 3). The funds' capital is invested into different foreign currencies and is so creating interest. This allows the government to make drawdowns without affecting the balance negatively. In the first few years after independence, only some 4 million were used annually (Toatu, 1993, p. 186). Indeed, a 2002 report by the Asian Development Bank conceded that Kiribati had been rather conservative and reluctant in making drawdowns from the fund, that it had preferred to safeguard for an uncertain future, and that it had set an annual drawdown limit of 12.6 million (pp. 38-39). However, drawdowns in recent years averaged at around 30 million dollars, and, while still steadily growing, the fund is expected to be depleted by 2030 if the current pace of spending and current economic developments continue as projected (Ministry of Finance and Economic Development, 2010; International Monetary Fund, 2016, p. 11).

After the RERF, the Kiribati Provident Fund (KPF) is the second largest albeit much smaller savings vehicle with its assets, too, being invested primarily overseas rather than domestically. Set up in 1977, participation in what is essentially a pension scheme is now mandatory for all I-Kiribati who are employers as well as employees in the public and private sector, and possible but not mandated for those in less regulated working conditions. The KPF suffers from a persistence of deficits which, among other things, is a result of "high crediting rates that are inconsistent with sustainable rate of return on its investments" (International Monetary Fund, 2016, p. 17).

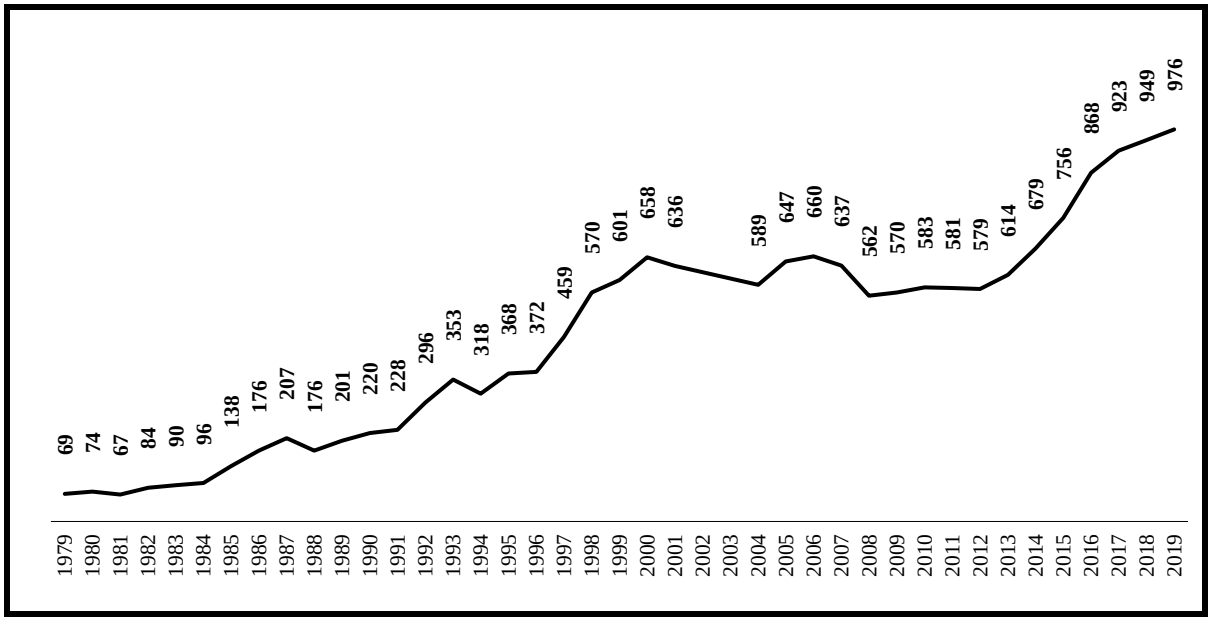


Figure 2.9: RERF balance (in million Australian dollars).
(Sources: Toatu, 1993; International Monetary Fund, 2001, 2009, 2011, 2013, 2014, 2015, 2016, 2017.)

A further, major source of income is constituted by Kiribati's territorial waters which include an exclusive economic zone (EEZ) that is 3.5 million square kilometres in size. Accordingly, international companies have to pay for licences if they wish to fish there. Respective revenues have constituted a substantial fraction of Kiribati's annual income for a long time. A recent report states that fishing licences accounted for 78% of the total national revenue of 253 million Australian dollars (Ministry of Finance and Economic Development, 2015, p. 14)! However, such profits are by no means stable but have been highly variable with changing weather conditions and market fluctuations (Ministry of Finance and Economic Development & Ministry of Fisheries and Marine Resource Development, 2016); moreover, economic interests, or indeed needs, always have to be weighed against measures to conserve fish stocks (Asian Development Bank, 2002, p. 31).

In contrast to EEZ related income, other trade streams are much smaller. Since phosphate reserves had been depleted in time for independence, current Kiribati exports comprise mostly of fish and coconut products. Around the year 2000, these two items made up almost 90% of the entire national export revenue; ten years later, their contribution had decreased but was still at an impressive 62% of the total 4.2 million Australian dollars (National Statistics Office, 2015b). However, these revenues are nowhere near close enough to cover the import costs: the deficit has hovered at around 80 million Australian dollars in the last decade (Ministry of Finance and Economic Development, 2016, p. 3).

Remittances from I-Kiribati seamen have, for decades now, also greatly contributed to the local cash flow. With reference to his term as governor between 1973 and 1978, J. Smith (2011) reports that

the majority of seamen remitted some 70 or 80% of their earnings back to their families (p. 109). In the early years of the millennium, they earned a combined 10 to 12 million Australian dollars annually (Ministry of Finance and Economic Development, 2016, p. 4). Lately, however, these remittances have been on the decline, owing to "economic conditions, changes in vessel technology, where ships have become larger, and increased competition from Asian nations' seamen", a trend that is projected to continue (pp. 3-4).

Finally, Kiribati is highly dependent on foreign aid. The European Commission (2018) reports that almost 66 million US dollars were donated in 2015, and almost 71 million in 2016. Important donors include Australia and New Zealand, the World Bank, the European Commission and the Asian Development Bank, but also China, Taiwan and Japan. Roughly a quarter of donations is invested in transport, another quarter in education. Climate change mitigation and adaptation, too, receive millions: in 2011, a peak year, a combined 34 million US dollars were donated towards related projects.

Owing to the economic circumstances discussed here, the current administration of Kiribati, led by president Taaneti Maamau, has formulated its *Kiribati 20-Year Vision 2016-2036* development plan (Office of te Beretitenti, 2018), or *KV20* for short. Among other things, it aims at maximising fishery revenues on a national as well as a local level, at creating more business and trade opportunities also on the outer islands, at improving employment opportunities in the international labour market, and at raising education standards for wider and better skills required for international as well as domestic employment. Two further and very ambitious goals that are to be reached by 2036 are worth highlighting, also but not only because they are of particular relevance for a sociolinguistic discussion. Firstly, the government plans to develop sustainable tourism and raise respective contributions to the GDP from what was 3.6% in 2016 to an astonishing 50% (p. 19). While it is probable that an increase will be more moderate, improvements in the tourism sector are likely to result in more linguistic contact situations, at the very least on South Tarawa (see Section 3.4.5 for further a discussion and statistics of foreigners in Kiribati). Secondly, the government intends to raise the English literacy rate (see also Section 3.4.1) as well as the not further specified "competency of teachers in teaching and learning" across all school levels to 100% (p. 25). In spite of relatively vague formulations in the KV20 outline document, it is evident that the improvement of English language education in Kiribati remains a very central issue.

Diplomatic relations with partner governments have also changed under the new administration which will have implications that are yet to be determined. On September 20, 2019, Kiribati ended an amicable relation it had with Taiwan since 2003. Well-trained Taiwanese civil servants were, until then, working in hospitals, farms that produce almost all fruits and vegetables available on South Tarawa, and in other crucial areas. The deployment of this workforce had longevity and sustainability, and was therefore more successful and beneficial than many other past and present schemes launched with

international partner agencies. Whether the reinstated diplomatic ties with China will result in these projects being replaced or which new projects will be introduced in the future is not yet entirely clear. It is unfortunate that this change of allegiance preceded the emergence and spread of COVID-19 only by a few months. The global pandemic has halted virtually all travel to and from Kiribati which put huge obstacles in the way of efforts to carry out or launch projects on-site, be it in collaboration with China, Australia, New Zealand or indeed any other partner government. The end of the pandemic and the arrival of a different contingent of foreigners will likely introduce a new swathe of projects and schemes, and a new chapter for Kiribati altogether.

2.8.3 Climate change

With the exception of Banaba, all of Kiribati's islands are low-lying atolls with minimal elevation. Thus, they are extremely vulnerable to climate change. Campbell and Bedford (2014) identify the following effects and resulting impacts on atoll islands and their communities: increases in sea levels, ocean acidity, ocean temperatures, air temperatures, exposure to storm surges, frequency and magnitude of droughts, salinisation of freshwater lenses, and rainfall uncertainty due to changing precipitation patterns – which increase problems of inundation, coastal erosion, reef health degradation, storm damage, agricultural productivity decline, and very importantly, incidence of diseases, with changing vectors, and the non-availability of clean drinking water. It is apparent that these environmental issues are all interconnected. Moreover, they jeopardise livelihood, land, and habitat (pp. 4-5) and have various social, demographic, economic and political implications (Black et al., 2011).

Over the last few years, Kiribati has received somewhat of a fame for its climate change politics that has been pushed by Anote Tong, Kiribati's president for three consecutive terms who has led the country's government between 2003 and 2016. In May 2014, he has made headlines for purchasing about 5'500 acres of land in Fiji, for almost 10 million Australian dollars, in order to invest in commercial, industrial and agricultural endeavours many of which are compromised on Kiribati itself due to climate change impacts (Office of te Beretitenti, n.d., a). In January 2016, he has welcomed a state delegation of the United Arab Emirates in Kiribati in order to build on already existing collaborations and discuss further climate change adaptation strategies:

> The joint project will identify and evaluate physical interventions that can reduce Kiribati's exposure to damage from the ocean. It will outline both the technical and economic feasibility of different options, as well as their potential environmental impacts. (UAEInteract, 2016)

More recently, in mid-2017, Tong has also approached the government of India to inquire about the creation of new land masses (Outlook India, 2017). Many migration possibilities have also been created

under his leadership; these are discussed in more detail in the following section. Kiribati's climate change politics has been and is a big factor in the securing of foreign donations: as stated earlier, approximately half of the 66 million US dollars Kiribati receives are spent on projects that are related to climate change adaptation and mitigation. More funding is hopefully going to follow in the near future from the Green Climate Fund (GCF), the largest source of climate change financing in the world, to which Kiribati has only recently been granted access.

At this point, it is worth noting in which ways many I-Kiribati learn about aspects of climate change as well as dependence on foreign donations. This is best illustrated with a short anecdote about the Kiribati Adaptation Program (KAP) whose projects are funded by big international donors such as the World Bank; I was lucky enough to do some voluntary work with them during my fieldwork in 2015 and thus to gain valuable insights into, essentially, the sociolinguistics of climate change in Kiribati. The KAP workers who have regular meetings with donors are the same people that visit individual communities where projects are to be realised. Many of these projects are fairly small, as for instance the installation of water tanks in a village centre in order to provide (better) access to clean drinking water. However, in order for such projects to get off the ground, the KAP workers engage in numerous, long, intense, and, most important of all, highly involving meetings with the village communities and their leaders. It is possible that not all villagers attend, but there are always messengers who make sure that important notices reach everybody. The project is explained in detail and all its ramifications as well as underlying reasons and purposes laid out carefully; many questions are asked and answered immediately when possible or in a subsequent meeting when further examination is needed; delicate issues concerning lands and right of way are discussed. It is through project meetings that many I-Kiribati learn about climate change issues and the many implications. That is not to say that they have not been affected previously, but they may, for a first time, be given concrete explanations for those problems they all experience almost on an every-day basis: sea walls collapsing, land erosion and inundation, less reliable rainfalls to replenish their thanks, salinised well water, or, as a result of the last mentioned as well as other factors, jeopardised health and increased incidences of sickness and diseases – to name but a few of the impacts. Moreover, it is through this chain of communication that many learn about the role of national as well as international agents with respect to climate change: they get into immediate contact with workers of governmental institutions, which are funded by foreign aid donors, with whom ties have been created in order to tackle the various climate change issues. And very importantly, it is often through these situations that many learn that the future of Kiribati is uncertain and that *Migration with Dignity* is planned for and already actively prepared for with several projects (see next section for more detail).

In Kiribati, hardly anybody has a TV, newspapers are very restricted in terms of print numbers and regional distribution, and internet-capable smartphones have only just been introduced (see Section 3.4). The best media outlet that reaches virtually all I-Kiribati is radio which informs regularly about climate change and related politics and projects. However, the communicative chain explained above

is the only immediate contact possibility for many, one that provides a lot more information than radio announcements and one that allows for participation and interaction. For many, radio is complementary to the experiences they make in their own village *mwaneaba* where meetings take place, rather than the other way round. In any case, climate change has long had impacts on Kiribati and the climate change discourse has by now become omnipresent.

In this context, foreigners who visit Kiribati play an important role, too. Many of the rather few visitors are reporters. Climate change is often the very reason they come to Kiribati and, even if not, their final articles or videos address related issues in some form or another. Many other visitors are researchers. Because climate change issues are so intricate to Kiribati – with regards to historical, cultural, social, economic, ecological, biological and other aspects –, it is seems quite impossible to conduct any kind of research without paying adequate attention to them. Indeed, with my in-depth analysis of linguistic variables presented in Chapter 4, I am trying to provide evidence for a possible connection between climate change issues and linguistic patterns, too. Lastly, even tourists visiting for pleasure are relevant. Kiribati does not (yet) attract tourists that are seeking luxurious, all-inclusive holiday experiences, but rather travellers who are aware of the islands' isolation and of a culture that has had comparatively little contact with or exposure to foreign influences. Many either knew about Kiribati's climate change issues before or learn about them very early on during their stay. Reporters, researchers and tourists all reinforce the discourse around climate change because they partake in it and, more often than not, provide further insights or opinions to the locals that they meet.

It is important to note that very few people, locals and foreigners alike, have a background in climate-related studies which may lead to a lot of false information being spread, which in turn can make the issue seem more or less alarming. This may well contribute to the spread and continuity of the discourse around climate change in Kiribati and render the effects of such a discourse even stronger, on aspects like culture, social life, and even linguistic behaviour.

2.8.4 Current migration schemes

The government and inhabitants of Kiribati take many steps towards climate change mitigation and adaptation. There are numerous national policies and programs, such as the National Adaptation Program of Action (NAPA), the Kiribati Adaptation Program (KAP), or the non-governmental Kiribati Climate Action Network (KiriCAN). In many cases, their projects are co-funded through foreign aid – climate mitigation and adaptation receive the third largest amount of international donations (see previous section). On an individual level, people build and re-build seawalls and dig wells in different locations where they hope to find less saline drinking water.

There is more. Besides adaptation and mitigation strategies, Kiribati is "the only country in the Pacific region that is planning for staged, international migration in response to climate change" (Campbell & Warrick, 2014, p. 25). It does so with a concept entitled *Migration with Dignity*, a policy created by the previous administration under Anote Tong:

> the Kiribati Government acknowledges that relocation of our people may be inevitable. . . . if relocation becomes necessary and nothing has been done to ready people for the move, it will not be possible to rapidly relocate over 100'000 people in a way that preserves the dignity of those being relocated and minimises the burden on the receiving countries. . . . I-Kiribati migrants should be sought after by the countries to which they wish to relocate. For this to happen our people must be in a position to provide the skills that are needed in the receiving countries. This creates a 'win-win' situation, where both Kiribati and the receiving country benefit. (Office of te Beretitenti, n.d., b)[44]

In spite of its name, *Migration with Dignity* not only focusses on relocation but also on outcomes which result from the preparations and which are to benefit both those who migrate and those who remain. That is, increased remittances are to follow from staged migration, benefitting family members and the national economy on the whole. Moreover, the government strives to provide the means for education: staff, materials, facilities. Not only will future migrants be equipped with skills that will make them more attractive to host countries – including English language proficiency –, those who do not migrate will also profit from increased educational standards. On the basis of her anthropological research aiming to find out under which circumstances the government's relocation strategies enhance the adaptive capacity of livelihoods in Kiribati, Duong (2015) reports that what her I-Kiribati informants experience or are hoping to experience in the future is very much in line with what is aimed at with *Migration with Dignity*.

To sum up, Kiribati suffers from huge climate change impacts which are tackled in various ways. The government establishes agreements with foreign aid donors, which finance national agents and programs through which projects can be realised. Such projects range from the very local and small scale, where a village community is provided with a water tank, to measures conducted on a national level, with contributions to the educational system. Furthermore, it establishes agreements with other governments so as to provide migration possibilities some of which are briefly discussed here: scholarships, working schemes, and participation in the Pacific Access Category (PAC) scheme.

Today, there are possibilities to study at different campuses of the University of the South Pacific (USP), prominently at that of Fiji, but also to go to Australia, New Zealand, Taiwan, and elsewhere. USP ties have existed for a long time, and many will make use of them in the future, even though Kiribati's local USP campus expansion was completed in late 2015 which has allowed for an expansion of the study programmes offered. Few people pursue a scholarship opportunity elsewhere:

[44] A full version of the *Migration with Dignity* policy outline is given in Appendix A.10.

recent reports show that there were 15 awards of Australian scholarships in 2013, 5 of New Zealander scholarships in the same year, and 39 of Taiwanese scholarships in 2012 (Office of te Beretitenti, 2012a, p. 24); an additional 384 I-Kiribati have graduated from the Australia-Pacific Technical College between 2008 and 2016, an annual quota of 42 (Australia-Pacific Technical College, 2017).[45] Agreements are also in place with Morocco and Cuba, the latter of which provides medical training to I-Kiribati exchange students and also sends doctors to support the hospitals on Tarawa.

As for the working schemes, I-Kiribati can apply for seasonal employment in New Zealand, under the Recognised Seasonal Employer (RSE) scheme, and in Australia, under the Seasonal Worker Programme (SWP) scheme. In most cases, they work in agriculture, viticulture, horticulture, or hospitality. The RSE has been in place since 2007 and some 120 I-Kiribati make use of this agreement annually (New Zealand Immigration, 2017b). The SWP started in 2010, and has an annual quota of 20 (Sherrell, 2017). The small number of successful applicants, however, are miniscule in comparison to the number of rejections: having become well-known, hundreds of people flock to the Ministry of Labour and Human Resources Development in Bairiki, South Tarawa, every day once radio announces the beginning of a new recruitment cycle. The vast majority are not eligible for the schemes because they do not meet the basic requirements which include – for some schemes – relevant experience, or – for all schemes – an adequate English proficiency level.

Kiribati is also a participating country in the Pacific Access Category (PAC) ballot scheme since 2002 under which it is provided 75 New Zealand resident visas every year. If granted, a holder is allowed to stay in New Zealand forever. However, as with the working schemes, there are certain requirements that not all applicants meet: to be able to support oneself through a job or family members that are already in New Zealand, and, here too, to have a certain proficiency level in English. The visa is highly sought after and a total number of almost 37'000 applications have been submitted since the scheme started – for the only 75 allocated visas per year (New Zealand Immigration, 2017a).

In conclusion, with the agenda that is inherent to *Migration with Dignity* and the many efforts to create migration possibilities, huge problems relating to economic limitations and climate change are reacted to by the Kiribati government; although the new administration under Taaneti Maamau is not advocating the policy as such, it is advocating for scholarships, working schemes, and participation in the PAC scheme. Problems as well as adaptation and mitigation strategies have become well-known to the inhabitants of Kiribati, which itself has various implications. Migration is now happening both on a temporary and on a permanent level: for instance, the I-Kiribati diaspora community living in New Zealand has increased from 645 to 2'115 between 2001 and 2013 (New Zealand Statistics, n.d.).

[45] The Australia-Pacific Technical College has campuses in Fiji, Samoa, Vanuatu, Papua New Guinea and the Solomon islands.

2.8.5 Excursus: Cholera on Tarawa

During Smith's term as Governor of the GEIC in the 1970s, there was an outbreak of cholera on Tarawa. His notes on this event, published in J. Smith (2011), shed light on several aspects of how life in the Gilbert islands was organised, and to some degree, how it still is today.

When Smith was informed by a doctor of, at that time, the only hospital in the Gilbert group that he had the suspicion some of his patients were suffering from cholera, action was taken promptly: traffic between Tarawa and the outer islands was prohibited, the British government was informed, and support was requested. Australia supplied tetracycline medicine that was needed for the treatment of cholera, New Zealand an army field hospital, and the World Health Organisation sent an investigation team. Suspicions were confirmed, cholera had indeed broken out. Smith then reports the following:

> As soon as the tetracycline supplies had arrived we arranged for the entire population of Tarawa to be dosed. It was not as difficult as it might sound. There was a road from end to end of South Tarawa and everyone lived within a few yards either side of it. Radio announcements told everyone when to assemble and medical teams drove from one end to the other handing out tetracycline that had to be taken on the spot. The whole operation was completed in a day. (J. Smith, 2011, p. 174)

Investigations later suggested that the disease had arrived with a foreign fishing vessel, or had developed when shellfishes were kept too close to latrines before being eaten. Either way, it made it to well waters and its spread was so facilitated.

The outbreak affected less than 500 and caused 18 deaths, but was under control after only two weeks. Traffic was permitted again under the conditions that travellers had taken tetracycline for three days before their departure.

This episode is indicative of the organisation of the GEIC and life in the Gilbert islands in several ways. First off, by the 1970s, urbanisation processes on Tarawa had advanced so far that health risks were developing. Overpopulation was regarded one of the potential sources for the cholera outbreak: it had become impossible to maintain that latrines were only built ocean-side. Secondly, the implications of this incident and the way it was handled indeed highlight the dependency of the colony on various institutions, governmental and others, thousands of kilometres away. Moreover, of all Gilbert islands, Tarawa has to be regarded the least inconvenient to administer, to reach from overseas, and to defend against an epidemic of that nature. While the islands have become independent in the meantime, overpopulation on Tarawa and related health risks have only developed for the worse. The ministry of health as well as other agents are continuously instructing the local communities to treat water and water sources, which includes recommendations about the building of *kainga* (hamlets), for example. Furthermore, political independence does not imply independence elsewhere. Kiribati receives a great amount of foreign aid in various forms and for various purposes, including health. Finally, while Tarawa's population has more than doubled since the 1970s, there is still only one main road and all of

its inhabitants live in close proximity to it. Most of the outer islands still have no hospitals and patients need to travel for medical assistance or wait until medical assistance reaches them.

CHAPTER 3

Sociolinguistic description of Kiribati

After a chapter dedicated to Kiribati's history as well as pieces of information circumscribing more recent developments and issues, I now provide a description of many relevant social and linguistic aspects. I begin this chapter with a brief account of my experiences in Kiribati during my first visit in 2015 as well as a description of the data I collected then. Subsequently, I describe both Gilbertese and Kiribati English: aspects of phonetics and phonology, grammar and syntax, lexis and pragmatics, and finally, aspects of language use. I conclude this section with an approach to assess Kiribati's English variety, by discussing conceptualisations of foreign and second languages, as well as models of World and post-colonial Englishes.

3.1 Fieldwork experiences and data collection

3.1.1 Three months in Tarawa

What follows is a short personal account of my fieldwork on Tarawa, Kiribati, that lasted from the beginning of June to the end of August 2015 (see Figure M.3 on page xiv for a simple map of the island). It is an attempt of capturing some of my experiences as a foreigner on a linguistic mission and includes anecdotes about how my cultural understanding grew, how I attempted to conduct interviews, and how I was faced with certain problems along the way. But mostly, I aim to at least hint towards the connection I feel not only with the project at hand, but also with the people and the islands I have gotten to know and love.

* * *

The sun rises as we touch down on Nauru. I step out of the airplane into what feels like an oven. No, these are not the jets. I get a sense of equatorial heat and breathe in Pacific air for the first time in my life. A few hours of transit lounge later, I board the last airplane. It takes us to Majuro in the Marshall islands first. Unlike Nauru, it is an atoll island. And flat. Very flat. On the lagoon side, a thin, dark-green line of palm trees separates the water and the sky. On the ocean side, there is just vast emptiness.

Taking off again, we fly over a number of other atolls. They are thin strips of land, almost completely green from the top. Not much later, we land in Tarawa.

Kiribati. I am picked up at the airport by Amon and his teenaged son Etekia. They first take me to Bikenibeu, a larger village in South Tarawa, where I drop off my huge backpack and a smaller rucksack. I make quite the sight. Being white may have something to do with it, too. I meet some family of Amon's. He is the only one who speaks English. We take a bus to Bairiki, another big village further west. There are buildings practically everywhere and I get a sense of how crowded South Tarawa is. So many impressions. The ride takes about 45 minutes, but being jetlagged and because everything is new to me, it feels much shorter.

Soon, Etekia and me are standing at a bus stop, waiting for Amon to return from his errands. It is a calm Sunday afternoon and not a lot of people are walking around. However, it feels as if a large fraction of the entire population drives by on busses. I again realise how the sheer sight of a white person is a surprise to most people here. Back to Bikenibeu. I take my belongings, get on a canoe and cross the lagoon. To a paradise. I am greeted by Tekinati, Amon's wife and Etekia's mother. I put sand on my cheeks and visit a shrine. I have now officially arrived on Kiribati.

Amon and his family run a homestay which, like the majority of hotels and guest houses on Kiribati, is listed on the official tourism website. Of these, it is the only one in North Tarawa and advertises itself with the statement that it offers the experiencing of the traditional lifestyle of Kiribati. This is perfectly in line with my personal interests as well as my research goals.

The name of the village is Tabiteuea. It is part of North Tarawa and quite a different world to that I have seen in the South, or to anything that I have seen at any other point in my life for that matter. Most of my time in the northern villages feels like magic. Amenities there are little. Houses are generally built with local materials. Bigger buildings have a large roof made of pandanus leaves that almost reaches the ground, so that one has to bow when entering. Smaller huts, for instance for sleeping in, have elevated floors to prevent crabs and other unwanted guests from intruding. Walls there are none. Electricity, generated in the power plant or through solar panels, may or may not be available. Water is collected in rain tanks, or fetched from wells. In some cases, like ours, there is a pump, that is operated by hand. A bucket of water and a cup is all that is needed, or all that there really is, to shower. At the end of the day, I get into my hut, drop the mosquito net and go to sleep with a gentle breeze and the sound of waves coming in from the lagoon.

During the day, I participate in the Kiribati life wherever I can, and am allowed to. I do work around the house which includes the cutting of palm leaves for building purposes, or the cutting of toddy, a sweet juice that is drunk with many meals – climbing on palm trees for that purpose has soon become one of my favourite activities as I find it to be very calming. I go to the small local shops and, as my Gilbertese language skills improve, can soon take over the orders of cooking oil, soap, or also diapers for, so I tell them, my same-aged friends. I play football and volleyball with the youths on

vicious grounds littered with sharp shells and stones which I make responsible for my bad performances rather than the lacking talent. I learn songs and dances, go to feasts, and on Sundays to church.

Amon and Tekinati speak English fluently and without inhibition or shyness unlike so many I-Kiribati. They both open many doors for me both as an outsider and as a linguist on a mission. Tekinati takes care of me almost in a motherly fashion and they are both overwhelmingly welcoming. Living with them is simply a treat so that I have soon decided to stay with them for more than the originally planned 10 days.

On Tabiteuea, Tekinati takes me on a tour through the village and introduces me to a lot of curious villagers. For our first trip down to South Tarawa, on my third day, we get on the village canoe that fits around 30 people. It does not leave for a long time; something to do with the motor. Tekinati has to translate dozens of questions and answers back and forth. The entire village now knows who I am and why I came to Kiribati.

Amon works for the Kiribati Adaptation Program (KAP) and often goes on trips to villages further north in order to carry out projects such as the installation of water tanks for the collection of rain water. He takes me with him and lets me accompany the team, officially as a volunteer worker. We stop at village community buildings for meetings, the first *mwaneaba* I ever enter being that of Nuatabu. An introduction of an outsider to a village could not be better: it is formal and official. The meeting is led by an *unimwaane*, a village elder, as well as the *tia babaire*, the village chairman. What at first I cannot do on my own, on account of my lacking Gilbertese language skills, Amon does for me: the official greeting and the stating of my name, my home island, my purpose here in Kiribati. Among the latter are not only my linguistic research goals, but also my being a volunteer who supports Amon and his team. The KAP projects have a big and very direct impact on the lives of many, and our work, my participation, is visible and valued. Another *mwaneaba* in Taratai follows. Albeit with much lower attendance here, these formal introductions greatly work in my favour. Soon, I am not only greeted as "te I-Matang!" but also as "Tobi" by people who must have heard about me through these official channels. I am an outsider with an identity and one whose presence is known – in the North, on Tabiteuea, and elsewhere.

The heat and the dark-green line of palm trees at the horizon that I have been introduced to on and over Nauru and the Marshall islands are of course also very characteristic of Kiribati. I have soon gotten very used to both. The same goes for the thin islet strips and the sound of breaking waves on the ocean side that can be heard at all times. In what does not feel like a very long time, I become reasonably familiar with island, culture and people and travel independently. I go to South Tarawa by canoe or, because it is often not as reliable as I would like it to be, walk for about one and a half hours to the next bus. The walk is beautiful and I often make it in the morning and in the evening. It offers stunning sites and loads of chances to exchange greetings which are done by raising one's eyebrows, and emphasised with a friendly smile. Like a magic spell, this makes even those few kids smile that were too stunned to

do so before, on account of me being a very obviously very white person. Kiribati leaves no doubt that fear of otherness is taught and learnt.

I am so very lucky to have been chosen to come here. Also, being lucky with my choices of accommodation and the people I so meet, being introduced officially, being visible, participating, making friends, and immersing in and learning about *te katei ni Kiribati* (the Kiribati culture) every day is a combination that works out very well. Needless to say that, as a linguist, I start to profit very quickly from it, too. However, not everything runs as smoothly as I anticipated. Firstly, as mentioned earlier, the English proficiency of most is very low and not sufficient for a sociolinguistic interview of 30 minutes or more. This is clearly the biggest fieldwork-related problem I encounter, and the principal reason why I end up with a relatively small data corpus of 33 recorded conversations. Secondly, and certainly a connected issue, is inhibition or shyness: saying something in English triggers the laughter of listeners, and even without others present, most I-Kiribati are very unconfident when it comes to speaking their second official language. Those who do sit down with me confirm this and often also say that they themselves feel very shy. Thirdly, I experience the difference between policies and practices. I have a lot of conversations with students and teachers alike, some of which recorded, where I am assured that English must be spoken when in school compounds. Violation of this rule results in detention. This is definitely not implemented so categorically. In practice, Gilbertese is almost always and everywhere the dominant language. As a fourth obstacle, putting English speakers on a list of contacts and then actually conducting an interview with them is not as straightforward as it may seem. I-Kiribati have large families and are very mobile. Visits to other islands are very common, and so is commuting to other parts of the same island which includes staying at someone else's place, often for several days or weeks. Whenever possible, I try to get acquainted with people first and only after a while ask for an interview. Due to the mobility issue, however, this is not always a possible approach and I have to think of my linguistic work very early on when meeting potential candidates.

It is because of the issues listed here that I abandon my initial strategy of only looking for North Tarawa informants. Finding enough proficient and uninhibited speakers within the time frame of three months, who ideally stay long enough for a few visits prior to a recording, seems unfeasible. Also, while it is certainly true that there are differences between the North and the South of Tarawa and that the latter certainly has more exposure to I-Matang and the English language – which is why I originally intended to only do fieldwork in the North –, it is not true that people can simply be labelled North or South Tarawa citizens, or Tarawa citizens for that matter. Again, almost everybody is very mobile and lists several other islands as home islands or as previous places of residence. I therefore soon start making contacts and conducting interviews in the South, too.

Although I face some issues and many challenges during the three months I spend in Kiribati, both on a personal and professional level, I enjoy every minute. Besides collecting a lot of interesting material for my research, I learn a lot about a people and a culture that are very foreign to me at first

but with which I become better acquainted as time passes. I leave Kiribati eager to continue my research on these fantastic islands for another three years – during which I return for several shorter visits.

* * *

3.1.2 Informants and materials

Following the short description of my fieldwork in Tarawa, I now briefly introduce those I-Kiribati who sat down with me for a sociolinguistic interview or a short test. I owe them my gratitude for their hospitality, their help and their friendship: without them, this report would not have been possible, and without them, my time in Kiribati would have been less informing, less interesting and less memorable.

I conducted sociolinguistic interviews with 33 participants. The duration of these conversations ranged from 30 minutes to 1 hour and 40 minutes, with an average of almost exactly an hour. In all but three cases, I spoke with one participant at a time. Some pieces of information that are of relevance for the study at hand are provided in Table 3.1 below. There is a relatively even distribution with regards to sex and age: 17 participants are female, 16 male; they are between 19 and 66 years old, with very few speakers born in the same year. However, it is worth noting that most participants have at least completed secondary school, have jobs with a regular income, and have travelled to other places for education or work. In this respect, my sample is not at all representative of Kiribati but captures an educational and occupational elite who generally have and have had more extensive contact with other cultures and languages. This skew is due to the overall low proficiency of the English language: it is uncommon for I-Kiribati without an educational or occupational background like that of my informants to be proficient enough to become potential candidates for a sociolinguistic interview of half an hour or longer. For much the same reasons, all of my informants are no younger than 19.

In addition to my sociolinguistic interviews, I am able to refer to a smaller corpus of spoken data the collection of which is also worth describing. It was during my third and last month that I finally got the chance to record some conversations with JSS students; arrangements for this have been made much earlier but independence week, holiday weeks, examination weeks and other breaks in the regular school schedule made for a rather long delay. On the other hand, this had given me time to gather enough linguistic impressions and to improve my Gilbertese proficiency so much so that I was able to create a word-list task that would allow me to analyse acoustic parameters in more detail. The task consisted mainly of minimal pairs: for example, *ben* (coconut), and English *pen* and *Ben* for the analysis of closure phases and voice onset times; the presentation order as well as the headers and colour schemes helped eliciting Gilbertese and English renditions of these target words. When I sat down with the first two primary students that were sent to me for what I hoped to be conversations of at least a few minutes,

I learned that non-verbal responses and maybe a few mono-syllabic utterances were the preferred mode of communication. I resorted to the word-list task which I had finished only minutes before while waiting for the students to arrive. I did not anticipate that I would have to rely on it. However, to my relief, the powerpoint presentation did not have any flaws but automatically displayed one expression after the other, so that I could still collect a corpus of what turned out to be valuable data with 10 JSS students.

This experience was ample proof that shyness and cultural concepts do not simply hide an otherwise good English language proficiency level: for the vast majority of I-Kiribati, primary education and often also secondary education are not sufficient to equip them with the linguistic skills needed for relatively simple conversational events in English. The overall proficiency level of English in Kiribati is, indeed, rather low.

As an alternative of some sort, I decided to seek out participants at the local USP campus. Initially, I hesitated to include them in my study as my sample may have skewed towards an educational elite. But this is simply linguistic reality in Kiribati: as stated earlier, it is generally only through tertiary education that I-Kiribati receive good-quality English language teaching that allows them to develop higher proficiency levels. When I got permission to roam about the USP campus and approach students, it was also very interesting to observe attitudinal differences. In contrast to my other informants, where I tried to seize as much time as possible to get to know them and vice-versa, I must have asked the first person after no more than 30 seconds whether he would want to participate in my project. Not only was he very happy to do so, when I returned later the same day for the interview, he had made sure that a handful of other people were eagerly waiting to participate too. They may still mention that they are shy, which may well be true for some, but they clearly regard a conversation with an I-Matang who just wants to hear them speak English as valuable practice and need very little convincing. I had no problem collecting a few interviews with USP students, even though they are not exactly from the age group or indeed from the educational background I had originally targeted. It is clear that they fit perfectly in my sample, however, and that my sample is representative of who speaks English in Kiribati: overwhelmingly, an educational and occupational elite.

It is through the fieldwork experiences and data collection described here that I am able to draw such conclusions about Kiribati's sociolinguistic reality. More concrete findings are presented in the remainder of this chapter.

Table 3.1: Informants participating in sociolinguistic interviews.

ID	Sex	Year of birth	Age	Ethnicity	Native language	Religion	Education	Occupation	Stay abroad
Ki01f1956	F	1956	59	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Nurse	Educational; Occupational; Holiday
Ki02f1969	F	1969	45	I-Kiribati	Gilbertese	Baha'i	Technical/ vocational	JSS teacher	Occupational
Ki03f1977	F	1977	38	I-Kiribati	Gilbertese	Protestant	Technical/ vocational	Nurse	
Ki04m1969	M	1969	45	I-Kiribati	Gilbertese	Protestant	Technical/ vocational	Seaman (retired); Village chairman	Occupational
Ki05m1974	M	1974	40	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	JSS teacher	Educational
Ki06m1986	M	1986	29	I-Kiribati	Gilbertese	Catholic	Secondary	Mayor	Educational
Ki07f1990	F	1990	24	I-Kiribati	Gilbertese	Protestant	Secondary	Treasurer (government)	
Ki08m1963	M	1963	52	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Priest (retired)	Educational
Ki08f1967	F	1967	48	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Teacher (retired)	
Ki09f1991	F	1991	24	I-Kiribati; Hindi-Fijian	Gilbertese; Hindi; Fijian	Catholic	University	Travel consultant	Holiday
Ki10f1990	F	1990	25	I-Kiribati	Gilbertese	Catholic	Secondary	Travel consultant	Educational; Holiday
Ki11m1980	M	1980	35	I-Kiribati	Gilbertese	Catholic	University	Marketing manager; International environmental organisation	Occupational
Ki12m1949	M	1949	66	I-Kiribati	Gilbertese; Nauruan	Catholic	Technical/ vocational	JSS, SSS, higher ed. teacher (retired); Chief commissioner scouts	Educational; Occupational
Ki13f1991	F	1991	23	I-Kiribati	Gilbertese; Nauruan	Catholic	Secondary	Treasurer (church youth group); Scout	Holiday
Ki14m1965	M	1965	49	I-Kiribati	Gilbertese	Mormon	University	Teacher (retired); Newspaper editor	Educational
Ki15f1988	F	1988	26	I-Kiribati	Gilbertese	Seventh Day Adventist	Technical/ vocational	JSS teacher; Teacher trainer	Educational

Ki16m1963	M	1963	52	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	School principal (retired); KIT lecturer (reitred); Secretary to the Kiribati Union of Teachers; Human Resources official (government)	Educational
Ki17f1976	F	1976	38	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	JSS teacher/principal	
Ki18f1990	F	1990	24	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Sister (rel.)	Educational; Occupational
Ki19m1955	M	1955	60	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Seaman (retired); Truck driver (retired)	Occupational
Ki20f1959	F	1959	56	I-Kiribati	Gilbertese	Catholic	Primary		Holiday
Ki21m1985	M	1985	30	I-Kiribati	Gilbertese	Jehova's Witness	University	USP student	Educational; Holiday
Ki22f1962	F	1962	53	I-Kiribati	Gilbertese	Catholic	Secondary	Tourist accommodation owner	Holiday
Ki23f1992	F	1992	23	I-Kiribati	Gilbertese	Catholic	University	USP student	
Ki24m1970	M	1970	45	I-Kiribati	Gilbertese		Technical/ vocational	Seaman (retired); Security guard	Occupational
Ki25m1972	M	1972	42	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Catechist	Holiday
Ki26f1995a	F	1995	19	I-Kiribati	Gilbertese		University	USP student	
Ki26f1995b	F	1995	20	I-Kiribati; Tuvaluan	Gilbertese		University	USP student	
Ki27m1995	M	1995	20	I-Kiribati	Gilbertese	Catholic	University	USP student	
Ki28m1994	M	1994	20	I-Kiribati	Gilbertese	Protestant	University	USP student	
Ki29m1994	M	1994	20	I-Kiribati	Gilbertese	Catholic	University	USP student	
Ki29f1996	F	1996	19	I-Kiribati	Gilbertese	Protestant	University	USP student	
Ki30m1957	M	1957	58	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Voluntary magistrate; Office of te Beretitenti (retired)	

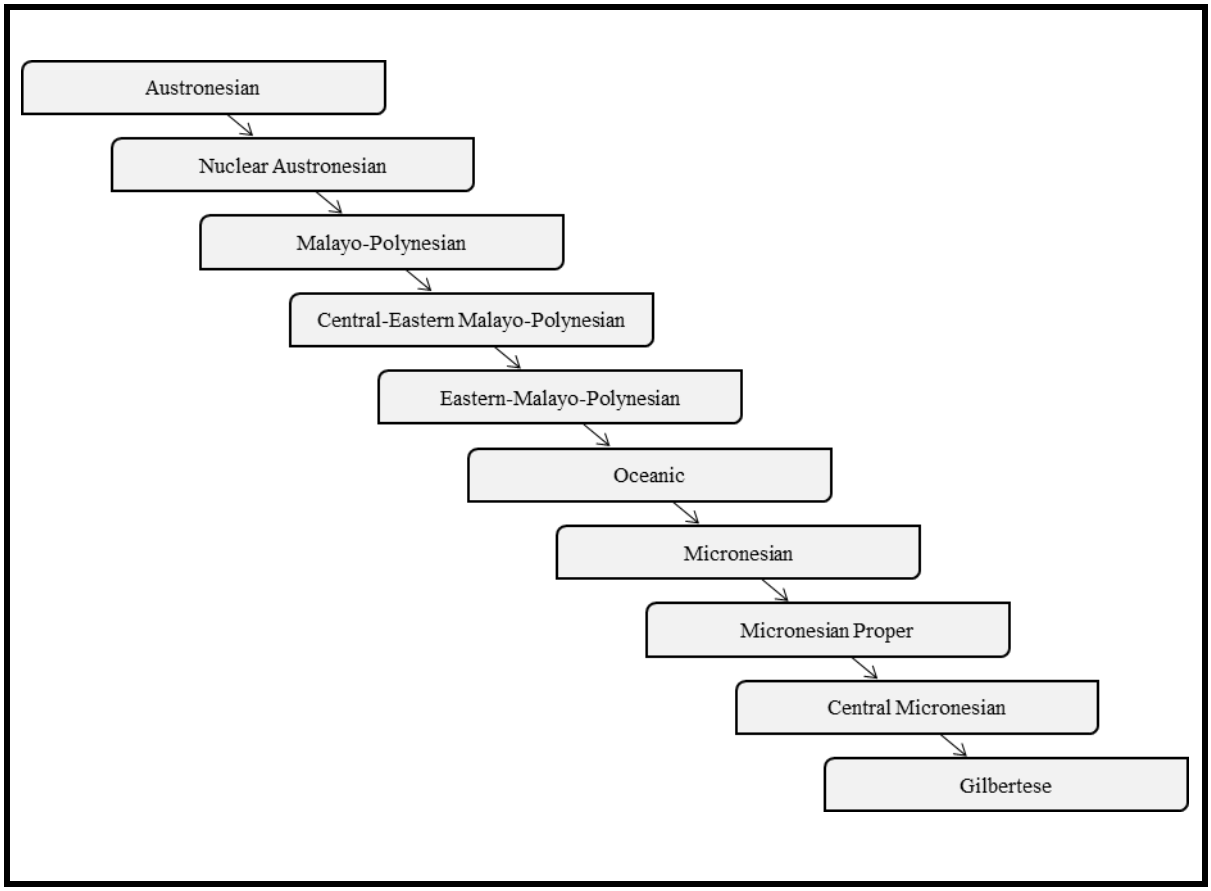


Figure 3.1: Classification of the Gilbertese language.
(Source: Hammarstroem, Forkel, & Haspelmath, 2018.)

3.2 The Gilbertese language

Gilbertese, as it is spoken today, was greatly shaped by the arrival of Samoans at around 1400 AD (as mentioned in Section 2.1.1 above). Consequently, there is "a substantial Polynesian adstratum" (Harrison, 1995, p. 882) in Gilbertese. Vice versa, there is a number of Gilbertese contributions to other Micronesian languages, in particular Marshallese, and according to *Ethnologue* (Simons & Fennig, 2017), there is a 26% lexical similarity with Pohnpeian. As presented in Figure 3.1, Gilbertese belongs to the Austronesian language family and to the subgroup of Oceanic languages which also branches into Micronesian; according to Harrison (1995), however, there are some uncertainties about the position of Micronesian within the Oceanic subgroup, as well as the branching of Micronesian itself.

There is less debate about the dialects of Gilbertese and the differences between a northern dialect (spoken only on Butaritari and close-by Makin), a central and a southern dialect are often mentioned. While there are certain lexical and intonational variations, the Gilbertese language is remarkably uniform throughout Kiribati and "any two speakers will certainly have mutual intelligibility of near 100%" (Groves, Groves, & Jacobs, 1985, p. 2).

The linguistic description that follows is brief and meant to discuss a few important features only, so as to provide an overview suitable enough for the analyses in subsequent chapters. It is largely informed by the works of Bingham (1908, 1922), Trussel (1979a, 1979b), Groves, Groves and Jacobs (1985), and Harrison (1995), who have all studied the Gilbertese language in great detail. These accounts, however, are not always fully congruent with one another and there are also some deviations from what I have observed. While my primary linguistic focus was not on the analysis or description of the Gilbertese language, I nevertheless conducted a number of small experiments with the aim of obtaining a fundamental understanding of its sound inventory and other basic linguistic features. I will make annotations when I deem relevant and noteworthy, and when I feel comfortable to do so with my limited background.

3.2.1 Phonetics and phonology

As Table 3.2 and Table 3.3 show, the phonemic inventory of the Gilbertese language is small, "both by Micronesian and by world standards" (Harrison, 1995, p. 885).

Plosives

To begin with, there are only unaspirated (non-specified) oral plosives: /p˚/, /t˚/ and /k˚/. The acoustic properties of these sounds are different from both the unaspirated and aspirated variant sets in English. Accordingly, Gilbertese speakers often do not perceive the differences between the two English sets, as my perception and production data seem to corroborate; the relevant acoustic parameters of (non-)aspiration and voice onset time (VOT) will be discussed in greater detail in Chapter 4.

Gilbertese /t/ seems to have undergone linguistic change. Bingham (1908) notes the following:

> *T* seems to represent two sounds. When it is followed by *a* or *e* or *o* it has the common sound of *t* in English, as in *tan, ten, toe*. When it is followed by *i* or *u* it resembles that of *t* in *nature, virtue, righteous, Christian*. Its correct utterance is difficult for a foreigner. (p. vii)

This clearly indicates that /t/ was produced in an assibilated form and strongly suggests the presence of a plosive before some sort of sibilant. Thus, its pronunciation was similar to but not identical with [tʃ].

Table 3.2: Gilbertese consonants.

	Labial	**Apical**	**Velar**
Oral stop	p	t	k
Nasal stop	m	n	ŋ
Roll/tap		r	
Fricative	v		

Table 3.3: Gilbertese vowels.

	Front	**Central**	**Back**
High	i		u
Mid	e		o
Low		a	

The above quote is taken from Bingham's 1908 publication, but he had been in the Gilbert islands since 1857. Decades later, this pronunciation seemed to have slightly changed, as Groves, Groves and Jacobs (1985) make apparent in their description of /t/ before /i/ and /u/:

> The /s/ exhibits fairly wide variation in pronunciation by different individuals and in different phonetic environments. It is sometimes pronounced with a slight stop before the air flow is released, but it is still fairly well approximated by the English sound /s/. (p. 10)[46]

With reference to the central and northern dialect of Gilbertese to which I was mostly exposed, I can only report a clear [s] in respective environments; especially but not limited to the southern region, [tu] is still in use. In conclusion, there is ample evidence that /t/ in Gilbertese has undergone an assibilation process during which the plosive was gradually lost; now, a clear [s] is produced before /i/ and, at the very least in the northern and central dialects, also before /u/.

In accordance with this sound change, the orthographic succession ‹ti› is realised in all dialects as [s] or [si] (Examples 1 and 2). The same holds true for ‹tu› which is realised as [su], in the dialects of the north but not that of the south (see Examples 3 and 4). Pannu (1993) states that, besides this, "there seems to be no other significant regional pronunciation difference" (p. 46).

1) ***ti****kiraoi* North: [**si**] / South [**si**] (good)

[46] Groves et al. (1985) do not use square brackets when talking about actual pronunciation. From the co-text, however, it is clear that these sibilant productions are allophones of /t/, which elsewhere remains [t].

2)	*mwai**ti***	North: [**s**] / South [**s**]	(much, many)
3)	***tu**anga*	North: [**su**] / South [**tu**]	(to ask)
4)	*te a**tu***	North: [**su**] / South [**tu**]	(head)

Depending on situational context and register, word-final ‹ti› may be rendered similar to word-internal pronunciations in that there is a sibilant as well as a vowel: [si]. However, high front vowels are more often reduced and either devoiced or deleted completely. This is frequent for final contexts, but it is also possible elsewhere:

5)	*Kiriba**ti***	[kiribɛ**s**]	(Gilbert)
6)	***tib**wa*	[**sib**a] or [**sØb**a]	(just)

Finally, /t/ is sometimes pronounced with an audible degree of frication: [tˢ]. Such renditions occur across all phonological context. This as well as other evidence which will be discussed in detail in Chapter 4 seem to indicate that there is a different explanation for affricated variants: it is very likely that the realisation of /t/ in English by I-Kiribati speakers is accountable.

There are also a few noteworthy comments on the production of the oral stop /k/. Usually, it is articulated in the velar region, but uvular variants occur, too. Moreover, it is now also produced as fricative, velar or uvular, depending on the phonological environment. Renditions like [xaxaŋ] for *kakang* (sharp) are rather frequent, at least among some speakers. I have, so far, not come across any such description and am thus wondering whether /k/ is undergoing a change similar to that of /t/ where frication is also an important component.

Nasals

The nasals /m, n/ and /ŋ/ may all occur as geminates at lexeme boundaries. They are, in fact, also the only consonants permitted in word-final position (Example 7) and are obligatory initial elements in consonant clusters (Examples 8 to 10).

7)	*te be**n***	(coconut)
8)	***ng**ke*	(you)
9)	*kai**n** te kawa*	(villager)
10)	***m**ro**n**ron*	(round)

Fricatives

Gilbertese only has one fricative with phonemic status: /v/. Groves, Groves and Jacobs (1985) briefly describe how Gilbertese [v] is “softer and pronounced with less friction and freer, less intense flow” than English [v] (p. 9).

Additionally, there are some fricatives that serve as allophones to other sounds. These, the sibilant [s] as a variant of /t/ and fricated velar or uvular sounds of /k/, have already been mentioned.

Rolls/tap

The Gilbertese /r/ is apical. It is usually short and thus often rendered as a tap. It is not subject to gemination. Bingham (1922) identifies a number of slightly different realisations in different phonological contexts, but summarises that there is "no exact representative sound in English" (p. 2).

Approximants

Many descriptions of the Gilbertese sound system include /w/. Bingham (1908) provides the following annotation:

> *W* represents a sound difficult to describe. It closely resembles the sound of *w* in English. In the latter case the lips are a little protruded, and the sound seemingly prolonged a little, while in Gilbertese the lips are slightly drawn back, and the enunciation is quick. (p. vii)

He further mentions that other writing systems represent the sound simply with a ‹u› (see also Bingham, 1922, p. 3). Groves, Groves and Jacobs (1985), too, address the similarity between [w] and [u] and refer to a debate about how to orthographically standardise them (p. 9). I have tried to identify the place and manner of articulation of /w/ and remain unsure about the velar involvement in the speech of I-Kiribati today. I wonder whether the labio-dental approximant [ʋ] or even a full vowel [u] are better candidates, or indeed whether several of these candidates occur as complementary allophones.

Moreover, it is often attested that /m/ and /b/ before [e] and [i] are articulated with velarised quality, as [mw] and [bw] respectively. Bingham (1908) labels this coarticulated /w/ "obscure" (p. vii), and, of importance for the present discussion, seems to imply that all [__e] and [__i] contexts are affected. In contrast, Groves, Groves and Jacobs (1985) state that velarised and non-velarised articulations can be used interchangeably (p. 11). That this feature is undergoing language change is backed up by my own albeit only superficial impressions: I can only recall older people realise words like *mwiina* (after, later) – which usually retains a ‹w› or ‹'› in orthography – as [mwi:na], while younger I-Kiribati produce [mi:na] also when asked to say the word slowly and in isolation.

Vowels

The vocalic inventory appears to be relatively simple, with its only five phonemes. All of these can occur in short and long form, making length a feature with phonemic status. For example:

11) *m**a**n* [mɛn] (being: humans, animals, etc.)

12) *m**aa**n* [m**ɛ:**n] (long duration)

However, with reference to actual speech, Harrison (1995) notes that "more often than not, long vowels are simply not distinguished from short vowels" (p. 885).

More noteworthy information with regards to the production of vowels in the environment of other sounds is given below.

Basic phonology

Gilbertese generally follows a simple structure where words usually end in a vowel and consonant clusters are very limited. There are two noteworthy exceptions that have, to some degree, already been discussed above: firstly, nasals can occur in final position as well as precede – some – other consonants, within and across word boundaries; secondly, the assibilation and reduction processes underlying ‹ti› sequences permits [s], too, to cluster with other consonants:

13) ***tib**wa* [siba] or [**sØb**a] (just)

14) *mwai**ti t**e karau* [mai**s t**e karau] (a lot of rain)

For other non-permissible consonant combinations, epenthetic /i/ serves as a consonant cluster resolution:

15) *kan toka* permissible cluster (want to get on; effectively: bus fare)

16) *kan**i** matu* non-permissible cluster (want to sleep)

In contrast to consonants, vowels can cluster freely and thus very frequently occur as diphthongs, triphthongs and even longer sequences, in compound words and even within the same lexeme:

17) *k**oaua*** 1 lexeme (true, sure)

18) *Tabit**euea*** 3 lexemes: tabi te uea[47] (Island and village name)

I also present here three example sentences given in Groves et al. (1985, p. 13), highlighting that vowel combinations are indeed both frequent and flexible:

19) *Iai aia aia aiaia iaaia.* (Their enemies had their firewood under them.)

[47] *Tabi te uea*, from *(e) tabu te uea*: a/the king is forbidden. *Tabu* has been documented by Captain James Cook (1821) after a visit to Tonga and has been adopted into English as *taboo*. It must have made its way to the Gilbert islands with the Polynesian arrival.

20)	*Iai uoua aia uee ao aua aia ie.*	(They had two flowers and four sails.)
21)	*A aoi aia uee iaoia.*	(Their flowers had dew on them.)

In some vowel sequences, the degree of lingual movement is very small, particularly but not exclusively for ‹ao›- and ‹ae›-diphthongs: for the former, there is only a minimal back and/or upward movement into [ɒ] or [ɔ], for the latter, there is a similarly minimal movement into [ɛ]. Both Bingham (1908, 1922) and Groves, Groves and Jacobs (1985) note how almost pure these diphthongs really are. I have perceived many of these sequences as monophthongs, which they may in fact have changed into or, more likely, are in the process of changing into.[48]

As for successions of identical vowels, there is “no marked hiatus, catch, or break” (Bingham, 1922, p. 4). Instead, the two vowels are pronounced as one (Examples 22 to 23). Moreover, a similar deletion process is sometimes found across identical CV pairs (Example 24).

22)	*at**uu***	[as**uu**] or [as**u**]	(my head)
23)	*n**a a**ki*	[n**a a**ki] or [n**a**ki]	(will not)
24)	*i a**ki ki**na*	[i a**ki ki**na] or [i a**ki**na]	(I do not know him/her/it)

Suprasegmentals

The Gilbertese language is mora-timed, with a complex set of underlying rules (see Blevins & Harrison, 1999, for a detailed analysis). In more general terms, Bingham (1908) remarks that in many words stress is “not very marked” (p. 11).

As for intonation, it usually signals whether an utterance is a statement or a question: for the latter, the intonation is rising. There may also be the tag *ke* (right?; elsewhere: or) added to the end of an utterance.

25)	*E aoraki**.***	Non-rising intonation	(He/she is sick.)
26)	*E aoraki**?***	Rising intonation	(Is he/she sick?)
27)	*E aoraki, **ke?***	Rising intonation on *ke*	(He/she is sick, right?)

[48] I remain unsure about a potential phonemic distinction between [e], for instance in *meri* (honey), and [ɛ], for instance in *mari* (abundant) – in other words, in non-diphthongal contexts. While there are expressions like *maamaa* (shy) or *wenewene* (to lie down) that, at least to my ear, seem to differ more clearly in terms of vowel quality, it is difficult to find minimal pairs like the one I listed here. Asking a few speakers to utter *meri* and *mari* results in only a very slight contrast, one that may not be made when these words occur in natural speech.

3.2.2 Grammar and syntax

Gilbertese features a variety of grammatical and syntactic characteristics that are indeed rather interesting – if not on their own, than at least in a contact situation with another, typologically quite different language such as English.

Gender

There are no gender markers. However, some words simply imply biological sex, such as *aine* (woman; female) and *mwaane* (man; male), which can be employed to modify other nouns; *nei* and *ten* before people's names have a similar function: the former is for girls and women, the latter for boys and men. In most cases, a person's name alone is not indicative of their sex.

Number

Usually, singular forms are preceded by the article *te* which cannot be defined as definite or indefinite since there are no further articles to establish such categories. There is a small number of other nouns that occur on their own: among them are names of places or people, the cardinal directions, and "some nouns which indicate things of which only one is considered to exist" (Groves, Groves, & Jacobs, 1985, p. 33), such as *taari* (the sea), *taai* (the sun) or *namwakaina* (the moon).

Pluralisation, on the other hand, is rather complex. It can be marked by the absence of *te*, and/or by the presence of plural articles like *taian*, and/or by pluralisation of relative pronouns, and/or by the lengthening of the first vowel in bimorphous nouns which permit such transforming:

> The plural form of bimorphous nouns is always characterised by the presence of a long vowel . . . . Strange as it may seem, the bimorphous nature of these nouns never is an essential indicator of the number of a noun. In all cases where a separate plural form is used, there are other indications of plurality in the utterance. Conversely, where there are no other indications of plurality, the distinct plural form of bimorphous nouns is not used. . . . In any case, number does not seem to be considered very important in Kiribatese. (Groves, Groves, & Jacobs, 1985, p. 41)

Similarly, Bingham (1922) notes that singular forms are used when the plural is intended (p. 12):

28) ***e*** *maiti* ***te ao****mata* (sg Pro, sg Art, sg N) (a lot of people)

Possession

There are four ways in which possession can be expressed: by markers preceding or following the noun, in which cases articles do not co-occur (Examples 29 and 30), or by employing genitive structures, with or without the indicator *n(i)* (Examples 31 and 32):

29)	***am** ben*	preceding marker	(your coconut)
30)	*tari**m***	following marker	(your brother/sister)
31)	*te tabo **ni** matu*	with *n(i)* indicator	(place of sleep/place for sleep)
32)	*ana ben tarim*	without *n(i)* indicator	(your brother's coconut)

The markers in Examples 29 and 30 are treated differently in their orthographic representation: preceding markers occur on their own, following markers are suffixed to the noun. This seems somewhat arbitrary, however, and makes their description a little more difficult. If treated uniformly, they could either be called pronouns (antecedent and postponed respectively), or affixes (prefix and suffix respectively). It is noteworthy that some nouns only allow prefixation, some only suffixation, and a few permit both but their meaning might be affected:

33)	*ira**u***	(my hair)
34)	***au** ira*	(my pandanus-leaf strips)

Pronouns

The Gilbertese language features personal pronouns (*i*,[49] *ko*, *e*, *ti*, *kam*, *a*) and emphatic personal pronouns (*ngai, ngke, ngaia, ngaira, ngkami, ngkeikei*). The latter are also used for short answers.

35)	***e** nako Abaiang*	(he went to Abaiang)
36)	***e** nako **ngaia** Abaiang*	(it was he/she who went to Abaiang)
37)	A: *Antai e nako Abaiang?*	(Who went to Abaiang?)
	B: ***Ngaia***.	(He/she did.)

Demonstrative pronouns *(aei, anne, arei, aikai, akanne, akekei)* and relative pronouns (*ae*, *ane*, *are*, *aika*, *akana*, *ake*) are sensitive to the number of referents as well as spatial relations with respect to the interlocutors. More specifically, there are different pronouns for singular and plural referents, and different pronouns to refer to the proximity of the speaker to the referent, the proximity of the listener to the referent, or the distance of both to the referent:

38)	*te nii **aei***	(this tree – near me)
39)	*te nii **anne***	(that tree – near you)
40)	*te nii **arei***	(that tree – far from us)

[49] In utterances in the future tense, the 1st person pronoun is *n*: ***i** nako* (I go/went) vs. ***n** na nako* (I will go).

41)	*taian nii* ***aikai***	(these trees – near me)
42)	*taian nii* ***akanne***	(those trees – near you)
43)	*taian nii* ***akekei***	(those trees – far from us)

44)	*te nii* ***ae*** *e buubura*	(the tree which is big – near me)
45)	*te nii* ***ane*** *e buubura*	(the tree which is big – near you)
46)	*te nii* ***are*** *e buubura*	(the tree which is big – far from us)
47)	*taian nii* ***aika*** *a buubura*	(the trees which are big – near me)
48)	*taian nii* ***akana*** *a buubura*	(the trees which are big – near you)
49)	*taian nii* ***ake*** *a buubura*	(the trees which are big – far from us)

Relative pronouns are always followed by personal pronouns, also when the head of the relative clause is an adjective, as in the examples above. Bingham (1922) rightly points out that, on account of the resulting vocalic combinations, the presence of a personal pronoun is only distinctly heard in the case of *ake* (p. 24); today, it is not rare to find all personal pronouns being omitted completely in such contexts, in speech as well as in writing.

Adjectives and adverbs

Adjectives can either precede or follow the noun. In case of the former, they are themselves preceded by a pronoun (Example 50) making them functionally indeed very similar to intransitive verbs (Groves, Groves, & Jacobs, 1985, p. 67); in case of the latter, a relative pronoun construction is employed (Example 51).

50)	*e* ***buubura*** *te nii*	(the tree is big; the big tree)
51)	*te nii* ***are e*** *buubura*	(the tree which is big; the big tree)

Gilbertese does not allow for expressions to describe an action that is implied in a verb in the same way that adjectives describe the properties of a (pro)noun. M. Wright (2015), author of a relatively recent dictionary, suggests that such adverbs can be circumscribed by adding the prepositional phrase *n te aro ae e* (in a way that is) to a verb:

52)	*karaurau*	(slow)
53)	*buti* ***n te aro ae e*** *karaurau*	(to drive in a way that is slow)

This strategy, however, seems to be more appealing to speakers whose native tongue features adverbs rather than to I-Kiribati who simply use constructions like *buti karaurau* (drive slowly).

Verbs

With regards to verbs, it firstly needs to be noted that Examples 54 and 55 can both signal present as well as past tense. That is because the grammatical structures of these tenses are very often identical, and the signalling is done through context, particularly through temporal adverbials such as the present marker *ngkai* (now) or the past marker *ngke* (when). The future may be indicated by the particle *na*, but its presence is not obligatory either:

54)	*a roko*	(they arrive/will arrive)
55)	*a* ***na*** *roko*	(they will arrive)

Particles, like *a*, and adverbs, like *tabe*, can be employed to mark progression, but again, the present progressive and past progressive often look identical in grammatical terms:

56)	*ti* ***a*** *takakaro*	(we are/were playing)
57)	*ti* ***tabe*** *takakaro*	(we are/were playing)

Similar to nouns, verbs can also co-occur with pronoun affixes, more specifically, object pronoun suffixes:

58)	*e tuang****ai***	*tuanga* + ***ai***	(he told me)
59)	*a noori****ko***	*noora* + ***ko***	(they saw you)

Affixation

Besides pronouns, there are other elements that are subject to affixation. A frequently used suffix is the passive marker *–aki,* or the prefix is *ka–* (co-occurring with the suffix *–a*), "perhaps the most productive in the Kiribatese language" (Groves, Groves, & Jacobs, 1985, p. 88), which gives an intransitive verb and even adjectives transitive meaning.[50]

60)	*amwarake*	(to eat)
61)	***ka****amwarake****a***	(to feed so./st.)
62)	*kukurei*	(happy)
63)	***ka****kukurei****a***	(to make so./st. happy)

For obvious reasons, Bingham (1908) describes this prefix causative and equivalent in meaning to make or cause (p. v).

[50] Other transitive suffixes include *–ra*, *–na*, and *–akina*. Moreover, Harrison (2001) argues that there is also a highly rule-governed and not always present intransitive suffix *–i*, which is usually a transitive marker in other Oceanic languages.

Reduplication

Reduplication is also very frequent in Gilbertese. It is possible with nouns and with verbs. In the case of the former, a reduplication (of usually the entire lexeme) creates an adjective with the meaning of "abounding in the things denoted by the corresponding noun" (Groves, Groves, & Jacobs, 1985, p. 101):

64) *tano* (sand)

65) *tano**tano*** (sandy)

In the case of verbs, reduplication seems to be more rule-governed. According to Trussel (1979b, p. 212) the doubling of the first syllable (and lengthening of the vowel) indicates a habit, while the reduplication of more than one syllable indicates continuity:

66)	*nako*	stem form	(to go)
67)	***naa****nako*	habit	(to usually go)
68)	***nako****nako*	continuity	(to walk)

Conjunctions

There are two noteworthy comments on the conjunctions *ao* and *ma*. Firstly, while the former more commonly functions as *and*, and the second more commonly as *with*, they are used rather interchangeably. Secondly, all elements in lists and enumerations are often connected with *ao*, rather than just the last two. Thus, it serves a function similar to a comma (Sabatier & Olivia, 1971, p. 18; Trussel, 1979b, p. 246).

Prepositions

Gilbertese has a very small number of "true prepositions" (Groves, Groves, & Jacobs, 1985, p. 65): *i* and *n(i)* (at; in; on), *mai* and *man* (from; since), and *nako* and *nakon* (to; towards; at). Other expressions implying a locative or temporal reference are formed with more complex constructions such as in the following examples:

68)

i	***ao***	***-n***	*tano*	
Prep	N	3rd pers sg Pro	N	
on	*surface of*		*sand/ground*	
				(on top of the sand/ground;
				→ on the ground)

69)	***i***	***aa***	***-n***	*te*	*nii*
	Prep	N	3rd pers sg Pro	Art	N
	in	*under-space*	*of*	*the*	*tree*
					(in the under-space of the tree; → under the tree)

Word order

With respect to word order, there are two basic types of constructions in Gilbertese. The first concerns equational and descriptive sentences which are formed with two noun phrases, or with a noun and an adjective phrase; there is no copula in either construction:

70)	***Taari***	***ngaia.***[51]	
	N	3rd pers sg emph Pro	
	(subject)	(subject)	
	brother	*he/she/it*	
			(He/she is the brother/sister.)

71)	***E***	***tikiraoi.***	
	3rd pers sg Pro	Adj	
	(subject)	(adjective)	
	he/she/it	*good*	
			(He/she/it is good.)

The second basic construction concerns sentences with verbs. Obligatory elements are an initial pronoun and a verb (Example 72). A subject noun may follow, in which case it will complement rather than replace its pronoun (Example 73). The verb can be affixed with a pronoun denoting the direct object (Example 74). In sentences employing a direct object as well as subject noun, the former precedes the latter (Example 75).

72)	***I***	***amwarake.***	
	1st pers sg Pro	V	
	(subject)	(verb)	
	I	*eat*	
			(I eat.)

[51] It is common, though not obligatory, to insert *bon(i)* between the two subjects, which also adds emphasis.

73)	***E***	***bwaka***	***te***	***karau.***	
	3rd pers sg Pro	V	Art	N	
	(subject)	(verb)		(subject)	
	it	*falls*	*the*	*rain*	
					(The rain falls. / It rains.)

74)	***A***	***noori***	***-ko.***	
	3rd pers pl Pro	V	2nd pers sg Pro	
	(subject)	(verb)	(direct object)	
	they	*see*	*you*	
				(They see you.)

75)	***E***	***ongo***	***te***	***kaberoro***	***te***	***aine.***
	3rd pers sg Pro	V	Art	N	Art	N
	(subject)	(verb)		(direct object)		(subject)
	he/she/it	*hear*	*the*	*noise*	*the*	*woman*
						(The woman hears the noise.)

There are only two ditransitive verbs in Gilbertese: *anga* (to give) and *tuanga* (to tell; to ask). The indirect object precedes the direct one, be it as a full noun (Example 76) or as a pronoun suffix to the verb (Example 77).

76)	***I***	***angan***	***tina***	***-m***	***te***	***kie.***
	1st pers sg Pro	V	N	2nd pers sg Pro	Art	N
	(subject)	(verb)	(indirect object)			(direct object)
	I	*give*	*mother*	*your*	*the*	*mat*
						(I give your mother the mat.)

77)	***I***	***tuang***	***-iia***	***te***	***karaki.***
	1st pers sg Pro	V	3rd pers pl Pro	Art	N
	(subject)	(verb)	(indirect object)		(direct object)
	I	*tell*	*them*	*the*	*story*
					(I tell them the story.)

<u>Questions</u>

It has been described above that rising intonation usually signals that an utterance carries interrogative meaning. Additionally, there are noteworthy comments about closed questions. In positively phrased

questions, *eng/eang* and *iaki/tiaki* can be translated with yes and no respectively. In negative questions, marked with *aki* (not), the confirming of the state or event that is put into question is shown with *eng/eang* (Example 78); the negation of the state or event that is put into question is usually shown with a positive rephrasing (Example 79).

78)	A: *Ko **aki** kua?*	(Are you not tired?)
	B: ***Eang.***	(Yes – I am not tired.)
79)	A: *Ko **aki** kua?*	(Are you not tired?)
	B: ***I kua.***	(I am tired.)

3.2.3 Lexis and pragmatics

In conversations, I-Kiribati use various expressions that are noteworthy from a semantic and pragmatic, as well as from a historical and cultural point of view. As will be demonstrated below, many of the expressions and habits briefly described here are employed quite frequently in English conversations, too.

Foreign words

There are a great many foreign words that have been introduced to the language and are used by the I-Kiribati on a daily basis. Pannu (1993) states that over 500 such words can be found in Bingham's work, in a "Gilbertised" form, as far back as his earliest publications in 1857 (p. 40). There are foreign words for foreign concepts, such as *kamitina* (commissioner), *bureitiman* (policeman), *boki* (book); but more surprisingly, the colours blue, green and brown have been adopted, too: *buru̧*, *giriin*, and *buraun* respectively. Finally, words for foreign concepts that are onomatopoetic have been created: *rebwerebwe* means motorbike because it is roughly the sound of an old two-stroke motor, and *kamea* means dog because "come here!" is what they have been shouted after by Europeans. Groves, Groves and Jacobs (1985) make a noteworthy comment on the adoption process of foreign vocabulary:

> Such words are brought by people of varied accents (Australian, English, American, Japanese, etc.), and are heard by people who are not used to hearing such sounds. Most Kiribatese hear such words from other Kiribatese rather than from the original speaker. (pp. 30-31)

This observation does not only hold true for adopted vocabulary, it also has important implications for the English variety spoken in Kiribati today.

Versatile words

There are two words in particular that can have a myriad of meanings: *(te) bwai* and *(te) mena*. The narrow definition of the former is hand or arm of some kind. However, according to the Sacred Heart Mission (SHM) dictionary, it can mean "thing, object, affair, member, organ, matter, material, element, personal belonging, property, instrument, machine, apparatus, utensil, result, report" (Sabatier & Olivia, 1971, p. 36). Similarly, *mena* means to be or to reside when defined narrowly, but it is used with a variety of other meanings. The SHM dictionary entry reads almost comically:

> *mena* n. Indeterminate thing, without name; *te mena ni bwai*: element of thing, matter; *te bwai*: a thing more determined than *mena*, object, affair. v.t. *mena*. . . . *mena* n. So and so. What do you call it? What's its name? Gadget, things (of which one can't recall or doesn't know the name), thingummy, thingumajig; . . . *Te mena are ko taku*: the thingummy you spoke of. v.t. *mena*: to do, to arrange, to machinate etc. (Sabatier & Olivia, 1971, p. 247; spelling and formatting adapted).

As implied, I-Kiribati often employ *te mena* to signal that they are thinking of something or are struggling to remember a certain word (Example 80). *Tera* (what) and *are* (that, who, which) have similar discourse-marker properties, the latter being more often used to further specify or better explain a preceding utterance (Examples 81 and 82).

80) *i kakaea,* ***te mena,*** *te bwa* (I'm looking for, uhm, fuel)

81) *i amwarake,* ***tera,*** *te mai* (I'm eating, uhm, breadfruit)

82) *kanau,* ***are****, te ika* (my food is, well, fish)

Numbering system

There are two numbering systems. The first is the simple counting with preceding numerals:

83) ***teuana*** *te boki* (one book)
uoua *te boki* (two books)
teniua *te boki* (three books)

A second system works with affixation. Here, the numerals are shortened and prefixed to the noun, and, in the case of the first numeral, there is also a suffixed *–na*:

84) ***te****man****na*** (one person)
uo*man* (two people)
teni*man* (three people)

85) ***te****kai****na*** (one stick)
uo*kai* (two sticks)
teni*kai* (three sticks)

Sibling terms

There is an interesting fact about the terms *tari* and *mwaane*. The first refers to a sibling of the same sex, the latter to a sibling of the opposite sex. Therefore, while in very many other languages a girl or woman is always a sister and a boy or a man is always a brother, these terms are chosen on the basis of who is talking or talked about in the Gilbertese language. For example: two girl-siblings will call each other *tariu* (my sister); two boy-siblings will also call each other *tariu* (my brother); but a boy will call his sister *mwaaneu* (my sister), and likewise, his sister will call him *mwaaneu* (my brother).

References to this phenomenon can be found in the various dictionaries, as well as in the Peace Corps language material by Trussel (1979a): he refrains from describing its structure as such, but warns that the terms *brother* and *sister* simply "do not work the same way as in English" (p. 88) and provides an English conversation together with the Gilbertese translation to highlight the different uses of these sibling terms.

Pragmatic expressions

I-Kiribati greet each other by saying *mauri* which means health. Farewells are done with *ti a boo* – we will meet (again).

Greetings, as well as saying yes, can also be done by raising one's eyebrows. Unlike in some other cultures, where non-verbal expressions alone are only considered not impolite when they accompany verbal utterances (for instance nodding is only polite if it is complementary to saying yes in many Western cultures), there is no such implication around raising eyebrows in Gilbertese. It is indeed possible to greet and be greeted by many people on a walk of several hours while at the same time never saying or hearing a word, or never being offensive or offended.

Verbally, conversations are most often opened with questions such as the following:

86) *Ko na aera?* (Where are you going?)

87) *Ko mwananga?* (You are travelling?)

88) *Ko a oki?* (You are coming back?)

Depending on how well the interlocutors know each other, the answer can be more or less specific. The first of these questions can simply be answered by pointing in a direction (usually that of travel) or stating the cardinal direction. The latter two questions can simply be confirmed – verbally, or non-verbally by raising eyebrows.

It is also very typical in the Gilbertese culture to excuse oneself before walking by or in front of other people. In order to be polite and show respect, one says *ko/kam matauninga* (you are suffering

an insult)[52] and crouches. It is usually responded to with *e mwaawa* (there is room). Such interactions are commonplace when passing someone sitting at the road side or when passing between people who are talking to each other, even if they stand relatively far apart from one another.

Lateral clicks, kiss-teeth and similar sounds are very commonly incorporated into conversations, too. They are used to signal surprise, unhappiness about a state of affair, or to tut at other people. The number of repetitions of individual sounds, their pitch, as well as other acoustic and contextual cues usually leave little doubt about their implied meaning.

Oral tradition

Story-telling is an interesting aspect of Kiribati custom indeed. As Autio (2010) discusses, stories do not only provide some historical content, but also windows on the traditional society. There are often specific people who are entrusted with keeping a story and with passing it on. They are rooted to certain families or larger communities, as well as to their lands. If nobody can be found who has the right to tell a specific story, for instance when the original guardian died without leaving back someone in charge, the community has to sit together and decide how to proceed.

There are many stories for which there are several variants, and some accounts have more authority than others. However, story tellers do not narrate a purposefully twisted rendition and mislead their audience in order to remain the only keepers of the true version, as is common for instance in the Pohnpeian culture (E. Keating, 1998). Rather, stories are recounted for entertainment and with deliberate embellishing (Maude, 1963, p. 7) which eventually results in different variants being spread.

However, an *unaine*, an elder woman, informed me that this oral tradition was changing. Many descendants of story keepers, herself included, do not desire to take on these roles any longer. Those stories can now be found in the library, she told me, explaining her decision.

3.3 The English language in Kiribati

In this section, various features of the English variety of Kiribati are discussed. For these linguistic descriptions, I make references to Englishes elsewhere: for instance, to the 50 varieties documented in the eWAVE, the *Electronic World Atlas of Varieties of English* (Kortmann & Lunkenheimer, 2013), or the 46 in the *Handbook of World Englishes* (Kortmann, Schneider, Burridge, Mesthrie, & Upton, 2004). This permits the drawing of conclusions about the universality of certain linguistic phenomena. On the

[52] Sabatier and Olivia (1971) note the following: "literally, and primitively, the word [*matauninga*] signified that ancients were sleeping in the mwaneaba, heads on pillow, and therefore one had to be careful in moving or acting so as not to offend them" (p. 241).

other hand, the sociolinguistic history suggests that there is comparatively little influence from other varieties of English (or other languages), but a relatively high degree of influence from the substrate language. When substrate influence is probable, I comment on it accordingly.

3.3.1 Phonetics and phonology

As regards consonants, there are indeed several instances where the substrate language seems to exert some influence on the production of the English counterparts; processes such as transfer or hyperadaptation often lend themselves as plausible explanation.

Plosives

Gilbertese has a one-variant plosive system featuring non-specified /p^0, t^0/ and /k^0/ only. Orthographically, these sounds are represented with ‹b›, ‹t›, and ‹k› respectively. I-Kiribati learners of English, then, have to acquire pronunciations that involve aspiration. This seems to explain why English plosives often retain their non-specified pronunciation and, at least partly, why English /t^h/ is frequently produced with a great degree of frication:

89) *ten* [**t^s**en] (/t/-affrication)

Furthermore, the voice onset times (VOT) of the Gilbertese plosives are generally shorter than those of the aspirated English variants [p^h], [t^h] and [k^h], but also longer than the non-specified ones [p^0], [t^0] and [k^0]. Therefore, I-Kiribati not only need to learn how to contrast these sets in perception as well as in production, they also need to produce both English variant sets with VOTs that are dissimilar to those of their mother tongue. This complex variable is discussed in great detail below, in Chapter 4.

Uvular pronunciations of /k^h/, similar to the substrate language, do occur but are rare and possibly more likely to occur before back vowels:

90) *take* [tei**k**] (velar [k])

91) *focus* [fɔ**q**ʌs] (uvular [q])

92) *coconut* [**q**ɔ**q**ɔnʌt] (uvular [q])

Fricated /k/ seems to be restricted to the substrate language and does not transfer into a speaker's English production.

Nasal stops

In Gilbertese, the nasals /m/, /n/ and /ŋ/ may all occur as geminates at lexeme boundaries. They are, in fact, the only consonants that are subject to gemination. Moreover, they are the only consonants that are permitted in word-final position and are obligatory initial elements in consonant clusters. Their versatility in the substrate language may at least partly explain why their English realisations are standard-like, in any environment or position.

Fricatives

As described above, there are no fricative phonemes in Gilbertese; sounds similar to [v], [s] or [x] only have allophonic status. This has, of course, several implications for the production of English fricatives. To begin with, the voicing distinction is very rarely realised and unvoiced variants are clearly predominant. Labio-dental and inter-dental fricatives are often stopped, to [p] or [t] respectively. Interestingly, there are also, rarely, occurrences of hyperadaptation where labio-dental stops are fricated. The following example occurred in several recordings:

93) *job* [tʃɔ**f**] (fricated stop)

Post-alveolar sibilants are frequently realised as [s], especially but not exclusively by basilectal speakers. Hyperadaptations, where /s/ is realised as [ʃ], are rare but exist. Finally, there is no /h/ in Gilbertese, explaining both respective deletion and insertion processes, the latter being a further instance of hyperadaptation:

94) *house* [**Ø**ɑus] ([h]-deletion)

95) *area* [**h**æɹia] ([h]-insertion)

Approximants

For the most part, I-Kiribati speakers of English are non-rhotic. In other environments, /r/ is usually realised as approximant, but rolls or taps, the variants of the substrate, are not uncommon. There is no lateral approximant in the Gilbertese sound inventory, neither as phoneme nor allophone. Instead, [r] or [ɹ] are employed (Example 96) or /l/ is vocalised (Example 97). Here, too, hyperadaptation phenomena occur where [l] substitutes [ɹ] (Example 98). Usually, renditions of /l/ are non-velarised.

96) *play* [p**ɹ**ei] (/l/ substitution with [ɹ])

97) *style* [sta**u**] (/l/-vocalisation)

98) *zero* [si**l**ɒ] (hyperadaptation with [l])

Gilbertese does not feature /j/ as a phoneme, but /i/ are frequently realised as palatal approximants in vocalic contexts, particularly when occurring medially in triphthongs. Speakers do not seem to have any difficulties in realising this sound in English.

As has been described above, the case of Gilbertese /w/ is more elusive and those linguistic accounts that do discuss this sound provide only vague descriptions of pronunciation properties. In English, however, I-Kiribati produce /w/ in such a manner that is not notably different from standard-like renditions.

Consonant clusters

There are only very few permissible consonant clusters in Gilbertese. This seems to exert some influence on English cluster productions. Interestingly, there are no epenthetic vowels. In onset clusters, simplification is achieved through substitutions of a similar kind to those already described where, for instance, /pl/ becomes [pr] (see Example 96 above). By and large, however, onset consonant clusters remain intact.

It has been described above how word-final vowels are often reduced, devoiced or even completely deleted in Gilbertese. While such processes are, admittedly, not always easily perceived, it seems that syllable- or word-final consonants and consonant clusters are produced with little to no adaptation either. Occasionally, final sounds are not realised: in many instances, it is not clear whether this is due to a phonological process and thus called deletion, or the result of a morpho-syntactic simplification process where plural *–s*, genitive *–s*, third person *–s*, or the past tense affix *–ed* are omitted (each of these features are discussed in more detail below). Proparalepsis, an epenthetic vowel added to the end of a word, does occur but only very rarely indeed. It is noteworthy that, particularly but not exclusively in the speech of basilectal speakers who also have surprisingly few issues with onset clusters, there is one word undergoing a process of metathesis:

99) *ask* [a**ks**] (metathesis in /sk/ cluster)

There are no examples of other words, neither such that I recorded nor such that I can recall from every-day conversations. It is, thus, plausible that [aks] has simply become reinforced for some speakers as the target form rather than reflecting a consonant cluster simplification process.

As for consonants forming affricates, reduction processes are relatively rare among my informants but a bit more frequent among learners and basilectal speakers. In the majority of cases, it is the preceding plosive that is omitted, rather than the sibilant:

100) *much* [mʌ**Øʃ**] (plosive omission in affricate)

101) *touch* [tʌ**tØ**] (sibilant omission in affricate)

In order to complement the discussion of vocalic production that follows, references are made to Figure 3.2 and Figure 3.3 containing four plots in total: for the production of monophthongs and diphthongs, by a basilectal (Ki06m1986) and by an acrolectal (Ki16m1963) speaker. The data for these plots consist of tokens occurring in casual conversations: an average of 16 monophthongs and 8 diphthongs have been measured per vowel set and speaker (N = 605). Measurements have been taken manually in Praat (Boersma & Weenink, 2011) and subsequently plotted in the software R (R Core Team, 2017) using the phonR (McCloy, 2016) package; confidence intervals for the construction of the ellipses have been lowered so as to create a more simplistic and schematic visualisation.

FLEECE, KIT, happY

There is only /i/ in the high front area of Gilbertese, but no /ɪ/. Unsurprisingly then, there are great overlaps of the English vowels FLEECE and KIT. Furthermore, HAPPY is also produced as [i]. This holds true for basilectal and acrolectal speakers alike.

DRESS

Many Gilbertese vowels fall into the region of [e] and [ɛ]. These qualities are generally transferred, therefore often resulting in slightly higher realisations of English DRESS that are very similar to [e].

TRAP

TRAP is frequently raised, too, and realised as [ɛ]. Moreover, unlike in other varieties of English, a clear distinction is maintained between TRAP and BATH in Kiribati's variety.

Raised pronunciations of mid front vowels are stereotypical for New Zealand English and also attested for Australian English (Burridge, 2004, p. 1090). It is plausible, then, that these two L1 varieties have an influence on the Kiribati English renditions. However, it is important to note that raised DRESS and TRAP in the Antipodean Englishes are not in the same way salient to language learners with very little exposure to the target language as they are to other L1 English speakers.

BATH

There is a large scattering of the lower (usually back) sounds. BATH, realised as a long vowel, is audibly neither a front [a] nor back [ɑ]. Moreover, BATH and START in Kiribati English are completely homophonous.

STRUT

STRUT scatters greatly and is, for many speakers, a very likely candidate for fronting. Productions that are similar to [ɒ] or even [a] are not uncommon. Hence, there are partial overlaps between the STRUT and the BATH sets.

LOT

Realisations of /o/ vary considerably in Gilbertese, as it occurs both as monophthong and in phonemically distinct quasi-monophthongs (the sequence /ao/ is hardly audible as diphthong but strongly resembles a monophthongal /ɒ/). For English /ɒ/, I-Kiribati speakers exhibit less variation: LOT is produced in the mid-low back region, as a monophthong [ɔ].

THOUGHT

The THOUGHT set ranges from mid-low to rather high back: [o] ~ [ɔ] ~ [ɒ] productions are common, and therefore also overlaps with LOT.

GOOSE, FOOT

Regardless of length properties, GOOSE and FOOT are often merged, completely or partly, in the high back corner: [u]. GOOSE fronting does not occur, or certainly not to the extent of other varieties including British, American, New Zealand or Australian English.

NURSE

The Gilbertese language features no phonemes with centre qualities. Thus, English NURSE is usually produced in the mid front area, very similar to the Kiribati English DRESS vowel: [e]. Its production indicates very little lingual movement, in other words, NURSE is realised as monophthong. Usually, acrolectal speakers centralise more, yet even speakers such as Ki16m1963, with a high educational level, a government job and a relatively high proficiency level of the English language, exhibit complete mergers with DRESS (see in Figure 3.2).

LETTER

LETTER tokens are quite scattered and, while tending to be more centralised than NURSE, can occur with qualities similar to DRESS and TRAP vowels: [e] ~ [ɛ].

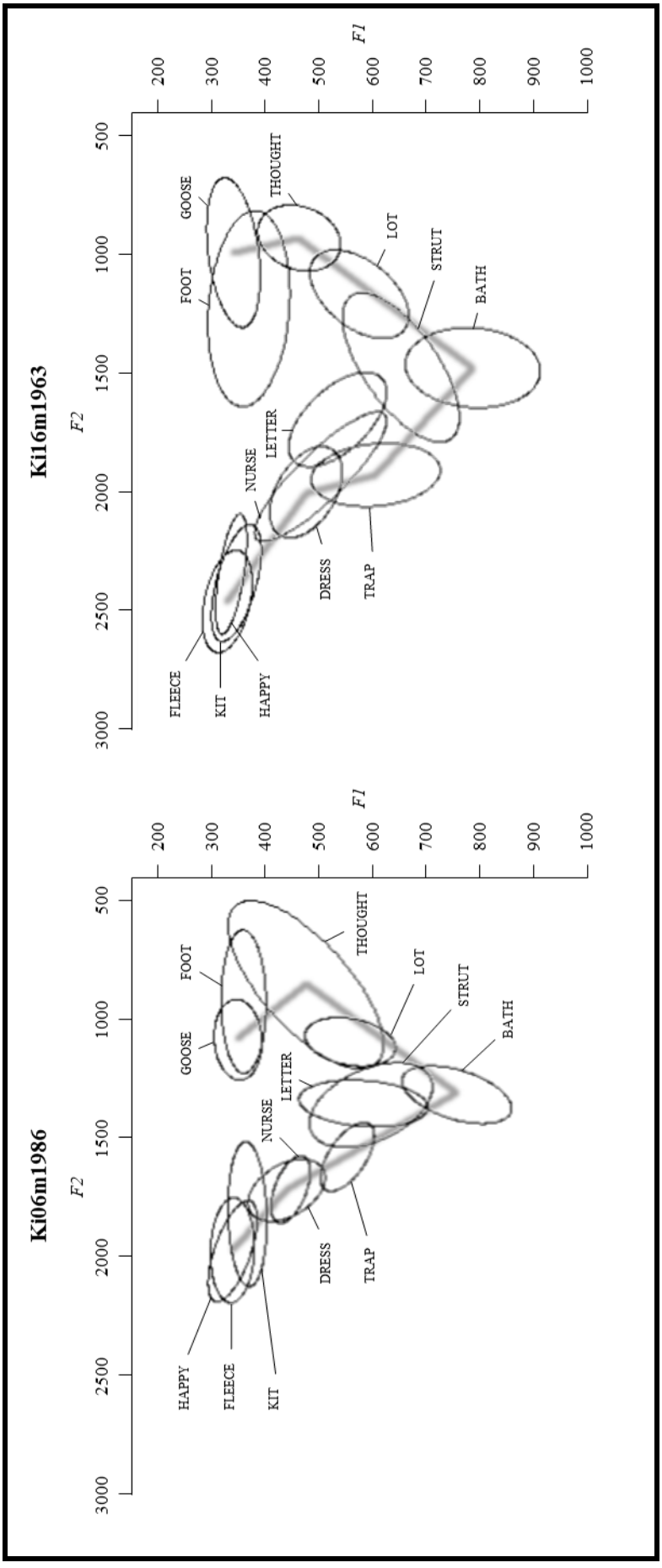


Figure 3.2: Schematic visualisations exemplifying monophthongs in Kiribati English. Left: basilectal speakers Ki06m1986; right: acrolectal speakers Ki16m1963.

Similar to many other non-standard or L2 varieties of English, many diphthongs involve only little lingual movement in Kiribati English, and some are even monophthongised. There are many diphthongs in the Gilbertese language which are hardly perceived as glides, yet they are phonemically distinct from monophthongs. This may well be favourable to the occurrence of (quasi-)monophthongised renditions in English.

FACE

FACE has a relatively low F1 onset frequency, in other words, its starting point is relatively high. The off-glide is often not as high as [i]. The trajectory of this diphthong, then, can be described as rather flat owing to a considerably greater shift in F2 (fronting) than in F1 (raising). Moreover, it can be relatively short and resemble a monophthongised [e].

PRICE

PRICE tokens are rather scattered in terms of both their on-glides and off-glides. The former are relatively central or back in the mid or mid-low region, and the latter often do not reach high front qualities associated with [i] but remain in the [ɪ] or [e] region. Renditions similar to [ʌɪ] or [ʌe] are not uncommon.

MOUTH

MOUTH off-glides are usually in the high back region. Only for some speakers, however, is the on-glide substantially lower rendering their pronunciation similar to [ɑu]; for others, MOUTH resembles a monophthong.

CHOICE

The [oɪ] production of CHOICE involves the largest lingual movement of all diphthongs in Kiribati English: its on- and off-glide are very audibly different, for practically all speakers.

GOAT

GOAT is very often realised as a monophthong which is produced in a rather high and back position, in the [o] region.

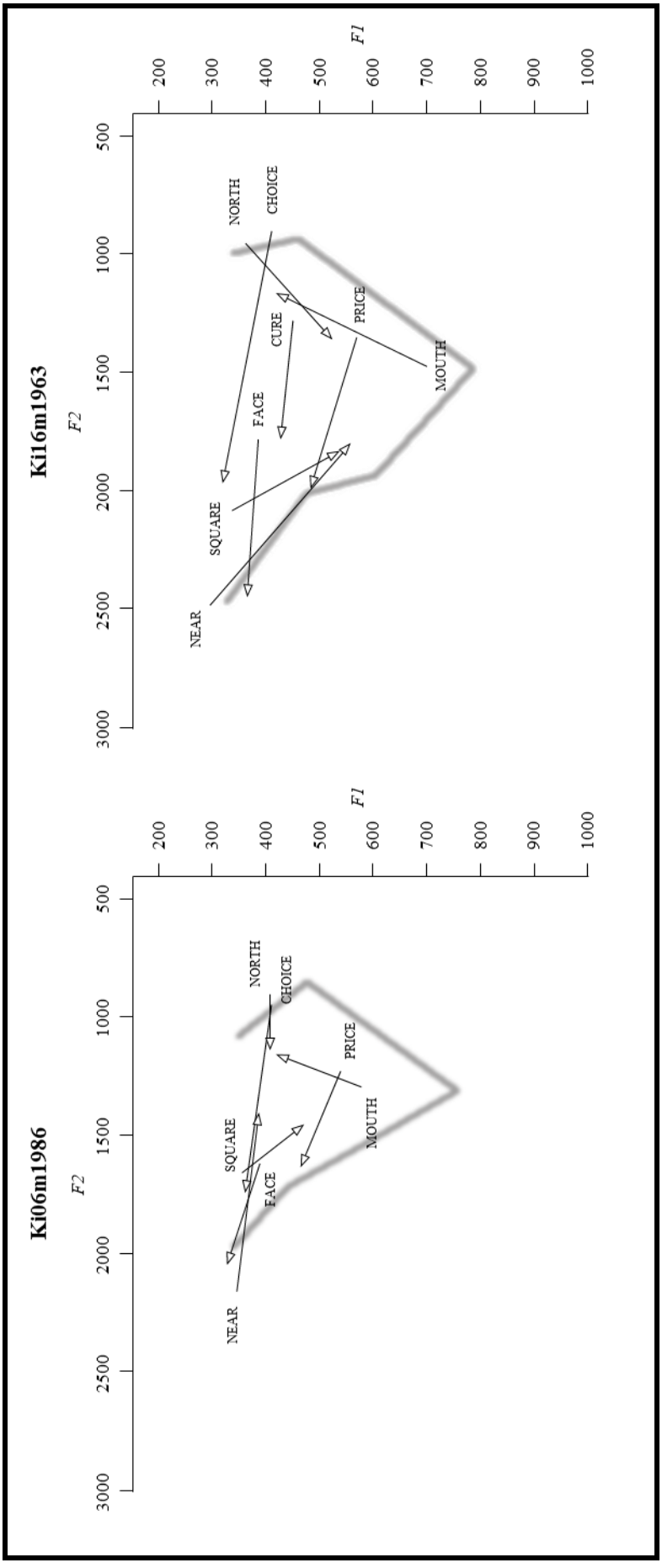


Figure 3.3: Schematic visualisations exemplifying diphthongs in Kiribati English. Left: basilectal speakers Ki06m1986; right: acrolectal speakers Ki16m1963.

NEAR, SQUARE, CURE, and NORTH

Kiribati English is a largely non-rhotic variety in which vowels preceding /r/ are realised with lingual movement, in other words, as diphthongs. In the case of NEAR, such movement is large enough to make the glide clearly audible. The off-glides fall into the BATH set, resulting in [iɑ] ~ [ia] pronunciations. The trajectories of SQUARE, CURE, and NORTH are towards the centre. However, they often involve only little lingual movement and many tokens have qualities similar to monophthongs: SQUARE falls between [e] ~ [eə] realisations, CURE between [ʊ] ~ [ʊə], and NORTH between [o] ~ [oə].

Vowel production is influenced by the phonological context they occur in. Presumably due to great versatility in the substrate language, vowel combinations that transcend syllable and word boundaries are rendered in a rather standard-like fashion; consonantal influence, however, may result in more idiosyncratic productions, since there are many more restrictions at play in Gilbertese. Processes that are found to be reoccurring in a seemingly systematic manner are described here.

Yod

Due to vocalic versatility in the substrate language, it is understandable that yod is realised categorically in Kiribati English. Interestingly, *New Zealand* is realised with yod, too. In the Gilbertese language mode, it is produced as [nusiran] without a yod or high front vowel and has since been orthographically codified as ‹Nutiran› (this entry also occurs in a list of assimilated foreign expressions compiled by Pannu, 1993, p. 49).

Hiatus resolution

Since the Gilbertese language allows for vowels to be frequently and freely combined into rather long strings, V#V sequences are mostly realised without epenthesis of, for instance, a glottal stop. However, where /r/ is orthographically represented, [r, ɾ] or [ɹ] may, but do not have to, serve as a link.

102)	*care about*	[k**ea**bɑut]	(hiatus with vowel sequence)
103)	*for a date*	[fɔ**ɾ**æ deit]	(hiatus with epenthetic [ɾ])

Assimilation

Occasionally, rounded consonants cause previous vowels to be assimilated in terms of lip-rounding. V[ʃ] combinations seem to be particularly prone to this process, and examples such as the following occur frequently across speakers of all proficiency levels:

104) *English* [iŋl**y**ʃ] (lip-rounding assimilation)

In terms of suprasegmental characteristics, the English spoken by I-Kiribati only exhibits few peculiarities. In some cases, they may exert influence on other sounds that are thus rendered somewhat differently from more standard-like varieties of English.

Stress

The Gilbertese language is mora-timed, with a complex set of underlying rules (see Blevins & Harrison, 1999, for a detailed analysis). In more general terms, Bingham (1908) notes that in many words stress is "not very marked" (p. 11). Consequently, many speakers produce full vowels in English, in contexts where more standard varieties employ reduced variants such as [ɪ], [ʊ] and of course [ə]. As a consequence thereof, *going to* and *want to* are predominantly produced with bursts and full GOOSE vowels, rather than being phonologically reduced to *gonna* and *wanna* respectively like in many other World Englishes. Variant choices do not seem to be linked to speaker proficiency levels.

Intonation

Intonation in Gilbertese usually signals, like in many other languages, whether an utterance is a statement or a question: for the latter, the intonation is rising. As will be discussed below, this intonational system is not simply transferred into the production of English.

3.3.2 Grammar and syntax

There are several grammatical and syntactical features that Kiribati's English variety shares with many other World Englishes, or with other varieties in the same region. In at least some of these instances, however, similar constructions are also found in Gilbertese, rendering substrate influence once again a possible explanation.

Articles

As has been described, most Gilbertese nouns are preceded by the articles *te* (singular) or *taian* (plural). They are neither definite nor indefinite, since there are no further articles to establish such categories. A small number of other nouns occur on their own. These conditions contribute to the frequent flouting of rules that govern the use of English definite and indefinite articles: I-Kiribati use definite articles for indefinite or zero marking in standard varieties, indefinite articles for definite or zero, and, but to a much lesser degree, zero for definite or indefinite. Irregular article production is the 12th most widely spread grammatical feature in World Englishes (Kortmann & Szmrecsanyi, 2004, pp. 1154-1155).

Number

Many Gilbertese nouns are used in the singular even when several referents are implied. This is transferred into English where plural nouns may remain unmarked. The absence of plural marking also affects measure nouns like *dollar* and *litre*, as is observed in other Pacific English varieties, too (Kortmann & Szmrecsanyi, 2004, p. 1176). Substrate influence and the stabilisation of learner patterns seem to account for this feature; it may further be facilitated by tendencies to simplify consonant clusters. Moreover, absence of plural marking has elsewhere been found to be prevalent when plurality is indicated differently, through context or co-text, or when it has occurred on previous lexical items (Mesthrie & Bhatt, 2008, p. 52), but this is not done, at least not systematically, by I-Kiribati speakers of English.

There are occurrences where *there's* precedes a pluralised noun phrase (Example 105). While it ranks rather high in eWAVE, with an attestation rate of 71% (Kortmann & Lunkenheimer, 2013), standard-like existentials are more common in my corpus. There are only very few exceptions, all of which are produced by basilectal speakers.

105) *there'**s** big wave**s*** (*there's* with plural subject)

A noteworthy lexical item from the perspective of number is the term *land*. I-Kiribati speakers use it in English conversations in the same way they use it in Gilbertese: *land* denotes a plot of land that is owned by someone, and it is very common that a person owns several plots in various different parts, even on various different islands. Thus, *land* is countable:

106) *I have **five lands*** (countable use of *land*)

In general, however, instances of pluralisation are often difficult to identify. Since the most common marker is the suffix *–s*, the interpretation of number is not straightforward for nouns whose singular forms end in alveolar plosives. This is due to the rather frequent /t^h/-frication which can be a source of confusion also elsewhere; more discussion on this ambiguity follows below.

Possession

Gilbertese forms possessive constructions in four ways: with preceding pronouns, with following pronouns, with the additional marker *n(i)*, which has a similar function to *of* in English, and without it. (see Examples 29 to 32 in the previous section). Accordingly, possession is very commonly marked through such prepositional phrases. None of the four ways, however, are analogous to the English genitive *–s* construction. Moreover, Platt, Weber, and Ho (1984, p. 61) state that genitive suffixes are rare in New English varieties elsewhere, especially in colloquial renditions. Nevertheless, genitive *–s* is frequently used by I-Kiribati speakers of English. In the few cases where it is absent (and possession is not otherwise marked by prepositional constructions), the word order is different from that of Gilbertese:

107) *my father**Ø** land* (absence of genitive *–s*)

108) *ana tabo tamau* literally: his land my father (Gilbertese structure without marker)

Pronouns

The first person subject pronoun *I* is very frequently substituted with *me* in utterances where several people are listed: *you and me* rather than *you and I*. Such renditions are very common for New Zealand and Australian English (Burridge, 2004, p. 1118), as well as most if not all World Englishes: this feature ranks fourth in eWAVE, with an attestation rate of 89% (see Kortmann & Lunkenheimer, 2013).

The gendered third person pronouns *he* and *she* are often used indiscriminately as is the case for many learners of English whose native languages do not distinguish grammatical genders (Platt, Weber, & Ho, 1984, pp. 61-62).

In Gilbertese, object pronouns are not specified for reflexivity. However, there are numerous occurrences of reflexive pronouns in the Kiribati English corpus, such as *himself* or *herself*. Forms without *–self/–ves* suffixation are rare.

It is worth pointing out that relative pronouns are used in a very standard manner rather than being omitted as is common for other Pacific English varieties (Burridge, 2004, p. 1124). That relative pronouns are very frequent in the Gilbertese language, for instance in the construction of adjective phrases, may explain their use in the English production of I-Kiribati at all proficiency levels.

Very infrequently, *us* precedes a subject. While likely facilitated by similar structures in the substrate language, the handful of examples that there are occur in the speech of both basilectal and acrolectal participants.

109) ***us we** just spend one year there* (subject preceded by *us*)

This feature is also relatively common in L1 varieties of English (Kortmann & Lunkenheimer, 2013), including New Zealand and Australian English. Those acrolectal study participants who do produce it

have had – relatively – extensive contact with these two varieties, which could explain why there is no straightforward correlation to proficiency levels.

As is fairly common elsewhere, language learners at early stages often omit both subject and object pronouns. At the more acrolectal level, however, this is virtually never the case. On the contrary, there are some instances where the subject is reduplicated through left (Example 110) or right (Example 111) dislocation. The latter is structurally analogous to the Gilbertese use of pronouns with subjects (see Example 73 above).

110) ***I-Kiribati they*** *have to move there* (left dislocation)

111) ***it*** *is falling down* ***the rain*** (right dislocation)

Adjectives and adverbs

Adjective forms that function as adverbs are very common: this feature is ranked third in eWAVE with a pervasiveness rate of 78% (Kortmann & Lunkenheimer, 2013), and is also reported for other Pacific Englishes (Kortmann & Szmrecsanyi, 2004, p. 1177). Given that there are no categories that distinguish adjectives and adverbs in Gilbertese, it could be expected that I-Kiribati speakers of English tend to opt for adjective forms without further suffixation, too. However, this is only rarely the case, and adverbs are employed very frequently.

With regards to comparatives and superlatives, I-Kiribati produce many forms that are fairly common for English language learners elsewhere as well as for other L2 and even L1 varieties (Burridge, 2004, p. 1119; Kortmann & Lunkenheimer, 2013): such forms include adjectives that are preceded by the degree adverbs *more* or *most* instead of carrying inflections *–er* or *–est*, or adverbs and inflections that occur in combination.

112) *easi**er*** (standard-like grading)

113) ***more*** *easy* (grading with adverb)

114) ***more*** *easi**er*** (grading with adverb and inflection)

Verbs

As is the case for other Pacific Englishes, the copula *be* is often absent (Kortmann & Szmrecsanyi, 2004, p. 1176). Moreover, there are many contexts where the Gilbertese language does not employ a copula. Consequently, this feature occurs in the speech of many basilectal speakers of English.

115) *that woman* ***Ø*** *my mother* (absence of copula)

With regards to third person singular verbs ending in alveolar oral plosives, it is not easily assessed whether a copula is present or not, since /t^h/ is rather often fricated. This issue is further discussed below.

On the other hand, *be* can occur as an auxiliary where standard constructions employ *have* or *do*, clearly more in basilectal than in acrolectal speech (example 116). However, there is often no auxiliary (example 117), regardless of whether standard varieties employ *be*, *have* or *do*, and regardless what a speaker's proficiency level is.

116) ***am** I look [like an] old woman* (*be* as auxiliary)

117) *they **Ø** been practicing* (absence of auxiliary)

When *don't* functions as an auxiliary in constructions of negation, it is often not conjugated for the third person singular:

118) *he **don't** want to hear that* (non-conjugated *don't* for 3rd pers sg)

In fact, there are 18 such examples in my corpus, while standard-like *doesn't* only occurs in four utterances. Moreover, there are also acrolectal informants using the non-conjugated form, suggesting that this feature is not linked to a speaker's proficiency level either.[53]

With regards to tense and aspect, it is very common for I-Kiribati speakers of English to use present tense where standard varieties employ the past and vice versa, to use simple, perfective and progressive constructions in a non-standard manner, as well as to use levelled forms and other non-standard constructions. This is very typical, of course, for learner varieties and probably facilitated by the absence of analogous tense and aspect markers in Gilbertese. The future tense, which is grammatically indicated more frequently in the substrate language, is marked more often and more standard-like in English, but very basilectal speakers frequently omit it too.[54]

In accordance with the tendency not to mark tense and aspect, verbs are often not inflected, in other words, without third person *–s* or past tense *–ed*. This has been attested for other Pacific Englishes (Kortmann & Szmrecsanyi, 2004, p. 1176). It needs to be considered that, firstly, the Gilbertese language does not feature verb inflections to mark person or tense either, and that, secondly, inflections may be absent as a result of a phonological process, namely word-final consonant cluster reduction. It is likely that the absence of inflections is influenced by both. Moreover, this seems to be a language learner feature rather than a characteristic that is or will become salient of Kiribati English.

As far as verb complementation is concerned, there are some instances of infinitives with *to* where more standard-like constructions employ bare infinitives without *to* (example 119). Similarly, gerund forms are used where standard varieties use infinitive constructions, with or without *to* (example 120).

[53] There are no unambiguous examples where *never* is used for past tense negation, even though it is very common for Pacific Englishes (Kortmann & Szmrecsanyi, 2004, p. 1177) and World Englishes (p. 1154).

[54] Mowat comments in his 1972 publication on education in Kiribati that infinitives following a past tense verb were very commonly inflected as for example in *I wanted to visit**ed** my grandfather* (p. 97). The same feature is certainly not as salient anymore today.

119) *you have to go **to** join a school* (infinitives with *to* complementation)

120) *it's very hard **to having** problems* (gerund form complementation)

Conjunctions

Many I-Kiribati use a variety of conjunctions in conditional sentences, more so with *when* than with *if*: besides the standard *then* and zero variant, *and* as well as the double conjunction *and then* are common:

121) ***if** they are very busy we can take over the office* (conjunction with zero variant)

122) ***when** we want to reply **then** we chat to them* (conjunction with *then*)

123) ***when** he build that canoe **and** he came again* (conjunction with *and*)

124) ***when** the light off **and then** the boy would crawl* (double conjunction with *and then*)

While similar constructions are attested in 36% of varieties in eWAVE (Kortmann & Lunkenheimer, 2013), this feature is quite clearly influenced by the substrate language: in Gilbertese, conditional sentences employ the conjunction *ao* which means *and* elsewhere. This explains the occurrence of *and* as well as *and then* in English.

Prepositions

There is great variability in the use of prepositions by (English) language learners worldwide. This also holds true for I-Kiribati, in whose case variability may further be promoted by the small number of true prepositions and other, differently constructed expressions implying temporal and locative references in the substrate language.

Questions

Gilbertese marks questions by intonation. Non-inverted word order in closed questions has the highest attestation rate (92%) as well as a very high pervasiveness rate (81%) in eWAVE (Kortmann & Lunkenheimer, 2013) and is found in all seven surveyed Pacific Englishes (Kortmann & Szmrecsanyi, 2004, p. 1176). Interestingly, however, I-Kiribati speakers of English do not employ this strategy as often as might be expected. Interrogative utterances with and without word order inversion, or with and without auxiliary verbs are all fairly common:

125) ***do** you have a sister* (question with auxiliary verb)

126) *what **Ø** you call it* (question without auxiliary verb)

127) ***is she** here* (inverted word order)

128) ***you are** here from the workplace* (non-inverted word order)

The system underlying responses to negative yes/no questions in Gilbertese that has been described above has a much lower attestation rate: 36% (Kortmann & Lunkenheimer, 2013). I-Kiribati certainly employ the same system in their English production, too, but not necessarily in all instances. In cases where I-Kiribati and foreigners meet, such as in the interview situations of this study, this can lead to ambiguity and misunderstandings, specifically in the case of negatively phrased questions:

129) A: *Are you **not** tired?*
B: Yes. (I-Kiribati interpret: B is not tired)

A further note on the absence of copula, third person *–s* and plural *–s*

Since Kiribati English /t^{h}/ is frequently produced with a rather audible degree of frication, many of the above described grammatical phenomena are difficult to assess. To begin with, utterances with *it* or *that* are often ambiguous: when does a sibilant [s] represent an abbreviated *is*, in other words, a grammatical entity, and when does it represent frication, in which case the copula would indeed be absent?

130) *tha**t** my mother* [t^{s}] (abbreviated *is* or frication?)

Similarly, whether a third person *–s* for verb stems ending in /t^{h}/ is realised or not can often not be assessed. This marker is absent for many other stems not ending in /t^{h}/, making it plausible that frication is produced rather than a grammatical entity.

131) *he ea**t*** [t^{s}] (3rd person *–s* or frication?)

Lastly, nouns with final /t^{h}/ can remain ambiguous as to their number. Once more, plurality can also be unmarked elsewhere and frication is a plausible interpretation of the sibilant:

132) *gran**t*** [t^{s}] (plural *–s* or frication?)

Ambiguity may or may not be resolved through acoustic cues such as frication duration and intensity, through the co-text of the utterance which may provide further indications of grammatical person or number (but less likely about whether a copula is or is not present), or through the context of a conversation, including the interlocutors familiarity with each other as well as with the topics discussed. In case of insufficient information, it may not be clear whether a speaker refers to one or several projects, grants or documents, to name but a few examples I recorded. A further, rather interesting case is the affricated utterance of the word *government*: in the given context, it could not be determined whether the speaker referred to the national or a specific local government – this is what the respective structures are commonly known as in Kiribati –, or to the national as well as local governments.

3.3.3 Lexis and pragmatics

Finally, there are interesting lexical and pragmatic features employed in or alongside the production of English by I-Kiribati speakers. They concern expressions as well as their implementation in a conversation. More often than not, the features described below reflect socio-cultural habits. What with very few contact possibilities, it would be surprising if these habits were changed, simply because a conversation is carried out in English rather than Gilbertese.

Gilbertese words

Just like there are words denoting concepts that did not exist in Kiribati before the arrival of I-Matang, there are many Gilbertese concepts that cannot be described, or not accurately, with English words. Therefore, certain expressions are almost never translated but adopted directly from the substrate. *Mwaneaba* is best translated to *community house*, but the English expression does not reflect the complex rules governing who can use it, when and how (see for instance Grimble, 1989; or Maude, 1980). *Unimwaane* and *unaine* are honorific titles for a man or woman of a certain age and rank, but the often used translation *elder* fails to convey the implications of roles, rights and responsibilities – this becomes hurtfully obvious now that there are many Mormons roaming about who call themselves elders despite not being older than 18. As a last example, a *bootaki* is an event where people assemble for a specific purpose; neither event, assembly, celebration nor any other English term accurately describes what the Gilbertese expression denotes.

Discourse particles

Mesthrie and Bhatt (2008) note that non-standard tags are fairly common for new varieties of English since the prototypical forms have "a complex rule involving pronoun and auxiliary copying with negative reversal" (p. 86). Unsurprisingly, then, many I-Kiribati make frequent use of the tag *ke* (or; right?); *eang* (yes; yes?) is commonly used to signal agreement but can function as a tag, too. To a lesser degree, the discourse markers *tera* (what) and *are* (that) are employed in much the same way like in Gilbertese where a speaker signals that they are thinking or struggling to remember a word. *Tera* is often literally translated:

133) *not yet **what** offered* (*what* as discourse marker)

Usually, suprasegmental events like a break in speech rate or change of intonation facilitate the interpretation of such instances of *what* for the hearer. *What* is also reported for Singapore English.

There, it signals contradiction and obviousness (Gupta, 1992; Leimgruber, 2011), making it semantically clearly different from *what* in Kiribati English.

The use of *like*, as discourse marker as well as quotative, is clearly linked to age: older speakers in my data show little to no usage, while at least some of the younger speakers use it a lot. On the other hand, *you know* does not seem to be correlated with age as it occurs across all study participants. The huge inter-speaker differences – some use it very rarely, others well over a hundred times in a conversation of about one hour – are more likely due to different backgrounds with the English language.

Semantic processes

There are some expressions whose semantic content is slightly shifted or widened, such as *appointment* which denotes a formal meeting but also a romantic date. Besides that, *go* and *come* often pose problems, for language learners everywhere. It may not help I-Kiribati that the counterparts in the Gilbertese language are very similar: *nako* and *nakomai* respectively (in isolation, *mai* is a preposition whose locative meaning is *from*).

Sibling terms

As has been described, the sibling terms *tari* and *mwaane* are used rather differently in Gilbertese: the first always refers to a sibling of the same sex, the second always to a sibling of the opposite sex. Many I-Kiribati seem unaware that there are semantic differences between Gilbertese and English regarding these sibling terms. It is only in situations where the listener knows or sees an implied referent that such misunderstandings are revealed, for instance when a girl says about another girl at her side: “She is my brother.” Especially at the basilectal level, such situations are frequent.

Pragmatic expressions

While unsurprising, it is noteworthy that I-Kiribati people employ many expressions and sounds they also use in Gilbertese conversations: this includes verbal greetings (*mauri*) and farewells (*ti a boo*), raising eyebrows to greet or confirm, as well as lateral clicks and kiss-teeth. Similarly, the conversation openers are translated:

134) *Where are you going?* (from: *Ko na aera?*)

135) *You are travelling?* (from: *Ko mwananga?*)

136) *You are coming back?* (from: *Ko a oki?*)

These questions together with the, usually, short answers are a polite yet superficial way of acknowledging someone without necessarily engaging in a longer conversation. While such interactions may serve as conversation openers, the questions do not seek to elicit important pieces of information about someone's movements nor do the answers seek to provide them. Therefore, they essentially serve the same purpose as *How are you?* which is often answered with *I'm fine* in English: in most cases, neither the person asking nor the person answering wishes to engage in an in-depth conversation about their well-being. These surface forms may look completely different, but the underlying functions are the same: polite acknowledging, small-talk.

3.4 Language use in Kiribati

Gilbertese and English are the two official languages of Kiribati. As has been discussed previously, the former was clearly dominant in all kinds of every day-life situations historically, yet English became more and more prominent. In this section, then, I provide an overview of how these two languages are used in Kiribati today, therefore discussing proficiency and literacy rates, policies and practice, linguistic aspects of the available media and linguistic landscape, the role of foreigners, as well as language attitudes.

3.4.1 English language proficiency

Information on English literacy has only been included in the censuses of 2010 and 2015. In both cases, a rate of just over 70% is reported. However, very little can be drawn from this figure. For the 2010 report (National Statistics Office, Ministry of Finance, 2012), literacy was elicited by asking informants whether they can read and write a simple sentence in English; sometimes answers could be given for others that were not present themselves. Annotations to this question include the following passage:

> Note that it does not ask whether they can speak it. Note also that there is no methodology of testing used but relies on the question being asked to the respondent and their response to the question. This is an indirect way of measuring literacy. (p. 202)

There are similar concerns with regards to the elicitation of literacy in the 2015 census (National Statistics Office, Ministry of Finance, 2016). To begin with, the question is even more open than for the previous report, at least on the collector's sheet: "Can person read/write English?" (p. 186). Further, it is explicitly pointed out that the literacy questions are very sensitive:

> the question on literacy is difficult to answer properly because the respondent is required to demonstrate his or her literacy capacity which takes time and is quite embarrassing, if not 'offending'. This is one reason why this literacy question was not asked in past censuses, except of course in the 2010 census. This is not to say that one cannot ask or tease out the literacy level of people but a better approach would be in a survey setting where one has more time to question and probe the respondent – not in a population census where time is critical and there are so many people to interview. (p. 21)

Clearly, there is not high validity in the literacy rates suggested in the census reports. Moreover, these rates must not be equated with proficiency levels, especially not spoken: from my experiences in Kiribati, I am confident in assessing that many people know a little bit of English, but only few have a high enough proficiency level that would allow them to get by independently in an all-English environment without further education or training. This is more closely captured in a 2014 report by the Ministry of Education which states that English literacy levels have been found to improve for Class 4 and Class 6 students between 2004 and 2009, but only 39% and 33% respectively achieve results that are "satisfactory or above" (p. 13).

A relatively low English proficiency level has long been a historical fact. Until the Second World War, foreign missionaries not only refrained from teaching English to the islanders, they also chose to speak Gilbertese among themselves (Pannu, 1993, p. 38). Afterwards, there were only a few people who benefitted from the teaching services of native speakers of English. Mass education developed only very slowly. Also, from the few linguistic annotations that there are, it is apparent that translators were required in many situations: for early trade business (Macdonald, 2001, p. 21), for announcing the purposes of the arrival of the ABCFM (Rennie, 1985, p. 11), for mediating the plans of the phosphate company in 1900 (p. 97), for teacher training at the LMS college (Pannu, 1993, p. 142), for interpreting during the British nuclear tests in the Line islands in the 1950s (Maclellan, 2015, p. 31), for separation and independence meetings in the 1970s (J. Smith, 2011, p. 121), or for nuclear waste clean-up projects on Kiritimati in 2004 (Steadman, 2006, p. 4). It was also quite common that exchanges were conducted entirely in the Gilbertese language since many long-term residents assimilated greatly, both culturally and linguistically, and became fluent speakers of it. Maude (1952), District Officer and later Resident Commissioner, writes that he had become "quite unaccustomed to speaking or hearing the English language" during an unaccompanied three-months' stay on Tamana (p. 80).

Figure 3.4 presents an overview of English literacy rates over time and provides some insights into educational development from the period since the Second World War until today. Although, for the reasons discussed, the validity of these data is not high, they nevertheless seem to reinforce the findings discussed in Section 2.7 above: the impact of the few expatriate language instructors, of whom only relatively few people benefitted, was very weak as is apparent from the low educational standard that improved only slowly.

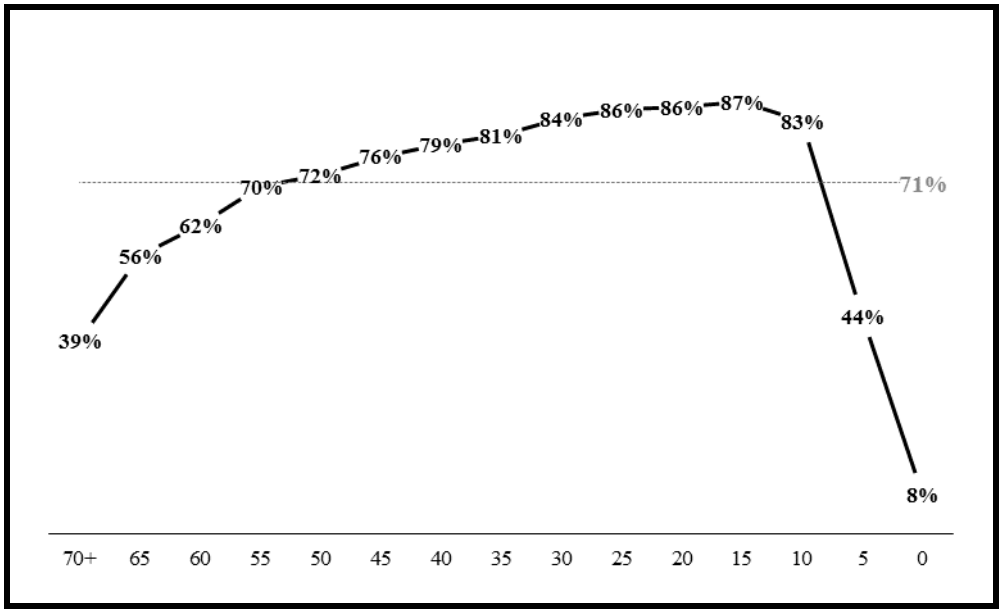


Figure 3.4: English literacy rate. Black: across different age groups; grey: overall average. (Source: National Statistics Office, Ministry of Finance, 2016.)

3.4.2 Policies and practices

Kiribati's constitution has been in place since independence in 1979 and has been amended once in 1995. It mandates that it is published in both Gilbertese and English but states the following:

> The provisions of this Constitution shall be published in a Kiribati language text as well as this English text, but in the event of any inconsistency between the two texts this English text shall prevail. (Kiribati Independence Order, ch. X, section 127)

It further grants people the rights to be informed in a language they understand when they come in contact with the law in some form, with the help of an interpreter if necessary. While providing very little linguistic policy, the constitution nevertheless is an important factor for the overall great prominence the English language has by giving it the same legal status as Gilbertese – or even more.

In 1993, Pannu reports that, generally, the language of the parliament was Gilbertese, while that of the court was English since it was the language in which judiciary staff were trained (pp. 242-243). As for today, a magistrate informed me that there are more and more attempts to "do away with English": their materials are still printed in English, but overwhelmingly, the language of verbal communication is Gilbertese. Therefore, I-Kiribati very rarely find themselves in a legal situation where

they are required to speak English. At higher levels, too, the dominant language is Gilbertese: during his time as governor, Smith "made sure that Gilbertese became the language of the House with translation into English as necessary" (J. Smith, 2011, p. 183).

As described in Section 2.7.4, there have been frequent changes with regards to language policies in the education sector. Until the Second World War, there was hardly any focus on English language teaching, whereas the many policy changes in the post-war era often granted it a highly prominent status in the curricula. All the while, only very little attention was paid to the teaching of the Gilbertese language. Current foci lie on bilingual education: according to the *Two Languages Interaction Model*, pre-school is in Gilbertese only, but starting with the first year of primary school, students come in contact with the English language and are gradually more exposed to it as they progress; by the time they attend a junior secondary school, English has become the medium of instruction.

In theory, students are supposed to speak English while in school compounds, hence posters like in Figure 3.5 are quite the norm. Many informed me that violating this unwritten rule results in detention, regardless of the level. Inside classrooms, the English language is found on many stickers and posters, mostly but not exclusively in the 'corners' dedicated to different subjects. At JSS level (year 7 to 9) at the latest, all instances of text are – or should be – written in English, with the sole exception of the 'Kiribati corner'. However, how much English is actually spoken in a classroom and in a compound is strongly dependent on the schools, the teachers, as well as the students (see also Burnett, 2005, p. 97), and it strongly determines the proficiency mostly but not exclusively of the latter. In general, most staff and students speak Gilbertese in informal contexts in spite of all policies and rules. There is a stark contrast between policies and practices, and likewise between the prominence and presence of the English language.

3.4.3 Media

I-Kiribati have only rather limited access to media. However, especially the better availability of smartphones is starting to have an impact on the way information spreads – and may possibly have implications for the speed and trajectory of socio-cultural change. In this section, then, I briefly discuss the media outlets that have existed for several decades already, and such that have been introduced more recently: newspapers, radio, music, television, and internet.

Figure 3.5: Poster in a classroom.

Newspapers

The number of Kiribati newspapers has hovered around five or six in the last few years. One of them, *Te Uekera*, is government-owned, and censored to some degree. These arrangements have led to scandals in the past, as recently in 2014 when a journalist of *Te Uekera* was suspended for "disobeying management orders" (reported by International Freedom of Expression Exchange, 2014; see also Korauaba, 2012).

All newspapers are printed and distributed on South Tarawa, once or twice a week. Around 500 copies are issued, sometimes more, sometimes less, depending on the week and the decisions of the editors. The readership, then, is very small indeed, considering that the population of Kiribati is over 100'000, and that of South Tarawa over 50'000 (see Section 2.8.1 for more details). Outer islands only get coverage when people travel in from South Tarawa and decide to bring a newspaper with them, often several days after the issuing date.

The newspapers are, with circa 12 pages, relatively short and their contents selective: what makes headlines in news agencies around the world may not appear on the radar of I-Kiribati reporters.

In the majority of cases, Gilbertese is the language of writing. English only crops up in the form of short code-switches where there is no convenient translation, in a few advertisements, and only randomly and infrequently as the language of entire articles. This seems to be in slight contrast to the early 1990s, when at least the government-owned newspaper also had a small English section for news as a regular component (Pannu, 1993, p. 241).

Radio

There are currently three radio stations in Kiribati, one of which is government-owned and subject to some degree of censorship like *Te Uekera* newspaper (Korauaba, 2012). The most recent one, affiliated with Kiribati's Catholic church, only went on air in early 2016. They all reach a rather large audience: approximately half of all households indicate that they own at least one radio (National Statistics Office, Ministry of Finance, 2016, p. 148). The devices are usually on for long periods of time each day.

There are several news slots during the day, with music and advertising in between. Similar to the newspapers, Gilbertese is clearly used more than English which, again, may occur in short code-switches especially in advertisements and only rarely for entire news segments A notable exception are segments that are produced overseas and in the English language (see also Pannu, 1993, p. 241). However, they are clearly less favoured than news that is read out in Gilbertese and many people often switch the station or start playing their own music.

Music and (universal serial) busses

Kiribati is hardly ever quiet. Radios or stereo systems are almost always on, and not infrequently several devices at once. At any point in time, there are a few hits that can be heard everywhere and all the time. Songs do not necessarily have to be in English in order to become famous in Kiribati, many are in Korean (yes, 'Gangnam Style' is well-known), Indian or other languages. Since music is on at almost all times and the same songs may be played on repeat, most people are quickly able to sing along to all of them, regardless of the language. It is about singing and the challenges of it, much less about the meaning. Therefore, many sing loudly and confidently in Gibberish their version of what, in its original version, is Korean, Indian, or any other language – including English.

A great many songs, however, are locally produced and in the Gilbertese language. There is, in relation to other everyday linguistic situations, a high degree of code-switching with English and the inserted utterances can be much longer. Somewhat surprisingly, many singers employ English, regardless of their proficiency level: many code-switches exhibit features and constructions that are clearly associated with the basilectal end of the continuum or are simply learner mistakes. In many cases, it seems as if singers use the English language because they associate some sort of prestige with it. Its prominence elsewhere seems to support this interpretation.

The busses in South Tarawa play an important role in the spread of music: they are basically boom boxes on wheels. The drivers decide what is on but they all seem to like the same chart list. Their USB sticks or SD cards are as essential to their job as their keys and maybe even plugged in first. It may be through busses and small off-line storage devices that music starts to spread and how radio stations come to know which songs to play rather than the other way round. Therefore, it is not only the many people that drive with the many busses in South Tarawa every day that constitute the big audience, but also the people that are reached subsequently when the radio picks up on the songs and when USB sticks travel to other islands. What is more, a small number of busses even have TV screens and show videos that go with songs providing passengers with a visual component and more or less stylised imagery of how life at other corners of the globe looks like. The role of music and busses as vehicles of (the English) language in Kiribati or as windows providing glimpses into other cultures is not to be underestimated.

TV and TV screens

Around 5'000 Kiribati households are indicated to have TV sets (National Statistics Office, Ministry of Finance, 2016, p. 149). By no means, however, does this mean that they have access to live television. That would require satellite dishes for which there are no numbers reported in the censuses simply because there are too few private households that have one. The screens that are available can then only be used for playing back movies. Most are in English, but there are also Bollywood productions and others. Depending on the version that was originally downloaded and shared, a movie comes with or without subtitles, in English or in another language. Watching movies may not be part of a regular routine yet, but it is becoming more popular these days.

Internet

Access to the internet is difficult to assess at this point in time. It is reported in the latest census that some 15'000 I-Kiribati (15%) use the internet (National Statistics Office, Ministry of Finance, 2016, p. 157), but only approximately 1'200 households (7%) have an internet connection (p. 72). As for mobile phones, a third of all households report that they have at least one (p. 150). However, these numbers can only provide some insights into the situation until 2015, coinciding with the time of my first visit. Firstly, the vast majority of mobile phones were not smartphones which make it quick and easy to go online. Only one year later, however, cheap smartphone models had become rather common. I had the impression that they were not yet used to go online often, as it was not very usual to put aside some money for recharge cards. Instead, people listened to music, took pictures, and shared files and apps via Bluetooth. Another half a year later, on my third visit, many of my friends were now using Facebook and other messaging apps and communicated wildly. This progression was indeed astonishing to

witness. It was by far the most striking impression of development that I was able to observe over such a short period of time. It is important to note, however, that having an internet-capable mobile phone does not necessarily mean that I-Kiribati explore the online world. An analogy that works for smartphone users all over the world is that the vast majority have never used a stock market app and become a broker only because they technically have access to it; in some cases, such apps are even pre-installed. That is not to say that I-Kiribati will not further explore the online world in the years to come, but at the moment, they are primarily using their mobile phones to stay in touch with one another.

Financial, technical, and linguistic hurdles may currently be at play. Until recently, there has only been one telecommunications provider: Amalgamated Telecom Holdings Kiribati Limited (ATHKL), a subsidiary of a Fijian company. It started replacing Telecom Services Kiribati Limited (TSKL), which was owned by the Kiribati government, in 2015. At the end of the same year, charges for internet data were a horrendous 0.99 Australian dollars per megabyte without a subscription plan. With a plan, prices get much lower, but the amount of data purchased expires after a determined period of time. Therefore, it is not cheap at all to go online with a mobile phone, which costs a fair bit of money itself. Furthermore, the internet is slow and unstable in many places, even lagoon-side where the signal is usually best. A new Chinese company, Ocean Link Limited, is only just establishing itself, and for the moment mostly on South Tarawa. Due to better and faster signal, it may become attractive for businesses, but since its prices are higher than that of the competition, it is not likely that many private customers will be enticed very quickly. Lastly, the language of the internet is not Gilbertese, which also inhibits many from exploring the online world. In conclusion, I-Kiribati have increased access to the internet, but only little more exposure to the English language as a result of it.

3.4.4 Linguistic landscape

In general terms, Kiribati's linguistic landscape is remarkably thin. On the outer islands, there are no concrete streets, therefore no street signs or letter boxes. There are very few facilities and shops. In most cases, these buildings do not have signs. They are simply superfluous. Firstly, the communities are small, and basically everybody knows where what is; and secondly, a building's function is commonly visible in its building style and materials. The instances of text that do exist in the linguistic landscapes of the outer islands can be summarised under three categories.

Clothing and imported goods constitute the first category. To begin with, there is text painted on light cloth that is worn around the hips called *be* (known as *lavalava* elsewhere), as well as stitched on women's shirts that are made in Kiribati. They often state a person's name, a greeting, or they refer to a special event: independence celebrations, Christmas, birthdays, celebrations of villages or other communities. With the exception of the words 'independence' and sometimes 'Christmas' or 'birthday',

the texts are usually in Gilbertese. Furthermore, I-Kiribati often buy second-hand clothes which arrive in huge bags filling entire ship containers. Not infrequently, then, these shirts and trousers bear text specific to a company, or a certain athletic or political event overseas, say, an electoral race where an aspiring candidate had t-shirts made for his voters. Regardless of what is written on a shirt arriving from overseas, I-Kiribati wear it and regard it as something of functional value first and of linguistic value later. In fact, many do not care or are unaware of what the messages on their shirts actually say or mean.

Text occurs, of course, on labels of all kinds of imported goods, from food and grocery items to mechanical equipment and motor vehicles. They come in a multitude of languages, depending on their origin. The local stores selling these imports are very small, there is often only one item of a kind rather than a selection of the same or different producers, and the stock inventory does not change quickly. Product advertisements are very rare indeed since they are superfluous, let alone available. Linguistically, this has at least two impacts: firstly, locals are very familiar with these products and do not need to study the labels in order to find out whether they will suit their needs; secondly, brand names often replace product names, as is the case with 'Colgate' for example, that is the only toothpaste available in many places.

There are many trucks in Kiribati that say 'Donated by the Republic of Taiwan (People's Republic of China)'. Recently, Taiwan has also equipped every single household of the outer islands with a small solar panel capable of charging three small lights that were shipped with it, as well as other USB-chargeable devices. On the lights, there is a greeting: 'Love from Taiwan'. A Gilbertese message is only found on a much smaller sticker on the bottom side. Until recently, Taiwan was so active in supporting Kiribati as well as other nations in the Pacific because they hoped, in turn, for support in their cause to be recognised as an independent nation; their agreement with Kiribati was, however, abruptly terminated in 2019 (see Section 2.8.2).

The first category, then, contains text types that occur on items that are not stationary and not public. However, they are visible to the public and therefore worth mentioning.

The second category is constituted by instances of text occurring inside semi-public buildings such as schools, churches, clinics, *mwaneaba*, and government buildings. There is of course a lot of text inside classrooms. The 'corners' that have already been mentioned above are full with posters, stickers and notes which are mostly written in English. In churches and *mwaneaba*, there are very often towels with the name of the building and the community painted on them, in Gilbertese rather than English. This second category describes environments that are public yet not visible for outsiders. But it is important to discuss these appropriately, since the majority of I-Kiribati are part of communities and churches, and are or were schooled.

Figure 3.6: Sign in front of a climate change adaptation support project pilot site in Abaiang.

Finally, the third category contains instances of text that are permanent, non-mobile, and visible to passers-by. Interestingly, of these items that are very typical for linguistic landscapes elsewhere, there are only very few on the outer islands of Kiribati. To begin with, there are a number of memorials on Kiribati commemorating, for example, the arrival of missionaries or a jubilee of some kind. Further, there are school signs, but not every school has one. Moreover, in order to see school signs, one would often have to leave the main road. Someone who is not familiar with a community will not simply do that for fear of trespassing on private land as this is highly impolite to the owner. Many of the signs that are visible from the main road are on or in front of facilities: solar power installations or so-called climate adaptation support project pilot sites. These are rather important, as they represent a cascade of events: the Kiribati government seeking the support of national and international agents that realise, after long and highly involved talks with local communities, a specific project (see also Section 2.8.3). The signs inform about the purpose of a project as well as about the international partners and financial donors (see Figure 3.6). Moreover, they are a reminder of issues that are responded to with these projects: for instance the lack of local electricity solutions, or the many climate change issues.

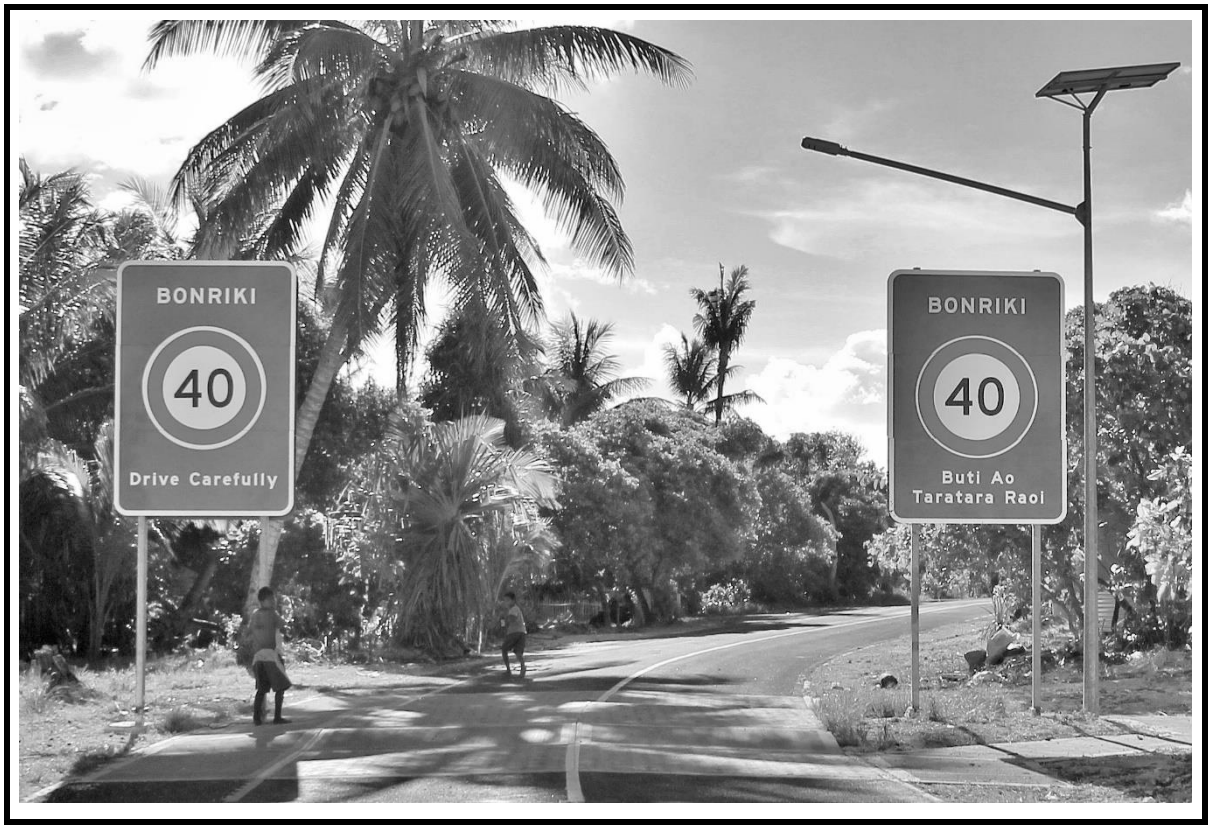


Figure 3.7: Road signs in South Tarawa. *Buti Ao Taratara Raoi* literally translates into *Drive And Watch Well*.

There is more of practically everything in South Tarawa: more governmental buildings, more schools, more companies, and consequently, more text in the linguistic landscape. Generally, the more official a text, the more likely it is written in English. This counts for the outside as well as the inside of a building, for instance a ministry. However, the more important it is that a message is understood by all, the more likely it is written in Gilbertese, sometimes but not always in addition to the English version.

There are also more and bigger shops as well as more advertisements. The latter are mostly small billboards that are already quite old and their colours washed out and blurry, and the majority of them are promotions either for the telecommunications provider, for Punjas, a producer and distributor of foods that has branches in many Pacific countries, or for Nestlé, a global producer and distributor.

Interestingly, there has been a very recent, very prominent addition to South Tarawa's linguistic landscape. Significant improvements to the road network were finished in early 2016 and there is now a wide, smooth concrete road connecting Bonriki in the east and Bairiki in the west (approximately 35 kilometres). Along this new road, there are many new road signs, with the name of the village or causeway, the speed limit, and a short warning: on the right side, the message is in Gilbertese (for

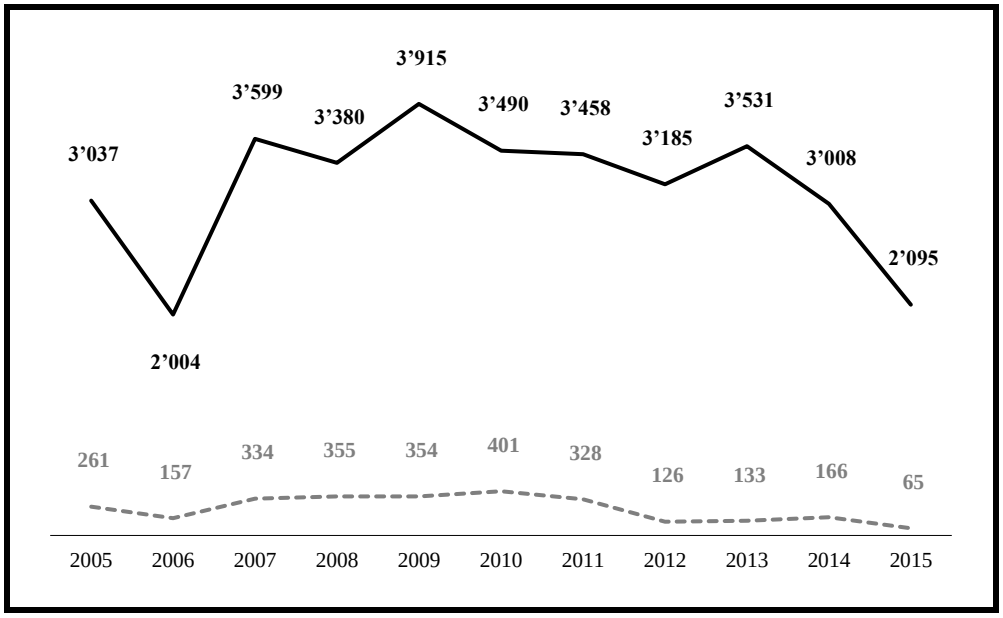


Figure 3.8: Tourist arrivals in South Tarawa. Black, solid: all arrivals; grey, dashed: travelling for pleasure.
(Source: National Statistics Office, 2015a.)

instance: '*Tarataraia Taan Nakonako*'), and on the left side, the English version ('*Watch For Pedestrians*'); another example is given in Figure 3.7.

In short, Kiribati's linguistic landscapes differ greatly between the outer islands and South Tarawa. Moreover, the instances of text that do exist on the outer island can be grouped into three categories: text on clothes and imports that generally move around with people, text inside public buildings, and text on permanent and stationary objects. It is striking that two of these categories contain instances of text that, arguably, are not even part of a truly public sphere.

3.4.5 Foreigners

As mentioned in Section 2.8.1 above, there are hardly any foreigners residing in Kiribati: of its population of 110'136, only 2'179 are ethnically not I-Kiribati; 1'381 of them live on South Tarawa (National Statistics Office, Ministry of Finance, 2016, p. 52). Interestingly, there seems to have been a rapid influx since 2010 when there were only 892 foreign residents (National Statistics Office, Ministry of Finance, 2012, p. 51). This is largely due to the growth of the New Zealander contingent: from 51 in 2010 to 668 in 2015. These are most likely temporary residents, working on different projects and programmes for only a limited time.

With regards to tourism, there are hardly any arrivals stating that their purpose of visit is pleasure. As visualised in Figure 3.8, the average number of tourists in the last decade is just shy of 250 (National Statistics Office, 2015a)[55] – Kiribati is listed regularly as one of the least visited countries on earth (United Nations World Tourism Organization, 2016). It is practically very difficult to enter Kiribati without doing so through the international airport in South Tarawa. There are no means to monitor their movement within Kiribati, but it is very unlikely that many ever get to the outer islands. Much like the foreign residents, most remain on South Tarawa.

Very low numbers of foreign residents as well as very low numbers of foreign visitors provide locals with very few opportunities to practice English. It partly accounts for the inhibition or shyness many I-Kiribati feel when they are supposed to speak the English language, and it makes apparent that there are not many reasons for them to learn it in the first place. However, it also makes contact situations very unique. Foreigners, especially white-skinned people are so rarely seen that they are truly a spectacle. Vice versa, travelling the islands as such an I-Matang is an unforgettable adventure!

3.4.6 Language attitudes

The English language has commonly been perceived as a means to gain more and better access to goods and services, virtually since its arrival in the Gilbert islands (several examples have been given in Chapter 2; see also Burnett, 1999). Today, Kiribati handles its responsibilities as an independent nation also on a regional and global stage, and discourse around climate change, *Migration with Dignity* and international mobility schemes have become increasingly more commonplace and public (see Sections 2.8.3 and 2.8.4; see also Burnett, 2013). This has created a context in which the perceived importance of English is even greater and even more widely acknowledged; instrumental motivations to learn it are very much the norm. Integrative motivations are less salient by comparison. Moreover, since there are hardly any permanent foreign settlers, it is important to point out that association with another (L1) culture is hardly possible locally. The majority of I-Kiribati who have integrative motivations towards the learning of the English language cannot but orient towards a spatially removed culture and largely absent representatives of it.

As a result of instrumental and integrative factors, the English language is frequently incorporated into songs, names of dance groups, and so on. Wide-spread lexical adoptions are also noticed in the every-day use of the Gilbertese language. On the one hand, it is acknowledged that there

[55] The numbers presented here are for South Tarawa only. There is hardly any data available on Kiritimati in the Line group "due to the non-availability . . . of arrival/departure cards" (National Statistics Office, 2015a). It is possible that the number of tourists, people travelling for pleasure, is comparable to or even larger than that for the entire Gilbert group.

are certain concepts and expressions that are not easily translated into Gilbertese, making adoption justifiable for most. On the other hand, there are many other adoptions that do not introduce a new concept, such as colour terms, or kin terms like *auntie* and *uncle*. Many informants comment on this when describing the linguistic situation in Kiribati. Most do so without voicing an opinion; others seem proud of such appropriation and the creativity underlying it; still others express a fear of the Gilbertese language – and culture – dying out (see also Pannu, 1993, p. 248).

Lastly and very importantly, virtually everybody asked about English language use in Kiribati will comment on their own shyness and inhibition; English teachers, too, have this sentiment. At least two factors need to be considered here. Firstly, there is the fear of making mistakes. This has been problematic for educational development in the past (see Section 2.7.4), but it is still prevalent to some degree today. A second source of inhibition is the fear of showing off in a society that strives for *booraoi*: unity through equality and conformity (Autio, 2010); or, as Pannu (1993) puts it, "it is simply impolite to be ambitious and show any sign of superiority", which includes the showing and thus showing off of English language skills (p. 59). As a consequence, there are obstacles in both the teaching and learning of English. Moreover, it explains at least partly why the overall proficiency level of English in Kiribati is relatively low. At least in part, these two factors explain why I-Kiribati virtually never speak English among themselves, why many feel incredibly embarrassed when they do, and why laughter by those who speak it and those who hear them speak it is so common a reaction.

To conclude, it is comprehensible that attitudes towards the English language are mixed. While the importance of it is undoubtedly recognised and instrumental motivations widely shared, English is not only associated with chances but also with climate change and dependence. It is representative for developments of which some are welcomed, others resented and feared. As a result of these tensions, I-Kiribati have two minds and two hearts now, as one informant aptly describes. This, many people are aware of. Expressed in English or in Gilbertese, it is not uncommon to hear someone say: *te katei ni Kiribati ao te I-Matang style* (Kiribati culture and I-Matang style).

3.5 Kiribati English or English in Kiribati?

By way of concluding both Chapter 2, on Kiribati's past, present and future, and Chapter 3, on Kiribati's sociolinguistic profile, it is worth discussing how the English variety of Kiribati may be labelled and where it can be placed in models of World Englishes. Owing to Kiribati's particular history in terms of cultural and linguistic contact, neither exercise is easily completed.

The Gilbert islands were, at no point in time, visited or settled by a large number of foreigners. Before the Second World War, beachcombers, resident traders, missionaries and even many government officials assimilated greatly, culturally as well as linguistically. Consequently, the English

language was hardly spoken, heard, or taught. Since then, educational standards have not yet reached satisfactory levels and the number of foreigners has hardly increased, at least not on the outer islands. The constitution that came into effect in 1979 may have defined English as the country's second official language and ascribed high importance to it; this constitutional promotion is clearly visible in educational domains and policies. However, neither in governmental nor educational affairs do policies really align with practices: almost always, the spoken language is Gilbertese, not English. Newspapers, too, almost always write in Gilbertese (and are only distributed in South Tarawa), and the language of the radio is predominantly Gilbertese (with the exception of a few segments produced overseas). English is clearly much more heard in songs and movies. However, given that many people have a relatively low proficiency of this language, the question arises as to how much is understood of such songs and movies. Similarly, internet access is clearly increasing, but there are financial, technical and linguistic factors that need to be taken into consideration as they put into question how much the English language is really promoted. Finally, Kiribati's linguistic landscape is thin on South Tarawa, and even thinner on the outer islands; it is rather non-intrusive in either case. English is favoured for official signs and occurs on pieces of clothing, which are functional rather than of aesthetic value rendering text of whatever language often meaningless. Other than that, there are only few road signs, even fewer advertisements, and very short messages on politically laden Taiwanese donations. In short, the presence of the English language in Kiribati has only little changed over time. English is still a very foreign language. What has changed is its status: it is perceived as very important and prominent.

With the sociolinguistic profile understood in context of its history, it is apparent that English in Kiribati does not fit in well with other ESL (English as a second language) varieties that are described as follows:

> Typically these are varieties that arose in countries where English was introduced in the colonial era in either face-to-face communication or (more usually) via the education system of a country in which there is, or had once been, a sizeable number of speakers of English. (Mesthrie & Bhatt, 2008, p. 5)

On the one hand, English in Kiribati has been introduced in colonial times, has become the second official language by today, and is being spread via the education system. On the other hand, its introduction did not result in spread, its officiality did not result in use, and lastly and most importantly, there is not and never has been a "sizeable number" of proficient speakers typical for the ESL category. The label EFL (English as a foreign language) is a better fit as it describes varieties whose "influence has been external, rather than via a body of 'settlers' " (p. 5). This is not usual for a nation that has formerly been colonised by the British – and only by the British. Likewise, EFL varieties are typically in places that do not have a colonial history during which English has been introduced, but given its sociolinguistic history, Kiribati does not differ substantially from such places. EFL seems to describe

Kiribati's linguistic reality most adequately, and accordingly, its English variety can be placed in the expanding rather than the outer circle in the *Three concentric circles* model proposed by Kachru (1988).

That the case of English in Kiribati is rather atypical is only further reinforced by using the *Dynamic Model* proposed by Schneider (2007) as a perspective on aspects of history, identity, sociolinguistic conditions and linguistic effects; the model encompasses five phases which characterise the development of an English variety: foundation, exonormative stabilisation, nativisation, exonormative stabilisation, and differentiation.

As regards history, Kiribati has had contact with missionaries and traders, a protectorate and a colony were proclaimed, English has become the language of administration, and political independence from Britain and subsequent self-regulation has been achieved. This would suggest that Kiribati has gone through the development associated with the first four phases. However, it needs to be repeated that there has never been a large number of settlers providing substantial groups of islanders with constant contact which is usually expected to occur in the first phase. Similarly, Kiribati remains far away from becoming self-dependent in an economic but also a linguistically more relevant sense: education matters particularly with respect to the English language are being tackled by the Australian-funded team leading the Kiribati Education Improvement Program (KEIP; see Sections 2.7.3 and 2.7.4); such dependency is more characteristic of the nativisation phase.

With regards to aspects of identity, it can be assumed that the self-perception of islanders has changed once they came in contact with foreigners. It was understood that the Gilbert islands were not the only ones, but that many other peoples, cultures and languages do exist and that contact with them can be both beneficial and problematic. The second phase may thus have been completed. In the third phase, a reasonably large settler group should have developed that perceived itself as permanent and local rather than, in the case at hand, British. Unlike in other, more intense contact situations, this certainly does not hold true for the Gilbert islands. However, characteristics usually associated with the fourth phase are once again applicable: having become independent, I-Kiribati now see themselves as a new and internally united nation, not least because of having become known for being at the forefront of global climate change in a regional and global discourse.

The English variety of Kiribati is more easily analysed in terms of sociolinguistic conditions. Typical for the first phase, the acquisition of English by and bilingualism of a limited few has also happened in the Gilbert islands, particularly through labour trade. Kiribati is only now in the second phase where bilingualism is in the process of spreading, primarily through education. It is worth calling to mind that an educational stance promoting the teaching and learning of the English language has not been taken shortly after first contacts had been established, but only after the Second World War. The third phase is definitely not yet reached: only few I-Kiribati are bilinguals with a high proficiency in the English language, and virtually no I-Kiribati are infant-bilinguals; the former may become more common as a result of improvements in (English language) education, but there is little to nothing that indicates a systemic change with regards to the latter.

Finally, the above analysis of linguistic features suggests that the English variety of Kiribati falls into the third phase where effects on all linguistic levels are observable. However, crucially, there is no Kiribati-own standard developing. The many features of the English variety of Kiribati that have been discussed in this chapter are not thought of as a dialect or any other linguistic form with any claim to legitimacy. That is not to say that the contrary, the denial of legitimacy, is expressed; rather, idealised, external varieties of English serve as targets, by and large without anybody making explicit judgements about learner forms that are common for I-Kiribati. There are linguistic reasons, such as similarities to the substrate language, that explain the systematic use of many features described above, but not social reasons. That is, there is no commenting or shaming when people produce English features in a Kiribati way, or likewise, when they produce them in a non-Kiribati way. In many ways, then, English in Kiribati is a learner variety.

Having established that English is a very foreign language in Kiribati, that it is best labelled as EFL in spite of its background with a British administrator, that it exhibits a rather atypical development insofar as it does not transition from one phase to the other as laid out in the *Dynamic Model*, and that it is a learner variety with external standards as targets, it is perhaps more fitting to talk about English in Kiribati rather than about Kiribati English. It is for this reason that I use the former for the title of this report. Other than in the present discussion about linguistic development in the context of Kiribati, however, a terminological distinction is neither necessary nor implied: both expressions are used interchangeably throughout all chapters, including the following one.

CHAPTER 4

Alveolar plosives in Kiribati English

A little after two weeks into my fieldwork, I sat down for a first time to put on paper a list of linguistic impressions that I was able to gather thus far, including some rudimentary drafts of sound inventories. With respect to plosives, I had realised that my own production of Gilbertese variants was somewhat odd, somewhat inaccurate. I made similar observations for the English rendition by I-Kiribati. Having had a fundamental understanding of voice onset times (VOT) and how our own L1 may interfere with both an accurate production and an accurate perception of plosive variants of other languages, I hypothesised that the VOT systems of English and Gilbertese may indeed be different and thus the source of interesting linguistic phenomena. The analysis of a few hastily conducted recordings of Gilbertese *ben* (coconut), and English *Ben* and *pen* uttered by the unlucky people sitting around me during my note-taking yielded further reasons to go ahead and take a closer look into durational properties of plosives. Over the remaining weeks, I put together a catalogue of minimal pairs similar to *ben*/*Ben*/*pen* and ultimately obtained 10 recordings that allowed for more impressions to be gathered. Once again, the results encouraged for a more detailed survey of plosives to be carried out.

In this section, then, I describe how I investigated more closely the production of English alveolar plosives by I-Kiribati and present findings that emerge from such analyses. For this purpose, I firstly describe how relevant data was extracted and annotated. Subsequently, I provide an overview of the variants realised by I-Kiribati for the two English alveolar plosive phonemes. The infrequent variants will then be subjected to a quick and superficial analysis; their low numbers do not allow for more detailed investigations to be carried out. In a second, more in-depth analysis that follows a brief review of relevant literature, the frequent affricated variants are juxtaposed to more standard-like, non-affricated realisations; subsequently, the factors that promote or inhibit the occurrence of these variant types are discussed. In the third analysis, I focus on the durational properties with which non-specified, aspirated, and affricated variants are produced, specifically the durations of the closure phase and the duration between the release and the voice onset on a following segment known as voice onset time (VOT); I begin the respective section with a description of laryngeal specifications and their relation to durational characteristics, which is followed by an extensive literature review that provides conclusive evidence for the effect of some factors but rather inconclusive results for others. The most important findings that emerge through the analyses of alveolar plosives in Kiribati English are summarised and further contextualised in the general discussion that concludes this chapter. I will propose plausible explanations for many of the patterns observed and argue that the comprehension of alveolar plosive production in Kiribati English necessitates the comprehension of the wider social and cultural context.

4.1 Data

The analyses and results reported below refer to my primary corpus of sociolinguistic interviews with 33 participants who have already been introduced in Section 3.1.2 above; Table 3.1 is repeated below for convenience on pages 174 and 175. As pointed out, there is a relatively even distribution with regards to sex (17 female and 16 male participants) and age (19 to 66), but a considerable skew towards an educational and occupational elite: the majority of participants have and have had more extensive contact with other cultures and languages. As such, the corpus captures relatively accurately who speaks English proficiently in Kiribati.

For all informants participating in sociolinguistic interviews, 100 alveolar plosives have been extracted, resulting in a corpus of 3'300 tokens: 996 realisations of /t^{0}/, and 2'304 realisations of /t^{h}/.[56] For extraction, certain criteria had to be met. All lexical items that stem from the Kiribati vocabulary, even though arguably borrowings into the emergent variety of English, were excluded; this affects names of people, institutions, places, and so on. Similarly, English words used in utterances that are otherwise Gilbertese were ignored. Lastly, tokens that were not clearly audible due to interference noise or other problems were of course also not included.

Although the recordings were 1 hour on average, I chose to start extraction from the beginning of the recording, for reasons mainly related to accommodation. It is very rare indeed for most I-Kiribati to find themselves in situations where they have the possibility to converse with someone in English for an extended period of time. It is thus likely that accommodation effects would emerge during longer

[56] Rather than to extract an equal amount of plosives for each phoneme, this approach was chosen for three reasons. Firstly, the majority of statistical analyses required for regrouping and exclusions. To begin with, while a few initial runs were performed on two variant groups (/t^{0}/ and /t^{h}/), most subsequent runs were done with three (/t^{0}/, /t^{h}/ and affricated /t^{s}/); whereas almost half of /t^{h}/ tokens are affricated, the sample size of the non-specified group is hardly affected. Moreover, many runs required for – often additional – exclusions: for instance, the analysis of pre-consonantal environments necessitated for pre-vocalic tokens to be excluded, and vice versa; also, since durational analyses are only possible with tokens that allow for respective measurements to be taken, realisations such as deletions and fricatives were excluded, among others. More information as to how individual subsets have been created follows in the respective sections below.

Secondly, I also expected a smaller number of /t^{0}/ tokens to suffice because, in terms of durational properties, such non-specified variants exhibit less variability: it is a rather consistent finding in the respective literature that average voice onset times (VOT) of non-specified tokens change to a much smaller extent than that of aspirated (or otherwise specified) variants, and that VOT variability around a given mean is much smaller for the non-specified realisations, too. That Gilbertese alveolar plosives are comparable to English non-specified variants further supports such an assumption: effects are expected to be smaller for English /t^{0}/ whose production requires very similar articulatory gestures than in the substrate language, in comparison to /t^{h}/ whose production I-Kiribati are less familiar with. More information with regards to alveolar plosive categories that exhibit different laryngeal specifications as well as different durational characteristics are provided in Section 4.4.

Lastly, as mentioned in the next few paragraphs, 100 useful tokens were found for all informants within the first 10 to 15 minutes of conversation, except in the three cases where informants were recorded in pairs rather than individually. Pushing back this mark in order to extract an even number of tokens for each phoneme – 50 /t^{0}/ and 50 /t^{h}/ tokens – may have increased the number of instances that were influenced by short-term accommodation effects with respect to both the choice of variants as well as the durational properties with which they are produced. Limiting token extraction to a relatively short time window at the very beginning of the recording helps to reduce such effects.

conversations: not only could there be an influence on the choice of variants, as will be discussed in more detail below, even seemingly elusive acoustic properties of a specific variant, which are of interest and importance for the study at hand, have been shown to be subject to short-term accommodation (see Section 4.4.2 for more discussion). Choosing to start token extraction from the beginning of the recording helps to minimise such effects. In most cases 100 useable tokens were found within the first 10 to 15 minutes; only in the three cases where informants were recorded in pairs did data extraction exceed this mark.

All extracted tokens were annotated extensively; Table 4.1 provides an overview of the variables and factor levels created on the basis of such annotations. The social information captured include the speakers' age, sex, and language background. The last is comprised of three variables operationalising occupation, stays abroad as well as an overall assessment of exposure to and usage of the English language. *Occupation* consists of four factor levels. In its first group are study participants who have completed primary or secondary education and do not work a job with a regular monetary income; the participants of the second group have a similar educational background but do get in contact, minimal though it may be, with the English language through a job with a regular salary; in the third group are university students who complete English language courses and thus considerably increase their proficiency; lastly, the fourth group is constituted by participants who work or have worked in positions where they were, in contrast to the job holders in the second group, in frequent contact with internationals with whom they corresponded in English – several people within this group worked for the government and are themselves university graduates. The implication is that exposure to and use of the English language increases from the first to the last group. The factor levels of the variable *Time abroad* divides participants into groups who have never left Kiribati, have done so only shortly, once or several times, or for a longer period, once or several times; exposure and usage levels are considered to increase from the first to the last group, too. Finally, *Exposure and usage* constitute an own variable, with the levels *low*, *moderate*, and *high*. Which group participants were placed in depended on several pieces of information about them: firstly and secondly, their occupational background and their time spent abroad, as already investigated individually; thirdly their educational background, that is, the period in which they were schooled, the school and teachers who taught them, as well as the highest level they reached; and lastly, any other pieces of information that is of relevance for their linguistic behaviour, such as, whether or not they are or were spoken to in English by older family members during their upbringing, whether or not they now speak English to their children, whether or not they read English books, watch English movies, frequently use the internet, or have other hobbies or interests that would bring them in contact with the English language. Through the informative recorded conversations and my familiarity with most of the I-Kiribati that participated in this study, I am rather confident in undertaking the distribution of speakers into three such groups.

As regards linguistic aspects, annotations for the preceding and following environment, utterance, grammar and plosive position are made. For the sound environments, these annotations

provide information about whether or not a particular sequence contrasts with the sound inventory or distribution rules of the substrate language, about whether the neighbouring element is a vowel, consonant or pause, about the vocalic or consonantal parameters, and about whether or not a particular sequence constitutes an assibilation context in the substrate language.

For the utterance, information relating to fluency and isochrony is included; the two aspects of the former are speaking rate and hesitation, those of the latter are word stress and phrasal accent. As the literature review under Section 4.4.2 will demonstrate, previous studies differ in terms of the methodologies used to define speaking rate: it is expressed in terms of vocalic, syllabic, lexical or sentential durations. For the analysis of the Kiribati English data, I chose a simple and practicable methodology and assessed whether tokens were uttered in slow, medium or fast speech. Since such a classification is subjective, I further chose to only categorise tokens as slow and fast when they were very distinctly slow and very distinctly fast respectively, for every individual speaker. The assessment of speaking rate relative to a speaker's mean is part of a methodology also applied by Stuart-Smith, Sonderegger, Rathcke, and Macdonald (2015) who found that local speaking rate, in their case syllables per second, did not show any effects on VOT production, but that speaker-relative speaking rate did. The assessment of hesitation is similarly subjective: if, to my ear, the utterance of an alveolar plosive and the sounds in its environment, exhibited some kind of break in speech fluency yet VOT measurements could be taken, such cases were treated as instances of hesitation.

Word stress and phrasal accent are analysed in a rather superficial manner, too, for reasons relating to isochronous differences between Gilbertese and English. Blevins and Harrison (1999) describe stress and prosody in Gilbertese as mora-based. They demonstrate that all rhyme-internal segments are moraic, while onsets are not; that is, even word-final nasals, the only consonants allowed in this position, constitute a mora. Furthermore, the minimal stress group and the minimal prosodic word are trimoraic, which is rare cross-linguistically and may even make Gilbertese "unique among the world's languages" (p. 209). Clearly, then, Gilbertese is different from the English language in terms of isochrony, as it is a stress-timed language and employs different rules to the foot. In order to assess which system an I-Kiribati speaker of English applies to a particular utterance containing a plosive requires, among other things, a minute analysis of durations and amplitudes – and for respective measurements to be of any good use requires for the recorded speech to be of an audio quality clearly surpassing that of my corpus. I therefore chose to keep the analysis of the factor stress more basic and to use a codification system with binary and very broad categories: a token was only then marked as unstressed when the syllable containing the plosive was heavily reduced; all other tokens are regarded as bearing neutral word stress. Analogously, a token was only then marked as having reduced or emphatic phrasal accent when it was very clearly distinct from more neutral renditions. As such, this methodology is similar to those applied in previous studies (see for instance Choi, 2003; Cole, Choi, Kim, & Hasegawa-Johnson, 2003; or Cole, Kim, Choi, & Hasegawa-Johnson, 2007), but differs in so far as the Kiribati data consists entirely of unscripted speech, and stress and accent assessments are

made on the basis of individual and possibly idiosyncratic pronunciations rather than on the basis of the phonology of the English language. Albeit reliant on subjective impressions, this approach allows for a far quicker and easier analysis of word stress and phrasal accent, and one that should rather clearly show potential effects.

The assessment of grammatical aspects is straightforward. The annotations about the word containing an alveolar plosive identify whether it belongs to the lexical or function category, determine its part of speech, and indicate whether or not the plosive is part of a past inflection.

Finally, information with regards to the position of the alveolar plosive is provided: it can occur in the initial, medial or final syllable of the word, in the onset or coda of the syllable, and as singleton or initial, medial or final element of a cluster within the onset or coda.

In addition to the token annotations mentioned here, durational characteristics of alveolar plosives have been assessed. The respective measurements allow for a systematic analysis of the closure and release phases, specifically closure durations and voice onset times. These variables are described, investigated and discussed in great detail in Section 4.4 where more information with regards to extraction methods will be provided.

All statistical calculations discussed below have been carried out using R (R Core Team, 2017) as well as various packages which will be cited below.

Table 3.1 (repeated): Informants participating in sociolinguistic interviews.

ID	Sex	Year of birth	Age	Ethnicity	Native language	Religion	Education	Occupation	Stay abroad
Ki01f1956	F	1956	59	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Nurse	Educational; Occupational; Holiday
Ki02f1969	F	1969	45	I-Kiribati	Gilbertese	Baha'i	Technical/ vocational	JSS teacher	Occupational
Ki03f1977	F	1977	38	I-Kiribati	Gilbertese	Protestant	Technical/ vocational	Nurse	
Ki04m1969	M	1969	45	I-Kiribati	Gilbertese	Protestant	Technical/ vocational	Seaman (retired); Village chairman	Occupational
Ki05m1974	M	1974	40	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	JSS teacher	Educational
Ki06m1986	M	1986	29	I-Kiribati	Gilbertese	Catholic	Secondary	Mayor	Educational
Ki07f1990	F	1990	24	I-Kiribati	Gilbertese	Protestant	Secondary	Treasurer (government)	
Ki08m1963	M	1963	52	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Priest (retired)	Educational
Ki08f1967	F	1967	48	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Teacher (retired)	
Ki09f1991	F	1991	24	I-Kiribati; Hindi-Fijian	Gilbertese; Hindi; Fijian	Catholic	University	Travel consultant	Holiday
Ki10f1990	F	1990	25	I-Kiribati	Gilbertese	Catholic	Secondary	Travel consultant	Educational; Holiday
Ki11m1980	M	1980	35	I-Kiribati	Gilbertese	Catholic	University	Marketing manager; International environmental organisation	Occupational
Ki12m1949	M	1949	66	I-Kiribati	Gilbertese; Nauruan	Catholic	Technical/ vocational	JSS, SSS, higher ed. teacher (retired); Chief commissioner scouts	Educational; Occupational
Ki13f1991	F	1991	23	I-Kiribati	Gilbertese; Nauruan	Catholic	Secondary	Treasurer (church youth group); Scout	Holiday
Ki14m1965	M	1965	49	I-Kiribati	Gilbertese	Mormon	University	Teacher (retired); Newspaper editor	Educational
Ki15f1988	F	1988	26	I-Kiribati	Gilbertese	Seventh Day Adventist	Technical/ vocational	JSS teacher; Teacher trainer	Educational

Ki16m1963	M	1963	52	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	School principal (retired); KIT lecturer (reitred); Secretary to the Kiribati Union of Teachers; Human Resources official (government)	Educational
Ki17f1976	F	1976	38	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	JSS teacher/principal	
Ki18f1990	F	1990	24	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Sister (rel.)	Educational; Occupational
Ki19m1955	M	1955	60	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Seaman (retired); Truck driver (retired)	Occupational
Ki20f1959	F	1959	56	I-Kiribati	Gilbertese	Catholic	Primary		Holiday
Ki21m1985	M	1985	30	I-Kiribati	Gilbertese	Jehova's Witness	University	USP student	Educational; Holiday
Ki22f1962	F	1962	53	I-Kiribati	Gilbertese	Catholic	Secondary	Tourist accommodation owner	Holiday
Ki23f1992	F	1992	23	I-Kiribati	Gilbertese	Catholic	University	USP student	
Ki24m1970	M	1970	45	I-Kiribati	Gilbertese		Technical/ vocational	Seaman (retired); Security guard	Occupational
Ki25m1972	M	1972	42	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Catechist	Holiday
Ki26f1995a	F	1995	19	I-Kiribati	Gilbertese		University	USP student	
Ki26f1995b	F	1995	20	I-Kiribati; Tuvaluan	Gilbertese		University	USP student	
Ki27m1995	M	1995	20	I-Kiribati	Gilbertese	Catholic	University	USP student	
Ki28m1994	M	1994	20	I-Kiribati	Gilbertese	Protestant	University	USP student	
Ki29m1994	M	1994	20	I-Kiribati	Gilbertese	Catholic	University	USP student	
Ki29f1996	F	1996	19	I-Kiribati	Gilbertese	Protestant	University	USP student	
Ki30m1957	M	1957	58	I-Kiribati	Gilbertese	Catholic	Technical/ vocational	Voluntary magistrate; Office of te Beretitenti (retired)	

Table 4.1: Token extraction. Left: social annotations; right: linguistic annotations.[57]

Social Variables

Topic	Aspect	Variable	Factor levels
Speaker		Speaker	*(33 levels)*
Speaker characteristics	Physiology	Age	*19-66 (1949-1996)*
		Sex	*female* *male*
	Language Background	Occupation	*non-monetary* *monetary (local)* *university student* *monetary (international)*
		Time abroad	*none* *short* *several short* *long* *several long*
		Exposure and usage	*low* *moderate* *high*

[57] The three sound types vowels, consonants and pauses (listed under linguistic annotations on the right) do not only constitute individual variables, but also factor levels (of the variable *Sound type*) that have been tested on their influence on variant choice and durational properties.

Linguistic Variables

Topic	Aspect	Variable	Factor levels
Preceding environment Following environment	Linguistic contrast	Sound inventory	*sound in Ki inventory* *sound not in Ki inventory*
		Distribution rule	*permissible in Ki* *non-permissible in Ki*
	Sound type	*Vowel*	*lip-rounding* *height* *fronting*
		Consonant	*voicing* *place* *manner*
		Pause	
	Assibilation environment		*_i / _u* *_#i / _#u* *other environment*
Utterance	Fluency	Speaking rate	*slow rate* *medium rate* *fast rate*
		Hesitation	*no hesitation* *hesitation*
	Isochrony	Word stress	*particularly unstressed* *normally stressed*
		Phrasal accent	*particularly unaccented* *normally accented* *particularly accented*
Grammar	Word category		*lexical* *functional*
	Part of speech		*(11 levels)*
	Past inflection		*past inflection* *other environment*
Plosive position	Position in word		*initial syllable* *medial syllable* *final syllable*
	Position in syllable		*onset* *coda*
	Position in onset/coda		*onset singleton* *onset-initial* *onset-medial* *onset-final* *coda singleton* *coda-initial* *coda-final*

4.2 Variant choices

For the data extracted and annotated in the manner just described, I first highlight a number of general observations with regards to variant choices. Evidently, the alveolar plosive phonemes of English /t^0/ and /t^h/ – are realised in 10 ways, at grossly different frequencies. For infrequent variants, only relatively superficial statistical analyses can be conducted which allows for only tentative conclusions to be formulated.

4.2.1 Results

The 10 alveolar plosive realisations are the following:

1) released [t^0] and [t^h],
2) affricated with alveolar sibilants [t^s],
3) deletions Ø,
4) unreleased [t̚]
5) flaps [ɾ],
6) interdental fricatives [ð] or [θ],
7) affricated with post-alveolar sibilants [$t^ʃ$],
8) glottal stops [ʔ],
9) spirantised to alveolar sibilants [s],
10) and spirantised to post-alveolar sibilants [ʃ].

Figure 4.1 shows the absolute and relative number of occurrences for each of these variants, for the phoneme /t^0/ in a) at the top, and for the phoneme /t^h/ in b) at the bottom. It is apparent that all variants, safe for the post-alveolar spirant [ʃ], occur for both phonemes. Furthermore, I-Kiribati produce a surprisingly high number of affricated realisations when speaking English: for the phoneme otherwise associated with aspiration, [t^s] is the second most favoured realisation.

In order to analyse the influence of social and linguistic factors on the occurrence of the less frequent variants – Ø, [t̚], [ɾ], [ð, θ], [$t^ʃ$], [ʔ], [s], and [ʃ] –, a relatively brief and quick statistical discussion will suffice. For this purpose, the nnet (Venables & Ripley, 2002) and the effects (Fox, 2003) packages for R were used: the former allows for the analyses of a dependent variable with more than two factor levels, and the latter allows for the computing of respective effects which can then be plotted.

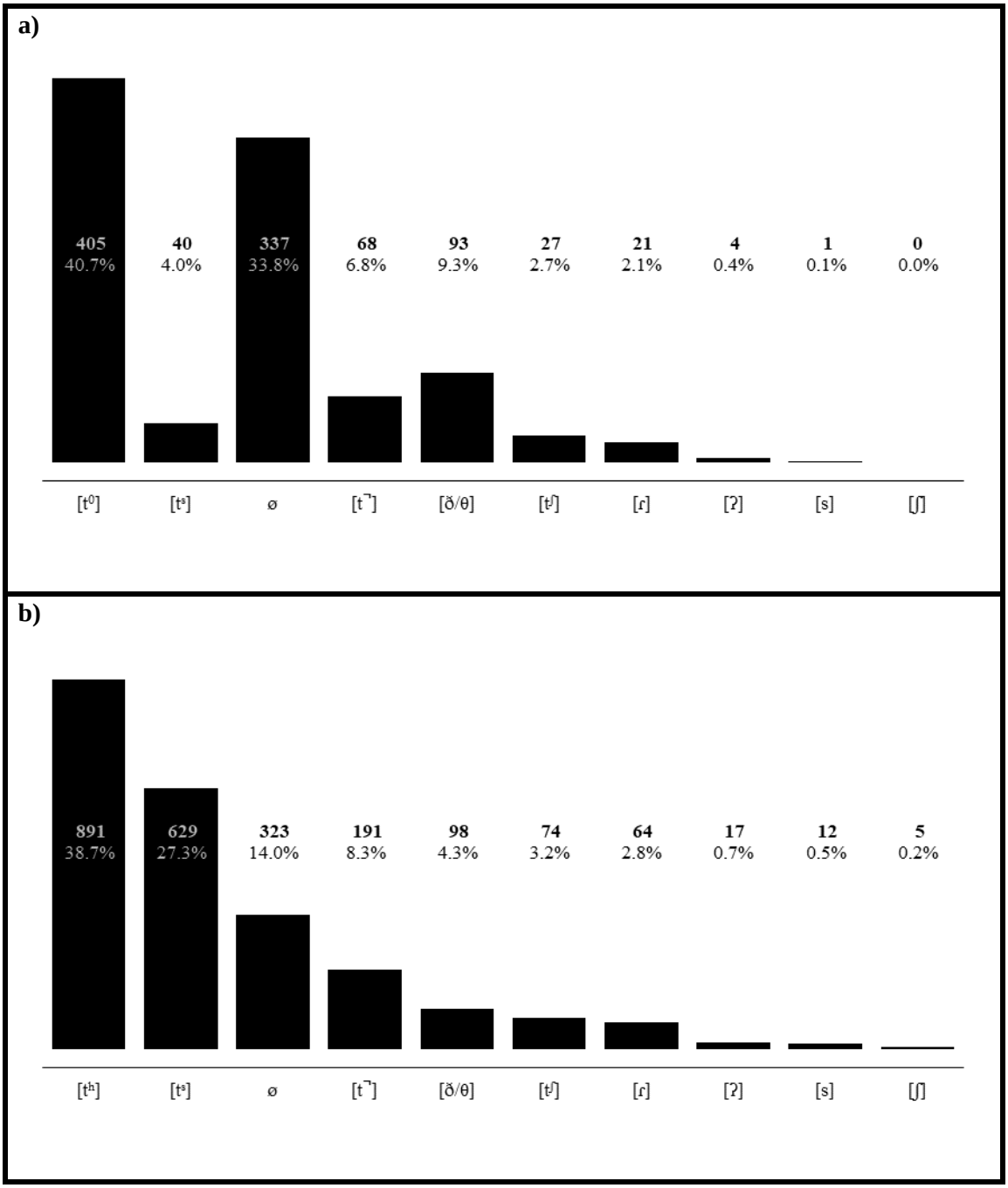


Figure 4.1: Variant choices for alveolar plosives: a) /t^{0}/; b) /t^{h}/.

I so constructed plots and inspected them on any saliences.[58] The most important findings that can be obtained through such a brief analysis are presented in Table 4.2 on pages 182 and 183.

[58] Individual tables and figures are provided in Appendix A.12.1.

A few observations are worth mentioning. Firstly, deletions are the most frequent of the infrequent realisations. They are more common in consonantal environments and, more generally, in those surroundings where distribution rules of the Gilbertese language do not permit an alveolar plosive; the latter is particularly true in the case of /t^{0}/. Deletions thus help reduce and simplify consonant clusters, a strategy quite common for language learners and less proficient speakers whose mother tongues do not permit a particular sound sequence. Secondly, although frication to sibilants is rare, it is worth noting that all 12 instances for /t^{h}/ occur in non-hesitant and normally stressed speech, and at both normal and fast speaking rates. In other words, [s] realisations do not occur in environments without isochronous prominence that elsewhere have been found to be particularly prone to lenition processes but more frequently in those that inhibit them (see for instance Honeybone, 2012). Thirdly, realisations lacking a release are more likely in instances of hesitation, which is not surprising; similar effects have also been reported by Docherty, Hay and Walker (2006) for phrase-final /t/ in New Zealand English. What is perhaps less expected is the apparent correlation with speaking rate: [t$^{\neg}$] are least likely in fast contexts, more likely at normal rates, and most likely at slow rates. Finally, those instances which, through posteriorisation, are realised as [t^{ʃ}] are likely to occur before alveolar and approximant sounds. Of the 101 tokens, 51 occur before [ɹ], in words such as *travel* or *country* – contexts in which [t^{ʃ}] is also very common in other varieties of English. No patterns for sex, age, occupation, time abroad or exposure and usage appear to be remarkably pronounced.

4.2.2 Discussion

Some of the observations that can be made for infrequent variants are in line with previously reported patterns for L1 varieties of English. In other cases, the structure of the substrate language seems to explain the occurrence of certain variants in certain contexts. Yet other instances remain less clear. However, in order to better understand these infrequent variants in the English variety of Kiribati, larger samples are needed to allow for more detailed investigations to be made. This is not the goal I am pursuing with my corpus or my extraction and methodologies, which are geared towards phonemic contrasts by means of affrication and durational properties; such aspects will be discussed in the remainder of this chapter.

Table 4.2: Influences on the choice of infrequent variants (summary).

Preceding environment	*Phoneme*	*Variant*	*Probability*
Sound inventory	/t^0, t^h/	[ø]	sound in Ki inventory > sound not in Ki inventory
	/t^0, t^h/	[ð/θ]	sound not in Ki inventory > sound in Ki inventory
Distribution rule	/t^0, t^h/	[ø]	non-permissible in Ki > permissible in Ki
Sound type	/t^0, t^h/	[ø]	consonants > vowels
	/t^0, t^h/	[ð/θ]	vowels > consonants, pauses
	/t^h/	[ʔ]	vowels > consonants
V: lip rounding	/t^0, t^h/	[ɾ]	rounded > unrounded
	/t^0/	[ø, t˞]	rounded > unrounded
	/t^0/	[ð/θ]	unrounded > rounded
V: height	/t^h/	[t˞, ɾ]	after mid-low to low vowels > elsewhere
V: fronting	/t^0/	[ø, t˞, ɾ]	back > centre > front
	/t^0/	[ð/θ]	front > centre > back
	/t^h/	[ø, t˞, ɾ]	back < front < centre
C: voicing	/t^0/	[ø]	before unvoiced > before voiced

Following environment	*Phoneme*	*Variant*	*Probability*
Sound inventory	/t^0, t^h/	[tʃ]	sound not in Ki inventory > sound in Ki inventory
Distribution rule	/t^0, t^h/	[ø, t˞, tʃ]	non-permissible in Ki > permissible in Ki
Sound type	/t^0, t^h/	[t˞]	vowels < elsewhere
	/t^0, t^h/	[r, ð/θ]	vowels > elsewhere
	/t^0, t^h/	[tʃ]	consonants > elsewhere
	/t^0/	[ø]	vowels < elsewhere
	/t^h/	[ø]	consonants > elsewhere
V: height	/t^0, t^h/	[ø, r, ð/θ]	indications of a height effect: variants more likely the higher the following vowel
	/t^h/	[tʃ]	high and mid-high vowels > elsewhere
V: fronting	/t^0, t^h/	[ð/θ]	centre vowels > elsewhere
	/t^h/	[tʃ]	front vowels > elsewhere
C: voicing	/t^0, t^h/	[ø]	unvoiced > voiced
	/t^0, t^h/	[t˞, tʃ]	voiced > unvoiced
C: place	/t^0, t^h/	[tʃ]	alveolar > elsewhere
C: manner	/t^0, t^h/	[tʃ]	approximant > elsewhere

Fluency	*Phoneme*	*Variant*	*Probability*
Speaking rate	/t^0, t^h/	[ø, ð/θ]	fast > medium > slow
	/t^0, t^h/	[t$^{\neg}$]	fast < medium < slow
	/t^h/	[ɾ, s]	fast > medium > slow
Hesitation	/t^0, t^h/	[t$^{\neg}$]	hesitation > no hesitation
	/t^0, t^h/	[tʃ]	no hesitation > hesitation
	/t^h/	[s]	no hesitation > hesitation

Isochrony	*Phoneme*	*Variant*	*Probability*
Word stress	/t^0/	[ø]	particularly unstressed > normally stressed
	/t^h/	[s]	normally stressed > particularly unstressed
Phrasal accent	/t^0, t^h/	[ø]	particularly unaccented > normally accented
	/t^0/	[r, ð/θ]	particularly unaccented > normally accented

Grammar	*Phoneme*	*Variant*	*Probability*
Word category	/t^0, t^h/	[ø]	functional > lexical
	/t^h/	[t$^{\neg}$, s]	functional > lexical
Part of speech	/t^0/	[ø]	high likelihood in nouns and the conjunction *and*
	/t^h/	[ø]	high likelihood in auxiliary verbs, e.g. *don't , can't , haven't*

Plosive position	*Phoneme*	*Variant*	*Probability*
Position in word	/t^0, t^h/	[ø]	medial > elsewhere
	/t^0/	[tʃ]	final > elsewhere
	/t^h/	[t$^{\neg}$, ɾ]	initial > medial >final
	/t^h/	[ʔ]	medial < elsewhere
Position in syllable	/t^0, t^h/	[ø, t$^{\neg}$, ʔ]	coda > onset
	/t^0, t^h/	[tʃ]	onset > coda
	/t^0/	[ɾ, ð/θ]	onset > coda
	/t^h/	[ɾ, s]	coda > onset
Position in onset/coda	/t^0, t^h/	[t$^{\neg}$]	higher likelihood as coda-singletons
	/t^0, t^h/	[tʃ]	higher likelihood in onset-initial position of cluster
	/t^h/	[ø]	higher likelihood in onset-meidal and coda-cluster positions
	/t^h/	[s]	higher likelihood as coda-singletons

4.3 Alveolar plosive affrication

Affricated realisations deserve a more detailed investigation owing to their frequency in Kiribati English. For this reason, I briefly summarise a list of important findings about alveolar plosive affrication in other languages and particularly other varieties of English, before then presenting and finally discussing the patterns emerging in the Kiribati English data.

4.3.1 Literature review

The mere occurrence of [tˢ] is not unique to the English variety of Kiribati, or to the English language for that matter. Hall, Hamann, and Zygis (2006) list a number of languages where assibilation processes – which affrication belongs to – are or have been observed. They further summarise relevant findings and conclude that such processes are typically caused by the sound following the plosive, which is typically /i/ or /j/: the narrower constriction in these contexts results in more airflow velocity and turbulence and, thus, more likely in frication.

As for the English language, Ogden in *An introduction to English phonetics* (2009) points out that "plosives released with short periods of frication are common" and that most speakers exhibit "some degree of frication" in their plosive production (p. 111). This general account is supported by the following descriptions of L1 varieties.

To begin with, Buizza and Plug (2012) report that, for their RP English speakers, affricated realisations make up approximately 10% of all alveolar plosives, and occur in much the same contexts where released but non-affricated realisations do: in broad terms, affrication is more likely word-initially and -finally than in word-medial positions.

In their overview of the New Zealand English phonology, Bauer and Warren (2008) seem to suggest that alveolar plosive affrication is very frequent "initially in stressed syllables" as well as in final position, when /t/ is not glottalised (p. 53). With respect to the same variety, Docherty, Hay, and Walker (2006) only focus on phrase-final /t/ for which they note that, when released, tokens occur much more commonly with than without heavy affrication. In complementation, data of Maori English speakers discussed by Maclagan, Watson, Harlow, King, and Keegan (2009) confirm that affrication is more likely before the high vowels /i/ and /u/ in comparison to low /a/.

As for Australian English, Horvath (1985), Haslerud (1995; quoted in Tollfree, 2001) as well as Tollfree (2001) report that affricated realisations are socially conditioned: by factors such as age,

sex, class, ethnicity and register.[59] Of relevance here is less what the variation within individual social factors looks like, but rather the fact that social factors can exhibit internal variation. With respect to linguistic constraints, Horvath (2008) confirms that affrication is "most noticed in prepausal position" (p. 100), but, as Tollfree observes in her data, also possible in intervocalic positions for some speakers.

In sum, /t/-affrication is common before high vowels and utterance-finally but also observed in word-initial and intervocalic positions, and it can be socially conditioned.

4.3.2 Results

In order to test whether the same or other constraints exist in Kiribati English, I conducted a more in-depth analysis of when alveolar plosives are produced with affrication and when without: since only 40 instances of /t^0/ occur as affricates (these instances are briefly discussed in Section 4.5), investigations are restricted to a juxtaposition of /t^s/ to /t^h/ only. The resulting subcorpus consists of 1'520 tokens: 891 instances without affrication, 629 with; equating to 58.6% and 41.4% respectively. The following discussions are based on results obtained using Rbrul (Johnson, 2009) which is especially designed for the statistical analyses of linguistic data. The same independent variables as above were scrutinised, with the exception of *Past inflection* due to an insufficient number of tokens that end in – phonemic – /t^h/ and could be identified as unambiguously referring to the past: more often than not, it was unclear whether a speaker intended to utter, for example, the word *spend* or *spent*. What follows is a discussion of the statistically significant results only, with a summary presented in Table 4.3 over pages 190 and 191.[60]

The influence of social factors on alveolar plosive affrication is discussed first. It is firstly of importance to note the substantial inter-speaker differences (*Speaker*). The affrication rates of some speakers is as low as 5.1% (*logodds* = -2.544), for others as high as 80.9% (*logodds* = 1.823). These inter-speaker differences are not well accounted for by *Age*, as the respective results and the complementing Figure 4.2 make apparent. In contrast, affrication rate for female speakers is 51.2% (*logodds* = 0.443), that of male speakers only 31.6% (*logodds* = -0.443); the effect size of the variable *Sex* (the difference between the highest and the lowest *logodds*) is 0.886. Thus, variant choice may indeed be socially governed – a notion which is supported by the analysis of durational properties that will follow. As for *Occupation*, no statistically significant effect is found. The remaining two social factors, the time a speaker has spent abroad (*Time abroad*) and the exposure to and usage of the English

[59] Horvath (1985) only differentiates between aspirated and heavily aspirated alveolar plosives, the latter of which "can even be affricated in some instances" (p. 97); in her 2008 publication, [t^s] realisations do constitute their own category.
[60] Appendix A.12.2 contains tables for the complete list of variables tested.

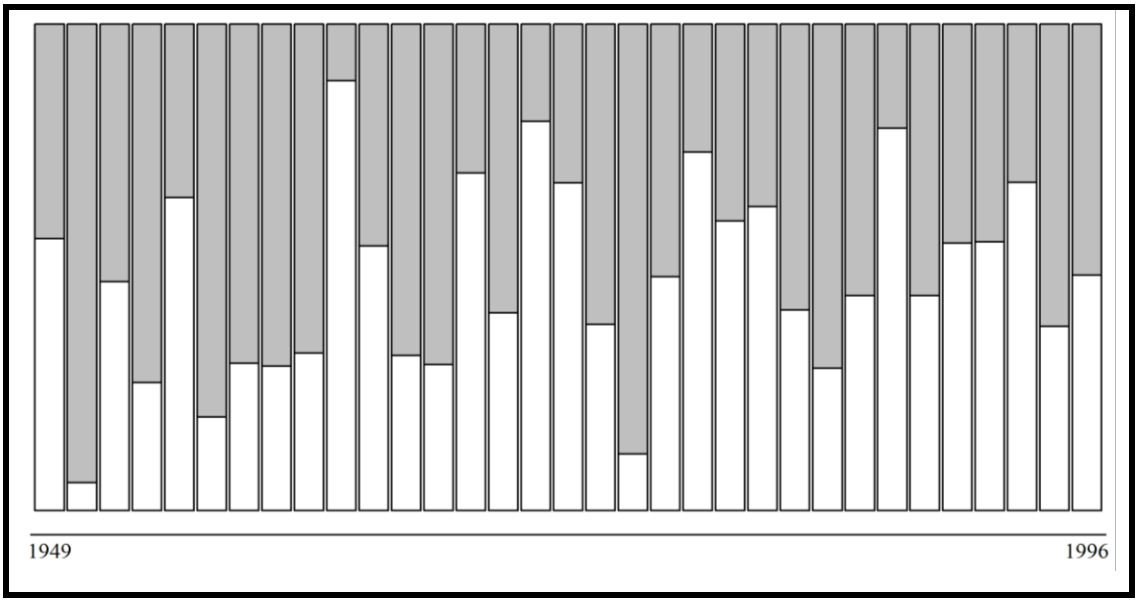


Figure 4.2: Affrication rates for 33 speakers ordered by age. White: aspirated variants; grey: affricated variants.

language (*Exposure and usage*), do seem to influence affrication rates. For the former, statistical analysis confirms that affrication is more common for speakers who have never left Kiribati or only done so once and for a short time, and less common for speakers who have been abroad more often and for longer periods. These results are only in partial agreement with those obtained for the latter variable, as speakers who have a moderate rating for exposure and usage have a significantly higher likelihood of producing affricated tokens (65.2%; *logodds* = 0.570) than speakers with a low rating (57.2%; *logodds* = 0.202). What remains in support of the findings for *Time abroad* is the lowest likelihood (34.9%; *logodds* = -0.772) for speakers with the highest rating. With respect to *Occupation*, *Time abroad*, as well as *Exposure and usage*, it is worth reiterating that the Kiribati English corpus at hand comprises 33 speakers. Distributed into four to five factor levels, these subgroups may not be big and varied enough for the true effects and effect sizes of these three social variables to become clear.

For the analyses of linguistic factors, statistical runs were conducted with *Speaker* as random effect in order to control for the inter-speaker variation. A few aspects of the sound preceding the alveolar plosive exert an influence on whether affrication is present or absent. To begin with, affrication after rounded vowels is much less likely than after unrounded vowels (28.3% vs 41.4%), an effect size of 0.636 (*PE-V: lip-rounding*). Almost double the effect size is found for vowel fronting, where preceding schwa coincide with an affrication rate of 57.6% (*logodds* = 0.574) in comparison to 39.8% (*logodds* = -0.017) for front, and 29.7% (*logodds* = -0.556) for back vowels (*PE-V: fronting*). The only consonantal parameter for which there is statistical significance is manner of articulation (*PE-C: manner*): it appears that if an alveolar plosive is preceded by another stop the likelihood for affrication

is rather high (53.2%; *logodds* = 0.427); it is worth noting that many of these preceding stops are not released, like in [pɹɛk˺tˢis] for *practice*. Affrication rates after nasal stops (47.8%; *logodds* = 0.141) and especially fricatives (36.9%; *logodds* = -0.244) are lower.

Similarly, a number of aspects relating to the sound in the following environment are influential. To begin with, affrication is more likely before sounds that are not in the inventory of the Gilbertese language (*FE: sound inventory*). With respect to sound types (*FE: sound type*), affrication rate is lowest before consonants (24.9%; *logodds* = -0.758), almost identical with the global rate for vowels (42.4%; *logodds* = 0.119), and highest before pauses, that is, for alveolar plosives in utterance-final position (55.5%; *logodds* = 0.639). Although statistically significant differences between different vowel heights exist, there is no gradual height effect (*FE-V: height*). What is perhaps worth noting is that both near-low and low vowels in the following environment coincide with the lowest affrication rates; fully representing two factor levels (the mid and centre region), following schwa too accounts for rather low rates. With respects to following consonants, once again only manner of articulation (*FE-C: manner*) yields a statistically significant result. However, token numbers for the individual factor levels are not high enough for conclusions to be drawn confidently. Lastly, those environments that constitute an assibilation context in the Gilbertese language (*Assibilation environment*) are also more likely instances where an alveolar plosive is affricated: /ti/ and /tu/ are frequently realised as [tˢi] and [tˢu] respectively (48.4%; *logodds* = 0.479). Only word-internal combinations are affected: the affrication rate in environments where word boundaries break up the above sound combinations is 31.2% (*logodds* = -0.384), which is even lower than that for all remaining environments (36.2%; *logodds* = -0.095).

With regards to *Phrasal accent*, results show that affrication is most likely in particularly accented environments (30.8%; *logodds* = -0.980), followed by normally accented (41.6%; *logodds* = -0.238), and then particularly unaccented environments (80.0%; *logodds* = 1.218); the effect size is with 2.198 rather large. Similar tendencies, albeit without statistical significance, are found for *Word stress*. Furthermore, this finding is in line with the high affrication rates for alveolar plosives before unstressed schwa, but less so with low rates for alveolar plosives after schwa. Together, these findings suggest that affrication is not more likely in environments without isochronous prominence that are prone to lenition.

Significant effects are also found for different *Parts of speech*. However, this is mostly due to some of the factor levels having relatively low token numbers, and some other levels representing too few different words; for instance, the 62 tokens in the pronoun group, which exhibits the lowest affrication rate (24.2%; *logodds* = -0.966) is comprised entirely by *it*, *that* and *what*.

Finally, the position of the alveolar plosive in the onset or the coda constitutes a highly significant factor (*Position in onset/coda*). Onset-singletons are very likely to be affricated (46.0%; *logodds* = 0.405), with a rate second only to that of alveolar plosives in coda-final position (56.1%; *logodds* = 0.683). Surprisingly, the affrication rate of the latter is considerably higher than that of coda-singletons (33.8%; *logodds* = -0.101). None of the onset-medial, coda-medial, or coda-initial instances are realised with affrication, as would be expected. Affrication does, however, occur in the remaining

two positions, both of which require further comments: all affricated onset-initial instances represent [tw] sequences with a semi-vowel rather than a full consonant; all 148 onset-final instances represent [st] clusters, an environment in which affrication is a much more surprising occurrence.

4.3.3 Discussion

While alveolar plosive affrication has been reported to occur more commonly before high vowels and utterance-finally but also observed in word-initial and intervocalic positions as well as to be socially conditioned in other languages and English varieties, not all of these observations can be made in Kiribati's variety: here, affrication is different from speaker to speaker, more frequent for female speakers – and perhaps constrained by further social factors –, and likely in coda- and utterance-final contexts as well as in environments that are not reduced in terms of isochronous prominence. In the contexts just listed, [tˢ] is in fact more frequent than its counterpart without affrication, and indeed the majority variant. Before this phenomenon can be discussed any further, it is necessary to take a closer look into the acoustic and durational properties that characterise individual alveolar plosive variants in Kiribati.

Table 4.3: Social and linguistic influences on alveolar plosive affrication.

	/t^s/ vs /t^h/ n	%	logodds	
Speaker				
(33 levels)				
input probability		*0.405*		
effect size		*4.367*		
p		*5.84E-34*	***	
R^2		*0.20*		

	/t^s/ vs /t^h/ n	%	logodds
Sex			
female	758	51.2%	0.443
male	762	31.6%	-0.443
input probability		*0.406*	
effect size		*0.886*	
p		*0.00186*	**
R^2		*0.17*	

	/t^s/ vs /t^h/ n	logodds	
Age			
19-66 (1949-1996)	1'520	0.013	
p	*0.00045*	***	
R^2	*0.01*		

	/t^s/ vs /t^h/ n	%	logodds
Time abroad			
none	445	54.6%	0.570
short	189	52.9%	0.520
several short	297	32.0%	-0.367
long	238	39.1%	-0.112
several long	351	27.9%	-0.611
input probability		*0.407*	
effect size		*1.181*	
p		*0.0123*	*
R^2		*0.17*	

	/t^{s}/ vs /t^{h}/		
	n	%	logodds
Exposure and usage			
low	187	57.2%	0.202
moderate	187	65.2%	0.570
high	1'146	34.9%	-0.772
input probability		*0.531*	
effect size		*1.342*	
p		*0.00118*	**
R^2		*0.17*	

	/t^{s}/ vs /t^{h}/		
	n	%	logodds
PE-V: fronting			
front	357	39.8%	-0.017
centre	99	57.6%	0.574
back	192	29.7%	-0.556
input probability		*0.411*	
effect size		*1.130*	
p		*0.000277*	***
R^2		*0.24*	

	/t^{s}/ vs /t^{h}/		
	n	%	logodds
PE-V: lip-rounding			
unrounded	556	41.4%	0.318
rounded	92	28.3%	-0.318
input probability		*0.340*	
effect size		*0.636*	
p		*0.019*	*
R^2		*0.23*	

	/t^{s}/ vs /t^{h}/		
	n	%	logodds
PE-C: manner			
oral stop	77	53.2%	0.427
nasal stop	297	47.8%	0.141
fricative	333	36.9%	-0.224
lateral approximant	9	33.3%	-0.345
input probability		*0.427*	
effect size		*0.772*	
p		*0.0462*	*
R^2		*0.14*	

Table 4.3 (continued): Social and linguistic influences on alveolar plosive affrication.

	/t^s/ vs /t^h/ n	%	logodds
FE: sound inventory			
sound in Ki inventory	896	37.5%	-0.206
sound not in Ki inventory	587	47.0%	0.206
input probability		*0.418*	
effect size		*0.412*	
p		*0.000401*	***
R^2		*0.17*	

	/t^s/ vs /t^h/ n	%	logodds
FE: sound type			
vowel	1'196	42.4%	0.119
consonant	177	24.9%	-0.758
pause	110	55.5%	0.639
input probability		*0.393*	
effect size		*1.397*	
p		*2.39E-07*	***
R^2		*0.19*	

	/t^s/ vs /t^h/ n	%	logodds
FE-V: height			
high	394	45.2%	0.280
near-high	283	51.6%	0.616
mid-high	102	44.1%	0.255
mid	141	31.2%	-0.349
mid-low	119	42.9%	0.322
near-low	22	31.8%	-0.478
low	135	26.7%	-0.647
input probability		*0.379*	
effect size		*1.263*	
p		*1.47E-06*	***
R^2		*0.23*	

	/t^s/ vs /t^h/ n	%	logodds
FE-V: fronting			
front	568	44.2%	0.172
centre	142	31.0%	-0.410
back	486	43.6%	0.238
input probability		*0.390*	
effect size		*0.648*	
p		*0.0101*	*
R^2		*0.20*	

	/t^s/ vs /t^h/ n	%	logodds	
FE-V: fronting				
front	568	44.2%	0.172	
centre	142	31.0%	-0.410	
back	486	43.6%	0.238	
input probability		*0.390*		
effect size		*0.648*		
p		*0.0101*	*	
R^2		*0.20*		

	/t^s/ vs /t^h/ n	%	logodds	
FE: assibilation env.				
_i / _u	626	48.4%	0.479	
_#i / _#u	32	31.2%	-0.384	
other environment	825	36.2%	-0.095	
input probability		*0.374*		
effect size		*0.863*		
p		*3.40E-06*	***	
R^2		*0.19*		

	/t^s/ vs /t^h/ n	%	logodds	
FE-C: manner				
oral stop	38	39.5%	0.503	
nasal stop	10	60.0%	1.336	
fricative	28	14.3%	-0.861	
roll	1	100.0%		
lateral approximant	5	20.0%	-0.456	
approximant	95	18.9%	-0.523	
input probability		*0.258*		
effect size		*2.197*		
p		*0.0094*	**	
R^2		*0.10*		

	/t^s/ vs /t^h/ n	%	logodds	
Phrasal accent				
particularly unaccented	65	30.8%	-0.980	
normally accented	1445	41.6%	-0.238	
particularly accented	10	80.0%	1.218	
input probability		*0.473*		
effect size		*2.198*		
p		*0.00456*	**	
R^2		*0.18*		

Table 4.3 (continued): Social and linguistic influences on alveolar plosive affrication.

	/t^s/ vs /t^h/		
	n	%	logodds
Part of speech			
N	362	39.2%	-0.079
Pro	62	24.2%	-0.966
Det	21	28.6%	-0.401
V	252	36.5%	-0.267
Aux	13	53.8%	0.493
Inf marker	193	42.5%	0.105
Part	2	50.0%	0.633
Adj	220	42.7%	-0.130
Adv	183	49.7%	0.379
Prep	169	47.9%	0.150
Conj	43	41.9%	0.084
input probability		*0.417*	
effect size		*1.599*	
p		*0.0132*	*
R^2		*0.19*	

	/t^s/ vs /t^h/		
	n	%	logodds
Position in onset/coda			
onset singleton	917	46.0%	0.405
onset-initial	41	26.8%	-0.539
onset-medial	4	0.0%	
onset-final	148	27.7%	-0.448
coda singleton	269	33.8%	-0.101
coda-initial	13	0.0%	
coda-medial	14	0.0%	
coda-final	114	56.1%	0.683
input probability		*0.362*	
effect size		*1.222*	
p		*8.46E-07*	***
R^2		*0.19*	

4.4 Acoustic and durational properties

It has been described above that Gilbertese only features one series of plosives: unaspirated (non-specified) /p^0/, /t^0/ and /k^0/. In English, on the other hand, there are two series: /p^0/, /t^0/ and /k^0/, and aspirated /p^h/, /t^h/ and /k^h/. In this and the subsequent sections, I will clarify why I use these, for variationist reports, unconventional terms and symbols by discussing laryngeal specifications and durational characteristics of plosives; it will also become apparent why these terms and symbols should be used more often in variationist reports. I aim to show, firstly, what the differences between Gilbertese and English plosives are, and secondly, that these cross-linguistic differences are responsible for the occurrence of affricated realisations of alveolar stops. In more specific terms, the acoustic and durational properties with which alveolar plosives are produced in both Gilbertese and English yield compelling evidence for the case that affrication serves as a means to distinguish /t^0/ and /t^h/ phonemes.

4.4.1 Laryngeal specifications and durational characteristics

In very simple terms, plosives[61] can be segmented into two phases: in a first phase, the closure phase, articulators are positioned in such a way that they close up and obstruct air behind the point of closure; subsequently, during the release phase, the closure is released, obstruction ceases, and air is permitted to flow again. There are, however, several acoustic events during these two phases, the presence or absence of which as well as their timing carry a bulk of information. Which events are phonemic, that is, an obligatory feature, differs from language to language, if not from variety to variety. That English features two series of plosive phonemes poses certain difficulties for EFL and ESL speakers, like I-Kiribati, who do not apply a phonemic distinction between plosives in their mother tongue. In order to understand which problems may arise from such dissimilarities, I provide here a brief overview of laryngeal specifications as well as durational characteristics with which plosives are produced across different languages.

There are four specifications of the larynx that characterise plosives. Firstly, vocal folds can be lax or tense. The former allows for air to pass without setting the vocal folds in vibration, while the latter does cause phonation. The respective laryngeal specification is |voice|. The second and third specifications relate to the size of the glottal opening: |spread glottis| and |constricted glottis|. The more spread the glottis, the more air flow is permitted. Thus, plosives that are specified for |spread glottis| can be perceived as aspirated. A constricted glottis, on the other hand, characterises the production of glottal stops as well as ejectives and implosives. Since the opening can only be one size at any one time,

[61] For the present discussion, I focus on released plosives only.

Table 4.4: Laryngeal specifications of obstruents.

	Laryngeal specification	**Symbols**
1.	non-specified	/p^0/ /t^0/ /k^0/
2.	|voice|	/b/ /d/ /g/
3.	|spread glottis|	/p^h/ /t^h/ /k^h/
4.	|constricted glottis|	/p'/ /t'/ /k'/
5.	|voice| + |spread glottis|	/b^h/ /d^h/ /g^h/
6.	|voice| + |constricted glottis|	/b'/ /d'/ /g'/

the presence of one necessarily means the absence of the other: if the larynx is specified for |spread glottis|, it cannot be for |constricted glottis|; if the larynx is specified for |constricted glottis|, it cannot be for |spread glottis|. However, the inverse is not true: the absence of one specification does not imply the presence of the other. The glottal opening can be of a size that, in a particular phonological system, is neither spread nor constricted. Finally, the fourth specification refers to a larynx that does not produce voice, aspiration, or glottalisation. In other words, it cannot be regarded as specified for |voice|, for |spread glottis| or for |constricted glottis|. It is simply non-specified.

The four laryngeal specifications allow for plosives to be produced in six distinct manners, as presented in Table 4.4. Four are obvious immediately, as they simply relate to the four laryngeal specifications individually: |voice|, or |spread glottis|, or |constricted glottis|, or non-specified. However, stops may be produced with voicing and aspiration, in other words, they are specified for both |voice| and |spread glottis| at the same time. Similarly, voicing and glottalisation can cooccur, rendering such sounds specified for both |voice| and |constricted glottis|.

It is obvious that the description of plosives in terms of their laryngeal specifications is far more detailed than traditional descriptions that dominate variatonist literature. In the latter case, stops are generally labelled as *voiced* or *voiceless*, which only allows for two types of sounds to be contrasted. The terms *unaspirated* and *aspirated* are also used frequently. However, it often remains unclear how they need to be understood in relation to *voiced* and *voiceless*: in some cases, they seem to be interchangeable, in others an alternative. More often than not, unfortunately, traditional descriptions of obstruents do not reflect laryngeal specifications, meaning that they do not reflect articulatory and acoustic events. Sometimes, they are just plainly wrong. For a proper understanding of plosives and features pertaining to their articulation, their acoustic properties, and their perception, it is imperative to disregard traditional labels and to instead adopt a perspective that pays adequate attention to laryngeal specifications (see for instance Beckman, Jessen, & Ringen, 2013, for a recent and more extensive discussion of traditional versus non-traditional descriptions).

The plosives of English, for instance, are traditionally described as *voiced* and *voiceless*: /b/, /d/ and /g/, and /p/, /t/ and /k/ respectively. However, for many speakers and in many phonological environments, the realisations of the first series do not exhibit voicing during the closure phase. In some instances, voicing may be present. However, crucially, it does not have to be; that is, |voice| is not phonemic. It follows that both sets are phonemically voiceless. They are contrasted on the basis of aspiration: /p/, /t/, and /k/ are produced with a spread glottis, while /b/, /d/, and /g/ are not. In conclusion, English contrasts a series of plosives that is specified for |spread glottis| with a series of plosives that is not specified, neither for |spread glottis| nor for |voice| (or |constricted glottis|). In order to more accurately reflect laryngeal specifications – at the very least for the purposes of this dissertation –, it makes sense to use the following symbols for English plosives: /p^0/, /t^0/ and /k^0/ for the non-specified series, and /p^h/, /t^h/ and /k^h/ for the aspirated series.

In languages that establish a two-way contrast by means of |voice|, voicing is phonemic, in other words, obligatory: if voicing is realised only partially or not at all, a plosive will not be identified as voiced by the hearer. Russian and many other Slavic languages are true voice languages. In English and other languages that establish a two-way contrast by means of |spread glottis|, voicing may occur in certain phonological contexts, especially intervocalically, or it may indeed be constrained by sociolinguistic factors (a brief discussion of this issue follows below), but its realisation is not obligatory.

Yet other languages feature three series of plosives. In Thai, for example, |voice| as well as |spread glottis| are phonemic and establish a three-way contrast with non-specified realisations. Similarly, four-way systems, like Hindi, five-way systems, like Siswati, or six-way systems, like Beja, employ the differing laryngeal specifications, proving that all of them are in use and not just theoretical possibilities (see for instance Iverson & Salmons, 1995, for more discussion and examples). And finally, there are of course languages that feature only one series of plosives. Such sounds are non-specified as they do not need to establish contrasts in voicing, aspiration or glottalisation. Gilbertese is such a language, making it systemically different from English which employs a two-way contrast by means of |spread glottis|.

However, languages do not only differ in terms of the number of categories they feature. Durational characteristics may also differentiate plosives cross-linguistically, even when they fall into the same category of laryngeal specifications. Languages that employ |voice| in order to establish phonemically distinct categories, that is, they require one category of plosives to be realised with voicing during the closure phase, may be dissimilar in terms of the duration of such voicing; or similarly, languages that employ |spread glottis| in order to establish phonemically distinct categories, that is, they

require one category of plosives to be realised with aspiration, may be dissimilar in terms of the duration of such aspiration. This requires further discussion of both, the closure phase and the release phase. [62]

Regardless of |voice| being a phonemic specification or not, a number of investigations about the closure phase can be made. Is voice present during the closure phase? If voice is present, is it continuous or partial? How long is the unvoiced part of the closure phase? How long is the voiced part the closure phase? How long is the entire closure phase? Figure 4.3 visualises schematically the oscillograms of three dissimilar plosives. In a), no voice (and no other noise) is present during the closure phase, hence a flat line. In b), the closure phase is partially voiced. This is represented by the continuation of periodic oscillation of the preceding voiced segment, for instance a vowel, (typically) with a lowered amplitude from the beginning of the closure. Finally, in c), the closure phase is fully voiced. As pointed out above, fully voiced closure phases are obligatory for true voice languages – including for utterance-initial segments which are not preceded by a voiced segment with periodic oscillation, or any other noise for that matter. Such instances are much rarer for languages like English that do not feature a voiced plosive series.

In some languages, the duration of the closure phase alone establishes phonemic categories. This is the case for Swiss German, for example: Kraehenmann (2001) reports short closure phases with a mean duration of approximately 60 milliseconds that distinguish one set of plosive variants from a second set characterised by closure phases that are twice as long on average. The sounds of both sets fall into the laryngeally non-specified category, thus their transcriptions do not reflect articulatory or acoustic differences that are in fact there: both bilabial variants are transcribed as /p^0/, and both alveolar variants as /t^0/.[63] Swiss German plosives exemplify that there are not just differences between different laryngeal specification categories, but also differences within laryngeal specification categories.

[62] From this point onwards, the discussion will revolve around non-specified and aspirated plosives, as neither English nor Gilbertese features stops that are specified for |constricted glottis| or phonemic |voice|.
[63] In most dialects of Swiss German, the velar variants are not only distinguished by means of closure phase duration, but also by means of affrication of the longer variant to [kx].

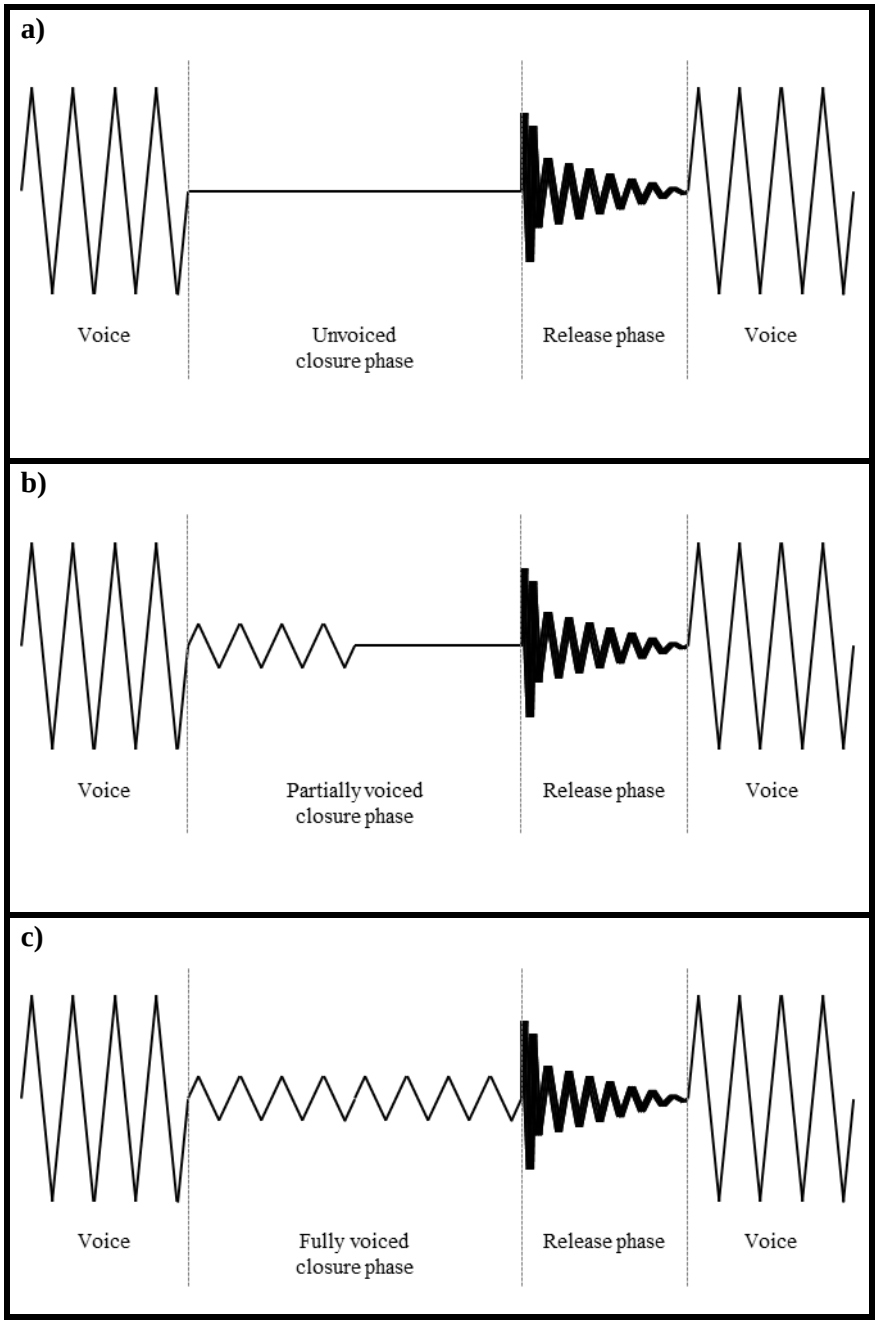


Figure 4.3: Schematic oscillograms for plosives with dissimilar closure phases: a) unvoiced; b) partially voiced; c) fully voiced.

The events during the closure phase have certain implications on the release phase. During the closure, air is obstructed and oral, supraglottal air pressure rises. Vocal fold vibration, however, is only possible when the supraglottal pressure is lower than the subglottal pressure to allow for adequate

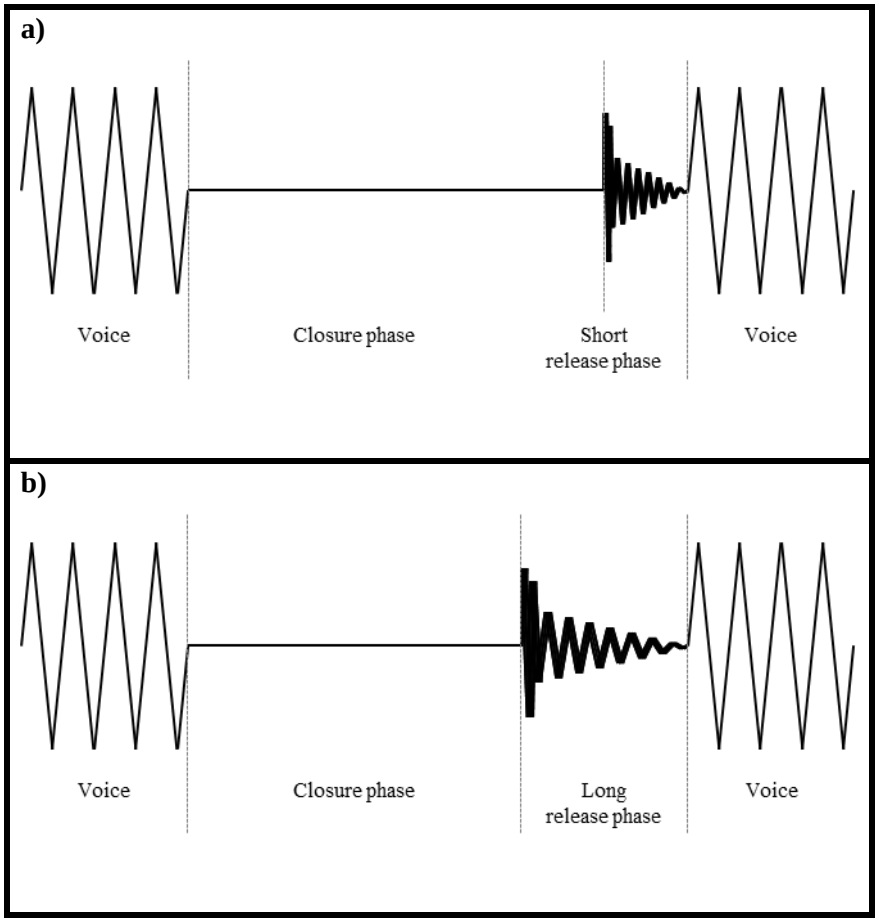


Figure 4.4: Schematic oscillograms for plosives with dissimilarly long release phases: a) relatively short; b) relatively long.

transglottal airflow.[64] For the release phase, then, investigations about the duration between the release and the onset of voicing on a following (voiced) segment can be made; in their seminal paper, Lisker and Abramson (1964) have coined the respective temporal feature voice onset time (VOT). In Figure 4.4, two dissimilar plosives are schematically visualised: one with a relatively short release phase in a), contrasted to one with a relatively long release phase in b). It is theoretically possible to provide more detailed information, such as the duration of the release burst only, or even the durations of the transient and frication phase of the release burst. However, as Abramson and Whalen (2017) point out, to make such fine-grained distinctions "has proven to be quite difficult and unreplicable", and "holds no theoretical importance" for VOT (p. 83).

[64] Kingston and Diehl (1994) provide a short discussion about the size of the air pressure difference for vocal fold vibration: there are a lot of indications suggesting that the initiation of voicing requires a larger pressure drop than its maintenance, but the difference may only be small (pp. 428-429).

Abandoning traditional labels and describing plosives instead in terms of laryngeal specifications allows for a more accurate categorisation of Gilbertese and English plosives: Gilbertese features plosives which are non-specified and can thus be represented with /p^0/, /t^0/ and /k^0/; English features two sets, non-specified /p^0/, /t^0/ and /k^0/, and aspirated /p^h/, /t^h/ and /k^h/ which are specified for |spread glottis|. If one were only given these categories, it would be a fair assumption that the non-specified series of plosives were similar across both languages. However, as just discussed, plosives cannot only differ in terms of laryngeal specifications but also in terms of durational characteristics. As will be shown in the following section, the non-specified series of Gilbertese and English do differ in that respect.

4.4.2 Literature review

Laryngeal specifications and certain durational characteristics of plosives are related. Finding that greater glottal constriction (smaller glottal spread) and, consequently, greater subglottal pressure and reduced air flow cooccur with longer VOTs, Higgins, Netsell, and Schulte (1998) suggest the former to be the cause of the latter. This is in line with Kim (1970) who argues that VOTs are in a direct inverse relationship with laryngeal specifications:

> the narrower the glottis at the time of release of a stop, the sooner the onset of vocal cord vibration, as the cords are almost already positioned for vibration; and the wider the glottis, the longer the intervening period between the release and the onset of voicing, i.e., the longer the aspiration. (p. 109)

Kim proposes that aspiration is simply a function of the glottal opening size at the time of the release: "if a stop is *n* degree aspirated, it must have an *n* degree glottal opening" (p. 111). In contrast to Lisker and Abramson (1964), this view suggests that speakers do not actively control VOT, that is, the timing of voice onset delay, but rather the size of the glottal opening (Kim, 1970, p. 112). Hence, since aspirated stops are laryngeally specified for |spread glottis|, they are expected to exhibit longer VOTs than stops that are non-specified. In general, this is true. However, VOTs can vary greatly and categorical durational contrasts are not always maintained.

In this section, then, I review relevant literature on factors that have been shown to affect VOT in one way or another: closure duration, place of articulation, burst frequency and aspiration intensity, formant frequencies, phonetic environment, speaking rate, characteristics of the word and phrase containing the plosive, sex, age, and L2 influences. Subsequently, the relevant findings of the discussions are concluded in order to highlight that, besides a number of strong indications for how a particular factor influences VOT, there are also many conflicting accounts and several unanswered questions. Finally, social factors are investigated whose influence on VOT seems very plausible in light

of other, insufficient and unsatisfactory explanations. The aim of this review is to explain the VOT variation emerging in the Kiribati English data as well as to draw attention to patterns that are unexpected and unique to Kiribati's linguistic situation.

Notes on production and perception experiments

Prior to discussing relevant literature, it is worth making an explanatory note on how production and perception experiments are usually carried out, and how their results are usually presented. A great many production experiments are conducted in sterile laboratory environments with sound booths and high-end equipment. It is also very common that participants are asked to produce a scripted sentence of only a few syllables, such as "Say ___ again", with differing plosives in the initial position of monosyllabic minimal pairs: for instance *bin* versus *pin*, *den* versus *ten*, or *goal* versus *coal*. This approach allows for various factors to be held constant, as well as for data analysis to be carried out comparatively easily and quickly. Traditionally, the obtained results are then presented in histograms, as schematised in Figure 4.5. Such visualisations are useful because they provide information about three aspects of plosive production that are of importance: the positions of clusters on the x-axis represent the VOT values with which plosives are produced; the widths of these clusters represent the VOT variability, in other words, the value range covered; and the distances between the clusters provide information about category separation. Such figures are complemented by references to statistical calculations like means, standard deviations, and so on.

The aim of production studies is to assess whether a particular factor exerts an influence on VOT, in terms of any of the three aspects mentioned. For reasons that will be addressed in the following paragraphs, changes are considerably more pronounced in the production of aspirated rather than non-specified plosives, a state of affairs that is also captured in the two panels of Figure 4.5: in a), both variant types exhibit relatively little variability and occupy separate VOT ranges; b), on the other hand, represents aspirated variants that are produced with lower VOTs and more variability which results in a partial overlap of the two categories, all while non-specified variants remain the same.

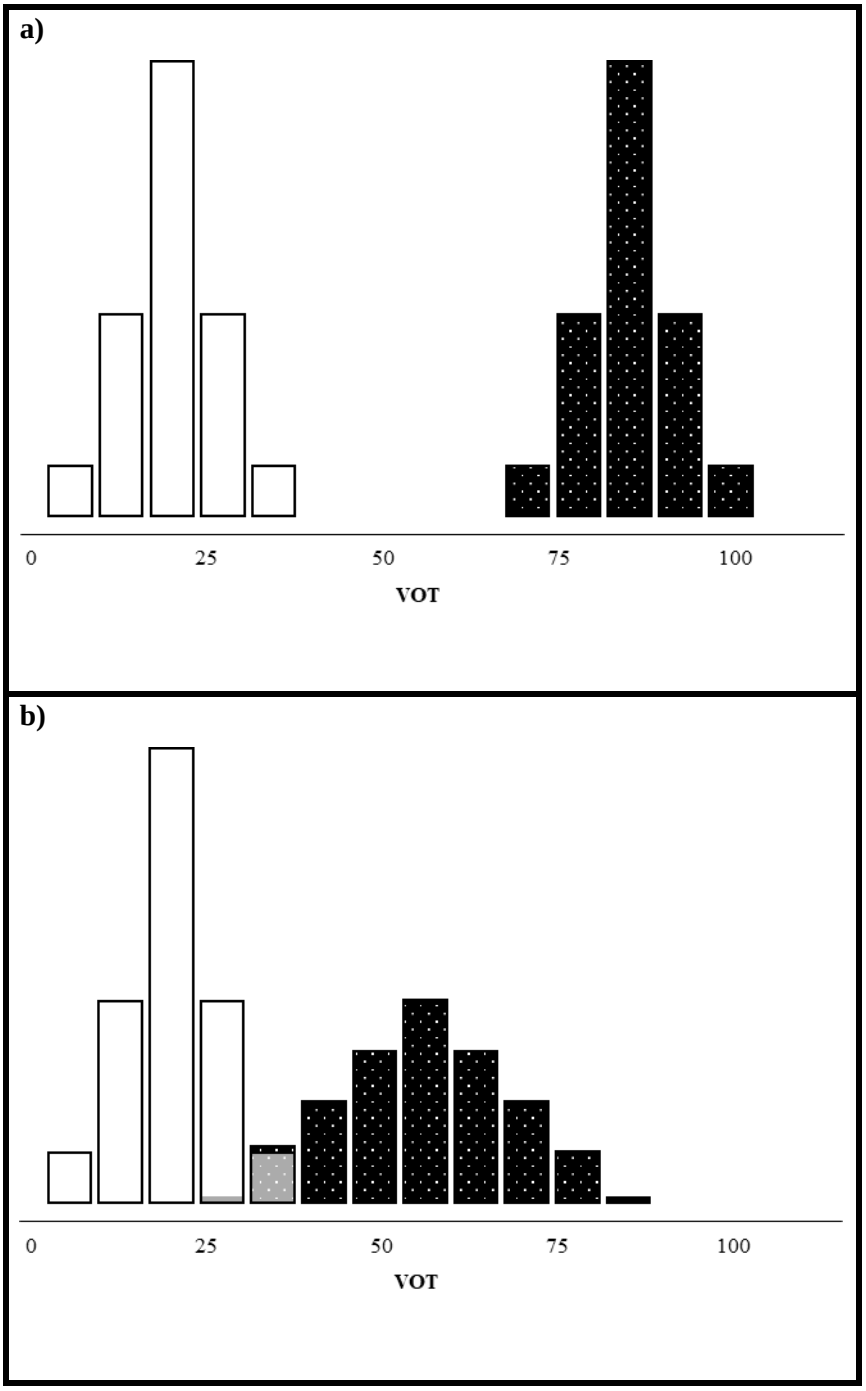


Figure 4.5: Schematic examples of histograms typically used in production studies. White: non-specified; aspirated: black, dotted. The two histograms present different patterns: a) relatively low VOT variability for separated variant types; b) relatively high VOT variability and lower VOT values for aspirated realisations, resulting partial category overlap.

Perception studies incorporate synthesised stimuli, usually of monosyllabic structure. For example, an alveolar plosive preceding [ɛn] may be processed in such a manner as to create a continuum

of stimuli with VOTs ranging from, say, 5 to 70 milliseconds, in 5-millisecond steps. In randomised order, these stimuli are then aurally presented to study participants who are tasked with their categorisation: ‹den› or ‹ten›, for /t^0/ or /t^h/ respectively. The responses so obtained can be visualised in a simple line plot, as exemplified in Figure 4.6. Such plots usually have one focus category and only present the percentages of either non-specified or aspirated responses. It is a common finding of perception experiments that stimuli with lower VOTs are perceived as non-specified, and stimuli with higher VOTs as aspirated. Thus, a plot visualising the response rate for the non-specified category shows a line starting at high percentages for lower VOT values which falls to low percentages for higher VOT values; conversely, a plot visualising the response rate for the aspirated category shows a line starting at low percentages for lower VOT values which rises to high percentages for higher VOT values; the plots in Figure 4.6 are of the latter kind.

The aim of perception studies is to assess at what point during a continuum the perception of synthesised stimuli changes from non-specified to aspirated, or vice-versa. By means of the above described methodology, it becomes apparent that there exists a boundary at or around which response rates change, usually relatively abruptly: the VOT value, at which the line intersects the 50%-mark indicates that perception boundary. It is worth noting that the boundary often falls between two stimuli whose response rates are more extreme, say, 25% and 75%; at least for native speakers of English. Studies further aim to determine the effect of a particular factor on VOT perception; that is, under certain influences, stimuli with identical VOTs may be perceived differently. For example, panel a) in Figure 4.6 indicates a perception boundary between 15 and 20 milliseconds and that a stimulus with a VOT of 35 milliseconds is identified as aspirated by most listeners tested, or, if it is presented more than once, in most of its repetitions; in panel b), the perception boundary is approximately 20 milliseconds higher, and the same stimulus with a VOT of 35 milliseconds is mostly identified as non-specified. In simple terms, a higher VOT boundary means more non-specified perceptions, and a lower VOT boundary means more aspirated perceptions.

The subsequent paragraphs contain discussions of factors that have been shown to exert an influence on VOT. Similar production patterns found across studies – higher or lower VOT averages, greater or lesser variability, category separation or overlap – are indicative of both whether and how a particular factor is influential. Similar perception patterns across studies – higher or lower VOT boundaries – allow for analogous conclusions. Moreover, the findings of production and perception experiments should complement each other: for instance, plosives produced with lower VOTs at faster speaking rates and perception experiments yielding lower VOT boundaries for faster-rate stimuli are in mutual support, whereas contradicting patterns make it doubtful whether a tested factor is truly influential.

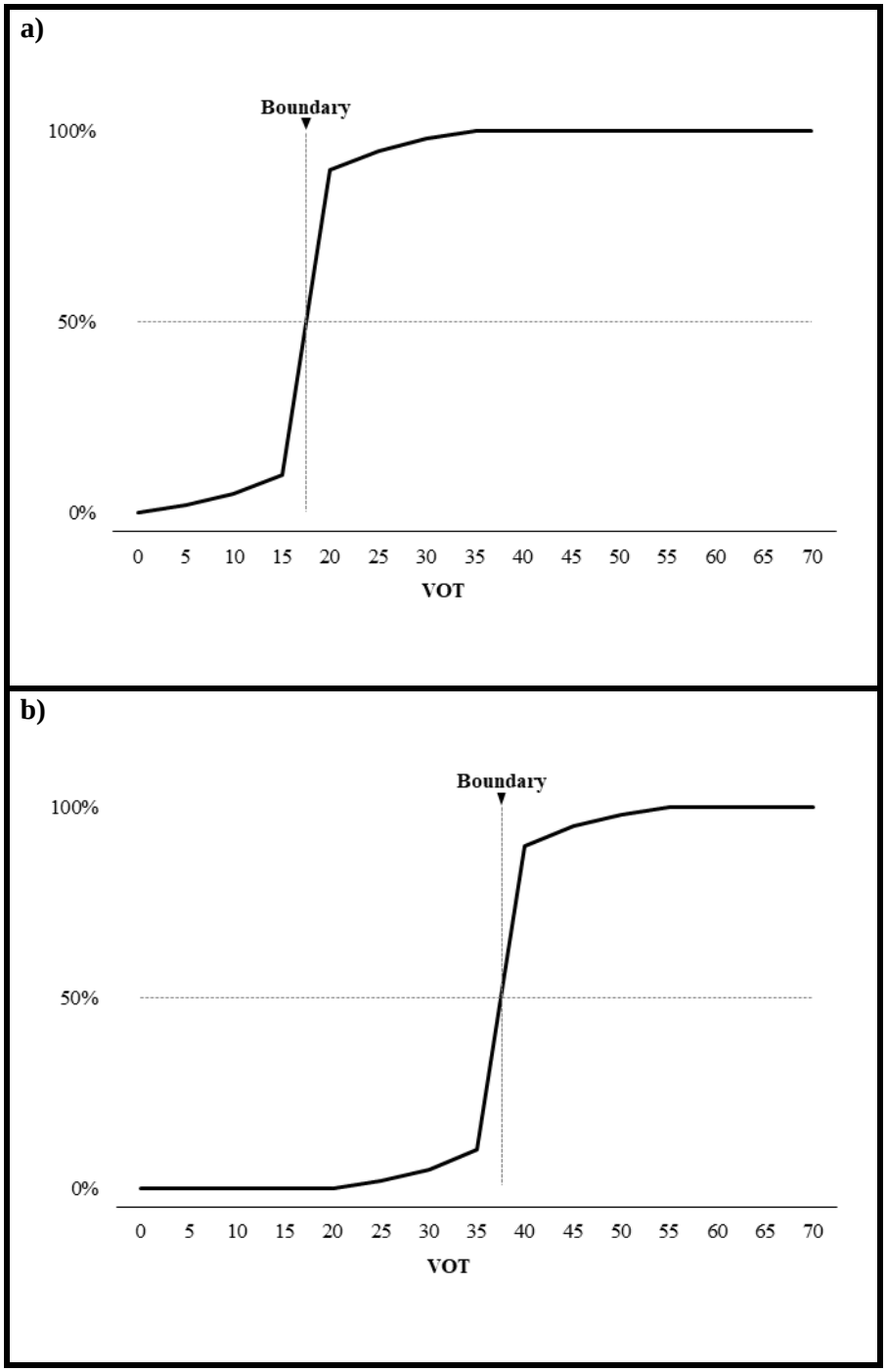


Figure 4.6: Schematic examples of line plots typically used in perception studies. The lines visualise how frequent a plosive stimuli with a certain VOT value is perceived as aspirated (lines for non-specified tokens start high and end low); the VOT value at which the line intersects the 50%-mark indicates the perception boundary: a) relatively low boundary; b) relatively high boundary.

The following discussions will show that effects on VOT can be relatively large. It may therefore be misleading to provide average values without specifying any further pieces of information

about the linguistic context. Keeping in mind such ramifications, however, a VOT boundary range of 20 to 40 milliseconds may serve as a good reference: perceptual boundaries have often been found to fall into this zone, and likewise, non-specified variants are often produced with values below, and aspirated variants with values above it. Moreover, I will focus somewhat more on aspirated stops than on their non-specified counterparts: firstly, in the English language, the latter are generally much less affected, by any factor that will be discussed below; secondly, stops that exhibit voicing during the closure time and unvoiced non-specified stops are traditionally analysed as one (see Lisker & Abramson, 1964) which is problematic, at the very least for an analysis of positive VOT values (see also Robb, Gilbert, & Lerman, 2005).

Closure duration

To begin with, closure duration requires a short discussion in its own right since there are indications that it may serve as an independent cue in the identification of non-specified and aspirated plosives. Lisker (1957) found that, in intervocalic position, the closure durations of bilabial non-specified stops average at around 75 milliseconds and that of bilabial aspirated stops at around 130; moreover, his perception experiment strongly suggests that listeners discriminate between the two sets on the basis of such durational characteristics. In subsequent studies, however, effects were somewhat different: on the whole, observed closure duration differences were over 50% smaller, only occurred in certain stress contexts and word positions, or exhibited an inverse relationship where the closure durations of non-specified variants were longer than those of their aspirated counterparts (see for instance Cole, Choi, Kim, & Hasegawa-Johnson, 2003; Flege & Port, 1981; Klatt, 1975; Lavoie, 2001; Stathopoulos & Weismer, 1983). Thus, there is not enough evidence to suggest that closure duration alone suffices as a perceptual cue for the distinction between non-specified and aspirated plosives.

With reference to extra-linguistic factors, it is possible that physiological changes in the later stages of life are responsible for relatively longer closure durations (see for instance Benjamin, 1982). However, the remainder of this literature review will cast a light of doubt on explanations relating solely to physiology. For a language such as English, with non-specified and aspirated categories of plosives, there are hardly any studies on the influence of any other extra-linguistic factors on the closure phase. Noteworthy exceptions are that of Jacewicz, Fox, and Lyle (2009) who report regional variation for the amount of closure that is voiced, and that of Podesva, Eckert, Fine, Hilton, and Jeong (2015) who observe that, for Californian Central Valley residents, the intensity of voicing during the closure varies as a function of whether or not their livelihood is earned off the land. They therefore make it plausible, if not evident, that seemingly subtle acoustic variables such as these are not just governed by linguistic processes but may also be subject to sociolinguistic variation. This point will be addressed in more detail in the last part of this section.

Unlike in the case of Swiss German, then, the duration of the closure alone does not seem to function as a primary means to establish phonemic contrasts between non-specified and aspirated plosives in English. Furthermore, Cooper and Nager (1975) specifically test whether changes in closure durations and VOT covary but found no consistent correlation. In the linguistic contact situation of Kiribati, then, it would be surprising to find speakers create a new phonemic category that does not exist as such in the substrate or the target language.

Place of articulation

Since only alveolar variants are investigated in the current study, effects relating to place of articulation are not of relevance. Moreover, unlike in the case of other factors that may influence VOT production and perception, the existing literature provides a rather clear and conclusive picture. A very brief discussion will thus suffice.

In their original study, Lisker and Abramson (1964) investigated 11 languages that differ in terms of the number and types of laryngeal specifications of plosives. They found that velar stops consistently exhibited the longest VOTs, followed by alveolars for which VOTs are either equal to or longer than those of bilabials. That such patterns have also been observed in numerous subsequent studies, notably a report on 18 languages (different ones from those surveyed by Lisker and Abramson) authored by Cho and Ladefoged (1999), suggests a universal tendency: the farther back the closure, the longer the VOT.

Burst frequency and aspiration intensity

Several researchers provide evidence that, besides the value of VOT representing the duration of voice onset delay, the frequency of the burst and intensity of aspiration during the delay are important cues for the identification of plosives as non-specified or aspirated. Cooper, Delattre, Liberman, Borst, and Gerstman (1952) report that the frequency of the burst provides information about the place of articulation of an aspirated plosive: high frequencies of approximately 3’000 Hertz and above are generally associated with /t^h/, while low frequencies of up to about 1’000 Hertz as well as the remaining mid frequencies are associated with /p^h/ and /k^h/, depending on the vocalic context and therefore on formant transitions (more information is given below). In a more recent study, Chodroff and Wilson (2014) report relatively similar findings with respect to the centre of gravity, the frequency value of the mean spectral energy. Furthermore, they demonstrate that non-specified stops are produced with lower burst frequencies than their aspirated counterparts in the same place of articulation, an effect that carries over into perception: the higher the centre of gravity, the more likely a stop is perceived as aspirated.

As regards aspiration intensity, Summerfield and Haggard (1974) as well as Winitz, LaRiviere, and Herriman (1975) show that replacing aspiration with silence – while keeping VOT constant –,

affects the perception of stops insofar as they become more difficult to correctly identify. Thus, the presence or absence of aspiration alone may not be indicative for a category distinction, at least not in synthesised stimuli which, as the former authors remark, are "not wholly natural" (p. 287). In another experiment, Winitz et al. changed the intensity of the aspiration noise – rather than to mute it altogether –, and so demonstrate that more sounds are perceived as aspirated when the respective portion is louder; however, only the perception of stops in some phonetic environments were affected. In a more rigorously structured study, Repp (1979) finds more robust evidence for this effect: as aspiration intensity increases, the perception boundary between non-specified and aspirated plosives shifts to lower values; that is, stops with loud aspiration are more likely to be perceived as aspirated.[65] This, Repp hypothesises, indicates that an increase in intensity is perceptually equivalent to an increase in duration (p. 182).

Formant frequencies

To begin with, McCrea and Morris (2005) demonstrate that intonational F0, or sentential pitch, has an effect on VOT production: asking their participants to repeat sentences at 10%, 30% and 50% of their established pitch range, it became apparent that the VOT values of aspirated stops decreased by approximately 6 milliseconds from the lowest to the highest pitch rendition; non-specified stops were unaffected. The study was replicated by Narayan and Bowden (2013) who find very similar relationships and, with a mean difference of 10 milliseconds, a somewhat larger effect.

Besides sentential pitch, F0 also exerts an influence in a more subtle fashion at the transition between the plosive and the following vowel. For non-specified stops, F0 after the plosive release is usually lower and flat or rising; for aspirated stops, it is usually higher and falling. Moreover, several studies report that both contours and the value of F0 itself are perceptible to listeners and aid in the identification of sounds as non-specified or aspirated: the higher F0, as a transition onset frequency or as stable value throughout the transition, the more likely a stop is perceived as aspirated (Abramson & Lisker, 1985; Fujimura, 1971; Haggard, Ambler, & Callow, 1970; Whalen, Abramson, Lisker, & Mody, 1993; Winn, Chatterjee, & Idsardi, 2013). Winn et al. (2013) also show that, when aspiration noise is reduced or masked, listeners rely increasingly more on such F0 information rather than on VOT; this is support for both F0 and aspiration intensity as perceptual cues. However, in terms of cue weighting, it is generally agreed that VOT is far more important than F0 in natural speech which is largely unmasked and unfiltered.

Furthermore, several experiments aimed at establishing the effect of first and second formant frequencies on VOT. They have shown that, in production, short VOTs are usually accompanied by

[65] Repp shows in a second experiment that the intensity of the burst alone plays a relatively small role: "rather, the total noise portion seems to be perceptually significant" (p. 187).

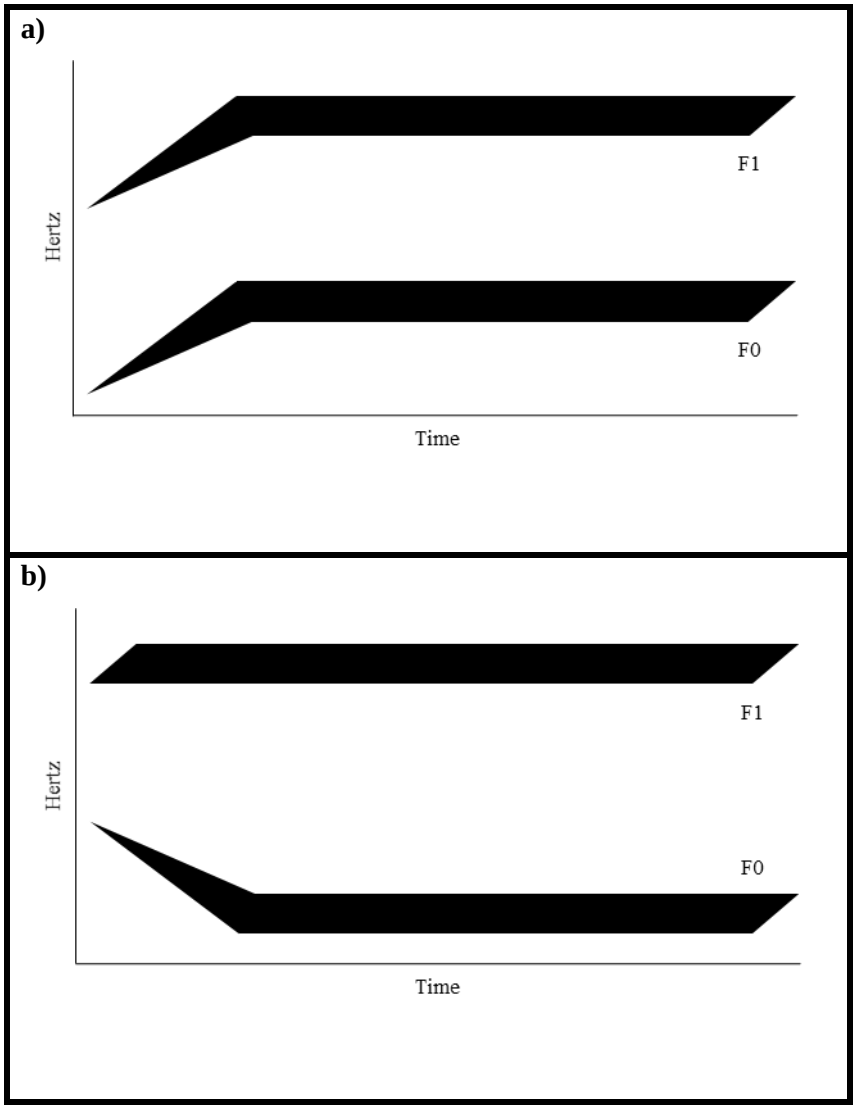


Figure 4.7: Schematic spectrograms of F0 and F1 contours at plosive-vowel transitions. Different production examples: a) low and rising F0 and F1 contours more likely associated with non-specified stops; b) high and falling F0 and stable F1 contours more likely associated with aspirated stops.

low F1 onsets followed by a rise into the target frequency of the following vowel, while delayed F1 onsets at higher frequencies are possible with longer VOTs; in perception, low F1 frequencies at the onset of the transition may constitute a cue, of a secondary nature, for non-specified rather than aspirated stops (Cooper, Delattre, Liberman, Borst, & Gerstman, 1952; Delattre, Liberman, & Cooper, 1955; Liberman, Delattre, & Cooper, 1958; Lisker, 1975; Winn, Chatterjee, & Idsardi, 2013). The frequencies of the second formant seem to carry information about the place of articulation of the plosive, but not about its laryngeal specification (Cooper et al., 1952; Delattre et al., 1955). In other words, there is no correlation between F2 and VOT, neither in production nor perception.

Figure 4.7 summarises the findings for formant frequencies at the plosive-vowel transition discussed here. The two panels show F0 and F1 contours which are more likely associated with a particular plosive category: a) shows low and rising contours during the transitions often found in the production of non-specified stops; b) shows high and falling contours for F0 as well as a steady F1 frequency, characteristics more often observed in the production of aspirated stops.

Phonetic environment

The literature suggests that the height of the vowel has durational implications on the VOT of an immediately preceding plosive. In reference to Docherty (1992) as well as Higgins, Netsell, and Schulte (1998), Morris, McCrea, and Herring (2008) summarise the influence of two factors on VOT production in prevocalic contexts:

> The first is lower peak oral airflows for the high vowels. Therefore the pressure drop in the supraglottal space to create the necessary transglottal pressure difference for the onset of voicing will occur more slowly and prolong the VOT. The second is an anterior, vertical pull on the vocal folds that would increase glottal resistance prior to high-vowel production. In this case, the phonation threshold pressure will be greater and more subglottal pressure will need to be developed for the onset of voicing. (p. 315)

Unsurprisingly, then, it is reported in a number of studies that plosives before /i/ occur with longer VOTs than plosives in the context of other vowels (Berry & Moyle, 2011; Flege, 1991; Higgins et al., 1998; Klatt, 1975; Maclagan, Watson, Harlow, King, & Keegan, 2009; Morris, McCrea, & Herring, 2008; Nearey & Rochet, 1994; Ohala, 1981; Repp, 1986; Sonderegger, 2012; B. L. Smith, 1978; Whiteside, Henry, & Dobbin, 2004); the average difference is generally smaller than 20 milliseconds.[66] Perception experiments further corroborate that /i/ is associated with longer VOTs (Cooper W. E., 1974; Kluender & Lotto, 1994; Nearey & Rochet, 1994). It is more surprising, however, to find less robust patterns for /u/ or indeed other vowels. Several researchers observe no significant or no straightforward effect of vowel height (Allen & Miller, 1999; Kessinger & Blumstein, 1997; Lisker & Abramson, 1967; Mortensen & Tondering, 2013; Petrosino, Colcord, Kurcz, & Yonker, 1993; Stuart-Smith, Sonderegger, Rathcke, & Macdonald, 2015; Weismer, 1979), or paradoxical patterns: Summerfield (1975), for instance, reports that the expected longer VOTs before /i/ in comparison to /a/ only occurred for velar aspirated plosives, whereas bilabial counterparts showed the inverse relationship. Similarly, Zue (1976) observes "no systematic variation" with regards to height (p. 85), as well as inconsistent patterns for lip-rounding or fronting (pp. 88-98).

[66] A notable exception is reported by Maclagan et al. (2009) in whose corpus some Maori speakers had a mean VOT of 69 milliseconds before high, and 29 milliseconds before low vowels. Maori only features a non-specified set of plosives, which may allow for greater vocalic effects.

It has been proposed that vowel tenseness rather than other vocalic characteristics affects VOT. Port and Rotunno (1979) observed that lax vowels /ɪ/, /ʌ/ and /ʊ/ are on average 25% shorter in duration than their tense counterparts /i/, /ɑ/ and /u/ respectively, and are responsible for a VOT shortening of approximately 10 milliseconds or 11% in the plosives that precede them; Weismer (1979) reports very similar patterns.[67]

On the basis of the literature reviewed here, it is questionable whether effects of vowel height and vowel tenseness will be apparent in the Kiribati English corpus. Furthermore, L2 speakers very frequently produce vowels with properties, including quality and tenseness, that render them dissimilar from vowels in the respective target variety. Detailed analyses of these phonetic features, such as formant frequency or temporal measurements for vowels, would therefore be required.

Literature on aspects of the phonetic environment other than the characteristics of the following vowel is comparatively sparse. Yao (2009) observes that consonants and vowels can exert a different influence on VOT, in the following as well as in the preceding environment; however, only two speakers are juxtaposed for whom patterns are dissimilar and of only very small effect sizes. In a larger and more focussed study, Sonderegger (2012) observes 21% longer VOTs for aspirated plosives preceding sonorants in comparison to prevocalic contexts.

Specifically comparing word-initial singletons and clusters, several authors report that VOTs of aspirated plosives preceding other consonants are longer than those of singletons, by an average difference of up to 20 milliseconds (Klatt, 1975), 29 milliseconds (Zue, 1976), or even 40 milliseconds (Menyuk & Klatt, 1975). When occurring in /s/-initial clusters, aspiration is massively reduced for plosives that fall into the phonemic category otherwise associated with the laryngeal specification of |spread glottis|. As a result, the above authors observe VOTs that are shortened to values that are hardly discernible from those of non-specified plosives (see also Smit & Bernthal, 1983). Importantly, this is the case for both prevocalic plosives in /s/-clusters (/s/__V) and medial plosives that precede a third consonant (/s/__C, for example /str/). Kim (1970) proposes that, in /s/-clusters, the feature |spread glottis| is shared between the fricative and the stop, allowing for glottal gestures to take place already during the former:

> the glottal movement for /p/ of /sp/ will start during /s/, i.e., the glottis will begin to widen. This means that, if the glottis is instructed to open to the same degree and for the same period for /p/ of /sp/ as it would for initial /p/, the glottis will begin to close by the time the closure for /p/ is made, and consequently, by the time /p/ is released, the glottis will already have become so narrow that the voicing for the following vowel will immediately start, and thus we have an unaspirated /p/ after /s/. . . . since /s/ is voiceless and does not require the closing of the glottis, the opening of the glottis for /p/ does not have to wait for the completion of /s/ but can proceed simultaneously with the oral articulation of /s/. (p. 114)

[67] Nearey and Rochet (1994) assert that the longest VOTs were produced before the tense /i/ and /u/ while the shortest VOTs were found before the lax /ɪ/, /ʊ/ and /ʌ/; this, however, is not corroborated by the data they provide in the respective article which do not suggest an orderly pattern of that kind.

It needs to be noted that English does not feature any syllable-initial clusters in which /s/ precedes phonemically non-specified stops. The necessity to maintain a distinction in terms of laryngeal and glottal gestures can thus be put into question. Moreover, learners of the English language often do not distinguish plosives in clusters from singletons and produce aspiration in both contexts – for example [st^{h}ei] for *stay* –, which lends further support to the view that non-aspiration is a possibility rather than a necessity. In EFL and ESL contexts like that of the present study, then, it is important to pay adequate attention to the realisation of plosives in /s/-clusters and analyse them as a separate cluster type.

Investigating the influence of syllables on VOT, Port and Rotunno (1979) report that a simple /ɪn/ rhyme structure is responsible for longer VOTs in the syllable-initial aspirated plosives than when compared to /ɪpt/. The difference of approximately 15 milliseconds or 20% cooccurs with a difference in vocalic duration of about 60%. The relationship per se is reminiscent of similar findings regarding vowel tenseness, as discussed above; the effect size, however, is much larger. As the vowels are phonemically identical in the minimal pairs tested, the authors point out that vowel duration changed as a function of the differentiating element, namely the coda. Therefore, the structure of the coda exerts an effect on VOT; if not on its own, then indirectly through affecting the duration of the intermediate vowel. Similarly, Weismer (1979) reports that the VOTs of aspirated plosives in the onset position are longer when the syllable-final (as well as word-final) plosive is non-specified rather than aspirated (for example [kɪd] versus [kɪt]). He concludes that vocalic durations and final consonants exert individual effects and, when combined, an effect that is best described as "simple, or additive" (pp. 202-203).

Complementing the discussion of syllabic influences, Yu, De Nil and Pang (2015) instructed their study participants to produce bilabial aspirated plosives in structures differing in syllable number: monosyllabic /pa/ and multisyllabic /pataka/. VOTs (of the initial stop) in the former context averaged at about 70 milliseconds, and in the latter at about 61. The effect may indeed occur as a result of syllable number. However, on the basis of the above cited literature, it is possible to identify differences in vowel duration or the addition of a non-specified stop after the vowel as plausible explanations for the observed variation. Moreover, increasing the number of syllables also increases the possibility that the rate at which mono- and multisyllables are produced does not remain constant. Speaking rate has been widely shown to affect VOT, and greatly so, requiring a discussion in its own right.

Speaking rate

In a follow-up study on their initial publication on VOT, Lisker and Abramson (1967) conclude that there are considerable differences between plosives in isolated words and stops in short – and, in their case, scripted – sentences. In isolated words, non-specified and aspirated variants are "distinctly different" (p. 5) within each place of articulation. In sentences, however, "appreciable overlap" can be observed (p. 24): while the non-specified series practically remained unchanged, aspirated stops were 30 milliseconds shorter in the sentence condition; variability around the mean VOT within each

category did not differ significantly. Importantly, Lisker and Abramson tentatively conclude that the rate of syllable production is a non-factor which only exerts a negligible influence on VOT, if any at all (p. 15).

Subsequent studies, however, provide ample evidence that VOT varies considerably as a function of speaking rate. Regardless of whether rate is measured in terms of vocalic, syllabic, lexical or sentential duration, or in isolated syllables or embedded in longer utterances, aspirated English stops are produced with shorter VOTs in the faster condition (Allen & Miller, 1999; Baum & Ryan, 1993; Diehl, Souther, & Convis, 1980; Kessinger & Blumstein, 1997; Miller, Green, & Reeves, 1986; Smith, Wasowicz, & Preston, 1987; Stuart-Smith, Sonderegger, Rathcke, & Macdonald, 2015; Summerfield, 1975; Theodore, Miller, & DeSteno, 2009; Volaitis & Miller, 1992; Yu, Abrego-Collier, & Sonderegger, 2013); similar evidence from Icelandic (Pind, 1995), a language also featuring non-specified and aspirated stops, suggests that speaking rate effects are universal. Instructing their subjects to produce CV syllables at eight different rates, Volaitis and Miller (1992) report a gradual increase of VOT by approximately 70 milliseconds for aspirated alveolar stops and 90 milliseconds for aspirated labial and velar stops as syllable duration increased from about 150 to 750 milliseconds; in a similarly structured study, Theodore et al. (2009) find comparable results and make the noteworthy observation that effect sizes vary considerably across speakers (see also Allen, Miller, & DeSteno, 2003, and Chodroff, Godfrey, Khudanpur, & Wilson, 2015). Klatt (1975) hypothesised that the reason for the relationship between VOT and speaking rate is that "the glottis does not have time to fully open, or there may be a reduction in the muscular effort expended to abduct the vocal folds in rapid speech" (p. 694), an argument that is in mutual support with that of a simple, inverse relationship between VOT and the size of the glottal opening as proposed by Kim (1970).

Only few of the studies cited entail discussions of the effect of speaking rate on VOT variability, suggesting perhaps that it is not great enough. Such an assumption is supported by Kessinger and Blumstein (1997) who explicitly state that variability does not change significantly (p. 157). Miller, Green, and Reeves (1986)[68] and Volaitis and Miller (1992), on the other hand, observe less variability for aspirated labial stops at faster rates. However, alveolar and velar stops which were also tested in the second study did not exhibit the same effect. While in both of these studies the sample sizes of only three subjects further compromise the validity and generalisability of the reported pattern, Smith, Wasowicz, and Preston (1987) find a similar effect for a larger test group, and across all places of articulation: at fast rates, variability remained constant for the younger group, but decreased by approximately 60% for the same-sized older group. This, they conclude "suggests that variability is not merely a function of duration" (p. 527). More discussion on age-related aspects follows below.

[68] The respective experiment is reported in Miller et al. (1986), but VOT variability is discussed in a later publication by Miller and Volaitis (1989).

Table 4.5: VOT value (in milliseconds) of an upper perceptual limit. (Source: Miller & Volaitis, 1989.)

	bilabial	**alveolar**	**velar**
Slow (CV syllable duration: 325ms)	168	169	165
Fast (CV syllable duration: 125ms)	81	87	92

In complementation to the evidence obtained in production studies, the VOT boundary above which stops are perceived as aspirated shifts to lower values as rate increases, regardless of whether rate is measured in terms of vocalic, syllabic, lexical or sentential duration, in isolated syllables or embedded in longer utterances (Ainsworth, 1973; McMurray, Clayards, Tanehaus, & Aslin, 2008; Miller & Volaitis, 1989; Raphael, 1972; Summerfield, 1975, 1981; Wayland, Miller, & Volaitis, 1994); [69] once again, the similar evidence from Icelandic (Pind, 1995, 1996) suggests universality. The shift of the perceptual boundary is not as large as the average shortening of VOT in production. In an attempt to find the maximum possible size of shift, Summerfield (1981) presented a sentence of 11 monosyllabic words at nine different speaking rates to six listeners; the duration of the shortest sentence was 5, that of the longest 35 seconds. The data obtained indicated that boundaries shifted from approximately 5 to 16 milliseconds to lower values, 12 milliseconds on average.

While the above listed perception studies are, for the purpose of this research paper, relatively similar in design, Miller and Volaitis (1989) chose to make a noteworthy addition: they not only asked listeners to identify non-specified and aspirated labial stops in CV syllables at different rates, but also variants with long VOTs that fell under a category labelled "exaggerated, breathy version" (p. 507). This allowed them to assess whether, in addition to positions of perceptual boundaries between non-specified and aspirated stops, there exists an upper boundary beyond which aspirated stops are perceived as unnatural. Their experiment supports the hypothesis of such an upper limit, and that its position, too, assumes shorter VOT values at faster rates; a later replication of this experiment yielded comparable results for labial and velar plosive stimuli (Volaitis & Miller, 1992). Table 4.5 provides the respective VOT averages. It is apparent that the shift of upper perceptual boundaries is considerably greater than that between non-specified and aspirated variants which are perceived as natural. Further

[69] In several studies listed here – that of Ainsworth, 1973, McMurray et al., 2008 and Raphael, 1972 – it was observed that durational differences in the vowel had an effect on the VOT boundary. Since the stimuli used in these cases were isolated monosyllables, these findings are better interpreted as speaking-rate effects, not vocalic effects (for a discussion on the dissociation of speaking-rate and vocalic effects, see for instance Repp, 1982).

evidence for the existence of an upper limit is provided by Yeni-Komshian, Caramazza, and Preston (1977) who report that their Arabic subjects did no longer perceive stimuli as plosives when VOT exceeded a certain value (p. 44).

Complementing the studies cited so far in which speaking rate effects on VOT were by and large investigated in very controlled settings, Baran, Laufer, and Daniloff (1977), Chodroff et al. (2015), Lisker and Abramson (1995), Sonderegger (2012), Stuart-Smith, Sonderegger, Rathcke, and Macdonald (2015) as well as Yao (2009), provide insights for unscripted conversational speech. They demonstrate that effects are generally similar in that fluent conversational speech triggers shorter VOTs for aspirated variants in comparison to values reported for more controlled speech. However, Baran et al. found considerably more VOT variability in conversational speech than in oral reading or in the citation of monosyllabic words, which seems to stand in contrast with other rate effects on variability that have been discussed above (no effect, or less variability at faster rates).[70]

In sum, the literature reviewed here allows for the following conclusions to be drawn: speakers produce shorter VOTs for aspirated stops at faster rates, and listeners expect shorter VOTs for aspirated stops at faster rates. I am unaware of studies in which a different effect – longer VOTs or stable VOTs – has been observed. But why are only aspirated stops affected in English? Beckman, Helgason, McMurray, and Ringen (2011) offer a compelling explanation: speaking rate influences those variants that are laryngeally specified. For languages with plosives that are specified for aspiration, the duration of such aspiration becomes shorter as speaking rate increases, resulting in a reduced temporal contrast between the aspirated and non-specified sets (for example English); for languages with plosives that are specified for voicing during the closure phase, the duration of such voicing becomes shorter as speaking rate increases, resulting in a reduced temporal contrast between the voiced and non-specified sets (for example French). This also holds true for languages that feature voiced, aspirated and non-specified variants: as speaking rate increases, the contrast between all three categories is reduced, as pre-voiced stops become less pre-voiced and long-lag VOTs become shorter (for example Thai). Beckman et al. finally discuss the case of Central Swedish which features a rare contrast of voiced and aspirated plosives in the absence of a non-specified set. In this variety, then, the phonemic categories are temporally more distinct than languages that feature a non-specified series which would allow for a clear contrast to be maintained even if only one variant set was affected by speaking rate. However, in line with and in support of the hypothesis that laryngeally specified variants change, the VOTs of both voiced and aspirated variants decrease at faster speaking rates.

[70] Baran et al. (1977) measured speaking rate in terms of syllables per second and found no significant differences between unscripted speech and oral reading; the latter exhibited the least variation of all (four) speaking styles tested. However, this method of measuring rate, did not allow for a comparison of these styles with the citation of monosyllabic words, which consistently exhibited the longest VOTs. It is very likely that a different method, for instance the comparison of syllable duration, would have shown citations to be the slowest, in which case the effect of speaking rate on variability would have been more robust: less variability for VOTs of aspirated variants at slower rates, and inversely, more variability at faster rates.

Word and phrase

VOT production is dependent on whether the word containing the plosive is uttered in isolation or is part of a larger phrase. Lisker and Abramson (1967) demonstrate that in the former condition aspirated plosives are produced with consistently longer VOTs, by approximately 30 milliseconds on average. As discussed above, they argue that, in their sample, these differences do not result from different speaking rates. Besides that, several other word- and phrase-related aspects exert an influence on VOT which will be discussed here in three blocks: 1) word frequency and word type, 2) word stress and plosive position in the word, and 3) phrasal accent and plosive position in the phrase.

As for the first block, word frequency and word type have both been observed to affect speaking rate. With only little differences cross-linguistically, frequent words are shorter in duration than infrequent words, and also more susceptible to reduction and lenition processes (for a discussion of relevant literature on this topic, see for instance Cole, Kim, Choi, & Hasegawa-Johnson, 2007). In their 13'910-word database consisting of unscripted conversational speech, Bell, Brenier, Gregory, Girand, and Jurafsky (2009) observe that function words are considerably more frequent than content words and are indeed clearly shorter. Moreover, they show that word predictability on the basis of the co-text has a similar effect, in that two words that have a relatively high probability to occur together are generally produced with shorter durations. These and the above discussed findings for speaking rate allow for three derivations to be made: firstly, the VOT values of stops in frequent words are lower because frequent words are shorter; secondly, the VOT values of stops in function words are lower because function words are more frequent and thus shorter; and thirdly, the VOT values of stops in predictable words are lower because predictable words are shorter. Sonderegger (2012) finds shorter VOTs for aspirated plosives in frequent words which is in support of the first derivation. Yao (2009) only reports a weak frequency effect, but observes that function and content words do differ as formulated in the second derivation: a visual inspection of the figures provided suggests a median difference of approximately 30 milliseconds for a first, and 20 milliseconds for a second speaker. However, no effect of lexical frequency is found by Stuart-Smith, Sonderegger, Rathcke, and Macdonald (2015) for a larger sample of 23 participants.

The second and third block entail discussions about relevant aspects of the word and the phrase that relate to their segmental as well as isochronic and metrical structure. To begin with, Buizza and Plug (2012) provide the following summarising description of how such aspects affect speech production in general:

> consonants in initial positions in domains such as the syllable, the word, the foot and the phonological phrase tend to be articulated with tighter stricture, greater initiation effort and expanded duration relative to non-initial consonants, while phrase-final consonants are frequently lengthened relative to phrase-medial ones. (p. 4)

Once again, factors that affect speaking rate, by extension, should also affect VOT – if they do not have a more direct effect. Such assumptions will be scrutinised here.

With respect to the foot, Iverson and Salmons (1995) posit that English stops belonging to the phonemic category associated with aspiration are, in reality, only produced with a glottis that is fully spread in foot-initial position: /t^{h}/ in words like *time*, *entire*, and *longitude* are foot-initial and therefore produced with aspiration, while /t^{h}/ in words like *sting*, *after*, or *night owl* are foot-medial and foot-final and are produced without a fully abducted glottis. Above, I have raised the point that, in EFL and ESL contexts, non-aspiration of syllable-internal clusters may have to be regarded a possibility rather than a necessity. This point is reiterated here: rules applying to the foot in the English language may or may not be adhered to by non-native speakers of English.

As regards word stress in more general terms, it has been observed that plosives in stressed environments have longer values than plosives in unstressed environments. Sonderegger (2012) reports a stress difference of up to 19% for aspirated plosives in conversational speech. Antoniou, Best, Tyler, and Kroos (2010) observe difference of up to 15 milliseconds on average for plosives embedded in more controlled sentences. Similarly, Lisker and Abramson (1967) find a difference of 6 milliseconds for plosives in sentences, and one of 24 milliseconds for plosives in isolated words; in their data, aspirated plosives are more affected than their non-specified counterparts, resulting in a diminished category separation in unstressed environments. Furthermore, the impact of word stress on the production of VOT seems to be dependent on the position of the plosive in the word and on the phonetic environment. Klatt (1975) shows that the VOTs of stops in stressed positions may be approximately 15 milliseconds longer than those of stops in unstressed intervocalic word-initial position (V#_V, or V#_C where the consonant is a sonorant), and approximately 35 milliseconds longer in comparison to those of stops in intervocalic word-medial or word-final positions (see also P. A. Keating, 1984, or Lavoie, 2001).

Finally, in the third block, findings relating to VOT effects of phrasal accent and of plosive position within the phrase are investigated. It has been suggested that during stops occurring in rapidly produced environments lacking metrical prominence, there is less time for the glottis to be fully abducted resulting in shorter VOTs (Iverson & Salmons, 1995; Kingston & Diehl, 1994; Klatt, 1975), which explains the observed patterns for word stress and phrasal accent, and their similarities: Choi (2003), Cole, Choi, Kim, and Hasegawa-Johnson (2003), as well as Cole, Kim, Choi, and Hasegawa-Johnson (2007) report that plosives in accented words exhibit roughly 10 to 20 milliseconds longer VOTs than plosives in unaccented words. Interestingly, phrasal accent also affects F0, in that increased values are found in the vicinity of accented stops; this and the previously discussed finding that stops with a higher F0 are more likely perceived as aspirated are in mutual support. Interestingly, in contrast to word stress, the above studies do not suggest that non-specified and aspirated stops are necessarily less separated when unaccented.

Table 4.6: Positional and metric effects on plosive production.
(Source: Kingston and Diehl, 1994.)

Position, metric	**[+voice]**	**[-voice]**
utterance-initial	short lag VOT	long lag VOT
or pre-tonic	weaker burst intensity	higher F0
	lower F0	higher F1
	lower F1	stronger burst intensity
intervocalic	shorter closure duration	longer closure duration
or post-tonic	closure voicing	no closure voicing
	lower F0	higher F0
	lower F1	higher F1
	longer preceding vowel	shorter preceding vowel
utterance-final	shorter closure duration	longer closure duration
and post-vocalic	closure voicing possible	no closure voicing
	lower F1	higher F1
	longer preceding vowel	shorter preceding vowel

With regards to plosive position in the phrase, however, the findings that are reported do not provide a clear picture: some observe that utterance-medial plosives are produced with shorter VOTs in comparison to utterance-final plosives (Flege & Hammond, 1982; Summerfield, 1975) or in comparison to utterance-initial plosives (P.A. Keating, 1984[71]); but others observe the inverse, namely that utterance-initial plosives can have shorter VOTs in comparison to plosives elsewhere (Yao, 2009); still others find no significant differences in average VOT as a function of phrasal position (Choi, 2003; Stuart-Smith, Sonderegger, Rathcke, & Macdonald, 2015); finally, Cole, Kim, Choi, and Hasegawa-Johnson (2007) do find differences in VOT variability, but also none regarding average VOT or, what is of importance too, for burst amplitude. It thus remains unclear whether or how phrasal position alone affects the production of VOT.

It is possible, however, that, much like word stress and plosive position in the word, phrasal accent and plosive position in the phrase interact. In reference to various other studies, Kingston and Diehl (1994) summarise how a list of characteristics, including formant frequencies and burst intensities, are affected in three different positional and metrical environments and thus help distinguishing voiced from voiceless stops (see Table 4.6). It is worth noting that they use traditional

[71] Keating does not discuss such differences explicitly as the focus her paper lies on a cross-linguistic comparison between Polish and English. However, the plots provided leave no doubt that, in her English data, the VOTs of medial aspirated stops are shorter than those of initial stops.

Table 4.7: Research on VOT and sex. Column *VOT ∩ sex*: lists the largest VOT difference reported in the respective study.

Author(s)	**VOT ∩ sex**	**Author(s)**	**VOT ∩ sex**
Women > men		*Women = men*	
Diehl et al. (1980)	Δ 48 ms	Koenig (2000)	Δ 12 ms (women > men)
Swartz (1992)	Δ 18 ms	Ryalls et al. (2004)	Δ 11 ms
Whiteside & Irving (1997)	Δ 16 ms	Sweeting & Baken (1982)	Δ 8 ms (women > men)
Ryalls et al. (1997)	Δ 13 ms	Benjamin (1982)	Δ 5 ms (women > men)
Thomas (2012)	Δ 2 ms	Morris et al. (2008)	Δ 1 ms (women > men)
Sonderegger (2012)	Δ 10%	Yu et al. (2014)	Δ 5 ms (no values provided)
Robb et al. (2005)		*Women < men*	
		B. L. Smith (1978)	Δ 4 ms
		Interaction	
		Torre & Barlow (2009)	sex ∩ age

labels but show sensitivity to actual laryngeal specifications and do provide positive VOT values also for the non-specified category. From the table and from the discussion of this and prior sections, it is apparent that the position of the plosive in the word as well as in the phrase are not sufficient indicators of VOT, but that there are indeed complex interactions between a myriad of speech production characteristics.

Sex

From the literature available, it is not entirely conclusive how VOT changes as a function of sex. In the majority of studies, it is reported that women have longer VOTs than men by up to 48 milliseconds

(Diehl, Souther, & Convis, 1980; Robb, Gilbert, & Lerman, 2005; Ryalls, Zipprer, & Baldauff, 1997; Sonderegger, 2012; Swartz, 1992; R. M. Thomas, 2012; Whiteside & Irving, 1997), or that differences are small and statistically non-significant (Benjamin, 1982; Koenig, 2000; Morris, McCrea, & Herring, 2008; Ryalls, Simon, & Thomason, 2004; Sweeting & Baken, 1982; Yu, De Nil, & Pang, 2015). In other cases, sex is only found to be influential when it is analysed in terms of an interaction with age, but not on its own (Torre & Barlow, 2009). As far as I am aware, B. L. Smith (1978) provides the sole example of an inverse pattern, that is, men having longer VOTs than women; only non-specified plosives were investigated for which the average sex difference was 4 milliseconds. Table 4.7 provides a summary of the literature and findings cited here.[72]

Most of these studies do entail statistical discussions including citations of standard deviations, which provide information about sex and VOT variability. However, variability is not discussed in its own right, most probably because women and men do not differ greatly in this respect, or not in a meaningful way: for some plosive variants, women are more variable than men; for others, men are more variable than women. VOT seems to be arbitrarily variable for the two sexes.

In reference to Fant (1966) who calculates the female vocal tract length to be approximately 20% shorter than that of the male, B. L. Smith (1978) argues that physiological differences between men and women are also responsible for VOT differences between the two sexes: men produced /t^0/ variants with 22 milliseconds on average, women with 18 – almost exactly 20% shorter. However, summarising previous literature on sex differences regarding respiratory function, laryngeal and supralaryngeal behaviour, Robb, Gilbert, and Lerman (2005) conclude that women build up more supraglottal pressure before the release of the plosive. It thus takes longer to fall back below the subglottal pressure, which is necessary to allow for transglottal airflow and phonation of the vocal folds. Hence, the conclusion that can be drawn from these physiological differences relating to sex stands in contrast to Smith's: on average, women are more likely to produce longer VOTs.

The above cited studies provide more evidence for the latter position. Yet, their reported findings are dissimilar: only in some cases, women were found to have longer VOTs than men; in others, the inverse relationship has been observed, or no apparent effect in either direction.[73] Morris, McCrea, and Herring (2008) propose that such dissimilarities are the result of different study designs. However, the remainder of this literature review allows for the assumption that physiological

[72] It is of importance to note that the studies discussed here differ greatly in terms of the methodologies applied: different plosive variants were tested; variants were tested individually in some cases, in others not; and not all authors provide statistical numbers or discussions. Such information is given in an enhanced version of Table 4.7 in Appendix A.11.1.

[73] To make matters even more complicated, the VOT production of women has been shown to be affected by hormone levels during the menstrual cycle: Whiteside, Hanson, and Cowell (2004) found that female speakers produced significantly different values during high oestrogen and progesterone phases and thus state explicitly that inconsistency between other reports on sex effects may be explained by hormonal states; their study was replicated by Wadnerkar, Cowell, and Whiteside (2006) with very similar findings and conclusions.

explanations alone do not suffice, and that other factors may be more influential on the production of VOT.

Age

Several studies have been conducted on VOT developments during childhood and adolescence. For languages like English, which establishes a phonemic contrast by means of aspiration, a series of physiological explanations suggests that aspirated stops are more difficult to produce than their non-specified counterparts and thus require a particularly long time to develop (see for instance Port & Preston, 1972); as reported by Eguchi and Hirsh (1969) or Tingley and Allen (1975), it is not until the age of 11 that adult control of VOT is acquired. In a more recent study, Yu, Nil and Pang (2015) not only corroborate that mean VOTs decrease until they are adult-like by age 10 or 11, but also that variability around the mean is greater until the age range of 16 to 18. Moreover, very similar results were obtained in a perception study by Elliott, Busse, Partridge, Rupert, and DeGraaff (1986): children between 6 and 8 exhibited perception patterns that were different from adults, but those of children between 8 and 11 were not.

With regards to (English) VOT development during adulthood, there is astonishingly little consensus in the literature. Some researchers find that for their study participants mean VOT is decreasing over apparent-time (Benjamin, 1982; Liss, Weismer, & Rosenbek, 1990; Morris & Brown Jr., 1987 Morris & Brown, 1994; Ryalls, Simon, & Thomason, 2004; Smith, Wasowicz, & Preston, 1987; Weismer & Fromm, 1983), but the reported effect sizes differ greatly from one another. Others conclude that VOT does not change gradually (R. M. Thomas, 2012), or not significantly (Petrosino, Colcord, Kurcz, & Yonker, 1993; Sweeting & Baken, 1982). And finally, in some cases, age is only found to be influential when it is analysed in terms of an interaction with another factor, but not on its own: age interacting with sex (Torre & Barlow, 2009), or age interacting with the following vowel (Neiman, Klich, & Shuey, 1983). As is apparent from Table 4.8, the range within which mean VOTs of younger and older speakers have been found to vary in the abovementioned studies lies between +2 and -23 milliseconds.[74]

Several physiological changes are known to occur during adulthood. In reference to a number of other studies, Neiman, Klich, and Shuey (1983) list the following developments: calcification and ossification of laryngeal cartilages, atrophy of the intrinsic laryngeal muscles, reduction of biomechanical efficiency, and reduction of vital capacity. Attempts to explain age-related VOT patterns with such physiological developments, however, are not entirely convincing. On the one hand, the

[74] Much like in the case of research on VOT and sex, the studies on VOT and age discussed here differ greatly in terms of the methodologies applied: different age groups were analysed; different plosive variants were tested; variants were tested individually in some cases, in others not; and not all authors provide statistical numbers or discussions. Here, too, such information is given in an enhanced version of Table 4.8 in Appendix A.11.2.

above literature review demonstrates that VOT can remain stable or change towards shorter values with increasing age. If physiological processes are at play, they seem to be inferior to other, stronger factors, and thus do not suffice to make predictions about whether or not VOT shifts will occur. On the other hand, there are better indications that VOT becomes more variable as speakers get older: those studies that provide relevant information either observe a significant increase in variability (Morris & Brown, 1994; Smith, Wasowicz, & Preston, 1987; Sweeting & Baken, 1982; Torre & Barlow, 2009), or no apparent effect (Neiman, Klich, & Shuey, 1983; Petrosino, Colcord, Kurcz, & Yonker, 1993; Weismer & Fromm, 1983), while an inverted relationship has not yet been reported, to the best of my knowledge. Thus, while physiological developments do not satisfactorily explain changes in mean VOT in all cases, there are somewhat better indications that they are responsible for changes in VOT variability.

It is important to note, that greater variability does not necessitate greater overlaps of the phonemic categories. Sweeting and Baken (1982) investigate category separation in its own right and confirm that, as a consequence of decreased VOT means and increased VOT variability, the tested /p^0/ and /p^h/ variants were gradually less separated over apparent-time. However, they also remark that only one of 10 participants over the age of 75 exhibited an overlap. Furthermore, Smith, Wasowicz, and Preston (1987) did not only observe an increase in variability over time: as already discussed above, variability was reduced by approximately 60% for faster rates of older speakers, while it remained constant for the younger group. Such an interaction, then, may help keeping the phonemic categories separated in fluent speech.

In short, the relationship between age and VOT remains not entirely clear. While previous literature suggests that variability may increase as speakers get older, there are conflicting results with regards to whether VOT averages decrease during adulthood. This state of affairs also makes it difficult to interpret developments observed during childhood and adolescence: it remains unclear which observable changes can be attributed to first language acquisition or physiological processes occurring during childhood and adolescence, and which changes can be attributed to factors that have been shown to be the source of VOT variation for adults. Which factors do influence VOT production over time is a question to be explored further as, so I argue on the basis of the above literature review, physiological explanations are insufficient and unsatisfactory.

Table 4.8: Research on VOT and age. Column *VOT ∩ age*: contains the largest VOT difference reported in the respective study; positive values indicate an increase across age groups; negative values indicate a decrease.

Author(s)	Age groups	VOT ∩ age	Author(s)	Age groups	VOT ∩ age
Decrease			*No effect*		
Morris & Brown (1994)	20-35 75-90		Sweeting & Baken (1982)	25-39 65-74 75+	Δ +2 ms Δ -9 ms
Smith et al. (1987)	24-27 66-75	Δ -2 ms	Petrosino (1993)	20-30 70-87	
Liss et al. (1990)	65-80 87-93	Δ -8 ms	Thomas (2012)	5-75 (7 groups)	
Benjamin (1982)	21-32 68-82	Δ -16 ms	*Interaction*		
Ryalls et al. (2004)	20-30 55-69	Δ -20 ms	Torre & Barlow (2009)	20-35 60-89	age ∩ sex
Morris & Brown (1987)	20-35 75+	Δ -20 ms	Neiman et al. (1983)	20-30 70-80	age ∩ foll. vowel
Weismer & Fromm (1983)	19-27 63-85	Δ -23 ms			

L2 VOT production

Of particular importance for a study of VOT production in a language-contact situation is of course the assessment of how different laryngeal specifications are acquired or learned, in particular after childhood. A myriad of relevant studies provide rather clear patterns.[75] It has been shown that a speaker's degree of foreign accent in general correlates strongly with their VOT production, in that less proficient speakers deviate more from target-like values than more proficient speakers (Flege & Eefting, 1987; Hazan & Boulakia, 1993; Major, 1987; Riney & Takagi, 1999). The implication is perhaps more surprising than the correlation itself: aspiration of English plosives is not acquired abruptly, but subject to gradual acquisition with VOT values becoming more target-like over time. Indeed, less proficient speakers either produce plosives in a similar fashion to their L1 or with VOT values that are intermediate to those of their L1 and the target language, while more proficient speakers are more target-like and effectively switch between language modes (Alharbi, 2009; Flege, 1991; Flege & Eefting, 1987; Flege & Port, 1981; Harada, 2003; Hazan & Boulakia, 1993; Kang & Guion, 2006; Mack, 1989; Magloire & Green, 1999; Major, 1987; McCarthy, Evans, & Mahon, 2013; Riney & Takagi, 1999; Schmidt & Flege, 1995; Schmidt & Flege, 1996; Swanson, 2006; Thornburgh & Ryalls, 1998; Williams, 1977, 1979). It is worth noting, however, that not all proficient L2 speakers of English have been found to exhibit target-like VOT patterns (Caramazza, Yeni-Komshian, Zurif, & Carbone, 1973; Fowler, Sramko, Ostry, Rowland, & Halle, 2008; Simon E. , 2009; Sundara, Polka, & Baum, 2006), or not in all phonetic contexts (Antoniou, Best, Tyler, & Kroos, 2010). Moreover, while perception studies clearly show that listeners discriminate between plosives with the same VOTs solely on the basis of the language context they are presented in, perception boundaries usually remain at intermediate values even for those L2 speakers that are more target-like in their production (Bohn & Flege, 1993; Caramazza, Yeni-Komshian, Zurif, & Carbone, 1973; Elman, Diehl, & Buchwald, 1977; Mack, 1989; Rojczyk, 2011; Williams, 1977).

Furthermore, studies whose focus lies on instances of code-switching show that VOT adjustments or more substantial switches between language modes can occur in rapid succession of one another, but crucially, they do not have to: only some researchers observe differences, albeit small ones, between the monolingual and code-switched modes (Piccinini & Arvaniti, 2015); others find that English plosives are more affected (they are rendered less English-like) by code-switches than those of the second language tested (Balukas & Koops, 2015), but the exact contrary has also been reported, that is, a lesser effect in English and a greater effect in the second language tested (Antoniou, Best, Tyler, & Kroos, 2011); yet others suggest that effects on the VOT production of code-switched English stops is greater for both L1 and L2 speakers in comparison to the second language tested (Bullock, Toribio,

[75] Many of the studies cited here investigate VOT production by Spanish-English bilinguals, but various other L1 are also represented: Arabic, Dutch, French, Greek, Japanese, Korean, Polish, Portuguese, and Sylheti. With the exception of Korean, all of these languages feature voiced stops, non-specified stops, or both, but no stops that are specified for aspiration.

Gonzalez, & Dalola, 2006), which is contradicted by reports that only code-switches in a speaker's dominant language are subject to such effects (Olson, 2013). In four out of the five studies cited here, the languages under scrutiny were English and Spanish, yet blatant contrasts exist, even between experiments where the proficiency levels of speakers were comparable.

Interestingly, there is more robust evidence that those factors which exert an influence on the VOT production of native speakers of English affect bilinguals in rather similar ways, even if their mother tongue is dissimilar in terms of laryngeal-plosive categories: F1 seems to be a perceptual cue also for speakers in whose mother tongue |voice| is contrasted to a non-specified category, rather than |aspiration| to a non-specified category (Benki, 2005); the VOTs produced by bilinguals are higher and more target-like for high vowels in comparison to low vowels (Thornburgh & Ryalls, 1998; Yavas & Wildermuth, 2006); bilinguals eventually produce plosives in the correct syllabic contexts with short VOTs that are usually associated with the non-specified category but do not always make such distinctions from the start (Swanson, 2006), supporting the claim that non-aspiration is an allophonic rule and a possibility rather than a necessity; speaking rate affects bilinguals in much the same way like English monolinguals, in that shorter VOTs are produced at faster rates (Magloire & Green, 1999; Schmidt & Flege, 1995; 1996); like in the target-language, the VOTs of plosives in isolated words are longer than in sentences (Flege, 1991; Simon E. , 2009; Williams, 1979); there are indications that the VOTs of plosives in word-final position are shorter and less target-like than those of word-initial and word-medial plosives (Alharbi, 2009); sentence-medially, VOTs are longer than sentence-initially (Flege, 1991; Schmidt & Flege, 1996); and finally, no sex differences have been reported in a study conducted by Thornburgh and Ryalls (1998).

Preliminary conclusions

Table 4.9 summarises the findings reported for the several factors discussed above. In some cases, existing literature provided relatively robust evidence for a VOT effect that particular factors exert, but effect sizes differ greatly: while, for instance, relatively clear yet small effects responsible for a mean VOT difference of only 6 to 10 milliseconds have been reported for intonation (sentential F0), a number of studies confirm that fast speaking rates may substantially shorten VOTs, by a magnitude of up to 90 milliseconds. On the basis of such findings, it is possible to formulate certain hypotheses for English production and perception data of other speech communities, including of course that of Kiribati: at higher sentential pitches or at lower speaking rates, for example, higher VOTs should facilitate the identification of a stop as aspirated, whereas lower values may be more difficult for a listener to interpret.

In other cases, however, it is less clear how a certain factor affects VOT, for instance, because physiological explanations and data obtained through experiments do not support one another. There are, for example, seemingly sound explanations for why the articulation of higher vowels should result

in longer VOTs, but this has only partly been proven correct: VOTs of plosives before high front /i/ are longer in comparison to other vowels, but high back /u/ or indeed other vowels do not adhere to the proposed relationship. Importantly, similar discrepancies between suggested physiological explanations and actual speech patterns also exist for the factors sex and age. For the former, a variety of findings have been reported: in some cases, women have longer VOTs than men, elsewhere, it is the inverse, and yet in other cases, no sex effect can be observed. If there are physiological factors, they are clearly inferior to other influences on VOT. Similarly, there are a lot of convincing arguments for why VOT should decrease over the lifetime of a speaker, but only some studies provide supporting data. In cases like these, it is not possible to make any predictions for how VOT production or perception may be affected and which patterns may emerge in the Kiribati English corpus, or indeed anywhere else.

It is important to note that those studies reviewed so far treat both sex and age as physiological factors. If, however, they are regarded as social factors, it is possible to provide tenable resolutions for the problems just highlighted.

Table 4.9: Summary of previously reported linguistic effects on VOT.

Factor	**Effect**	**Derivation**
Closure Duration	Effect on category distinction: no consensus; VOT: no correlation	
Place of articulation	VOT: bilabials < alveolars < velars	
Burst frequency	$C^h > C^0$	C^h perception facilitated through higher burst frequency
Aspiration intensity	$C^h > C^0$	C^h perception facilitated through higher aspiration intensity
F0 (intonation)	VOT: lower > higher (Δ: ca. 6-10 ms)	C^h perception facilitated through longer VOT at higher pitch
F0 (at CV transition)	for C^0: lower and flat or rising for C^h: higher and falling	C^h perception facilitated through higher F0 at CV transition
F1 (at CV transition)	for C^0: low and rising for C^h: delayed and higher	C^h perception facilitated through higher F1 at CV transition
F2 (at CV transition)	No effect on category distinction; carries information about place of articulation	
Height of following vowel	VOT: /i/ > other vowels (Δ: less than 20ms)	C^h perception facilitated through longer VOT preceding /i/
Tenseness of following vowel	VOT: long V > short V (Δ: ca. 10ms or 11%)	C^h perception facilitated through longer VOT for long vowels
Singleton vs cluster	VOT: __C > singleton (Δ: up to 40ms)	C^h perception facilitated through longer VOT for plosives preceding other consonants
Onset structure	VOT: singleton > s__(C) (Δ: equal to C^h vs C^0)	s__ in English renders C^h unaspirated
Rhyme structure	VOT: __VC > __VCC (Δ: ca. 15ms or 20%) VOT: __VC^0 > VC^h (Δ: up to 9ms)	C^h perception facilitated through longer VOT for plosives preceding simple rhymes or rhymes constituted by a non-specified plosive

Syllable number	monosyllables > multisyllables (Δ: ca. 9ms)	C^h perception facilitated through longer VOT for plosives in monosyllables
Speaking rate	VOT: slower rates > faster rates (Δ: up to 90ms; up to 70ms for alveolar plosives) VOT variability: no consensus	C^h perception facilitated through longer VOT for plosives at slower rates
Utterance	VOT: isolated words > larger phrases (Δ: ca. 30ms)	C^h perception facilitated through longer VOT for plosives in isolated words
Word frequency	duration: infrequent words > frequent words	VOT expected to be longer for plosives in infrequent words
Word category	VOT: content words > function words (Δ: up to 30ms)	C^h perception facilitated through longer VOT for plosives in content words
Word predictability	duration: less predictable words > more predictable words	VOT expected to be longer for plosives in less predictable words
Word stress, plosive position in the word	VOT: pre-stressed > elsewhere (Δ: up to 24ms) VOT: pre-stressed > unstressed intervocalic word-initial > intervocalic word-medial/word-final (Δ: ca. 15ms and 20ms respectively)	C^h perception facilitated through longer VOT for plosives in pre-stress positions and, to a lesser degree, in unstressed intervocalic word-initial positions
Phrasal accent, plosive position in phrase	VOT: accented > unaccented (Δ: ca. 10-20ms) VOT in different phrasal positions: no consensus	C^h perception facilitated through longer VOT for plosives in accented positions
Sex	VOT for females and males: no consensus VOT variability: no consensus	
Age	VOT for different ages: no consensus VOT variability: old > young	C^h production expected to be more variable for older speakers
L2 speakers	VOT: monolingual TL > proficient L2 > non-proficent L2 > monolingual NL	C^h production expected to be more target-like for more proficient L2 speakers

Social factors

I have adopted a point of view also expressed by Stuart-Smith, Sonderegger, Rathcke, and Macdonald (2015) who argue that many of the incongruencies found in the existing literature may in fact be the result of social constraints. Firstly, they refer to the fact that, rather than to observe VOT variations that pattern nicely with sex or age individually, interactions between the two factors have been reported (see for instance Torre & Barlow, 2009) which, they propose, suggests that VOT "may reflect age as a socially-conditioned lifestage as much as the results of aging physiology" (Stuart-Smith et al., 2015, p. 4). Secondly, they take the following position on dissimilarities between individual speakers:

> individual variation is consistent with the idea that VOT can be manipulated as a social-indexical characteristic at the level of the speaker, which may or may not intersect with larger social categories such as age, gender, and ethnicity. (pp. 4-5)

Besides the already mentioned discrepancies, there are many other pieces of evidence for such an argumentation which I will discuss here: VOT production patterns reported in studies on imitation, heritage and L2 language speakers, ethnicity, and intra- as well as cross-varietal differences.

As a whole, imitation studies confirm that, under certain circumstances, it is possible to mimic VOTs that are different from a speaker's usual production. To begin with, the data presented by Flege and Eefting (1988) show that, when presented with stimuli that cover a VOT continuum, speakers generally replicate plosives with values they are familiar with rather than to reproduce the linear increase that characterises the sample of stimuli. Similarly, L2 speakers of English replicate plosives with values that approximate or correspond to the laryngeal categories that are featured in the native language, target language, or in both. Flege and Eefting's study shows that, for English-imitating Spanish speakers, whose mother tongue contrasts a |voice| and a non-specified series, this leads to productions of voiced and non-specified stops, or voiced and aspirated stops, or voiced, non-specified and aspirated stops; the first pattern is especially common for monolingual speakers, who have very limited knowledge of English, as is also observed by Yeni-Komshian, Caramazza, and Preston (1977).

Other studies focus on VOT imitation by monolingual speakers of English only. For example, Flege and Hammond (1982) instructed some of their participants to read out sentences, others to read out sentences specifically in a Spanish accent: the latter produced VOT values for what are aspirated plosives in neutrally-accented English speech which were substantially shorter than those of their peers in the control group, but many were not short enough to fall comfortably into the non-specified range. Evidently, it is also possible to produce values that are less typical for both the mother tongue and the target language. In a study by Nielsen (2011), listeners were presented with natural-sounding speech whose – synthesised – plosives had VOTs that were consistently longer or shorter from their own. After exposure to word-initial /p^h/ stimuli with VOTs that were elongated by 40 milliseconds, study participants produced a shift towards the values that were heard. Moreover, this effect was generalised to /p^h/ in words that were not included in the speech sample, as well as to /k^h/ words and thus a different

plosive altogether. Importantly, however, VOTs which were reduced by the same amount of 40 milliseconds were not approximated after exposure, possibly because category separation may greatly diminish and thus "introduce phonological ambiguity" (p. 139). Besides corroborating that speakers can produce unfamiliar VOT values, Nielsen's study clearly shows that VOT production is subject to speech accommodation like many other linguistic variables, too.

That such accommodation can be governed by social factors is demonstrated by Yu, Abrego-Collier, Sonderegger (2013) whose methodology is fairly similar: participants were presented with a story including plosives whose VOTs were elongated by 100%; it was either told by a more likeable narrator and concluding in a happy ending, or told by a less likeable narrator and ending more negatively. Participants were subsequently asked questions about themselves and about the narrative. While post-exposure plosive production was highly variable in terms of context and across individuals, the authors observed that those who heard the narrative with a positive outcome, had more positive attitudes towards the narrator, and judged themselves to be more open to new experiences produced longer VOTs after having been exposed to elongated ones; conversely, those who heard the narrative with a negative outcome, had more negative attitudes towards the narrator, and judged themselves to be less open to new experiences produced shorter VOTs after having been exposed to elongated ones. The observed patterns of convergence and divergence are of course reminiscent of those already discussed by Coupland (1984), for example, and strongly support the claim that VOT production is subject to speech accommodation which is governed by social factors.

Further evidence for this claim comes from studies on heritage language speakers. In line with the above cited literature on L2 VOT production, people who have migrated into an English language setting produce stops of their heritage language with VOT values that are intermediate to those of monolingual speakers of either language involved; generally, these values become gradually more English-like for the generations that follow (Kang & Nagy, 2012; McCarthy, Evans, & Mahon, 2013). However, Nagy and Kochetov (2013) observe that only two out of three ethnic groups they surveyed exhibited such a generational shift. In reference to what are clearly also social factors, the authors propose a number of plausible reasons for most – but not all – of the apparent differences: dissimilar degrees of institutional support and classroom input, dissimilar degrees of pressure to assimilate to English norms, absence or presence of ties to the home country or the desire to practice a culture and language once oppressed.

In further discussing the same data, Nagy (2015) also explicitly addresses the question whether intermediate VOT values are simply a case of incomplete language acquisition or language attrition. At least for the speakers under scrutiny, she concludes that this is not the case as there are "virtually no significant correlations" between VOT and an ethnic orientation score that is constituted by indications about cultural and linguistic environment, attitudes and practices (p. 321). Crucially, if social factors are, at least in part, accountable for intermediate values for stops in the production of the heritage languages by immigrant speakers, they may of course have a similar influence on L2 speakers of English

and may thus explain certain dissimilarities among the reported findings. Another study that allows for the rejection of incomplete language acquisition or attrition arguments is that of Geiger and Salmons (2006) who investigate a German dialect spoken in Wisconsin: after settlement in the mid-19th century – thus spanning much more time than the immigration contexts discussed above –, a generational shift is apparent, but one that diverges away from both the heritage language and the English variety. The resulting gradual shortening has led to a quasi-merger of the non-specified and the once fully aspirated alveolar stops. Importantly, the authors remark that English stops were normally aspirated, which renders this instance of language change arbitrary and puzzling – unless social factors are taken into consideration.

Studies on ethnicity where migration is not a factor provide further support for the claim that VOT is also governed by social influences. In a first study, Ryalls, Zipprer, and Baldauff (1997) find significant VOT differences of up to 7 milliseconds between Caucasian- and African-American speakers. A replicating study revealed no such pattern or, if anything, inverse tendencies (Ryalls, Simon, & Thomason, 2004). The authors hypothesise that there may have been sampling errors or that the older age of the participants may have masked previously observed ethnicity effects. These two studies show that VOT can be, but does not necessarily have to be, among the many linguistic features which characterise African American Vernacular English and which carry a plethora of social meanings.

Even more evidence for the influence of social factors on VOT is found in studies showing intra-varietal differences that can neither be attributed to migration nor ethnicity. Stuart-Smith, Sonderegger, Rathcke, and Macdonald (2015) analyse a corpus of spontaneous Glaswegian speech and make the crucial observation that young speakers produced longer VOTs than the older speakers in the 1970s, but by the 2000s, this pattern had been reversed. Clearly, no one physiological account of how VOT production changes over time can explain such a reversal. The authors provide a number of other reasons. On the one hand, they consider it possible that differences had emerged as a result of more casually conducted conversations in case of the 2000s recordings. On the other hand, they refer to a more general sociolinguistic polarization between working- and middle-class adolescents in more recent years and conclude that the production of shorter VOTs as well as of other linguistic features that are usually associated with vernacular rather than standard forms of Scottish English "may be part of a more general construction of local, non-standard sociolinguistic personae" (p. 39). These findings strongly suggest that VOT does differ as a function of social factors, just like other seemingly subtle acoustic parameters such as voicing intensity (Podesva, Eckert, Fine, Hilton, & Jeong, 2015, as discussed above), or indeed a myriad of other linguistic variables.

Finally, there are good indications that social factors are at least partly responsible for cross-linguistic VOT differences. It has been mentioned above that there seems to be a universal tendency for the effect of place of articulation on VOT production: the farther back the point of obstruction, the longer the voice onset delay; this is also a general finding of the studies on VOT in bilingual contexts

discussed above. Cho and Ladefoged (1999) provide a summary of physiological explanations that have been proposed in the past for this state of affairs. However, crucially, as their survey of 18 languages shows, not all VOT variation can be explained: the analysis of velar plosives showed substantial cross-linguistic differences, even among those languages that share the same number and laryngeal types of plosives in this place of articulation. The authors conclude that, while certain physiological processes are certainly at play, "there is plenty of evidence that languages differ in the targets that they choose" (p. 225). This, too, lends credibility to the claim that social factors can account for VOT variation.

In conclusion, this literature review has shown that certain factors exert a predictable influence on VOT, while in other cases, variation is more likely accounted for by social factors. The former will allow for systematic comparisons to be made between Kiribati English and more standard-like speech patterns. The latter will provide further insights into which social parameters are relevant in the interesting sociolinguistic site that is Kiribati. As such, the following VOT study is one of rather few in which entirely unscripted, spontaneous speech is analysed, one of rather few in which a wide variety of factors are investigated, one of rather few in which age and sex are treated as social rather than physiological factors, and one of rather few that is carried out on an outer-circle, post-colonial World Englishes variety.

4.4.3 Results

In this section, I provide a more detailed account of how alveolar plosives are produced in the English speech of I-Kiribati. For this purpose, I extracted durational measurements for tokens whose oscillograms and spectrograms provided sufficient cues. Figure 4.8 serves as a visual aid for the description of relevant measurement points set: whenever possible, the duration between the release (point 3) and the voice onset (point 4) was measured for all tokens in order to obtain VOT information; points at the beginning of air obstruction (point 1) and, if present, at the end of voicing during air obstruction (point 2) were set for further analyses of the closure phase, particularly the temporal relationship between it and the release phase. A total of 1'381 alveolar plosives proved useful for VOT measuring: 360 [t^0], 543 [t^h], and 478 [t^s] tokens; instances of the entire 3'300-token corpus were not included when the alveolar plosive was not followed by a voiced segment, or discarded when oscillograms and spectrograms provided insufficient cues. In the case of 883 tokens, it was possible to set further measurement points during the closure phase: 236 [t^0], 327 [t^h], and 280 [t^s] tokens; instances were not included when the alveolar plosive was utterance-initial and did not exhibit pre-voicing, or discarded when there were insufficient cues.

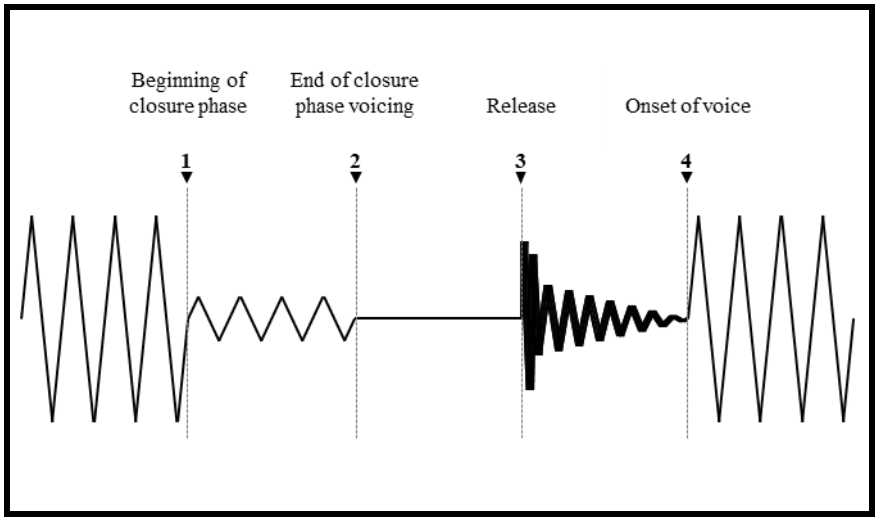


Figure 4.8: Measurement points for the durational analysis of alveolar plosives.

In order to better understand these durational measurements and in order to be able to interpret them in their language-contact context, it is of course necessary to know how alveolar plosives in the English speech of I-Kiribati compare to realisations of alveolar plosives in the substrate language. I used two materials to obtain a VOT reference value: firstly, Gilbertese items in the word-list task conducted with JSS students (as described in Section 3.1.2 above), and secondly, a random sample of Gilbertese utterances occurring in the 33 recorded conversations that constitute my main body of data. The respective measurements show rather clearly that alveolar plosives in Gilbertese are produced with VOTs of 25 milliseconds on average; there is little inter-speaker variation and, surprisingly for a language in which no phonemic distinction needs to be maintained, very little VOT variability. Recalling that phonemic boundaries in English have often been shown to fall into a range between 20 to 40 milliseconds, it is apparent that alveolar plosives would be rendered ambiguous if I-Kiribati produced them in English with the same durational properties as in the substrate language: in such cases, they would neither clearly fall into the non-specified zone, nor clearly into the aspirated zone; accordingly, a more standard-like production of /t^0/ requires shorter VOTs, and, by an even greater margin, a more standard-like production of /t^h/ requires longer VOTs.

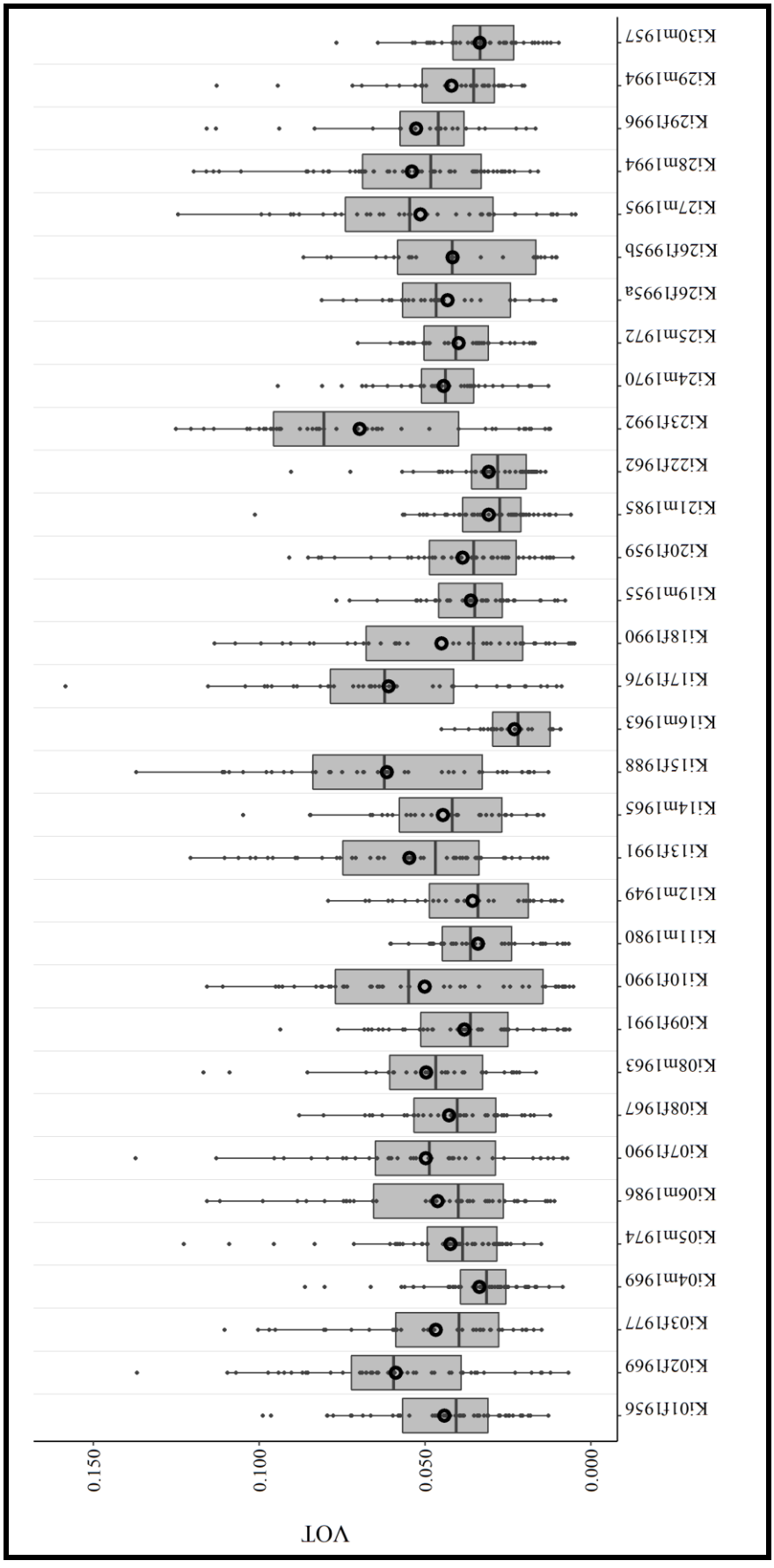


Figure 4.9: VOT measurements for 33 speakers: all variants combined.

The statistical discussions presented below are divided into three parts. In a short, first part, the presentation and inspection of a few simple plots will provide an overview of general patterns as well as answers to questions that may appear simple but are nevertheless of importance in the linguistic context of Kiribati, where substrate and superstrate differ in terms of number and types of alveolar plosive variants. In the second and third part, I discuss the VOT effect of much the same social and linguistic factors that have previously been tested on their influence on variant choice; once again, no analysis is conducted on the variable *Past inflection*. Additionally, investigations are undertaken for alveolar plosives in /s/-initial onset clusters, closure duration, coda structure, word frequency and predictability. The above literature review has also revealed that aspiration and affrication intensity as well as formant frequencies may have a compensatory effect for shorter VOT values. Thus, it would have been ideal to include respective measurements in the analysis of each token. However, there was generally too much interference noise from the environment – such as wind, waves or traffic – in order for these subtle acoustic parameters to be measured with confidence; temporal events such as plosive bursts and voice onsets, on the other hand, were much less affected so that the necessary information for VOT analyses was still preserved.

Figures and tables are presented alongside the text in the case of statistically significant results; Appendix A.12.3 provides the respective materials for all variables tested, those with a significant as well as those with a non-significant effect on VOT.

General patterns

Figure 4.9 plots, for all 33 speakers individually, all tokens that were released and for whom measurements could be taken; statistical information corresponding to this and the following two plots is provided in Table 4.10. The grand mean of the 1’381 tokens is 0.045 seconds – 45 milliseconds. Already from such a general plot, it is apparent that individual speakers differ from one another in noteworthy ways: firstly, the deviation from the grand mean is smaller for some speakers whose VOTs fall into a relatively narrow range of values than for others whose data points are more widely scattered; secondly, the means and medians for individual speakers are in some cases close to the grand mean, in others they are more distant and higher or lower.

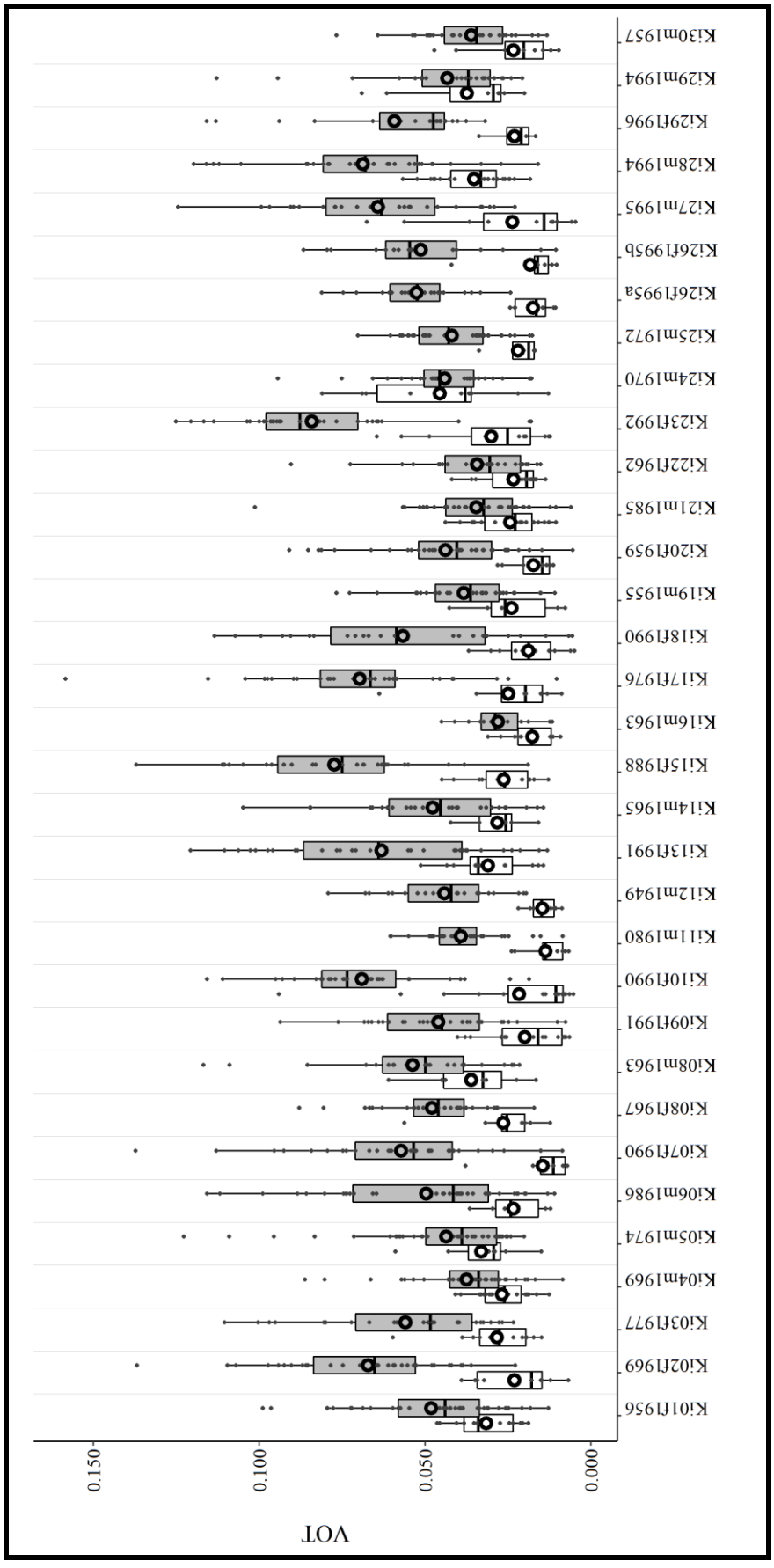


Figure 4.10: VOT measurements for 33 speakers: /t^0/ versus /t^h/.

Next, it is necessary to assess whether /t^0/ and /t^h/ phonemes are differentiated by I-Kiribati speakers of English who do not employ such a contrast in their mother tongue. Figure 4.10 and the corresponding section in Table 4.10 provide a tentative answer: differentiations are generally made and /t^0/ means are lower than /t^h/ means for all speakers, by 26 milliseconds on average, but such differentiations are not maintained categorically by any speaker or equally across speakers. Besides that, it is also apparent that interspeaker differences are of dissimilar orders for /t^0/ and /t^h/: speakers differ much less in terms of deviation from the category mean for the former than for the latter. The VOT average for /t^0/ is 25 milliseconds and thus identical to the reference value for the substrate language. This clearly suggests transfer of mother-tongue patterns and may explain the lesser degree of VOT variability for the respective category.

At this point, it is worth investigating how /t/ variants are realised in /s/-initial onset clusters. As discussed in more detail previously, EFL and ESL speakers may differ from native speakers insofar as they may not produce plosives in such clusters without aspiration and with durational properties that are almost identical with /t^0/ variants, but may retain aspiration and longer VOTs. According visual and statistical inspections show that, while aspiration as well as affrication do occur in some cases and for a few speakers rather frequently, the vast majority of #s__ instances fall into /t^0/ ranges (see Figure A.10 in Appendix A.12.3 for more details.)

Another general question of great interest relates to whether or not affricated tokens constitute a distinct category, albeit without the implication of phonemic status.[76] Figure 4.11 and the third and last section of Table 4.10 leave little doubt that they are: /t^s/ variants have the highest means for all speakers, with the exception of Ki19m1955 for whom only one affricated token could be measured. Analysing /t^h/ and /t^s/ individually shows that the average category separation between /t^h/ and /t^0/ diminishes from 26 to 18 milliseconds, while that between /t^s/ and /t^0/ is 36. In the latter case, category separation is in fact categorical for five speakers – Ki02f1969, Ki11m1980, Ki26f1995a, Ki27m1995, and Ki29f1996 – and almost categorical for many others.

Even when the number of alveolar plosive categories is increased to three and, in doing so, sample sizes per category are reduced, interspeaker variation remains rather large. Table 4.10 provides the relevant figures: differences are highly significant as indicated by the *p*-values for each of the three alveolar plosive categories, and the effect sizes are with 32, 39 and 57 milliseconds for /t^0, /t^h/ and /t^s/ respectively rather large; the R^2-values indicate that models with only *Speaker* as independent variable explain 23%, 19%, and 33% of the variances in the respective data sets.[77]

[76] Although slashes will be used henceforth in order to distinguish between the three alveolar plosive categories identified in this paragraph, they do not signify phonemic status for /t^h/ and /t^s/.
[77] Only the summaries of the respective runs are presented here; see Appendix A12.3 for full runs.

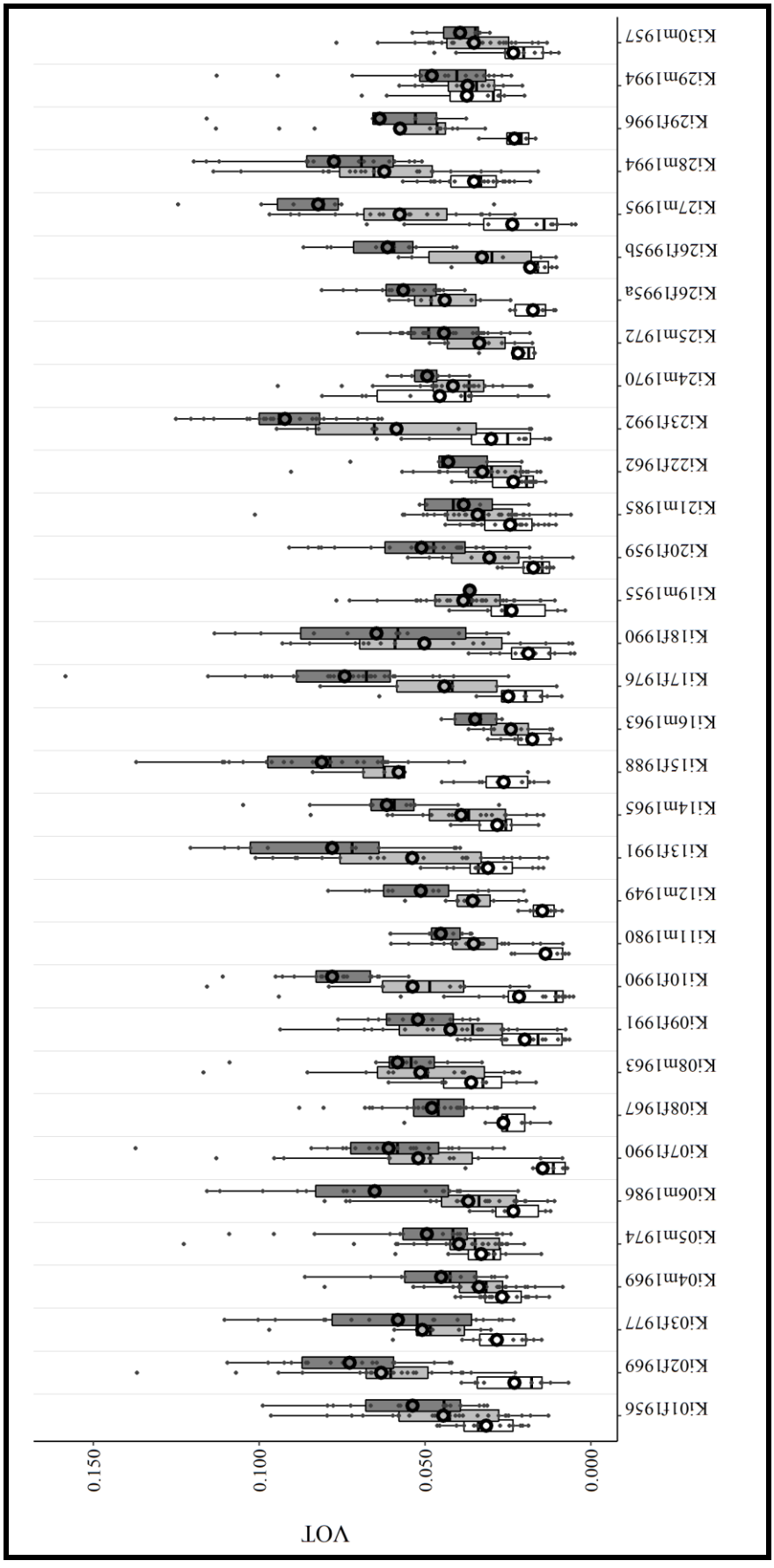


Figure 4.11: VOT measurements for 33 speakers: /t^{0}/ versus /t^{h}/ versus /ʧ/.

Finally, it is necessary to investigate whether category distinction is achieved or maintained by means of closure duration. This is not the case. Correlations between VOT and closure duration are very weak, or at best moderate; this conclusion holds when closure duration is analysed as one temporal event or when its voiced and unvoiced phases are investigated separately, as well as when plosive categories are pooled together or looked at individually (see Table A.59 as well as Figures A.11 and A.12 in Appendix A.12.3 for more details). As has been discussed above, closure duration is not equally as important for category distinction as VOT in the English language and not at all employed as a phonemic differentiator in Gilbertese; hence, this outcome is only little surprising.

These first few points of discussion provide simple yet important pieces of information that are of relevance for further analyses. To begin with, although the Gilbertese language features only one category of alveolar plosives, there are strong indications that I-Kiribati are aware of a differentiation between the two phonemic categories in English and, at least in some form and to some extent, realise it in their own English production. Much like for the analyses on variant choices, affricated realisations remain of particular interest as speakers achieve a better and sometimes even complete category distinction in comparison to renditions that involve aspiration. For all remaining statistical analyses, these three types of alveolar plosives will thus be treated as separate categories. Also, as literature on the topic suggests, the non-specified category exhibits relatively little variation, a tendency that holds across various independent variables, as will be shown. Accordingly, the /t^h/ and /t^s/ categories will be more central during the discussions to follow. Furthermore, /t/ variants in #s__ clusters are durationally more similar to /t^0/ variants, although not without exception. For the remaining analyses, these instances will be counted towards the /t^0/ category. And lastly, the data as analysed so far indicates considerable interspeaker differences. These will be accounted for by including *Speaker* as a random effect in all remaining runs. With such caveats explained, the effect of social variables on VOT can now be scrutinised.

Table 4.10: VOT and *Speaker* (summaries).

	/t⁰/ & /tʰ/		
	n	mean	coef
Speaker			
(33 levels)			
intercept		*0.045*	
effect size		*0.047*	
p		*2.18E-33*	***
R^2		*0.16*	

	/t⁰/			/tʰ/		
	n	mean	coef	n	mean	coef
Speaker						
(33 levels)						
intercept		*0.025*			*0.051*	
effect size		*0.032*			*0.056*	
p		*2.64E-09*	***		*4.95E-52*	***
R^2		*0.23*			*0.27*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Speaker									
(33 levels)									
intercept		*0.025*			*0.044*			*0.58*	
effect size		*0.032*			*0.039*			*0.057*	
p		*2.64E-09*	***		*5.91E-13*	***		*7.95E-27*	***
R^2		*0.23*			*0.19*			*0.33*	

Social factors

Analogous to the analyses of variant choices above, the same social factors are tested on their effect on VOT production: the speakers' age, sex, type of occupation, times abroad, and overall exposure to the English language. Corresponding statistical figures are presented in Table 4.11 below.

The variable *Age* is indeed an interesting one. Its analysis reveals that the above noted inter-speaker variation is not entirely unpatterned. VOT values for /t^{h}/ variants show an annual increase of 0.3 milliseconds (slope *m*); that of the /t^{s}/ category is twice as high which corresponds to a difference of 28 milliseconds between the youngest and the oldest speaker (a 47-year time span) as well as a moderate correlation (correlation coefficient $r = 0.32$). It becomes apparent that older speakers produce all three categories with VOT ranges that greatly overlap, while younger speakers generally achieve a much clearer distinction between /t^{0}/ and /t^{h}/, and especially /t^{0}/ and /t^{s}/. Much like in the case of the variable sex which is discussed below, it is not clear whether age acts as a physiological or social factor, in the case of the Kiribati English corpus or in general. Decreases have been reported in many but not all studies cited above, and they are of a smaller magnitude than that observed here. It is also of importance to repeat that there is no correlation between age and English proficiency levels: impressionistically, speaker Ki06m1986 is one of the most basilectal speakers but has an above-average VOT mean for /t^{s}/ variants; speaker Ki16m1963 is one of the most acrolectal speakers but his mean VOT for /t^{s}/ is the lowest in the entire data set. In other words, the two speakers' English proficiency is not a good indicator of VOT production, but their age is. Possible explanations for the emergent pattern and for what, in the context of previous literature on VOT and age, are surprisingly large effects will be discussed below.

There are relatively robust findings for the influence of *Sex* on a speaker's VOT production, as its complementing graph shows: female speakers produce longer /t^{h}/ and /t^{s}/ tokens than male speakers, on average by 8 and 12 milliseconds respectively. It is not entirely clear how such sex differences are to be interpreted. The literature on this factor yields an inconclusive picture about whether sex exerts an influence on VOT production as a physiological factor, as a social factor, or both.

In case of the variable *Occupation*, four groups have been constructed for which exposure to and use of the English language increase from the first to the last. Accordingly, one might assume that the first and second group, constituted by participants without a job and participants with a local job respectively, produce lower VOTs and exhibit greater category overlap than the university students and job owners of the third and fourth group. However, no such effects are apparent. All four groups are remarkably alike.

Similar conclusions can be drawn for the effect of time that speakers have spent outside Kiribati. Neither the duration nor the number of stays abroad seems to have had an impact on durational properties of English alveolar plosives (*Time abroad*). There are no continuously larger VOTs or increased category distinctions from speakers who have never been abroad to those who have spent several months or years outside Kiribati, even repeatedly (since statistically significant yet

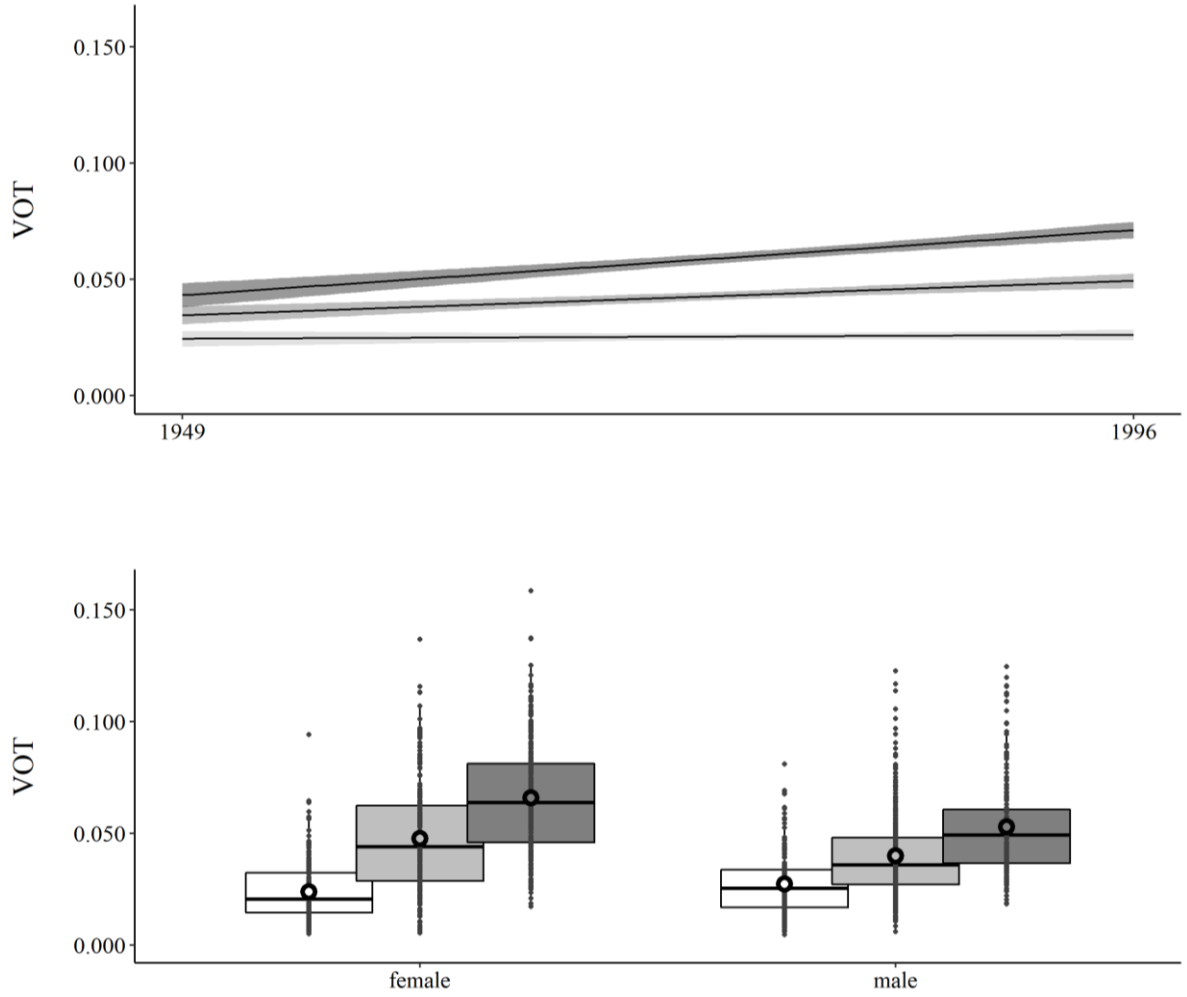
unmeaningful differences can only be noted for the /t^h/, the relevant tables and figures are omitted here but presented in Appendix A.12.3).

Finally, a VOT difference between speakers who rank low in an overall rating for exposure to and usage of the English language and speakers who rank high would not be unexpected. Once again, however, no such pattern emerges. There is no increase in terms of VOT or category distinction from the low-exposure to the high-exposure group.

Table 4.11: Social influences on VOT.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Age									
	360	0.025		543	0.043		478	0.061	
m		*0.0000*			*0.0003*			*0.0006*	
r		*0.04*			*0.20*			*0.32*	
p		*0.5077*			*1.495E-06*	***		*1.257E-12*	***
R^2		*0.00*			*0.04*			*0.10*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Sex									
female	184	0.024	-0.002	218	0.048	0.004	291	0.066	0.006
male	176	0.027	0.002	325	0.040	-0.004	187	0.053	-0.006
intercept		*0.025*			*0.044*			*0.059*	
effect size		*0.004*			*0.008*			*0.012*	
p		*0.166*			*0.0212*	*		*0.0136*	*
R^2		*0.19*			*0.17*			*0.30*	


VOT
0.150
0.100
0.050
0.000
1949
1996
VOT
0.150
0.100
0.050
0.000
female
male

Linguistic factors

For the statistical analyses of linguistic variables, the substantial age-graded interspeaker differences do not allow for absolute VOT measurements to be used. For example, certain sounds following the alveolar plosives may coincide with very high VOTs and others with very low VOTs – relative to every single speaker. However, this effect may be masked when cross-speaker analyses are undertaken because what are high values for some – older – speakers are low in comparison to the values of other – younger – speakers. To resolve this issue, all absolute VOT measurements have been relativised for individual speakers; that is, a speaker's lowest VOT equates to 0%, their highest to 100%. In this manner, if certain sounds in the following environment truly are responsible for higher VOT values relative to each speaker, the analyses of speaker-relative VOTs will bring this effect to light.

With the data processed so, several linguistic parameters are analysed on their effect on VOT production. They include various aspects of the phonological environment which the alveolar plosive is embedded in, aspects of speech fluency such as speaking rate and the presence or absence of hesitation, aspects related to the word such as frequency, predictability and part of speech, as well as structural and positional aspects of the word, syllable, and onset or coda. Table 4.12 over pages 252 to 265 provides complementing statistical figures.

With regards to aspects of the preceding environment,[78] no effect of similarities or dissimilarities between Gilbertese and English is apparent. That is, English VOT production seems unaffected by whether or not a sound exists in the Gilbertese inventory (*PE: sound inventory*), as well as unaffected by whether or not a sound combination would violate a Gilbertese distribution rule (*PE: distribution rule*).

The effects of preceding vowels and consonants (*PE: sound type*) differ insofar as category separation is slightly decreased for the latter where /t^0/ VOTs are increased. Means are most separated in the vicinity of pauses, owing to relatively high /t^s/ VOTs; /t^h/ also exhibits high values, but the patterns for this alveolar plosive category are not statistically significant. As for specific vocalic parameters, no statistically significant influences on VOT production are attestable (*PE-V: lip-rounding*, *PE-V: height*, *PE-V: fronting*). With regards to consonantal parameters, alveolar plosives exhibit considerably more category overlap after unvoiced than after voiced consonants (*PE-C: voicing*). Interestingly, this is predominantly due to /t^0/ instances being produced with high VOTs in the former context. In the latter, /t^0/ VOTs are lower, and /t^s/ VOTs are higher. Little can be said, however, about the place and manner of articulation of consonants in the preceding environment (*PE-C: place*, *PE-C: manner*), given the generally low sample sizes. Perhaps the two exceptions are nasal stops and fricatives, of which there are almost 100 tokens each: in context of the former, the three alveolar plosive categories are nicely separated even though there is a substantial degree of variability; in context of the latter, categories

[78] For analyses relating to the preceding environment, the data has been slightly reduced: 49 cases, for which the sound preceding the alveolar plosive could not be clearly identified, were discarded.

greatly overlap. I am uncertain how to interpret the effects described here. Relevant literature is scarce and there do not seem to be any obvious reasons that would explain the observable patterns.

As for aspects of the following environment, there are indications that linguistic contrasts exert an effect on VOT production. While it seems irrelevant whether or not the sound following the alveolar plosive exists in the Gilbertese inventory (*FE: sound inventory*), /t^0/ and /t^h/ are realised with higher values in non-permissible environments in comparison to permissible environments (*FE: distribution rule*), with a mean difference of a small yet statistically significant 4.2 and 6.7%; as such, category separation is not affected. It is plausible that non-permissible sequences provide more difficulties and thus lead to longer VOTs for the language learners and speakers who have limited exposure to the English language that are surveyed here.

Whether the following sound is a vowel or a (voiced) consonant (*FE: sound type*) makes a further substantial difference. All alveolar plosive categories exhibit higher mean VOTs and category separation is better maintained in the latter context; the calculated effect sizes are 9.9, 17.2, and 18.9% for /t^0/, /t^h/ and /t^s/ respectively. I know of only one study in which the effects of such general sound distinctions are analysed: Yao (2009) also reports dissimilarities between following consonants and vowels, but effects were small and different for the only two informants. The pattern in the Kiribati English corpus is more consistent and more robust, as supported by the statistical data.

The respective vowel subset is further investigated on effects of specific articulatory characteristics. Category distinction is greater for alveolar plosives preceding rounded rather than unrounded vowels (*FE-V: lip-rounding*), owing to relatively low /t^0/ VOTs. The only study in which, to my knowledge, lip-rounding is mentioned is that of Zue (1976) who noted no consistent pattern. Assuming, however, that rounded lips allow for less air flow than unrounded lips, it may take longer for the supraglottal air pressure to be reduced for phonation to begin after the release of the plosive; as discussed above, Morris, McCrea, and Herring (2008) described similar processes for the comparatively narrow lingual constriction in the production of high versus other vowels in the following environment. I am, however, not certain whether a labial constriction is narrow enough for such effects to become apparent, particularly in fluent speech. Furthermore, while the pattern in the Kiribati English data could be explained in such a manner, it did not emerge in Zue's study. With regards to vowel height, several studies provide good indications that /i/ account for longer VOTs in preceding plosives but not necessarily /u/ or other vowels. Surprisingly, the Kiribati English data yield a different pattern in that VOTs gradually decrease as the following vowel changes from high to low (*FE-V: height*). Differences affect all three alveolar plosive categories and are especially apparent in the context of high vowels (both [i] and [u]), near-high vowels ([ɪ] and [ʊ]), and mid-high vowels ([e] and [o]), while they are less pronounced before vowels in the lower half of the quadrilateral. As for vowel fronting, following centre vowels are responsible for lower VOT values and more category overlap in comparison to following front and back vowels (*FE-V: fronting*). This is little surprising, as the only centre vowels in the data set are unstressed [ə]: previous research provides rather good indications that VOTs in environments

without isochronous prominence are lower; more discussion on related aspects follows below. Interestingly, better category separation seems to be achieved preceding back rather than front vowels. Neither has such an effect been noted by Zue (1976) who also tested for vocalic effects, nor does it seem to occur in the study of Nearey and Rochet (1994) who present means for individual vowels but do not discuss vowel fronting in particular.

There are, unfortunately, only a total of 106 consonants in the following environment for which there are corresponding VOT measurements. The voicing parameter cannot be analysed because only following voiced consonants allow for voice onset time measurements to be taken. As for place and manner of articulation, too many factor levels are represented by too few tokens within each alveolar plosive category (*FE-C: place*, *FE-C: manner*).

Finally, the above literature on the Gilbertese language as well as on VOT production require for two more factors of the following environment to be tested. Firstly, it seems plausible that alveolar plosives in the context of high and near-high vowels exhibit remarkably different VOT values. As described in Section 3.2.1, Gilbertese ‹ti› and ‹tu› sequences are mostly assibilated to [s(i)] and [s(u)] respectively. Moreover, the analyses on variant choices above demonstrate that realisations with affrication – also an assibilation process – are far more likely to occur in such high-vowel contexts than in other environments. Do affrication-prone contexts thus permit comparatively longer VOTs? This is indeed the case, interestingly for alveolar plosives of all three categories (*Assibilation environment*). Category separation is greater for such contexts but, since VOT values of /t^0/ are also increased in the environments in question, not by as large a margin as one would perhaps have expected.

Secondly, it has been shown that the structure of the coda can exert an influence on durational properties of alveolar plosives in the onset, either directly or indirectly via its effect on the intermediate vowel: /ɪn/ rhymes have been found to trigger longer VOTs than /ɪpt/ rhymes (Port & Rotunno, 1979), and non-specified coda plosives have been found to trigger longer VOTs than aspirated coda plosives (Weismer, 1979). For the Kiribati English corpus, I applied a more general approach and tested the three parameters of the (first) coda consonant on their influence on the VOTs of onset-singleton alveolar plosives; the respective syllable structure is found for a subcorpus of 728 tokens. The results so obtained show that voicing has no apparent effect (*Coda-C: voicing*). For place of articulation, it is noteworthy that the many alveolar realisations exhibit short VOTs and very little variability for /t^0/ variants, while those of the /t^h/ and /t^s/ categories are considerably more scattered (*Coda-C: place*). Finally, fricatives in the coda position account for greater category overlap owing to longer VOTs for /t^0/ variants in comparison to oral and nasal stops (*Coda-C: manner*).

A lot of literature is available on the effect of *Speaking rate* on VOT, among which there is little doubt that speakers produce shorter VOTs for aspirated stops at faster rates. For alveolar plosives, differences of up to 70 milliseconds have been reported. Since only extreme cases were categorised as non-medium speaking rate, the groups for slow and fast speech feature very few tokens. Subjective as my methodology may be, these few extreme cases still reveal whether or not the same speaking rate

effects that have so widely been reported before are also apparent in the Kiribati English data. Category separation is best for alveolar plosives uttered in slow speech, reduced at medium rates, and smallest for fast speech. Interestingly, category overlap between /t^0/ and /t^h/ is substantial at faster rates, while many /t^s/ tokens retain rather high values. In other words, category separation seems to be more easy to maintain with affricated than with non-affricated variants; this line of argumentation will be pursued to a greater extent below. What remains to be noted, however, is that only the statistical runs for the /t^h/ category reveal significant differences, which is most likely exactly due to the low token numbers for the slow and fast groups. I therefore conclude, although with a certain level of caution, that speaking rate effects in the Kiribati English data are as expected.

As a second assessment of speech fluency, the effects of *Hesitation* on VOT production have been investigated. Statistical runs only reveal a significant effect on /t^s/ realisations: the 44 tokens occurring in hesitant speech are longer, by an effect size of 11.3%. This finding, in complementation to the results obtained during the analyses on variant choices show that, while affrication may not be a more favoured variant realisation in hesitation contexts, its production is affected in terms of duration of the sibilant.

Turning to aspects related to isochrony, the methodology I chose for the assessment of *Word stress* and *Phrasal accent* resulted in low token numbers for the non-neutral categories. As an unfortunate consequence, statistical runs yield no significant patterns for either variable.

As regards grammatical influences, it is firstly of importance to test the three derivations made on the basis of observations by Bell, Brenier, Gregory, Girand, and Jurafsky (2009) that were discussed in more detail above: owing to their effect on speaking rate, VOT values should be lower for frequent words, function words and predictable words; previous literature yields an inconclusive picture. In order to test for an apparent frequency effect in the Kiribati English data, those words that occurred over 50 times in the 3'300-token corpus were categorised as frequent: *to*, *and*, *but*, *that*, *two*, *just*, *don't* (both plosives), and *not*. A comparison of the VOTs of alveolar plosives in frequent and in infrequent words reveals no apparent effect.[79] As for word category, alveolar plosives in lexical and function words are distinct in so far as the latter are produced with shorter VOTs, particularly /t^0/ and /t^h/ plosives, not however /t^s/ plosives. Of the 50 tokens in the non-specified category, 49 represent forms of the auxiliary verb *do*. Respective discussions below further corroborate that the lower /t^0/ values observed here are an effect of part of speech, not word category. In short, the above derivation for lexical and function words cannot be confirmed, at least not in the Kiribati English data. Finally, in order to test for a predictability effect, I chose to juxtapose two expressions to all remaining entries: *outer islands* and

[79] In other studies, more sophisticated methodologies are applied where huge corpora serve to establish frequency, which is then expressed numerically. Clearly, referring to a small corpus of only 3'300 entries is less exact. On the one hand, it must be assumed that the factor level entitled *infrequent* also contains many words that are more frequent in actuality. On the other hand, the label *frequent* is not a surprising descriptor for any of the eight words in the respective category. Although I am not certain, I doubt that the absence of a frequency effect is due to the simplicity of my methodology.

secondary school. In Kiribati, the use of these adjectives with the respective nouns can be said to be predictable since neither are used frequently in other contexts; this is, once again, a fairly subjective assessment. In the corpus, these expressions are only uttered 45 times, and VOT measurements could only be taken for 27 of them. Unfortunately, then, there is too little data for predictability to be tested as a factor on VOT.

VOT is affected by a word's *Part of speech*. Although sample sizes are small for a number of factor levels, a few interesting observations can be made, particularly about verbs and auxiliaries. In comparison to other parts of speech, alveolar plosives in main verbs exhibit relatively high category overlap, also due to long /t^0/ VOTs. On the other hand, /t^0/ realisations in auxiliary verbs are produced with remarkably short VOT means as well as low VOT variability. Since all of the auxiliaries in question represent forms of *do*, it could be assumed that vocalic influences are at play. For this to be true, similar effects should have been found for mid to high vowels, back vowels, or both. As discussed above, higher vowels are responsible for relatively high VOTs. With respect to vowel fronting, it seems that the /t^0/ average for the back-vowel environment is slightly lowered due to effect of auxiliaries rather than auxiliaries exhibiting low values because they occur before back vowels. In other words, /t^0/ variants that occur before back vowels but are not *do* auxiliaries are produced with longer VOTs. Furthermore, the above analysis of frequency effects revealed no significant difference between /t^0/ in *don't* and /t^0/ in infrequent words. Thus, the question remains as to why /t^0/ VOTs in auxiliaries are so low. Lacking statistical significance for the respective category may simply mean that this pattern is an accidental occurrence.

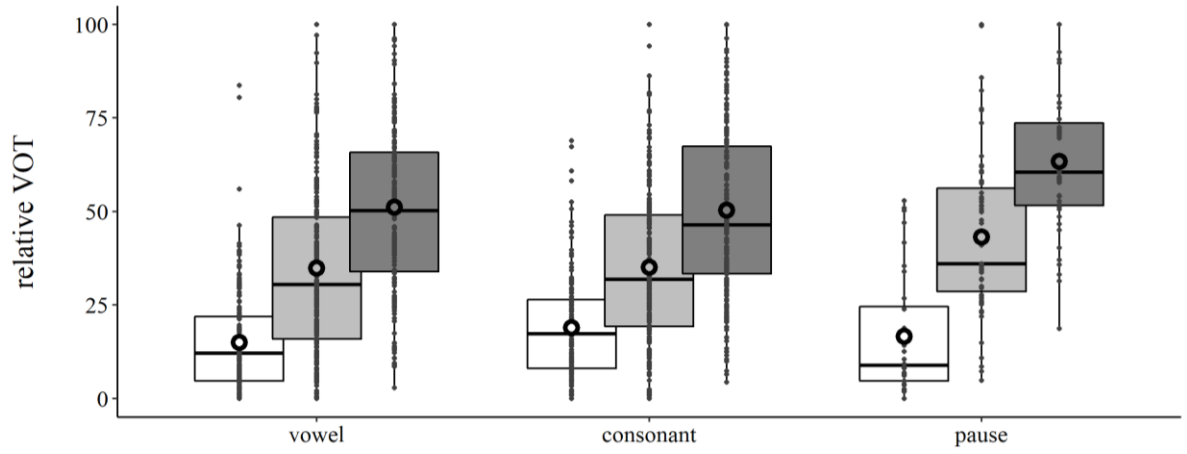
Finally, positional effects are analysed. Findings reported in previous studies are varied but seem to generally indicate that the positional parameters alone do not suffice for predictions about VOT production to be made. Rather, VOTs of alveolar plosives differ depending on their position in the syllable, the word, and the utterance but, more importantly, depending on the phonological environment and isochrony that characterise such positions. However, a number of noteworthy observations can be made for the Kiribati English data. While VOT production appears unaffected by whether the alveolar plosive occurs in an initial, medial or final syllable (*Position in word*), the position within a syllable has a small yet statistically significant effect on /t^h/ and /t^s/ variants: for the former, VOTs are shorter in the coda than in the onset, resulting in a great degree overlap with the /t^0/ category; for the latter, the VOTs are longer in the coda, resulting in a considerably better category separation (*Position in syllable*). Investigating more specifically the position of alveolar plosive within the onset or the coda, it becomes apparent that the above effect is mostly due to singletons in either position; the remaining factor levels are not represented by enough tokens to substantially alter this pattern, or for any other meaningful conclusions to be drawn (*Position in onset/coda*).

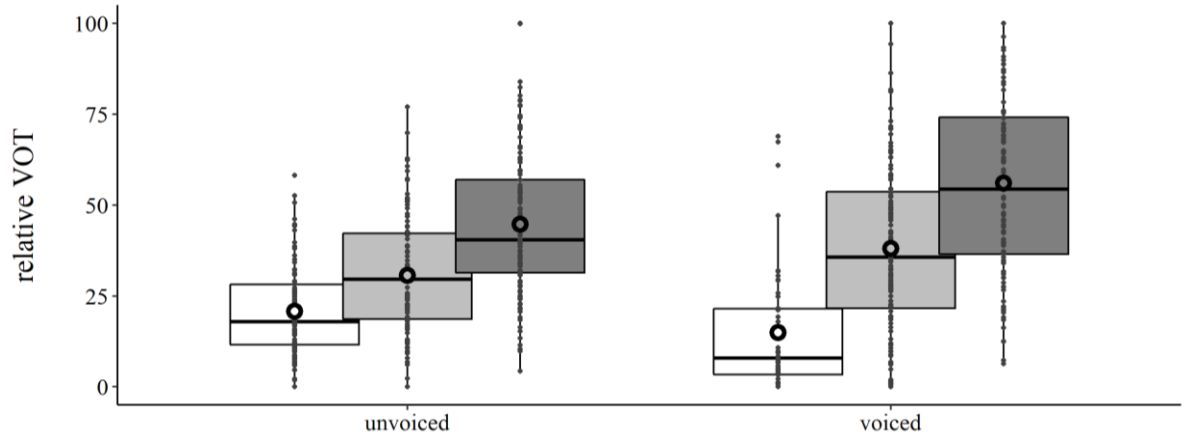
Table 4.12: Linguistic influences on relative VOT.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE: sound type									
vowel	170	15.0	-1.9	246	34.8	-2.5	190	51.2	-1.9
consonant	147	18.9	2.0	211	35.0	-2.3	230	50.3	-4.0
pause	32	16.6	-0.2	63	43.2	4.8	43	63.3	5.9
intercept		*16.4*			*37.6*			*54.3*	
effect size		*3.9*			*7.4*			*9.9*	
p		*0.0465*	*		*0.0514*			*0.0278*	*
R^2		*0.11*			*0.08*			*0.16*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE-C: voicing									
unvoiced	100	20.8	3.3	87	30.6	-4.7	117	44.8	-5.4
voiced	47	14.9	-3.3	124	38.1	4.7	113	56.1	5.4
intercept		*17.7*			*34.9*			*50.1*	
effect size		*6.6*			*9.5*			*10.8*	
p		*0.00917*	**		*0.000613*	***		*0.000263*	***
R^2		*0.16*			*0.26*			*0.20*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE-C: place									
bilabial	3	14.9	-7.1	28	32.6	-0.3	24	45.0	-1.5
labio-dental	2	34.0	15.5	47	32.7	-2.3	32	57.0	10.5
interdental	2	21.7	5.6						
alveolar	138	18.8	-1.1	102	39.2	5.9	149	50.5	7.5
post-alveolar	1	23.6	6.0	3	48.5	7.0	2	26.5	-17.6
velar	1	1.3	-18.9	31	25.8	-10.4	23	47.3	1.2
intercept		*19.8*			*34.9*			*43.7*	
effect size		*34.4*			*17.4*			*28.1*	
p		*0.363*			*0.00116*	**		*0.101*	
R^2		*0.15*			*0.26*			*0.20*	


relative VOT
100
75
50
25
0
vowel
consonant
pause


relative VOT
100
75
50
25
0
unvoiced
voiced

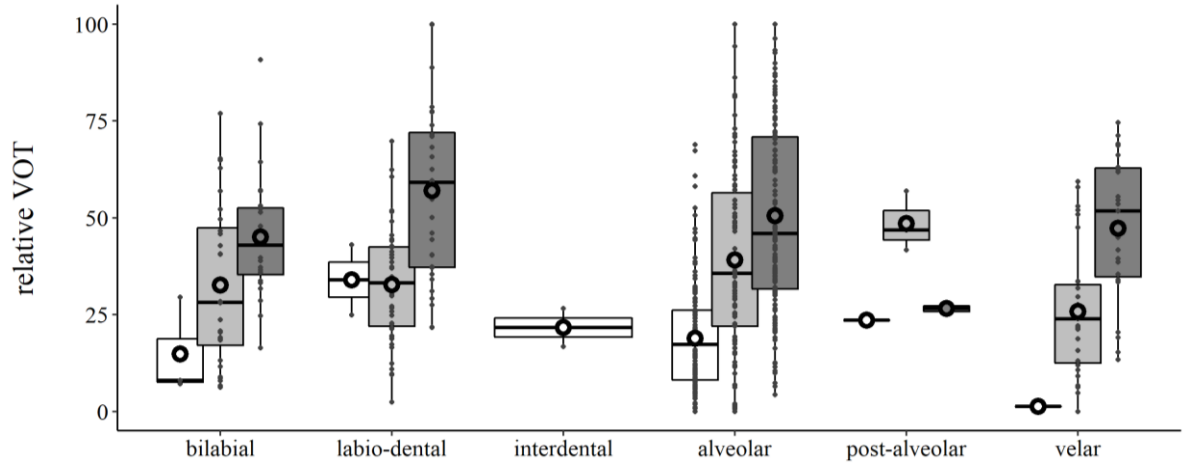
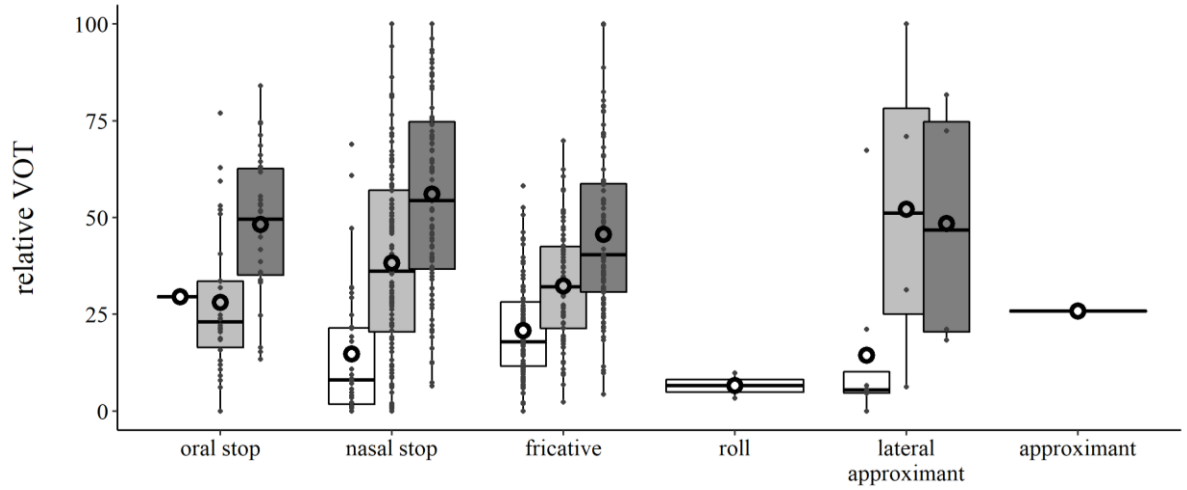

relative VOT
100
75
50
25
0
bilabial
labio-dental
interdental
alveolar
post-alveolar
velar

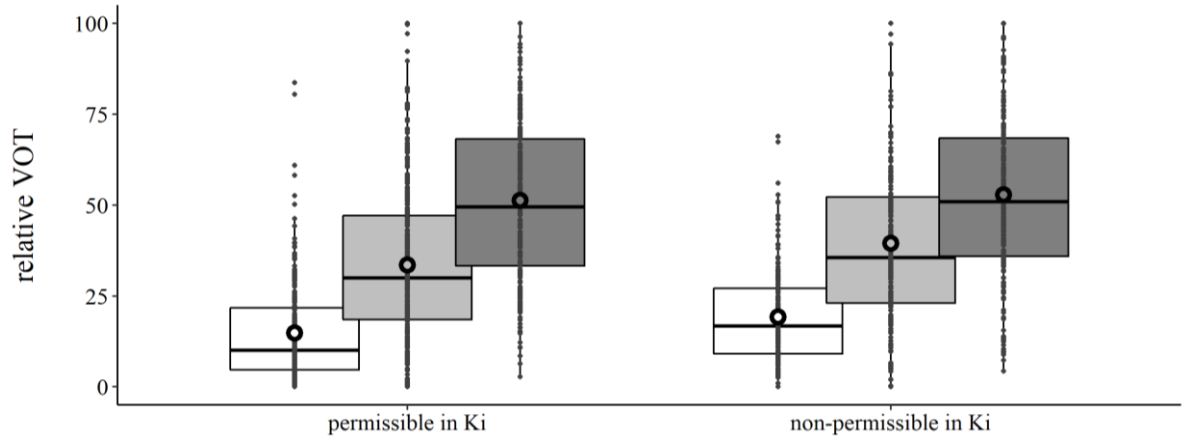
Table 4.12 (continued): Linguistic influences on relative VOT.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE-C: manner									
oral stop	1	29.5	7.1	30	28.1	-10.7	32	48.2	-2.9
nasal stop	35	14.8	-4.1	104	38.3	2.0	95	56.1	6.6
fricative	100	20.8	2.8	73	32.3	-5.5	99	45.6	-3.1
roll	2	6.6	-15.7						
lateral approximant	8	14.4	-4.1	4	52.1	14.2	4	48.4	-0.6
approximant	1	25.8	14.0						
intercept		*18.3*			*37.9*			*49.0*	
effect size		*29.7*			*24.9*			*9.7*	
p		*0.0587*			*0.00159*	**		*0.0146*	*
R^2		*0.20*			*0.26*			*0.19*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE: distribution rule									
permissible in Ki	210	14.8	-2.1	331	33.6	-3.3	272	51.3	-0.1
non-permissible in Ki	150	19.2	2.1	212	39.5	3.3	206	52.9	0.1
intercept		*16.6*			*36.8*			*52.1*	
effect size		*4.2*			*6.7*			*0.2*	
p		*0.0046*	**		*0.000578*	***		*0.918*	
R^2		*0.12*			*0.11*			*0.16*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE: sound type									
vowel	333	15.9	-4.9	486	34.1	-8.6	456	51.0	-9.4
consonant	27	26.4	4.9	57	50.9	8.6	22	72.1	9.4
intercept		*20.4*			*42.8*			*60.6*	
effect size		*9.9*			*17.2*			*18.9*	
p		*0.000383*	***		*1.42E-08*	***		*0.0000573*	***
R^2		*0.13*			*0.14*			*0.19*	


relative VOT
100
75
50
25
0
oral stop
nasal stop
fricative
roll
lateral approximant
approximant


relative VOT
100
75
50
25
0
permissible in Ki
non-permissible in Ki

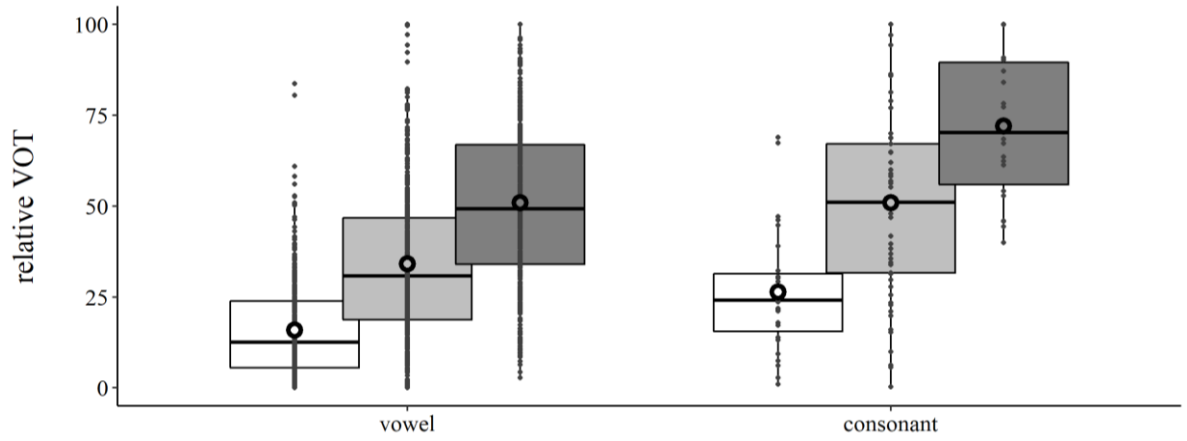
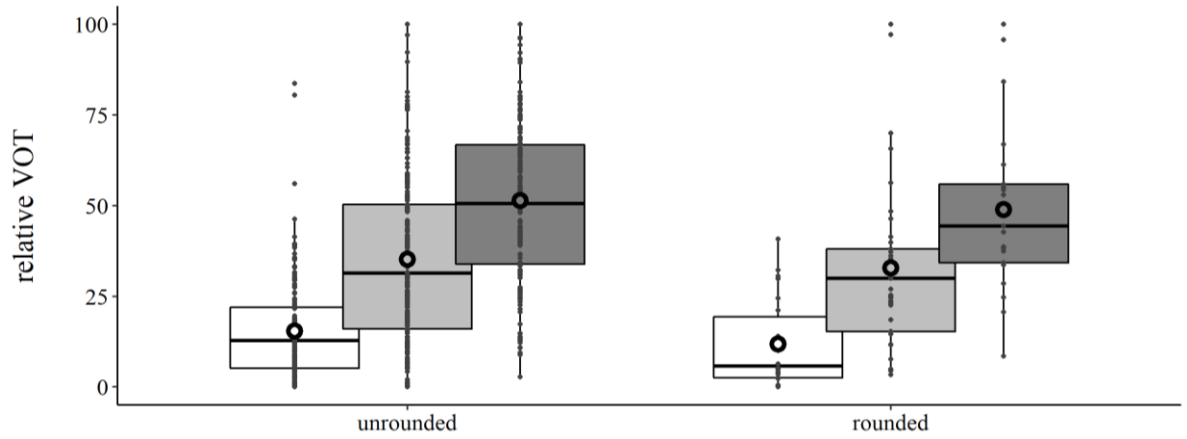

relative VOT
100
75
50
25
0
vowel
consonant

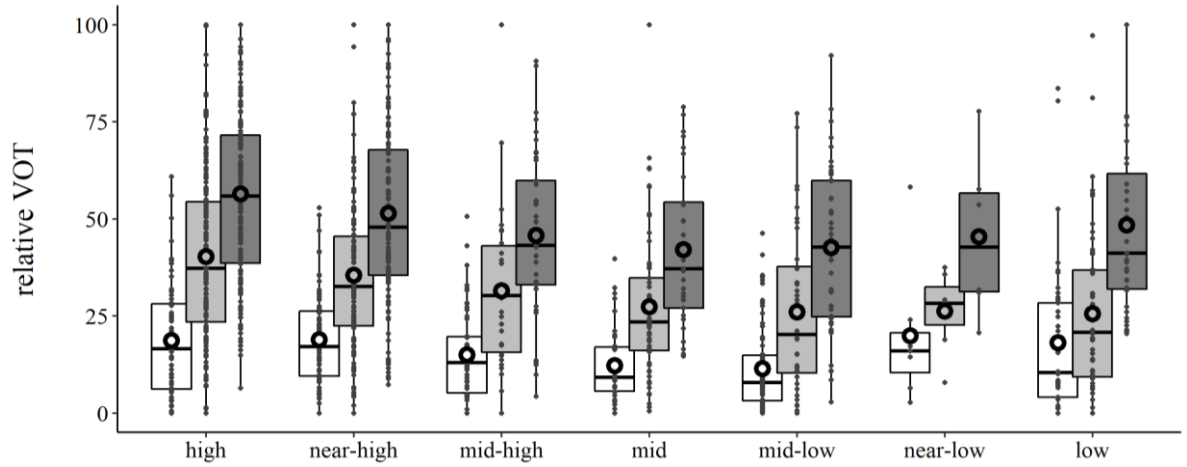
Table 4.12 (continued): Linguistic influences on relative VOT.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE-V: lip-rounding									
unrounded	265	16.9	2.4	359	33.3	-1.2	358	50.6	-0.9
rounded	68	11.7	-2.4	127	36.3	1.2	98	52.2	0.9
intercept		*14.2*			*35.0*			*51.6*	
effect size		*4.8*			*2.5*			*1.9*	
p		*0.00929*	**		*0.242*			*0.45*	
R^2		*0.07*			*0.13*			*0.18*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE-V: height									
high	62	18.7	2.1	182	40.3	10.1	167	56.5	9.1
near-high	63	18.9	2.3	117	35.5	6.2	131	51.5	2.2
mid-high	50	15.0	-1.3	30	31.5	2.2	41	45.8	-0.2
mid	34	12.2	-4.2	59	27.4	-3.9	29	42.1	-5.1
mid-low	73	11.4	-4.6	36	26.1	-5.9	47	42.7	-3.3
near-low	7	19.9	4.2	7	26.3	-4.9	6	45.4	-0.6
low	44	18.1	1.5	55	25.5	-3.9	35	48.4	-2.2
intercept		*16.2*			*30.5*			*48.0*	
effect size		*8.7*			*16.0*			*14.2*	
p		*0.0133*	*		*2.57E-08*	***		*3.16E-04*	***
R^2		*0.09*			*0.22*			*0.22*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE-V: fronting									
front	201	17.7	3.1	201	34.7	2.7	240	50.5	2.5
centre	34	12.2	-2.3	60	27.2	-6.2	29	42.1	-5.9
back	98	13.3	-0.8	225	35.4	3.5	187	53.0	3.5
intercept		*14.2*			*32.5*			*48.0*	
effect size		*5.4*			*9.7*			*9.4*	
p		*0.0156*	*		*0.00402*	**		*0.0889*	
R^2		*0.07*			*0.15*			*0.18*	


relative VOT
100
75
50
25
0
unrounded
rounded


relative VOT
100
75
50
25
0
high
near-high
mid-high
mid
mid-low
near-low
low

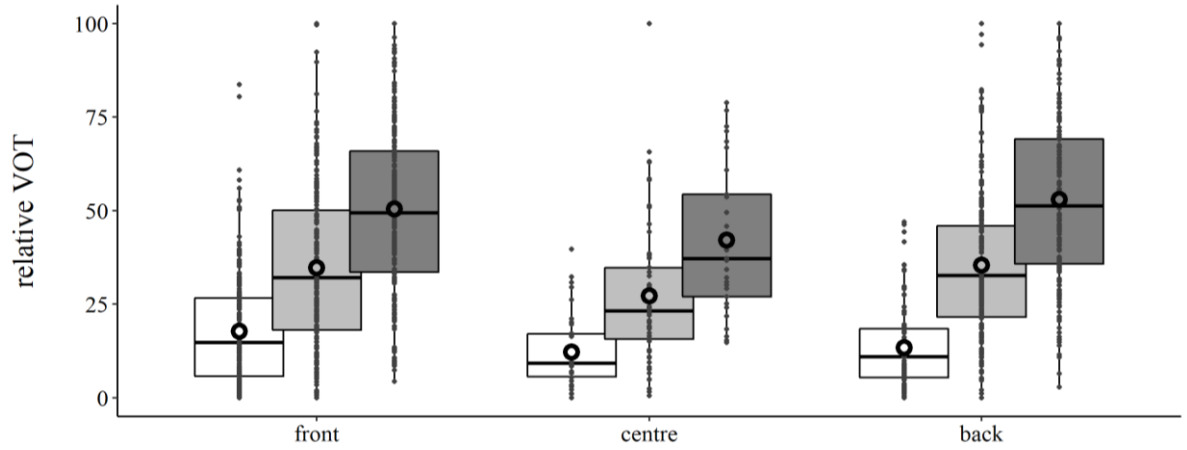
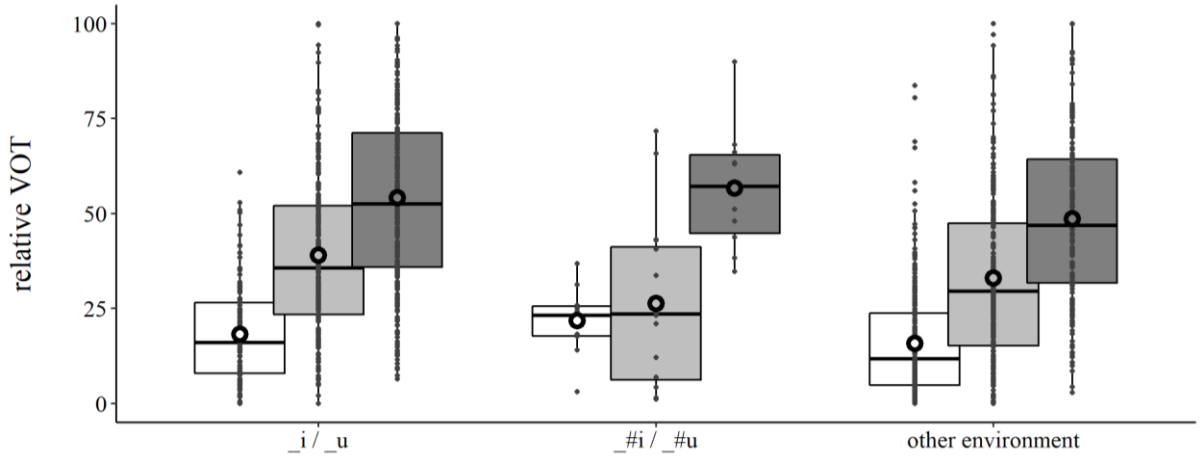

relative VOT
100
75
50
25
0
front
centre
back

Table 4.12 (continued): Linguistic influences on relative VOT.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE: assibilation env.									
_i / _u	110	18.2	-1.0	276	39.0	6.7	276	54.1	-0.1
_#i / _#u	10	21.8	3.8	16	26.3	-6.6	10	56.7	5.6
other environment	240	15.8	-2.9	251	33.0	-0.1	192	48.6	-5.5
intercept		*18.3*			*33.0*			*54.3*	
effect size		*6.7*			*13.3*			*11.1*	
p		*0.2*			*0.000295*	***		*0.0157*	*
R^2		*0.11*			*0.12*			*0.18*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Coda-C: place									
bilabial	19	10.9	-6.3	40	30.1	-8.2	28	51.2	-0.4
labio-dental	26	20.8	3.6	24	29.4	-7.1	15	44.0	-2.7
interdental	10	17.0	0.9	19	36.1	0.3	16	40.1	-7.8
alveolar	78	11.0	-5.8	150	36.6	-0.9	133	50.8	2.0
post-alveolar	4	27.5	5.6	4	37.2	-1.6	7	46.9	-8.6
palatal	22	15.1	-2.3	3	51.7	14.2	7	56.2	3.4
velar	6	11.6	-5.8	56	33.6	-4.2	48	44.1	-3.0
uvular							1	34.1	-17.7
glottal	1	23.7	10.2	6	44.8	7.5	5	83.5	34.8
intercept		*16.6*			*37.7*			*48.8*	
effect size		*16.4*			*22.3*			*52.5*	
p		*0.0343*	*		*0.138*			*0.00572*	**
R^2		*0.16*			*0.17*			*0.27*	


relative VOT
100
75
50
25
0
_i / _u
_#i / _#u
other environment

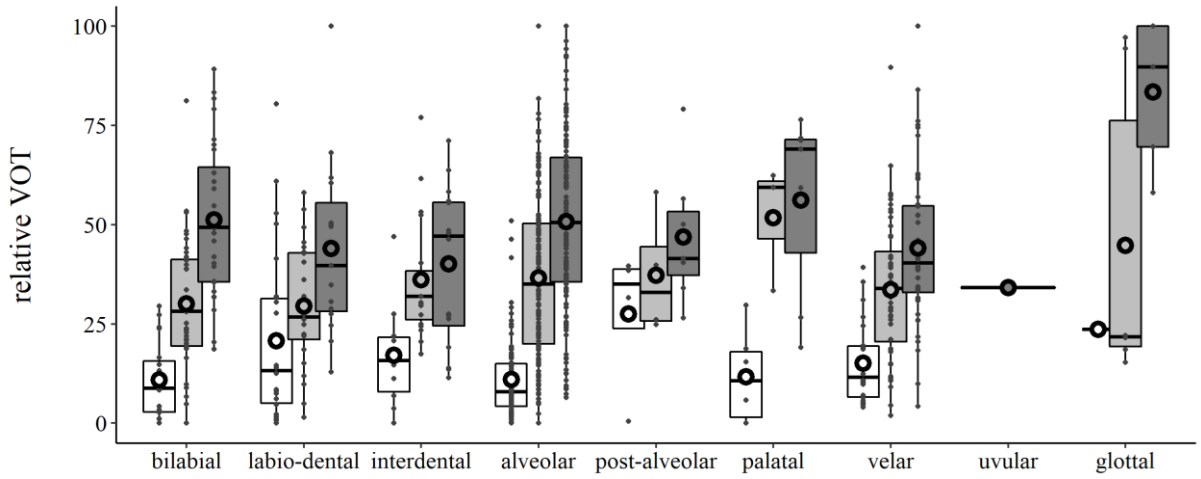
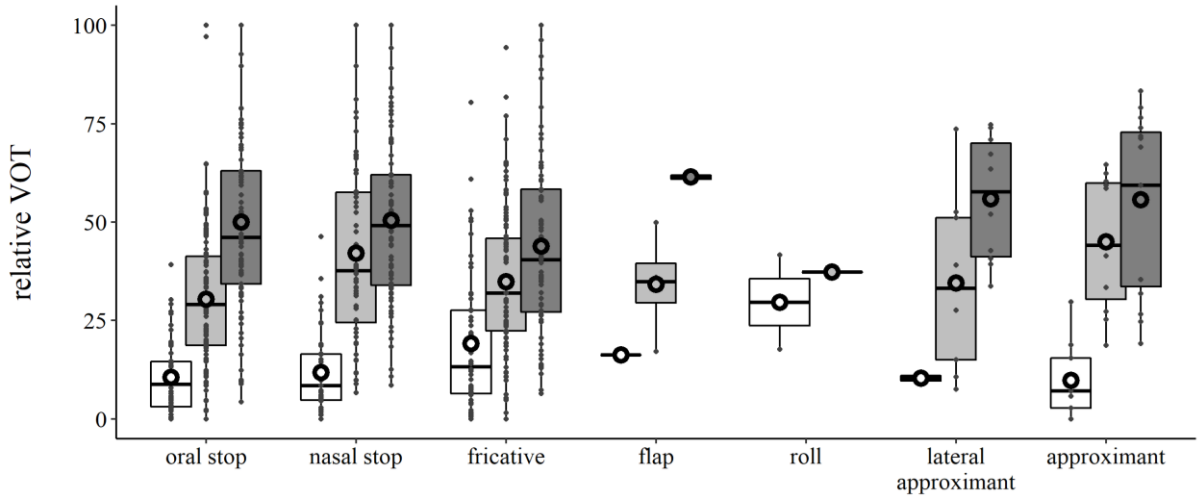

relative VOT
100
75
50
25
0
bilabial
labio-dental
interdental
alveolar
post-alveolar
palatal
velar
uvular
glottal

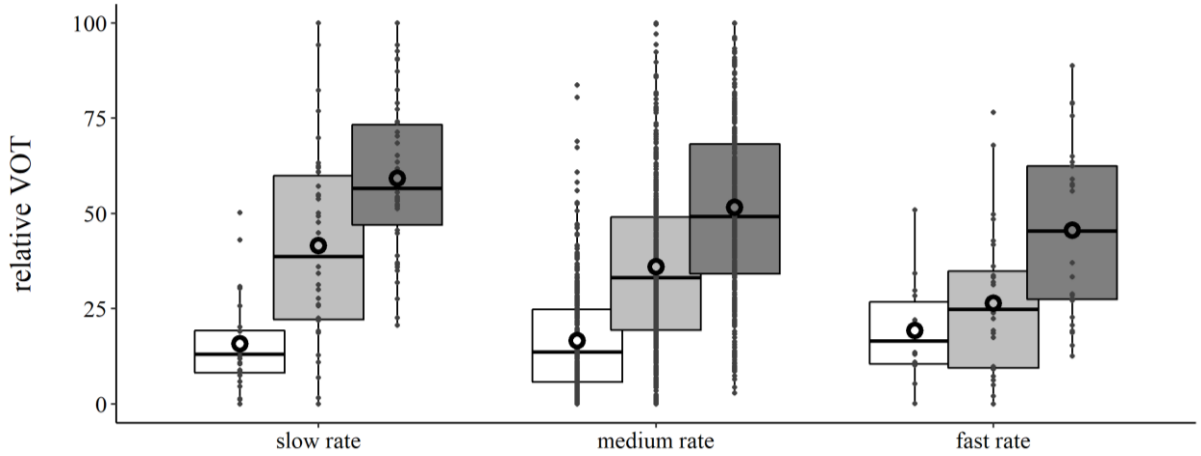
Table 4.12 (continued): Linguistic influences on relative VOT.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Coda-C: manner									
oral stop	51	10.6	-4.1	120	30.4	-5.7	81	50.0	-2.0
nasal stop	47	11.8	-3.0	60	42.1	5.6	83	50.4	-2.2
fricative	54	19.1	4.2	97	34.8	-1.9	69	43.8	-7.8
flap	1	16.3	1.9	4	34.2	-4.7	2	61.5	2.2
roll	2	29.7	10.0	1	37.3	-1.0			
lateral approximant	2	10.3	-3.8	9	34.5	0.8	10	55.9	6.0
approximant	9	9.8	-5.2	11	45.0	7.0	15	55.6	3.8
intercept		*14.3*			*36.8*			*52.0*	
effect size		*15.3*			*12.7*			*13.8*	
p		*0.0205*	*		*0.00827*	**		*0.186*	
R^2		*0.16*			*0.18*			*0.23*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Speaking rate									
slow rate	24	15.8	-1.1	38	41.5	6.5	42	59.2	5.9
medium rate	322	16.6	-0.4	478	36.0	1.7	408	51.6	-0.9
fast rate	14	19.3	1.5	27	26.4	-8.2	28	45.6	-5.0
intercept		*16.6*			*34.5*			*52.6*	
effect size		*2.6*			*14.8*			*10.9*	
p		*0.856*			*0.0267*	*		*0.0802*	
R^2		*0.10*			*0.09*			*0.17*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Hesitation									
no hesitation	338	16.6	0.0	481	36.6	2.1	434	51.1	-5.6
hesitation	22	17.7	0.0	62	30.7	-2.1	44	60.3	5.6
intercept		*16.2*			*34.4*			*56.7*	
effect size		*0.1*			*4.2*			*11.3*	
p		*0.974*			*0.166*			*0.00116*	**
R^2		*0.10*			*0.08*			*0.19*	


relative VOT
100
75
50
25
0
oral stop
nasal stop
fricative
flap
roll
lateral approximant
approximant


relative VOT
100
75
50
25
0
slow rate
medium rate
fast rate

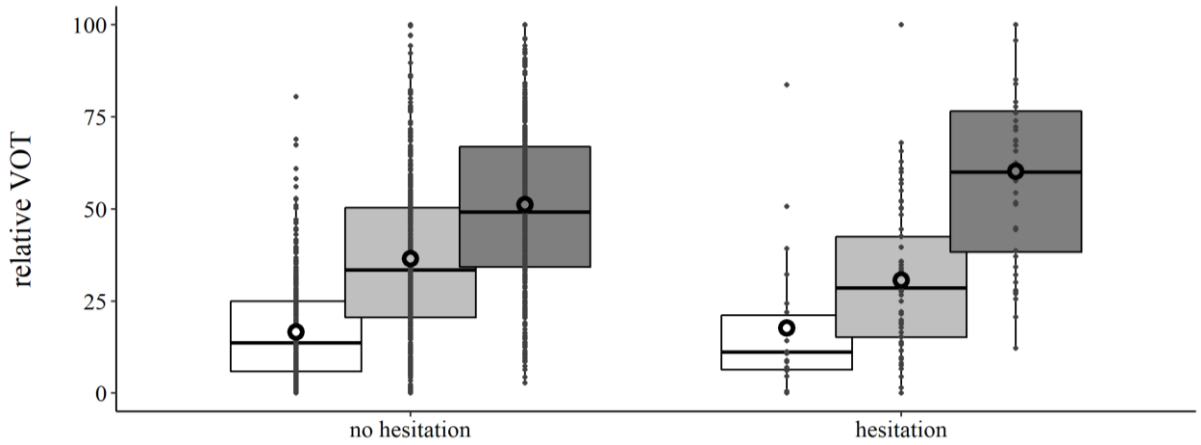
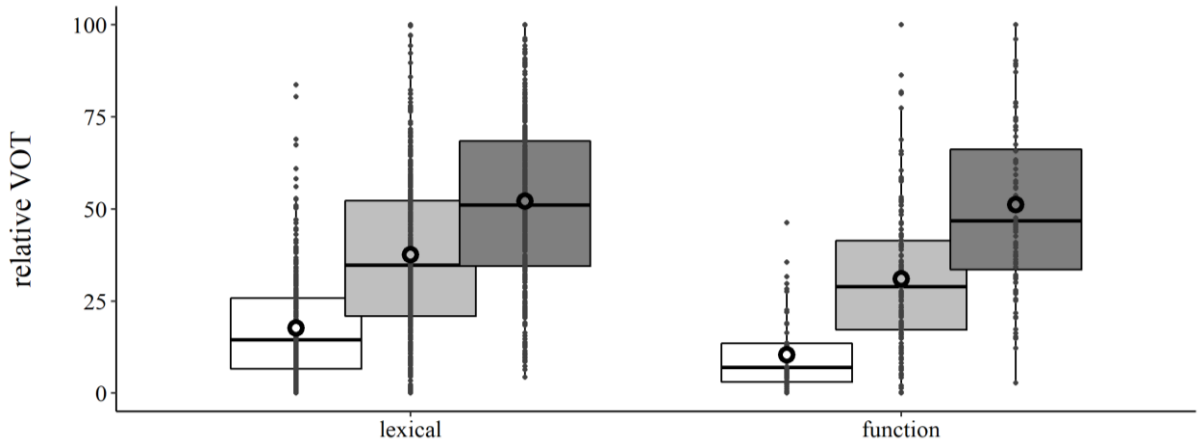

relative VOT
100
75
50
25
0
no hesitation
hesitation

Table 4.12 (continued): Linguistic influences on relative VOT.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Word category									
lexical	310	17.7	3.2	398	37.6	2.7	390	52.1	0.5
function	50	10.4	-3.2	145	31.0	-2.7	88	51.2	-0.5
intercept		*14.0*			*34.8*			*51.2*	
effect size		*6.4*			*5.3*			*0.9*	
p		*0.00305*	**		*0.0129*	*		*0.725*	
R^2		*0.11*			*0.09*			*0.17*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Part of speech									
N	106	17.3	4.2	114	40.4	6.8	93	49.7	-6.7
Pro				20	40.2	8.7	5	64.7	11.9
Det				8	23.9	-6.8	2	94.7	42.8
V	121	17.7	4.0	69	30.8	-1.6	83	44.0	-12.3
Aux	49	10.4	-2.3	2	21.8	-9.2	3	51.0	-9.3
Inf marker				101	32.2	-0.2	70	48.6	-11.7
Part							1	44.3	-7.1
Adj	62	18.3	4.3	85	39.8	7.8	80	56.5	-2.6
Adv	20	18.5	4.3	58	39.4	5.6	67	56.1	-5.7
Prep	1	2.2	-10.8	72	35.9	3.1	66	56.7	-3.4
Conj	1	9.3	-3.7	14	15.3	-14.2	8	54.4	4.1
intercept		*13.1*			*32.7*			*58.1*	
effect size		*15.2*			*23.0*			*55.1*	
p		*0.125*			*0.00247*	**		*0.00065*	***
R^2		*0.11*			*0.11*			*0.22*	


relative VOT
100
75
50
25
0
lexical
function

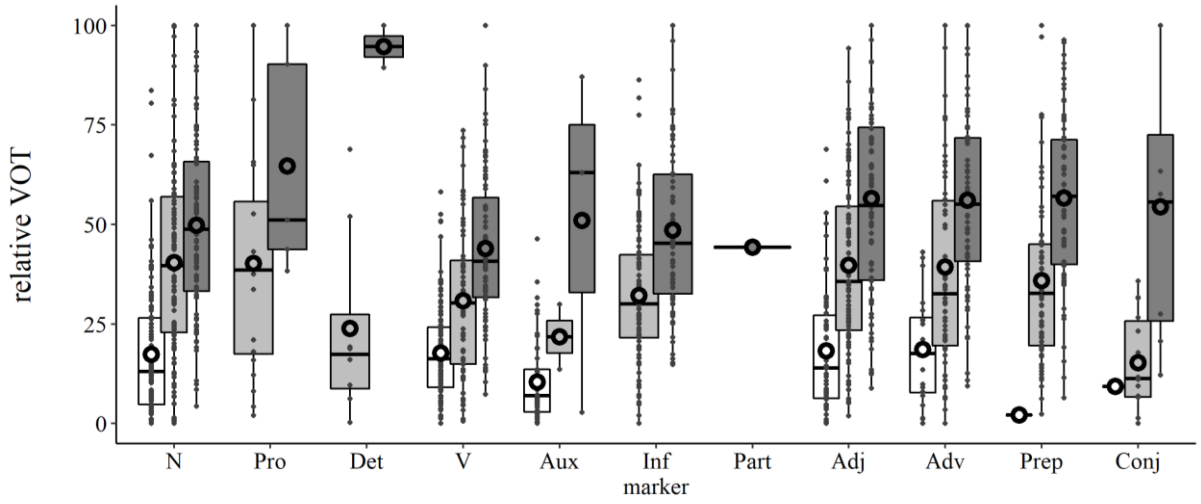
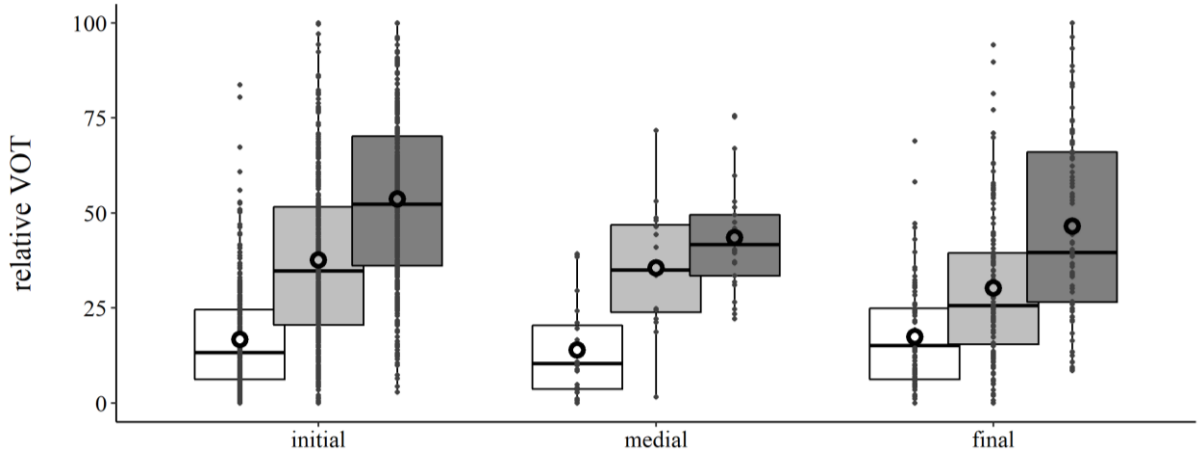
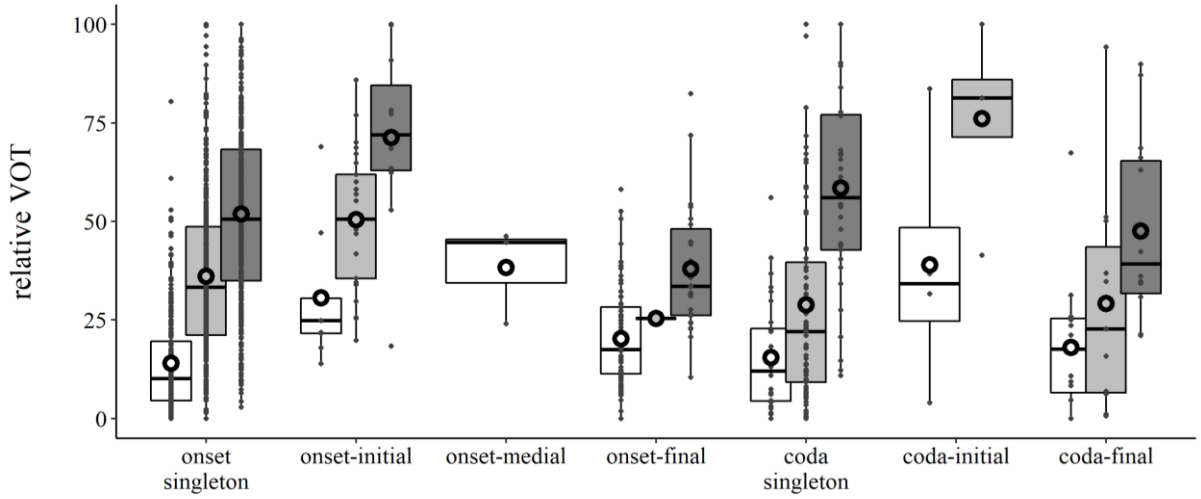

relative VOT
100
75
50
25
0
N
Pro
Det
V
Aux
Inf marker
Part
Adj
Adv
Prep
Conj

Table 4.12 (continued): Linguistic influences on relative VOT.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Position in syllable									
onset	313	16.4	-0.9	451	36.9	2.6	428	51.5	-4.5
coda	47	18.3	0.9	92	30.9	-2.6	50	55.4	4.5
intercept		*16.9*			*34.3*			*55.5*	
effect size		*1.9*			*5.3*			*9.0*	
p		*0.389*			*0.0352*	*		*0.00772*	**
R^2		*0.10*			*0.09*			*0.20*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Position in onset/coda									
onset singleton	219	14.1	-11.1	425	36.1	-6.5	391	51.9	-1.9
onset-initial	9	30.7	4.3	25	50.4	7.7	11	71.3	9.6
onset-medial	3	38.3	13.9						
onset-final	82	20.3	-4.8	1	25.4	-8.1	26	37.9	-13.5
coda singleton	28	15.5	-10.2	77	28.8	-12.8	36	58.5	11.1
coda-initial	4	39.0	14.0	4	76.0	34.2			
coda-final	15	18.1	-6.2	11	29.1	-14.6	14	47.5	-5.4
intercept		*24.6*			*42.6*			*53.3*	
effect size		*25.0*			*48.8*			*24.6*	
p		*2.81E-07*	***		*4.47E-06*	***		*0.000085*	***
R^2		*0.19*			*0.13*			*0.22*	


relative VOT
100
75
50
25
0
initial
medial
final


relative VOT
100
75
50
25
0
onset singleton
onset-initial
onset-medial
onset-final
coda singleton
coda-initial
coda-final

4.4.4 Discussion

Without doubt, the above analysis reveals a number of interesting results. However, it is often not clear whether the patterns observable for I-Kiribati speakers of English are ordinary or in any way surprising. Addressing linguistic effects first, some patterns are difficult to explain given the lack of studies in which the same or similar factors are analysed for native speakers of English, or for other L2 speakers of English. This is especially true for aspects of the sound preceding the alveolar plosive. For aspects of the following sound, more literature is available. On the one hand, there are accounts of laryngeal events which suggest that high vowels should – or could – exhibit longer VOTs. On the other hand, empirical studies can generally not confirm such a pattern. In my data, however, a surprisingly clear height effect is apparent, one that seems to be independent of vowel fronting. It remains an unanswered question as to why the L2 speakers of English of the present study adhere to the proposed pattern, but why many L1 speakers reportedly do not: if the laryngeal events have been incorrectly described, what other explanation is there for a height effect that is only observable here but not elsewhere?

The observed social patterns are similarly difficult to interpret. For age and sex, statistically significant effects emerge, but the existing literature is simply inconclusive. For occupation, time abroad as well as exposure to and usage of the English language, no effect can be observed. Since particularly the last variable is an indicator of a speaker's overall proficiency in the English language, it must be concluded that VOT and proficiency are not correlated. It is necessary to understand these results in context: that of Kiribati, and English in Kiribati. I aim to provide plausible explanations in the following section where I not only further discuss the key findings of all three analyses conducted in this chapter, but also make references to Kiribati history and socio-linguistic profile.

4.5 General discussion

The above investigation of the choice of variants, the affrication rate as well as the durational properties of alveolar plosives in Kiribati English allows for five general observations to be made which deserve further discussion:

1) /t^0/ and /t^h/ are contrasted;
2) affricated tokens occur, for both /t^0/ and /t^h/;
3) affricated tokens are the second most frequent variant for /t^h/, after [t^h];
4) affricated tokens exhibit longer VOTs than [t^h];
5) alveolar plosive production is socially and linguistically conditioned, including in terms of VOT production.

In the remainder of this chapter, I seek to propose plausible explanations for why these seemingly so fundamental observations can be made and why they are of particular importance in the context of the sociolinguistic analysis at hand.

4.5.1 Observation 1: Contrast between the non-specified and specified phonemes

This first observation simply confirms that /t^{0}/ and /t^{h}/ are contrasted, even though Gilbertese only features one alveolar plosive phoneme. VOT measurements show that I-Kiribati speakers of English generally reproduce this contrast: category separation is larger for some speakers than for others, but there are few indications that the two phonemes remain completely merged.

4.5.2 Observation 2: Affrication for the non-specified and specified phonemes

There is compelling evidence that affrication is associated with the alveolar plosive phoneme otherwise associated with aspiration, which is partly due to aspects of acoustic intensity. The above discussed studies by Winitz, LaRiviere, and Herriman (1975) as well as Repp (1979) show that the intensity of aspiration noise has a perceptual influence in so far as plosives with louder release phases are more likely perceived as /t^{h}/. Since [^{s}] is acoustically more intense than [^{h}], it can be assumed that this effect is even stronger for affricated variants. Alveolar plosive affrication by I-Kiribati speakers of English thus helps to establish contrast between /t^{0}/ and /t^{h}/. Moreover, Repp hypothesises that an increase in intensity is perceptually equivalent to an increase in duration of the release phase, in other words, to an increase in VOT. High-intensity affrication thus compensates for what may otherwise be insufficient durational differentiation.

If it is true that affrication is associated with the /t^{h}/ phoneme, it should not be realised as a variant of the non-specified phoneme. This is not entirely true, but almost: there are only 40 instances of [t^{s}] for /t^{0}/. They very likely reflect a common language learner error and indicate that, although a phonemic contrast has generally been acquired, the required allophone is sometimes substituted by a phonetically similar but phonemically different sound; an abundance of studies in the wake of the Contrastive Analysis Hypothesis or the Speech Learning Model, proposed by Lado (1957) and Flege (1995) respectively, support such an assumption.

4.5.3 Observation 3: High affrication rate for the specified phoneme

As such, association with /t^{h}/ does not explain the high frequency of affricated tokens. The above analyses of VOT, however, has shown that category separation is considerably larger – and consistently so – between /t^{0}/ and /t^{s}/ in comparison to /t^{0}/ and /t^{h}/; many speakers even achieve a complete or almost complete category separation. Thus, affricated tokens do not only have a lower perceptual boundary on account of their increased intensity which would compensate for shorter VOTs, they are in fact also produced with longer VOTs than /t^{h}/. Affrication clearly is a better differentiator than aspiration in Kiribati English. The high affrication rate, as formulated in the third observation, may at least partly be explained by longer VOTs for /t^{s}/ variants, as stated in the fourth.

4.5.4 Observation 4: Long VOTs for affricated variants

But why are VOTs longer for /t^{s}/ in comparison to /t^{h}/? This fourth observation requires a revisiting of the articulatory gestures involved in the production of alveolar plosives since there is no necessity, at least not of an obvious kind, that aspirated variants have shorter VOTs. It is true that all speakers have higher /t^{s}/ averages (with the exception of Ki19m1955 for whom only one affricated token could be measured), but many speakers produce individual /t^{h}/ tokens with VOT values that exceed these averages; moreover, the /t^{h}/ means of many, mostly younger, speakers exceed the /t^{s}/ means of many other, mostly older, speakers.

Importantly, /t^{h}/ and /t^{s}/ involve different articulation gestures to control for VOT. As described above, the duration between the plosive release and the subsequent voice onset is dependent on the size of the glottal constriction: a smaller glottis results in a longer VOT than a larger glottis. According to Kim (1970), the relationship is simple: “if a stop is *n* degree aspirated, it must have an *n* degree glottal opening” (p. 111). Furthermore, his account suggests that it is not the duration per se that is controlled, but the size of the glottal opening (p. 112). In contrast to alveolar plosive realisations that only involve aspiration, affricated variants include another important gesture, namely a lingual constriction. Through it, airflow is further reduced which results in a longer voice onset delay; Buizza and Plug (2012) as well as Maclagan, Watson, Harlow, King, and Keegan (2009) confirm that /t^{s}/ variants have longer VOTs than /t^{h}/, in RP and Maori English respectively. Affrication thus offers a viable alternative to control for VOT and discriminate between alveolar plosives.

Moreover, for I-Kiribati speakers of English, affrication is arguably the easier method to control for VOT than aspiration. The Gilbertese language does not feature [h]. A small degree of aspiration is employed in the production of alveolar plosives, if it is defined as the aperiodic noise between the release and the voice onset, but it does not serve to establish phonemic contrast: by definition, Gilbertese

plosives are non-specified. On the other hand, [s] exists, as a frequent allophone of /t/. Can it be assumed, for I-Kiribati speakers of English, that durational properties of transitions between [s] and a following voiced segment (for example: *seal* → [si:l]) allow for more precise control than transitions between phonetic [h] on a plosive and a following voiced segment (for example: *teal* → [tʰi:l])? Weismer and Cariski (1984) conclude exactly that: tasked with reproducing unfamiliar durational characteristics, "VOT is harder to control than /s/" (pp. 220-221). However, their study only included two participants and their data analysis is problematic. For I-Kiribati speakers of English, the most obvious piece of evidence is found in the corpus itself and relates to the simple observation that /tˢ/ variants exhibit longer VOTs and so allow for a considerably better category distinction than /tʰ/.

4.5.5 Observation 5: Social and linguistic influences

As regards social influences, particularly robust effects are apparent for sex on affrication rate – female speakers produce more affricated variants than male speakers –, as well as for sex and age on VOT production. As discussed above, sex effects on affrication rates have been reported previously. With regards to durational characteristics, however, the available literature unfortunately leaves questions about whether both sex and age are to be regarded as physiological factors in which case the observed effects can be considered ordinary, or whether they are social factors and reflective of extra-linguistic processes happening in Kiribati.

On the one hand, the Dynamic Model suggests that internal differentiation and diversification within a variety only takes place during the fifth and last phase of its development. As has been discussed in section 3.5, Kiribati English is not nearly as far advanced in terms of sociolinguistic conditions and linguistic processes: it has virtually no native speakers, only relatively few proficient second language speakers, and external L1 varieties are targeted as standards. In this context, it is thus doubtful whether any socio-cultural effect on the English production of I-Kiribati emerges. If they can be negated, those sex and age patterns that are observable in the Kiribati English corpus need to be regarded as physiological rather than social effects, especially (perhaps) in the case of an acoustically so subtle variable as VOT.

On the other hand, the Kiribati culture is still marked by contrasts concerning sex and age, in various aspects of every-day life. This includes linguistic aspects as far as the Gilbertese language is concerned (Autio, personal correspondence). It is possible that the same cultural factors also account for the sex and age effects that emerge in the production of alveolar plosives by I-Kiribati in their English production. With regards to sex, the analysis of variant choices above has shown that affricated realisations are more frequent for female than for male speakers – a difference that is hardly due to physiology. If the production of alveolar plosives is demonstrably constrained by the speakers' sex in

terms of variant choice, it is plausible that it is constrained by the same factor in terms of the VOT of the variant chosen. In short, the effect apparent in the Kiribati English data may be due to sex as a social factor.

As for age, its correlation with VOT accounts for a mean difference of 15 and 28 milliseconds for /t^{h}/ and /t^{s}/ respectively. This begs the question whether speakers will and have followed along these correlation patterns. That is, did older speakers ever produce longer VOTs at younger ages and decrease over time, or did they always produce shorter VOTs than today's younger speakers? And likewise, will younger speakers, who produce longer VOTs for /t^{0}/ and /t^{s}/ in comparison to their older peers now, gradually produce lower values as they get older?

Previous literature does not fully answer these questions. To begin with, the effects reported range from +2 to -23 milliseconds; many studies report no effects. There is more consensus about the development of VOT variability, suggesting it to either remain stable or increase over time, while, crucially, category overlaps are avoided. The Kiribati English data are not fully congruent with such findings: firstly, the decrease of 28 milliseconds over apparent-time exceeds the largest previously reported change; secondly, older speakers generally exhibit less VOT variability than younger speakers; and thirdly, older speakers produce a considerable amount of category overlap. The literature discussed, however, relates to native speakers of English. Age-graded VOT patterns may be different for second language speakers of English, such as I-Kiribati. Taken this into consideration, it does not seem to be so surprising that speakers of all age groups are less precise, that is, more variable, in terms of VOT production; such variability is also found in the vowel production of language learners as can be measured in terms of formant frequencies, to name only one similar case. However, I fail to identify a plausible explanation, one that does or does not relate to a linguistic contact situation of the likes of Kiribati, that accounts for the magnitude of the decrease over apparent-time. Given that alveolar plosives in the substrate language are produced with 25 milliseconds on average and very little variability around that average, it would be less surprising to find younger speakers producing shorter VOTs for /t^{h}/ and /t^{s}/ and consequently not achieving as good a category distinction in their English production as they in reality do. This would result in a less pronounced decrease which falls more comfortably within the ranges as suggested by previous literature. As is, a decrease of the magnitude found in the Kiribati English data may appear too large to be accounted for by age if it is interpreted solely as a physiological factor.

Age may act as a social factor. Accordingly, older speakers never produced VOT values as high as today's younger speakers, and younger speakers will maintain a fairly good category distinction owing to higher values as they grow older. This may not forfeit physiological effects or indeed explain all age variation, but perhaps some. This argumentation necessitates that those sociocultural processes are identified that account for the sociolinguistic patterns observed in the data at hand – processes which affect or have affected younger and older I-Kiribati in dissimilar ways.

One such process concerns English language education which has changed in meaningful ways over a relatively short period of time. As discussed in Section 2.7 above, it was grossly neglected before the Second World War and only little progress was made after. Only towards the end of colonial administration were more pragmatic, more comprehensive and better structured models proposed. Issues relating to finances, geographical dispersion, infrastructure, materials, availability and qualification of teachers and teacher training, and so on are still prevalent today, but not to the same degree as they were in the past. Although many older I-Kiribati, including some of my study participants, had native English speakers as their teachers, the overall standards for education in general and English language education in particular have improved considerably.

Such improvements per se do not explain age-related VOT patterns in a corpus of fairly proficient English speakers. Rather, they need to be understood in a wider context. Kiribati is at the forefront of global climate change, a fact that locals are faced with every day. Climate change effects also have implications on the drafting of policies, the creation of agreements, contracts and schemes, or the implementation of local adaptation and mitigation programs. An explicit aim of the *Migration with Dignity* policy, which is well-known locally and has also received international attention, is it to improve educational standards in order to make I-Kiribati eligible for the various mobility programs, such as study opportunities, seasonal work, and the Pacific Access Category (PAC) ballot scheme with New Zealand. The educational improvements just described are thus not only in line with policies that respond, at least in part, to climate change issues, but also explicitly mandated in them. It is unsurprising that, in this context of climate change and policies that explicitly promote the English language as an instrument to achieve educational, social and economic goals, the people of Kiribati develop instrumental motivations towards the learning of the English language. It is also in this context that cultural inhibitors on the use of the English language which are connected to the concept of unity through equality and conformity are slowly being removed, in some domains more than others.

These developments affect younger and older I-Kiribati in dissimilar ways. The older generation has experienced colonial rule and the transition into an independent state with a claim to an own national identity. Linguistic negotiations were very likely more geared towards such socio-political changes rather than influenced by instrumental aspects relating to migration, among other things, which have only gained momentum after independence. In contrast, younger I-Kiribati only know their country as an independent nation with a strong sense of unity and identity. They have grown up while policies and programs were either already in place or in the making. They have also always had to face an uncertain future in which they may have to make use of mobility programs and, as a requirement, be able to speak English proficiently.

If instrumental motivations truly differentiate younger from older I-Kiribati, it is very likely that manifestations are observed on a linguistic level, for instance in the production of alveolar plosives. However, if VOT was affected, one would expect such an effect to be of an indirect rather than a direct nature: instrumental motivations lead to higher proficiency levels, and higher proficiency levels lead to

more target-like VOT values (the latter relationship has been observed in numerous studies, many of which have been cited in the discussion of L2 VOT production in Section 4.4.2); instrumental motivations leading to more target-like VOT values without affecting the general level of proficiency seems unlikely. It appears that VOT and English proficiency are not strongly correlated in Kiribati. How, then, can the observable age pattern be explained? Can speakers, regardless of their proficiency level, become conscious enough about such a subtle acoustic parameter which then allows them to make a conscious effort to differentiate alveolar plosive phonemes in their own production? Given that teachers and students complete pronunciation drills with the exact aim of creating awareness of a phonemic distinction that does not exist in the mother tongue (see Table 2.2 in Section 2.7.4) suggests that this may not be as unlikely as it seems at first glance. It is not impossible – this is perhaps the best formulation here – that, as a result of more instrumental motivations, younger speakers make a conscious effort to maintain a phonemic distinction that has been drilled in even after they leave school.

In conclusion, an explanation for the age pattern observable in the Kiribati English data remains elusive. On the one hand, age does not seem to be a purely physiological factor, since the observed effects are different and larger than those reported previously. On the other hand, a social explanation can be found for different instrumental motivations of younger and older generations, but it is not certain whether such an explanation accounts for a VOT production that is not correlated with English proficiency levels. It is probable that physiological effects in combination with wider socio-cultural processes are responsible for the emergent age pattern.

Yet to be addressed are the linguistic factors that influence alveolar plosive production in Kiribati English. The investigation of variant choices has clearly shown that affricated realisations are not restricted to environments without isochronous prominence that have been reported to be prone to lenition in other varieties of English. Indeed, affrication occurs rather frequently in almost all linguistic contexts tested; the only exceptions are a few consonantal and onset-medial environments, for which token numbers are low. It may be useful here to refer to an argumentation Honeybone (2012) pursues in his discussion of lenition:

> There are (i) conditioned changes, which can be thought to be 'caused' by the environment in which they occur due to the influence of neighbouring segments or other phonological entities, (ii) strongly unconditioned changes, where phonological environment plays no role at all, and (iii) weakly unconditioned changes, which are not context-free in that they may not affect every occurrence of a segment, but which cannot be seen to be caused by the environment in which they occur. The best understanding of lenition is that the term groups together phenomena that can effect weakly conditioned change in consonants. Lenitions can be affected by their prosodic and melodic environment, but are not caused by it. This approach allows lenition theory to focus not on what causes lenition, or on environments that promote its occurrence; rather, it directs the focus onto environments where lenition is inhibited. (p. 10)

It is a somewhat unfortunate coincidence that this example relates to the phenomenon of lenition given that there is an on-going debate as to whether plosive affrication may or may not be subsumed under it: it is not my aim to make deductions or indeed inductions on the basis of the Kiribati English data under scrutiny here. What, of the above quote, is of relevance and importance for the study at hand is the conceptualisation of certain features exhibiting linguistic variation: on account of the relative frequency and freedom, alveolar plosive affrication in Kiribati English may well be regarded as affected but not caused by linguistic context; or similarly, linguistic contexts may have to be investigated in terms of affrication-inhibition rather than affrication-promotion. It follows that /t^{s}/ is a viable alternative to /t^{h}/ in Kiribati English rather than a consequence of phonological environment. The data I collected clearly support this notion. Affricated realisations are almost as frequent as aspirated plosives; some speakers even produce more /t^{s}/ than /t^{h}/ tokens within the first 10 to 15 minutes of conversation. Furthermore, category separation between /t^{0}/ and /t^{s}/ is generally substantially better than between /t^{0}/ and /t^{h}/, and in a few cases even categorical.

I-Kiribati relatively easily and quickly understand that English, their second official language, features two phonemically distinct alveolar plosive categories. How to phonetically realise these two phonemes is evidently a more difficult task. On the one hand, neither the aspirated nor the non-specified variants are produced exactly like in the substrate language. On the other hand, I-Kiribati students as well as their I-Kiribati teachers hardly have any exposure to native or more standard-like Englishes; in other words, they only relatively rarely hear /t^{h}/ actually being realised as [t^{h}]. While all five of the observations about alveolar plosive production discussed here can at least partly be explained in the social and linguistic context that is Kiribati, there remain a number of surprising findings and patterns for which there do not seem to be any fully satisfactory explanations.

CHAPTER 5

Conclusions

The history of Kiribati is indeed fascinating. Contact between islanders and foreigners has never been intense, neither before, during or after British administration. In the past, there were only few beachcombers, missionaries and government officials; Gilbert islanders more commonly got in contact with other peoples, cultures and languages by participating in the labour trade. Today, there are still only few foreign residents or tourists, especially on the outer islands; I-Kiribati more commonly get in contact with other peoples, cultures and languages by participating in international mobility programs.

The English language has become the second official language of Kiribati and educational policies help to promote its status. Attitudes towards it are overwhelmingly positive and virtually all I-Kiribati perceive it as a very important language. However, in spite of constitutions, policies and attitudes, English is a very foreign language in Kiribati and only relatively few are proficient in it. Therefore, it is neither surprising that many features found in the English production of I-Kiribati are similar to those found for language learners elsewhere in the world, nor that many features can be explained by substrate influence, nor that the many features are not thought of as an English dialect even though they are produced so frequently by I-Kiribati, nor that *English as a foreign language* (EFL) is a better label for this variety than *English as a second language* (ESL).

The detailed, sociophonetic analysis of alveolar plosives only reinforces such conclusions. A contrast between the two phonemic categories of the target language is generally maintained, but often not in a standard-like fashion: very frequently, the specified variants are affricated instead of aspirated. It is unsurprising that, in the absence of foreigners, such innovative productions emerge. More surprising are the observable social patterns such as the following two: firstly, female speakers favour affricated variants more than male speakers, and they produce them with longer VOTs; and secondly, younger speakers achieve a better category separation than older speakers. Physiological explanations cannot be ruled out for these two findings, but neither can explanations that relate to the socio-cultural situation of Kiribati.

Having discussed historical, linguistic and sociophonetic information in great detail, I close my dissertation with a few concluding remarks about Kiribati and its future, as well as about the English language in Kiribati and its future.

5.1 Concluding remarks about Kiribati

Development in Kiribati will remain slow for the foreseeable future. It will remain dependent on its phosphate reserve fund and limited drawdowns, on its exclusive economic zone and the sale of fishing licences, and on foreign aid donations and a locally assisting foreign workforce. Climate change issues will remain problematic with respect to agricultural productivity, food sustainability, economic growth and financial prosperity, as well as population pressures and health.

Australia and New Zealand have become important partners for Kiribati. They provide millions of dollars in aid every year as well as personnel who help to carry out projects locally. Of particular importance are the mobility schemes like the Seasonal Worker Program (SWP) with Australia, or the Recognised Seasonal Employer (RSE) and Pacific Access Category (PAC) with New Zealand. Participants are able to earn and remit money as well as to gain valuable experiences that will be useful when returning and may lead to local employment. It is worth pointing out, however, that Australia and New Zealand are not only trying to achieve humanitarian goals. I-Kiribati and other Pacific islanders are exploited for cheap labour – colonialism for Kiribati and many other countries may have changed over time, but it has never truly ended. Nevertheless, Kiribati is interested in maintaining these ties. Since independence three decades ago, it has politically and economically clearly been oriented to the South.

This may change soon. In September 2019, Kiribati's current administration has made the announcement that diplomatic relations with China are reinstated. Taiwan has been lost as a partner that has provided important monetary aid, well-trained civil servants who have supported Kiribati in various crucial areas, as well as scholarships and medical treatment for I-Kiribati. It is still uncertain how Kiribati will be affected by immediate changes, or whether ties with China will be beneficial or restricting in the long run.

With Kiribati aiming to better establish itself regionally and globally, and with increasing geopolitical tensions putting it in the focus of nations like Australia, New Zealand and China, foreign involvement in local affairs is very likely to increase. It is possible that the near future will bring economic and financial growth, moderate though it may be, and I-Kiribati may profit from more and better mobility schemes and access to previously unavailable goods and services. What else is awaiting is yet unknown and almost certainly not entirely in the control of Kiribati alone.

5.2 Concluding remarks about English in Kiribati

This report clearly reaffirms that English in Kiribati remains a foreign language most people are not proficient in. Until the Second World War, beachcombers usually assimilated culturally as well as linguistically, whalers and traders conducted business on their ships, missionaries were vehemently opposed to teaching or even speaking English, and the British government officials were preoccupied with phosphate mining on Banaba (Ocean Island); no foreigner contingent had ever been large. After the Second World War, different stances towards education, particularly that of the English language, were taken but progress was slow; the number of foreigners remained relatively small and English was still not frequently heard. Various policies have been produced; they followed one another in rapid succession, were implemented very hastily, and led to only little success.

That English is still a very foreign language today is due to much the same factors that have prevented development from being quicker in the past. Transportation in Kiribati has become better and travelling easier, but the 33 islands are of course still dispersed over the same vast distances. Upgrading schools in terms of infrastructure or the introduction and monitoring of new materials and methodologies remain rather difficult. Understaffing, underqualified teachers or cultural inhibitors experienced in the classroom or other education offices are still a problem, although not as much as a few decades ago. Budgets have become bigger, mostly due to large sums of foreign aid, but they are not sufficient to bring about substantial systemic improvements and sustain higher educational standards.

While many of the issues listed so far are mostly not in the control of government or education officials, others are. For instance, more efforts need to be made to counteract centralisation of institutions and services to South Tarawa, and to better support the outer islands instead. The community high school scheme between 1977 and 1980 had a few promising aspects, although it remained unsuccessful on account of improper planning, implementation, community inclusion and efforts to communicate aims and purposes clearly and transparently (see Section 2.7.2). Importantly, the four schools were nicely distributed in the Gilbert group. To pay more attention to such regional hubs, while avoiding past mistakes and instead employing strategies that are adequate and feasible in Kiribati today – without the introduction of any policy changes or other unnecessary additions, but integrated into the educational framework as it is –, may lead to much needed improvements of educational standards on the outer islands.

Also, more efforts could be made to better coordinate the various agents working in the educational sector of Kiribati, specifically English language educators. In recent years, there have been many English courses; some were offered by larger educational institutions, some by charity organisations or other NGOs, some by individuals with no affiliation to the beforementioned. Such courses are surely beneficial to their participants, but they remain limited to a few venues, mostly on

South Tarawa. For a few years now, the Kiribati Institute of Technology (KIT) has run regular English language courses for adults not otherwise enrolled there; doubtlessly, a great effort, but one that is limited to two locations in South Tarawa. Systemic improvements are not achieved. If, however, there existed a framework for adult education under which individual agents – and funds – were coordinated or even combined, long-term planning of regular courses in various locations could be undertaken. The creation of such a framework would also provide an accessible contact point for individuals desiring to get involved as well as for their quick and easy integration; moreover, vacancies could be advertised. As such, a new framework is not an addition of services, but a re-organisation of existing ones. Clearly, such an endeavour would be ambitious, but systemic improvements are unlikely without any system in place.

Finally, many lessons could and should be learned from the past mostly because, unfortunately, a large number of policies, projects and schemes remained unsuccessful. It is my hope for Kiribati that there will not be yet another policy any time soon. Neither is the current policy, introduced under the Kiribati Education Improvement Program (KEIP), perfect – because it has been rolled out without conducting surveys at the classroom level and therefore without adequately responding to existing problems, or because it has been rolled out without proper advice concerning its implementation, to name only a few issues –, nor is it bad – because similar policies work well in bilingual contexts elsewhere. Rather, it should serve as a goal: the educational system is not yet ready, for instance, for English to become the language of instruction at JSS level, but this can be worked towards. Regardless of when a next policy will be drafted, required at the present time are proper support for in-service teachers to ensure that, with their individual qualifications, they can carry out the tasks they are given, as well as the continuation and expansion of pre-service and in-service teacher training so as to ensure that teacher qualifications, and with it educational standards, are continuously raised. Also, an adequate assessment of needs and problems must precede the implementation of future introductions and changes to the educational system – nothing but a fundamental requirement. Given the history of numerous failed policies, projects and schemes, it seems only reasonable to call for adjustments leading to improvements of what already exists, rather than for replacements or innovations resulting in the repetition of patterns that are evidently problematic.

Given the country's own agenda and those of bigger geopolitical players, it is very likely that foreign involvement will increase and that more foreigners will come to Kiribati for a variety of reasons, not just to support education. Partly as a consequence of such developments, I-Kiribati will find themselves better informed about issues that concern their country. It is thus possible that scepticism and criticism among I-Kiribati will grow: with respect to the role of foreigners in global affairs, including climate change politics; with respect to their role in regional affairs, including Asia-Pacific politics; and with respect to their role in local affairs, including education, among other things. Not for all, but for some, this may result in resentment of foreigners; such attitudes are uncommon at present, but do already exist.

Attitudes to the English language, however, are unlikely to change much any time soon. Slowly, educational standards are improving. Slowly, proficiency levels will increase and bilingualism will spread, too. Regardless of the currently low English proficiency of most I-Kiribati, instrumental motivations towards learning it are very common: many regard it an important asset or tool through which local employment and a regular income can be secured, through which there are possibilities to study overseas that increase the chances of such employment, through which they become eligible to participate in labour mobility programs that have a great appeal for many, or through which they can safeguard for a future when climate change issues may make their home islands uninhabitable. Such attitudes and motivations will not fade away soon.

English may have been introduced relatively recently and opposed by the colonial government and early missionaries; its education may have suffered from various issues and slow progress; it may still not be spoken proficiently by many and remain a very foreign language. Yet, it is the second official language of Kiribati, and truly a part of it.

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A.1 Oral history

A.1.1 A legend of creation

Nareau the Elder was the First of All. Not a man, not a beast, not a fish, not a thing was before him. He slept not, for there was no sleep; he ate not, for there was no hunger. He was in the Void. There was only Nareau sitting in the Void. Long he sat and there was only he.

Then Nareau said in his heart, "I will make a woman." Behold! a woman grew out of the Void: Nei Teakea. He said again, "I will make a man." Behold! a man grew out of his thought: Na Atibu, the Rock. And Na Atibu lay with Nei Teakea. Behold! their child – even Nareau the Younger.

And Nareau the Elder said to Nareau the Younger, "All knowledge is whole in thee. I will make a thing for thee to work upon. " So he made that thing in the Void. It was called the Darkness and the Cleaving Together; the sky and the earth and the sea were within it; but the sky and the earth clove together, and darkness was between them, for yet there was no separation.

And when his work was done, Nareau the Elder said, "Enough! It is ready. I go, never to return." So he went, never to return, and no man knows where he abides now.

But Nareau the Younger walked on the overside of the sky that lay on the land. The sky was rock, and in some places it was rooted in the land, but in other places there were hollows between. A thought came into Nareau's heart; he said, "I will enter beneath it." He searched for a cleft wherein he might creep, but there was no cleft. He said again, "How then shall I enter? I will do it with a spell." That was the First Spell. He knelt on the sky and began to tap it with his fingers, saying:

Tap… tap, on heaven and its dwelling places.
It is stone. What becomes of it? It echoes!
It is rock. What becomes of it? It echoes!
Open, Sir Stone! Open, Sir Rock!
It is open-o-o-o!

And at the third striking, the sky opened under his fingers. He said, "It is ready," and he looked down into the hollow place. It was black dark, and his ears heard the noise of breathing and snoring in the darkness. So he stood up and rubbed his fingertips together. Behold! the First Creature came out of them – even the Bat that he called tiku-tiku-toumouma. And he said to the Bat, "Thou canst see in the darkness. Go before me and find what thou findest."

The Bat said, "I see people lying in this place." Nareau answered, "What are they like?" and the Bat said, "They move not; they say no word; they are all asleep." Nareau answered again, "It is the Company of Fools and Deaf Mutes. They are a breed of slaves. Tell me their names." Then the Bat settled on the forehead of each one as he lay in the darkness and called his name to Nareau: "This man is Uka the Blower. Here lies Naabawe the Sweeper. Behold, Karitoro the Roller-up. Now Kotekateka the Sitter. Kotei the Stander now" – a great multitude.

And when they were all named, Nareau said, “Enough. I will go in.” So he crawled through the cleft and walked on the underside of the sky; and the Bat was his guide in the darkness. He stood among the Fools and Deaf Mutes and shouted, “Sirs, what are you doing?” None answered; only his voice came back out of the hollowness; “Sirs, what are you doing?” He said in his heart, “They are not yet in their right minds, but wait.”

He went to a place in their midst; he shouted to them “Move!” and they moved. He said again “Move!” They set their hands against the underside of the sky. He said again, “Move!” They sat up; the sky was lifted a little. He said again “Move! Stand!” They stood. He said again “Higher!” But they answered, “How shall we lift it higher?” He made a beam of wood, saying, “Lift it on this.” They did so. He said again, “Higher! Higher!” But they answered, “We can no more, we can no more, for the sky has roots in the land.” So Nareau lifted up his voice and shouted, “Where are the Eel and the Turtle, the Octopus and the Great Ray?” The Fools and Deaf Mutes answered, “Alas! they are hidden away from the work.” So he said, “Rest,” and they rested; and he said to that one among them named Naabawe, “Go, call Riiki, the conger eel.”

When Naabawe called him; he answered not, but lifted his head and bit him. Naabawe went back to Nareau, crying, “Alas! the conger eel bit me.” So Nareau made a stick with a slip-noose, saying “We shall take him with this, if there is a bait to lure him.” Then he called the Octopus from his hiding place; and the Octopus had ten arms. He struck off two arms and hung them on the stick as bait; therefore the octopus has only eight arms to this day. They took the lure to Riiki, and as they offered it to him Nareau sang:

Riiki of old, Riiki of old!
Come hither Riiki, thou mighty one;
Leave thy wife, the short-tailed eel,
For thou shalt uproot the sky, thou shalt press down the depths.
Heave thyself up, Riiki, mighty and long,
Kingpost of the roof, prop up the sky and have done.
Have done, for the judgement is judged.

When Riiki heard the spell, he lifted up his head and the sleep went out of him. See him now! He puts forth his snout. He seizes the bait. Alas! they tighten the noose; he is fast caught. They haul him! he is dragged away from his wife the short-tailed eel, and Nareau is roaring and dancing. Yet pity him not, for the sky is ready to be lifted. The day of sundering has come.

Riiki said to Nareau, “What shall I do?” Nareau answered, “Lift up the sky on thy snout; press down the earth under thy tail.” But when Riiki began to lift, the sky and the land groaned, and he said, “Perhaps they do not wish to be sundered.” So Nareau lifted up his voice and sang.

Hark, hark how it groans, the Cleaving Together of old!
Speed between, Great Ray, slice it apart.
Hump thy back, Turtle, burst it apart.
Fling out thy arms, Octopus, tear it apart.
West, East, cut them away!
North, South, cut them away!
Lift, Riiki, lift, kingpost of the roof, prop of the sky.

It roars, it rumbles! Not yet, not yet is the Cleaving Together sundered.

When the Great Ray and the Turtle and the Octopus heard the words of Nareau, they began to tear at the roots of the sky that clung to the land. The Company of Fools and Deaf Mutes stood in the midst. They laughed; they shouted, "It moves! See how it moves!" And all that while Nareau was singing and Riiki pushing. He pushed up with his snout, he pushed down with his tail; the roots of the sky were torn from the earth; they snapped! the Cleaving Together was split asunder. Enough! Riiki straightened out his body; the sky stood high, the land sank, the Company of Fools and Deaf Mutes was left swimming in the sea.

But Nareau looked up at the sky and saw that there were no sides to it. He said, "Only I, Nareau, can pull down the sides of the sky." And he sang:

Behold, I am seen in the west, it is West!
There is never a ghost, nor a land, nor a man;
There is only the Breed of the First Mother, and the First Father and the First Beginning;
There is only the First Naming of Names and the First Lying Together in the Void;
There is only the lying together of Na Atibu and Nei Teakea,
And we are flung down in the waters of the western sea.
It is West!

So also he sang in the East, and the North, and the South. He ran, he leapt, he flew, he was seen and gone again like the lightnings in the sides of heaven; and where he stayed, there he pulled down the side of the sky, so that it was shaped like a bowl.

When that was done, he looked at the Company of Fools and Deaf Mutes, and saw that they were swimming in the sea. He said in his heart, "There shall be the First Land." He called to them "Reach down, reach down-o-o! Clutch with your hands. Haul up the bedrock. Heave!" They reached down; they hauled up the First Land from the bottom of the sea. The name of it was Aba the Great, and there was a mountain that smoked in its midst. It was born in the Darkness.

And Nareau stood on Aba the Great in the west. He said to his father, "Na Atibu, it is dark. What shall I do?" Na Atibu answered: "Take my eyes, so that it may be light." Then Nareau slew his father and laid his head on the slope of the mountain that smoked. He took his right eye and flung it east: behold! the Sun. He took his left eye and flung it in the west: behold! the Moon. He took the fragments of his body and scattered them in the sky: behold! the Stars. He took Riiki the Great Eel; he flung him overhead; and behold! his belly shines there to this day, even the Milky Way.

And Nareau planted in Aba the Great the beam of wood that had lifted the sky: behold! the First Tree, the Ancestor Sun. The spirits of the underworld grew from its roots; and from the whirlpool where its roots went down to the sea grew the Ancestress, Nei Nimanoa, the far-voyager, from whom we know the navigating stars.

And when it was light, Nareau made Aba the Little in the West and Samoa in the South. He planted in Samoa a branch of the First Tree, the Ancestor Sun, and ancestors grew from it. They were kings of the Tree of Samoa, the Breed of Matang, the company of red-skinned folk, whose eyes were blue – Auriaria and Nei Tituaabine, Tabuariki and Nei Tevenei and Taburimai. And Auriaria was king of the crest; and his children were Kanii and Batuku who reigned beneath the Tree.

And Nareau plucked the flowers of the tree of Samoa. He flung them northwards and where they fell, there grew Tarawa, Beru, Tabiteuea, and a multitude of islands between South and West, not to be numbered. All the lands of the earth were made by Nareau the Younger. Who shall know the end of his knowledge and his works? There is nothing that was not made by him.

So at last all things were finished according to his thought. He said in his heart, “Enough. It is finished. I go, never to return.” And he went, never to return.

(Recorded in Grimble, 1952; adapted spelling.)

A.1.2 A legend of Matang

In Matang of old dwelt Nakaa the Judge, and he had lordship over all the people. The spirits of Matang also bowed before him, for they feared to look into his eyes. But no land ever seen by man was as beautiful as that land. It was great, it was high: many were its mountains; all manner of trees were there, and rivers of fresh water. The trees were heavy with fruit; there were lakes also with abundance of fish. No hunger, no thirst were in that place, never an ill wind visited it, and the people knew not death.

Nakaa had his dwelling below a mountain, in a spot that was very fruitful. And behold! he planted two pandanus trees there, very wide and tall. One tree stood in the north, the other in the south. He said, "The men shall be gathered under the tree in the north and the women shall be gathered under the tree in the south." And so it was; the men turned north, the women turned south; each company turned away with its own happiness; and there was neither death nor grey hair among them.

But there came a day when Nakaa was to go on a journey. He gathered the men and the women together in the midst between the trees, and behold! they looked on each other's bodies.

And Nakaa said to all of them, "I go on a journey. See that ye turn away from each other when I am gone, the men to north, the women to south." He said again, "This is my word: there shall be no traffic between the men and women when I am gone." He said again, "There is a mark that I shall know when I return, if perchance the men play together with the women." Those three commands spake Nakaa before he went on his journey.

And when he was gone, the men returned to their tree in the north, and the women returned to their tree in the south, and each company abode with its own thoughts. So it was for a long time. But their hearts were not at ease, for they had looked on each other's bodies. As it were, their hearts were turned over within them.

And after a long time it was night, and a south wind moved in the trees. Cool was that wind and sweet with the scent of the flowers of the women's tree. And the scent was blown upon the company of the men where they lay sleeping in the north. Behold! the men stirred; they awoke; their hearts were drawn to the women. They arose. They said together, "We will go play with the women, for the scent of their tree is sweet." See them now! They go forth, they are running, they are beneath the tree of the women, they are playing with the women beneath the tree. Alas! the mark of Nakaa is upon them, but as yet they know it not.

And after that, time was not long ere Nakaa returned. He arrived, he stood in the midst between the trees, he called the people to him, saying, "Come, gather here before me." They heard his word. They came to bow before him, and when they bowed he took their heads between his hands. He lifted the hairs of their heads with his fingers, he searched here, he searched there; and alas! he found his mark upon them; he saw grey hairs among the black, and he knew they had not hearkened to his word. He said, "Ye have played together under the women's tree," and the people answered nothing.

And Nakaa said again, "Because ye could not hearken to my word, ye shall leave the land of Matang for ever."

Then the men and the women entreated him, saying, "Drive us not forth. If thou hadst not gathered us together, we should not have looked upon each other's bodies, and our hearts would not have been overturned. This was thy work." So also the spirits of Matang spoke for them.

And his heart was softened, but only a little; he said, “Sometimes ye shall see Matang in dreams. Yet ye shall not come near it. Think not to land upon its shores.” And when the people wept, he said, “Enough! There shall be no return to Matang.”

He said again, “Here be two trees, the men’s and the women’s. One of them ye shall take with you, the other shall remain. Which tree do ye choose?” And the men answered, “We choose the trees of the women.” And Nakaa said, “Ye have chosen the tree of Death. So be it. The tree of Life shall remain in Matang. Ye shall have Death always with you. And because this is my tree that ye take with you, the ghosts of your dead shall find me sitting at the gate between the lands of the living and the dead; and none shall escape my net or my pit whose way has not been straightened according to my word.”

And he gave them the ritual that is called Te Kaetikawai (The Straightening of the Way), saying, “Perform this over your dead, that they may escape my net and ye may escape my pit.” And he said, “Let no man lie with his sister, or eat the totem of his fathers, or do dishonour to his father’s bones if he would escape the stakes of my pit.” And he said again, “Ye shall bury your dead in mats plaited by women of the leaves of the tree of Death. That is also my word to you.” These were the judgements of Nakaa when the people had chosen their tree; and we have done his will from that day to this, lest the spirits of Matang turn away from us; for the spirits of Matang fear the eye of Nakaa.

And when the people lifted the tree of the women to take it away, Nakaa plucked leaves from it. And he wrapped up in the leaves all the sicknesses and pains known to mankind – tooth-rot, and stomach ache, and rheumatism, and coughing, and fever, and fading away – a multitude of ills; and he pelted the heads of the people with the leaves; and those things have been with us ever since.

Alas! there is no return to the shores of Matang, no, not even in dreams. But Au of the Rising Sun will return to us one day with his Company of Matang, for this he has promised. And the gate of Nakaa is not shut for us when we die, for if we obey his words it will lie open before us, and the way will be straight to Bouru, and Marira, and Neineaba. And there we shall be happy, for there the ancestors await us, and we shall be gathered with them for ever.

(Recorded in Grimble, 1952; adapted spelling.)

A.2 Discoveries of the islands of Kiribati

A.2.1 Spanish discoveries between 1521 and 1606

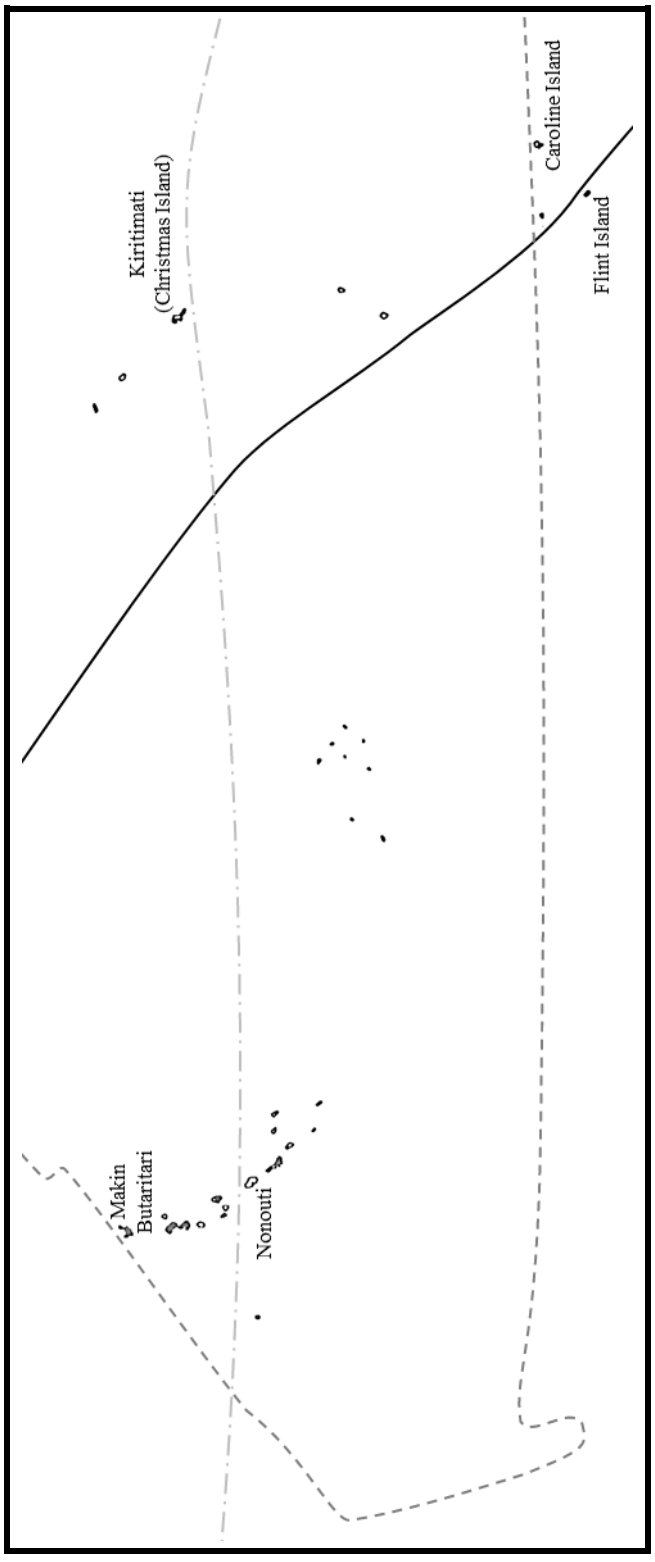

Figure A.1: The routes of Spanish explorers: Black, solid: Magellan (1521); dark-grey; dashed: Grijalva's crew (1537); light-grey, dash-dotted: Quiros (1606); names are indicated for the sighted islands.
(Source: Maude & Heyen, 1959.)

A.2.2 The two waves of discoveries

Table A.1: Discoveries and rediscoveries of Kiribati islands, listed from north to south in their respective groups. (Sources: Maude & Heyen, 1959; Maude, 1961.)

Island	**Spanish Flag**	**Second Wave**
Banaba (Ocean Island)		1801 (Gardner)
Gilbert Group		
Makin	1606 (Quiros)	1788 (Gilbert & Marshall)
Butaritari	1606 (Quiros)	1788 (Gilbert & Marshall)
Marakei		1824 (Duperrey)
Abaiang		1788 (Gilbert & Marshall)
Tarawa		1788 (Gilbert & Marshall)
Maiana		1809 (Patterson)
Abemama		1799 (Bishop)
Kuria		1788 (Gilbert & Marshall)
Aranuka		1788 (Gilbert & Marshall)
Nonouti	1537 (Grijalva's crew)	1799 (Bishop)
Tabiteuea		1799 (Bishop)
Beru		1826 (Clerk)
Nikunau		1765 (Byron)
Onotoa		1826 (Clerk)
Tamana		1804 (Cary)
Arorae		1809 (Patterson)
Phoenix Group		
Abariringa (Canton Island)		1823 (Barney)
Enderbury Island		1823 (Coffin)
Birnie Island		1823 or 1824 (Emmett)
McKean Island		1794 (Barber)
Rawaki (Phoenix Island)		1815 or 1822 (whalers)
Manra (Sydney Island)		1823 (Emmett)
Orona (Hull Island)		1828 or before (unknown)
Nikumaroro (Gardner Island)		1824 (Kemin)
Line Group		
Teeraina (Washington Island)		1798 (Fanning)
Tabuaeran (Fanning Island)		1798 (Fanning)
Kiritimati (Christmas Island)	1537 (Grijalva's crew)	1777 (Cook)
Malden Island		1823 (Clark)
Starbuck Island		1819 (Henderson)
Caroline Island	1606 (Quiros)	1795 (Broughton)
Vostok Island		1820 (Bellingshausen)
Flint Island	1521 (Magellan)	1801 or 1802 (unknown)

A.3 ABCFM in Abaiang

Figure A.2: Protestant church, Abaiang.

Figure A.3: Bingham's memorial, Abaiang. Engraved: "Kanuringan moani waeraken Beingam Dr Hiram Bingham I taboneteba n Nobemba 18, 1857. Boni ngaia ae te moa ni mitinare ae uota te euangkerio nako Kiribati. E karekea te koroboki ni Kiribati ao raira te baibara – 1957 – Kanuringani koron te tienture." (Memorial for Dr Hiram Bingham who arrived on November 18, 1857 as the first missionary and brought the Gospel to Kiribati. He created the writing of Kiribati and translated the bible – 1957 – memorial marking one century

A.4 Treaty between Great Britain and Germany relating to the Demarcation of the Spheres of Influence

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Declaration between the Governments of Great Britain and the German Empire relating to the Demarcation of the British and German Spheres of Influence in the Western Pacific, signed at Berlin, April 6, 1886.

The Government of Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, and the Government of His Majesty the German Emperor, having resolved to define the limits of the British and German spheres of influence in the Western Pacific;

The Undersigned, duly empowered for that purpose, viz.:

1. Sir Edward Baldwin Malet, Her Britannic Majesty's Ambassador Extraordinary and Plenipotentiary;
2. Count Herbert Bismarck, His Imperial Majesty's Under-Secretary of State for Foreign Affairs;

having agreed, on behalf of their respective Governments, to make the following Declaration:-

1. For the purpose of this Declaration the expression "Western Pacific" means that part of the Pacific Ocean lying between the 15th parallel of north latitude and the 30th parallel of south latitude, and between the 165th meridian of longitude west and the 130th meridian of longitude east of Greenwich.

2. A Conventional line of demarcation in the Western Pacific is agreed to, starting from the north-east coast of New Guinea, at a point near Mitre Rock, on the 8th parallel of south latitude, being the boundary between the British and German Possessions on that coast, and following that parallel to point A, and thence continuing to points B, C, D, E, F, and G, as indicated in the accompanying Charts, which points are situated as follows:

    A. 8 deg. south latitude, 154 deg. longitude east of Greenwich.
    B. 7 deg.10' south latitude, 155 deg. 25' east longitude.
    C. 7 deg.15' south latitude, 155 deg. 35' east longitude.
    D. 7 deg.25' south latitude, 156 deg. 40' east longitude.
    E. 8 deg. 50' south latitude, 159 deg. 50' east longitude.
    F. 6 deg. north latitude, 173 deg. 30' east longitude.
    G. 15 deg. north latitude, 173 deg. 30' east longitude.

    The point A is indicated on the British Admiralty Chart 780, Pacific Ocean (South-west sheet); the points B, C, D, and E are indicated on the British Admiralty Chart 214 (South Pacific Solomon Islands); and the points F and G on the British Admiralty Chart 781, Pacific Ocean (North-west sheet).

3. Germany engages not to make acquisitions of territory, accept Protectorates, or interfere with the extension of British influence, and to give up any acquisitions already established in that part of the Western Pacific lying to the east, south-east or south of the said Conventional line.

4. Great Britain engages not to make acquisitions of territory, accept Protectorates, or interfere with the extension of German influence, and to give up any acquisitions of territory or Protectorates already established in that part of the Western Pacific lying to the west, north-west or north of the said Conventional line.

5. Should further surveys show that any islands, now indicated on the said on one side of the said are in reality on the said line shall be such islands shall same side of the line as a p on the said Charts.

6. This Declaration does not apply to the Navigator Islands (Samoa), which are affected by Treaties with Great Britain, Germany, and the United States; nor to the Friendly Islands (Tonga), which are affected by Treaties with Great Britain and Germany; nor to the Island of Niue (Savage Island), which groups of islands shall continue to form a neutral region; nor to any islands or places in the Western Pacific which are now under the sovereign protection of any other civilized Power than Great Britain or Germany.

Declared and signed in duplicate at Berlin, this sixth day of April, one thousand eight hundred and eighty-six.

(LS.) Edward B. Malet (LS.) Graf Bismarck

(Source: *Treaty between Great Britain and Germany relating to the Demarcation of the Spheres of Influence 1886*.)

A.5 Proclamation of the British protectorate over the Gilbert islands

A.5.1 Captain Davis' proclamation at Abemama, May 27 1892

Proclamation in the name of Her Majesty Victoria Queen of the United Kingdom of Great Britain and Ireland Empress of India

By Edward Henry Meggs Davis
Esquire Captain in Her Majesty's Fleet and Deputy Commissioner for the Western Pacific
Commanding Her Majesty's Ship "Royalist"

Whereas I have it in command from H. M. Queen Victoria that H. M. has this day assumed a protectorate over the group of islands known as the Gilbert Islands situated between 4° north and 3° south latitude and 172° east and 177° east longitude and that the following islands all small islands or islets depending upon them are included in such protectorate viz: Arorae, Tamana, Onotoa, Beru, Nikunau, Tabiteuea, Nonouti, Aranuka, Kuria, Abemama, Maiana, Tarawa, Abaiang, Marakei, Butaritari, Makin. Now . . . Therefore I Edward Henry Meggs Davis Captain in H. M. Fleet and Deputy Commissioner for the Western Pacific Commanding H. M. S. "Royalist" do hereby proclaim and declare to all men that from after the date of these presents the above mentioned islands have been placed under British protection.

Given under my hand at Abemama this twenty seventh day of May one thousand eight hundred and ninety-two.

Ed. H. M. Davis

Witness F. H. Luscombe, Lieut;. R. D. Corrie, Trader.

(Reported in Werber, 2011; adapted spelling.)

A.5.2 Commemorative plate in Taratai, Tarawa

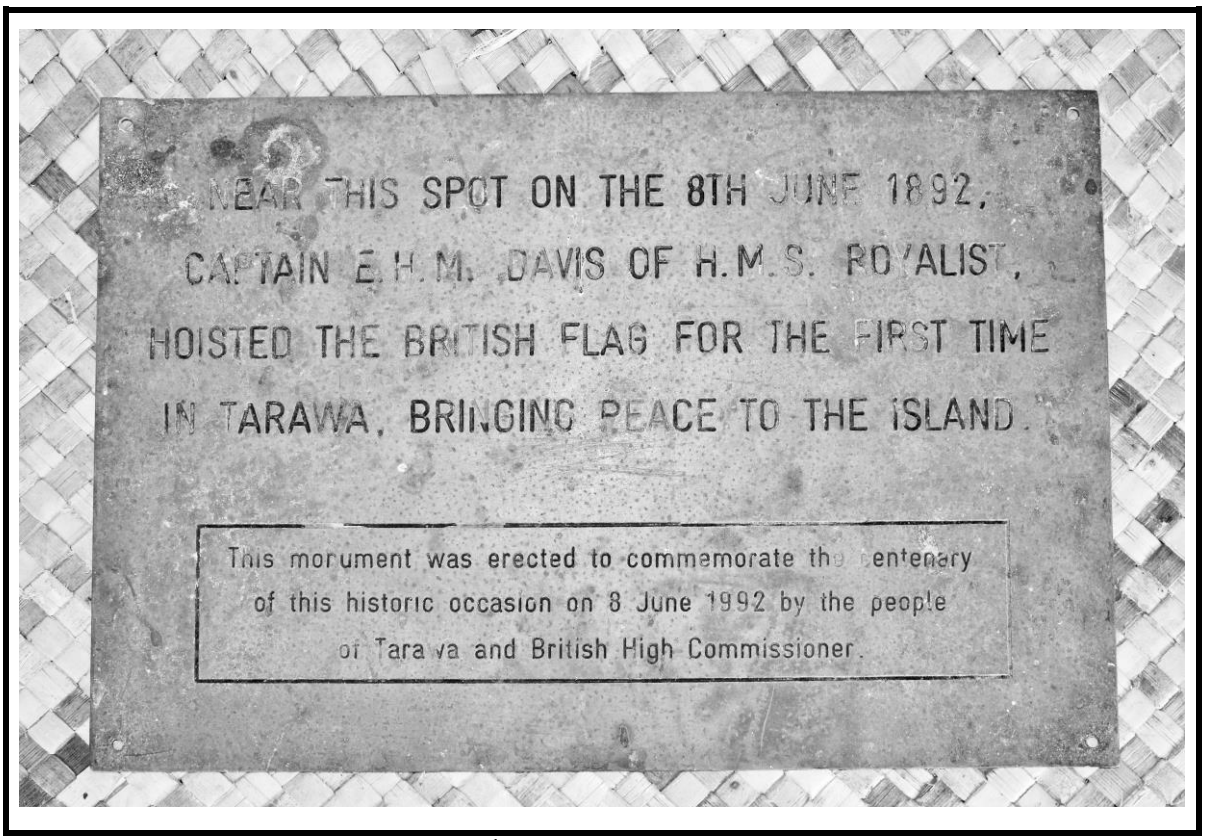

Figure A.4: Engraved: "Near this spot on the 8th June 1892, Captain E. H. M. Davis of H. M. S. Royalist, hoisted the British flag for the first time in Tarawa, bringing peace to the island. This monument was erected to commemorate the centenary of this historic occasion on 8 June 1992 by the people of Tarawa and British High Commissioner." Davis happened to arrive at times of warfare in Tarawa. While it is true that his arrival caused warfare to halt and he made the chiefs involved sign a peace treaty, he also enforced that there was only one king and, like elsewhere, collected all firearms (Macdonald, 2001, pp. 68-69) – he was not exactly "bringing peace" to Tarawa.

A.6 Campbell's legacy

Table A.2: Campbell's laws and regulations in place by 1904, including penalties.
(Reported in Werber, 2011, p. 154; adapted spelling.)

No. 1	It is forbidden to bury dead persons in a town: they are to be buried in the cemeteries	10 pounds
No. 2	People allowing their children to go naked are to be punished	1 pound
No. 3	It is forbidden to commit a nuisance in the town, or the lee-beach, or in the bush	2 pounds
No. 4	If a man and a woman want to get married, they are first to see the magistrate; and shall not be married until three months afterwards	1 month imprisonment
No. 5	'Mwaie' (obscene games) are forbidden	1-3 months imprisonment
No. 6	Begging is forbidden – 'bubuti'	1 month imprisonment
No. 7	It is forbidden for people to walk about after 9 p.m. They are to remain in their own houses	1-4 weeks imprisonment
No. 8	It is forbidden for single women to go on board a vessel	1 month imprisonment
No. 9	It is forbidden to practice sorcery	1-6 months imprisonment
No. 10	All pigs are to be kept in pens. If the pigs get loose, the owner is to be fined	
No. 11	Any person cutting down a food tree in bearing is to be punished	1 month imprisonment
No. 12	Any man drinking sour toddy is to be punished	4 months imprisonment
No. 13	Any man who does not work on public works is to be punished	2 weeks imprisonment
No. 14	Churches are to be placed at 30 feet from the road, and at 200 yards from the mwaneaba; and churches of different denominations are to be at least 400 yards apart	
No. 15	All persons wishing to travel are to make application [*sic*] to the Court for permit …	1 month imprisonment
No. 16	It is forbidden for natives to visit the hospital	1 month imprisonment
No. 17	Card playing is forbidden	10 pounds
No. 18	If a person has his house in a dirty condition, he is to be fined	1 pound
No. 19	Any person moving a boundary stone is to be punished	6 months imprisonment
No. 20	Parents whose children are suffering from a contagious disease, and who fail to report it are liable to be punished	1 month imprisonment
No. 21	Births and deaths are to be registered within 21 days	4 pounds
No. 22	It is forbidden for people to visit [an]other village for the purpose of dancing, except on public holidays	
No. 23	A married man shall not sleep in the house or village of his wife's sister, unless accompanied by his wife.	

A.7 The Gilbert islands in the Second World War

A.7.1 Coast-watchers

Table A.3: New Zealander and colony personnel working as coast-watchers during the Second World War. (Source: McQuarrie, 2012, pp. 221-220.)

Island	**New Zealander Radio Operators**	**New Zealander Soldiers**	**GEIC Radio Operators**
Banaba	R. S. Bastin R. Third P. B. Thorburn		F. Resture M. Teonea P. Lauti R. Uatioa
Gilbert Group			
Makin	M. P. McQuinn	L. B. H. Muller B. L. Were	
Butaritari	J. M. Jones	J. M. Menzies M. Menzies	Beriki
Abaiang Tarawa	S. R. Wallace		T. Faati R. G. Morgan J. Milne W. Schutz B. Narruhn D. Muller
Maiana	A. C. Heenan	C. J. Owen L. B. Speedy	R. Ianti
Abemama	J. J. McCarthy	R. J. Hitchon D. H. Howe	Taukiei
Kuria	H. R. C. Hearn	R. A. Ellis R. Jones	M. Peniamina
Nonouti	A. E. McKenna	C. A. Kilpin J. H. Nichol	Kapoa
Beru	A. L. Taylor T. C. Murray		F. Sosene I. Kaisala Tekarara
Tamana	C. A. Pearsall W. A. R. Parker	R. M. McKenzie	
Phoenix Group			
Abariringa (Canton Island)	F. R. Dayman J. M. Lee A. M. Wilde		M. Neeia T. Homasi
Orona (Hull Island)			A. Cookson F. O'Brien
Nikumaroro (Gardner Island)			R. Uatioa F. Christopher R. Resture
Line Group			
Kiritimati (Christmas Island)			Flemming G. V. Langdale F. H. Rostier

A.7.2 Japanese proclamation at Tarawa

Declaration

The Empire of Japan declared war on America, Britain and Dutch Indies to break down these hostilities on Dec 8th and Japanese Naval Forces have occupied Gilbert Islands today in the morning. It is our duty to secure the military supremacy in our hands but we have never enmity for the Gilbert peoples. Accordingly the peoples to do the peaceful conduct will be protected sufficiently, but if you will do hostile acts or do not submit my order, you will be punished with heavy penalties.

December 10th 1941
Commander of Japanese Squadron

(Source: McQuarrie, 2012.)

A.7.3 Remains of the Second World War

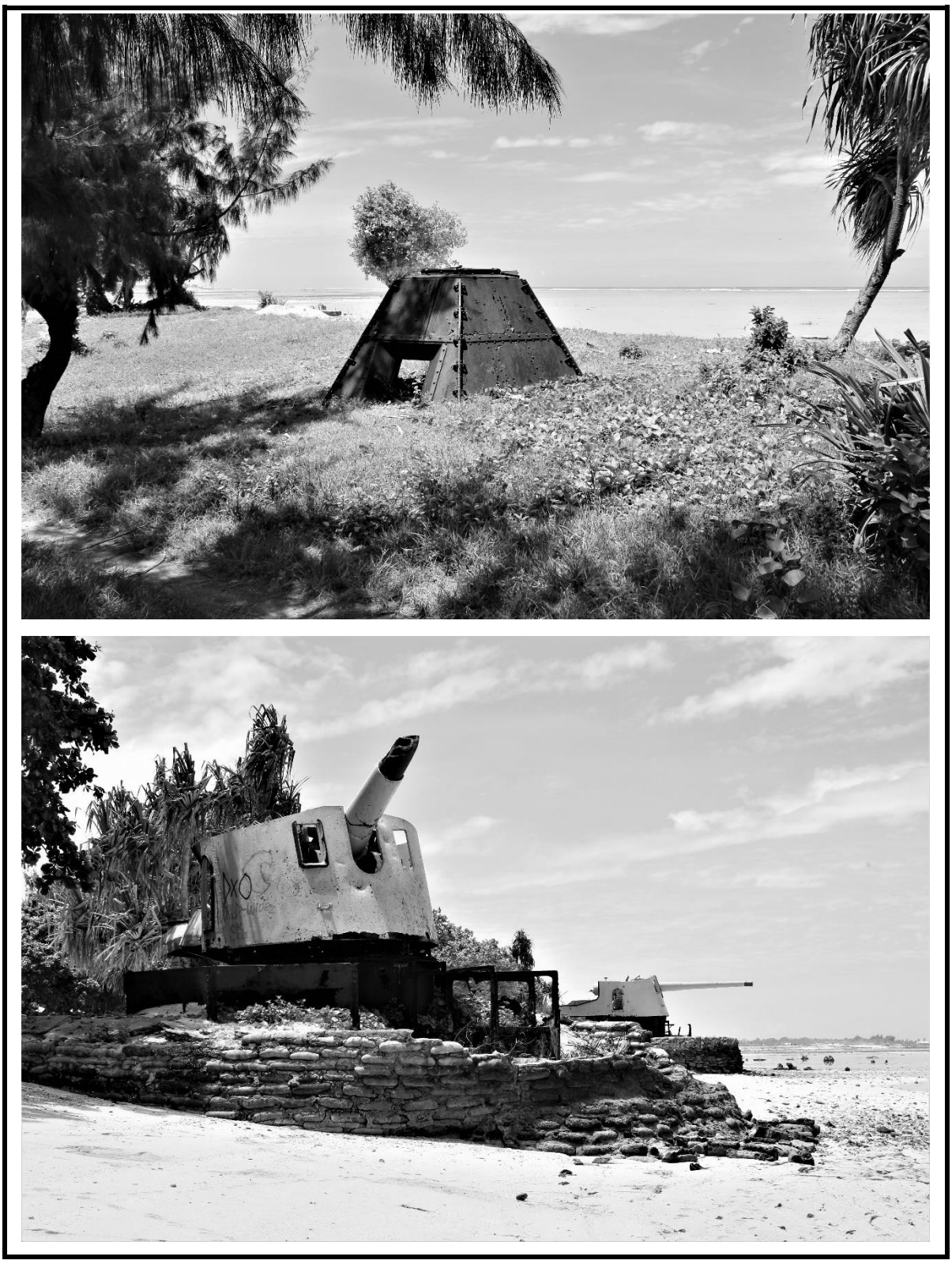

Figure A.5: Remaining bunkers and guns on Betio, South Tarawa. A small area in the east of Betio has been protected as a memorial site that has become known as Taiwan Park.

Figure A.6: Memorial in Naa, North Tarawa. After American superiority had been established on Betio, the main site of the Battle for Tarawa in the south-west, Japanese troops fled east and then north until some 165 reached Naa, the northern-most tip of the island.

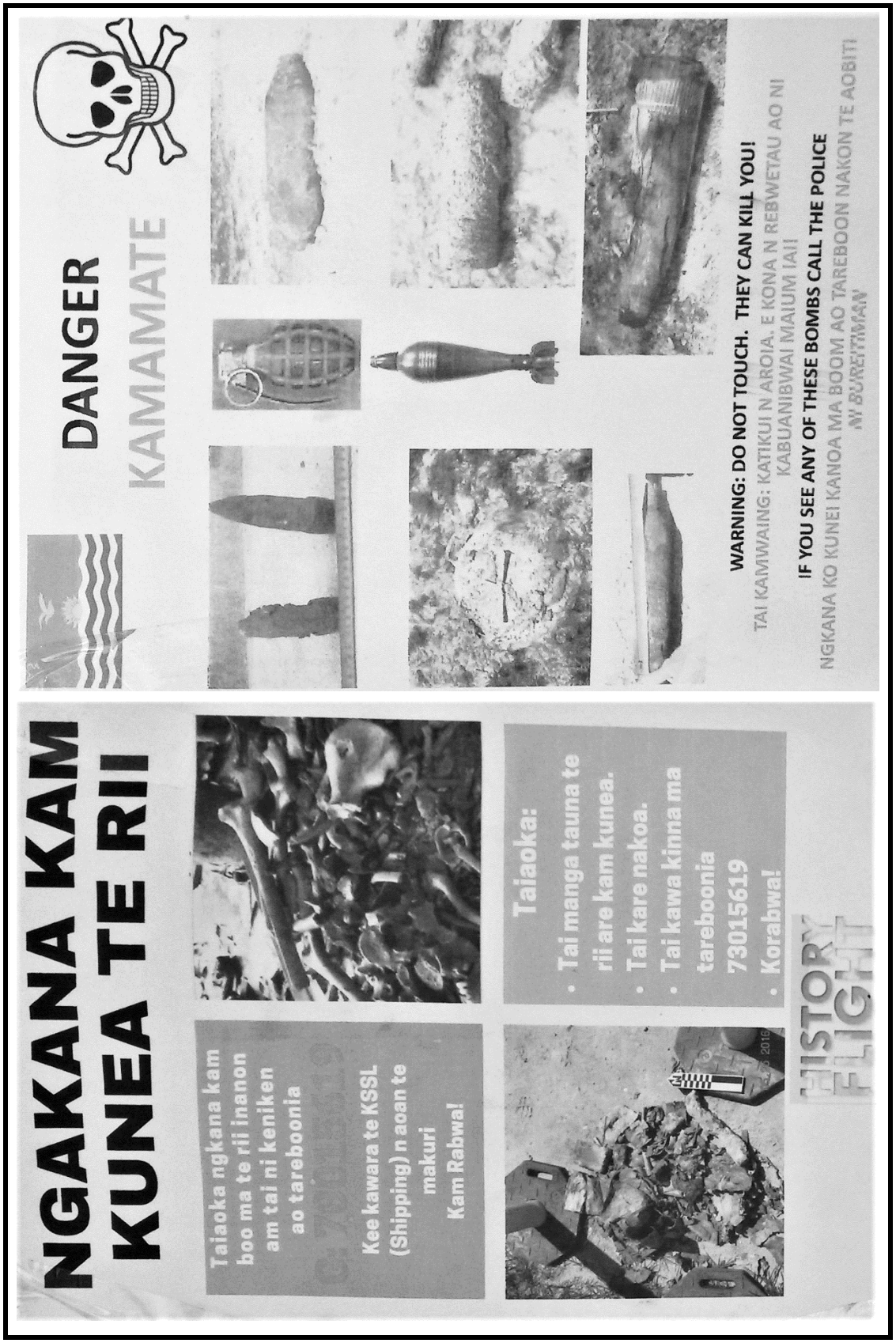

Figure A.7: History Flight posters in the window of a store in Betio, South Tarawa. Left: advice to not keep or throw away discovered bones but to call the organisation; right: advice not to touch bombs and grenades but to call the police.

A.8 Exploitation of Banaba

A.8.1 Contract between the Pacific Islands Company and the people of Banaba

---

Ocean Island, May 3rd, 1900

An agreement made this day between the Pacific Islands Company, Limited, of London, England, and Sydney, hereinafter called the 'said Company' of the one part, and the undersigned king and natives of Ocean Island (Banaba) for and on behalf of the entire population of Ocean Island, hereinafter called the 'said natives' of the other part –

1. The said natives concede to the said Company the sole right to raise and ship all the rock and alluvial phosphate on Ocean Island for and on account of the said Company.
2. The said natives agree that the said Company shall have the right to erect buildings, lay tram lines, make roads, build jetties and shipping places, or make any other arrangements necessary for the working of the phosphate deposits, also to bring labourers from other countries for the purpose of carrying on the aforesaid work.
3. The said Company agrees not to remove any alluvial phosphate from where coconut or other trees or plants cultivated by the said natives are growing, but to have the right to remove any non-fruit-bearing trees which may interfere with the working of the phosphate deposits.
4. The said Company agrees to keep a store or stores on Ocean Island where the said natives may buy goods at prices current in the Gilbert group and shall purchase from the said natives coconuts, fruits, vegetables, fish, etc., at prices current in the Gilbert group, the said natives agreeing that the said Company shall have the sole right to keep stores or trading stations on Ocean Island.
5. In consideration of the foregoing privileges, the said Company agrees to pay the said natives at a rate of fifty pounds ($50) per annum or trade to that value at prices current in the Gilbert group, payable half-yearly.
6. This agreement to be in force for a term of nine hundred and ninety-nine (999) years.

The Pacific Islands Company Limited
per Albert F. Ellis

Temati, King of Ocean Island.	Kariatabewa, Chief.	Witness to all signatures,
His X mark.	His X mark.	J Makinson.
Witness: E. Riakim	Witness: E. Riakim	

(Reported in Macdonald, 2001, pp. 95-96; adapted spelling.)

A.8.2 BPC map of Banaba

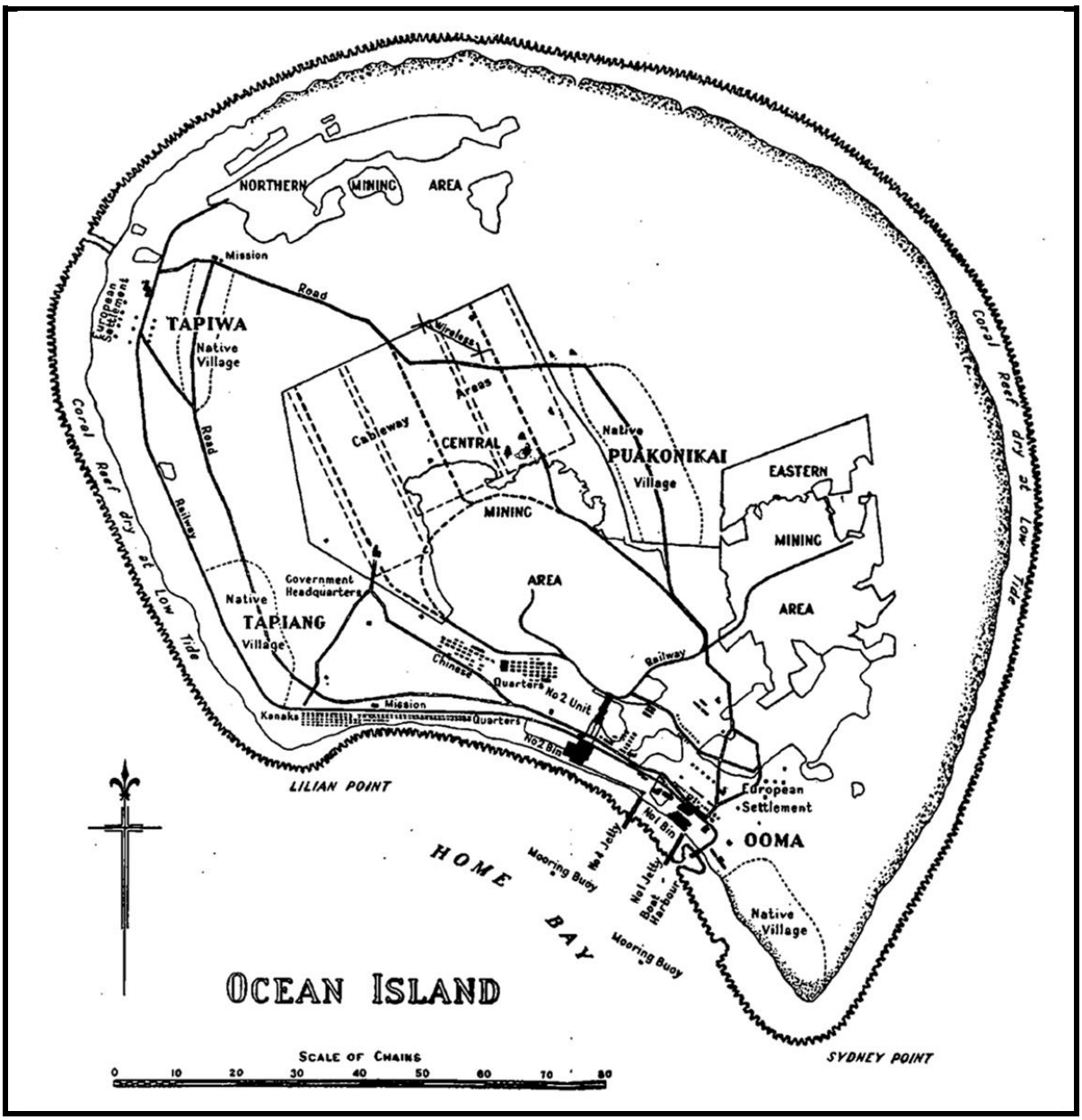

Figure A.8: Map of Banaba with BPC facilities, in or around 1936.
(Source: Ellis, 1936.)

A.8.3 Phosphate mining on Banaba

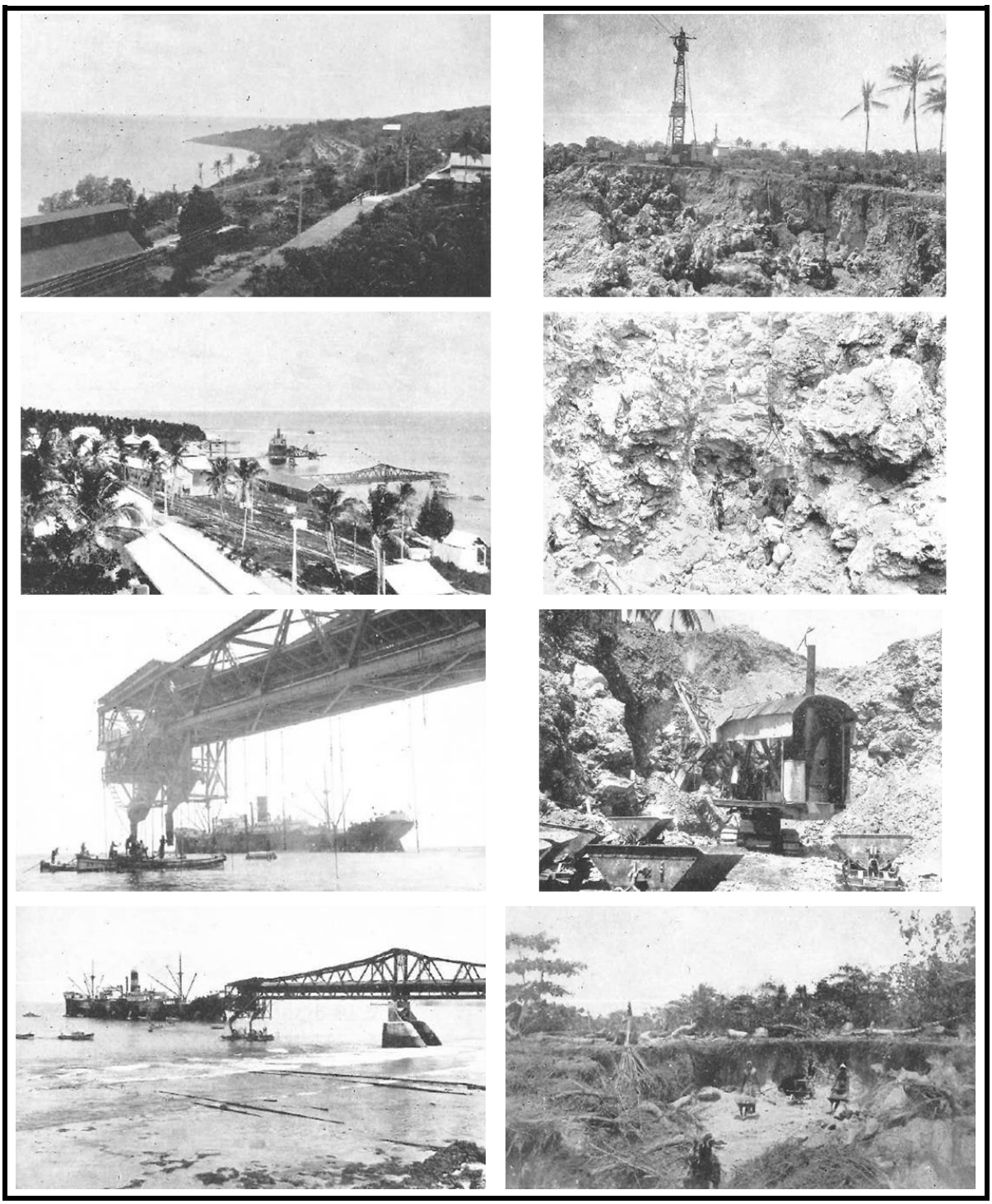

Figure A.9: Phosphate mining activities on Banaba. First and second row, left: overlooking Home Bay (photo credit: H. Gaze); third and fourth row left: phosphate is loaded onto a ship via cantilever; first to fourth row, right: mining in process. (Source: Ellis, 1936.)

A.9 Governor Smith's list of 52 questions

Questions to be answered before an independence constitution can be drafted.

A constitution is a set of rules for governing a country. Independence removes external influence and the people of the Gilbert Islands will have an opportunity to decide for themselves the rules by which they want to be governed. To help discussion of a set of rules for independence, a list of some questions which have to be answered is given below. The questions take into account the following:

(a) Gilbertese custom, remembering that custom does not stand still but survives in everyday use by change and adaptation:

(b) The experience of recent years as a nation taking part in regional affairs and dealing with international organisations; and

(c) The present system of government to which people have become accustomed.

Name

1. Should the name of the country remain the Gilbert Islands or should it be changed?
2. If the name is to be changed how should a new name be found?
3. Have you a name you would prefer?

Place in the world

4. Should the Gilbert Islands remain in the Commonwealth?
5. Should the Gilbert Islands join the United Nations or only continue membership of the various UN agencies such as WHO?
6. Should the present fundamental human rights provisions be retained in the constitution?
7. If so, are here any changes which should be made?
8. Who should qualify to be a citizen of the Gilbert Islands?
9. Should there be any means by which those without constitutional qualification as citizens can become citizens?
10. If so, on whose authority?

Law-making

11. Should an elected assembly continue to make laws for the Gilbert Islands?
12. Should the name of the elected assembly remain House of Assembly?
13. Should the numbers of elected members remain as at present or should the House be enlarged?
14. If it should be enlarged how should it be enlarged – by extra constituencies in large islands or by some other means?
15. Do the qualifications for election need to be changed?
16. If so what should they be?
17. Is the present electoral system adequate or should it be changed?
18. Who should have the power to dissolve the House?

19. Should constituencies have the right of 'recall', that is to be able to decide that they don't want their member any more before the House is dissolved?
20. Should members be paid?
21. Who should decide what members should be paid?
22. Should the House continue to be presided over by an elected member or should someone who is not a member be elected by the members to preside?
23. Should the business of the House be so arranged that the proposals for laws (that is bills) must normally be made at one meeting (first reading) and then deferred until a subsequent meeting (committee stage and second reading) so that members can discuss them with their constituents?
24. Should proposals raised by individual members also be deferred so that a careful and considered reply can be given by the Government?
25. Is there any formal institutional way in which island mwaneabas could be associated with law-making?
26. Is there a need for a second or Upper House?
27. If so, how would it be chosen and what would be the qualifications for membership?

The Government

28. Should the House of Assembly continue to elect the chief executive (the Chief Minister) from among its members or should the chief executive be elected in some other way?
29. If the chief executive should be elected in some other way should it be by national election?
30. If not, how?
31. Once elected should the Chief Executive chose [*sic*] his own team of ministers to form a Government or should they be chosen in some other way?
32. If they should be chosen by some other way, by what way?
33. Should the members of the Government be drawn from the House or would it be acceptable for them to be draw [*sic*] from elsewhere (e.g. as in the USA)?
34. If ministers were chosen from elsewhere (for example a renowned fisherman to be Minister of Fisheries) should they still be responsible to the House and be ex-officio members?
35. Does a rigid distinction between minister and secretary (political and civil heads of a ministry) have validity in Gilbertese custom and an economy as small as that of the Gilbert Islands?

Head of State

36. Should the Gilbert Islands retain the British monarchy as the Head of State, the Queen being represented by a governor-general?
37. If yes, on whose advice should the Queen appoint the governor-general?
38. If no, should the chief executive also be the head of state, that is an executive president, or should there be a president who is head of state but not the chief executive?
39. If there is to be a president who is not the chief executive, how would he be chosen?
40. What powers, if any, should he have? (The powers of a governor-general are established by precedent in the United Kingdom and are not subject to discussion.)

The Judiciary

41. Should there be courts independent of the government?
42. Should all courts be subject to the control of a chief justice?
43. How should the chief justice be chosen?

The Public Service

44. Should the public service be independent of political control or not?
45. If yes, should it be controlled by an independent commission?
46. How should that commission be appointed?

The Police

47. Should the police force continue to have a special status guaranteed by the law?
48. How should the commissioner of police be appointed?

Finance and Audit

49. Should there continue to be a Public Accounts Committee?
50. If so, how should that committee be chosen?
51. Should the basic provisions of the Public Finance (Control and Audit) Ordinance be included in the constitution?

Variation of the Constitution

52. If a change is to be made in the constitution on whose authority should it be made?

(Source: J. Smith, 2011, pp. 257-260; adapted spelling.)

A.10 *Migration with Dignity* policy outline

The science is clear – climate change threatens the long-term survival of Kiribati. As such, the Kiribati Government acknowledges that relocation of our people may be inevitable. It would be irresponsible to acknowledge this reality and not do anything to prepare our community for eventual migration in circumstances that permit them to migrate with dignity. That said, relocation will always be viewed as an option of last resort. We will do all that we can to preserve Kiribati as a sovereign and habitable entity. At the same time, if relocation becomes necessary and nothing has been done to ready people for the move, it will not be possible to rapidly relocate over 100'000 people in a way that preserves the dignity of those being relocated and minimises the burden on the receiving countries.

The relocation strategy of the Kiribati Government has two key components. Firstly, opportunities must be created to enable the migration of those who wish to do so now and in the coming years. This will assist in establishing expatriate communities of I-Kiribati, who will be able to absorb and support greater numbers of migrants in the longer term. It will also benefit those who remain by lifting the levels of remittances. Secondly, the levels of qualifications able to be obtained in Kiribati will be raised to those available in countries such as Australia and New Zealand. This will make qualified I-Kiribati more attractive as migrants, but will also improve the standards of services available locally.

The concept of 'migration with dignity' is crucial to the effectiveness of the Government's relocation policy. I-Kiribati migrants should be sought after by the countries to which they wish to relocate. For this to happen our people must be in a position to provide the skills that are needed in the receiving countries. This creates a 'win-win' situation, where both Kiribati and the receiving country benefit.

(Source: Office of te Beretitenti, n.d., b)

A.11 Summary tables for previous VOT research

A.11.1 VOT and sex

Table A.4: Previous research on VOT and *Sex*.

Author(s)	Variant(s)	VOT ∩ sex	Notes
Women > men			
Diehl et al. (1980)	/k^h/	Δ/k^h/ 26-48 ms	differences for two speaking rates; no signficance test reported
Swartz (1992)	/t^0/ /t^h/	Δ/t^0/ 4 ms Δ/t^h/ 18 ms	all variants individually
Whiteside & Irving (1997)	/p^0, t^0, k^0/ /p^h, t^h, k^h/	Δ/p^0/ 2 ms Δ/t^0/ 16 ms Δ/k^0/ 5 ms Δ/p^h/ 9 ms Δ/t^h/ 3 ms Δ/k^h/ 11 ms	all variants individually; results only signficant for /t^0/ and /p^h/
Ryalls et al. (1997)	/p^0, t^0, k^0/ /p^h, t^h, k^h/	Δ/p^h/ 10 ms Δ/t^h/ 13 ms Δ/k^h/ 10 ms	results for aspirated stops; all variants pooled together for significance test
Thomas (2012)	/p^0, t^0, k^0/ /p^h, t^h, k^h/	Δ 2 ms	all variants pooled together
Sonderegger (2012)	/p^h, t^h, k^h/	Δ/p^h, t^h, k^h/ 10%	all variants pooled together for significance test; results significant for manual but not automated measurements
Robb et al. (2005)	/p^0, t^0, k^0/ /p^h, t^h, k^h/		all variants individually; results only signficant for /p^h, t^h, k^h/, no values provided

Author(s)	Variant(s)	VOT ∩ sex	Notes
Women = men			
Koenig (2000)	/p^0, t^0/ /p^h, t^h/	Δ/t^h/ 12 ms (women > men)	unclear whether variants were pooled or analysed individually; results non-signficant
Ryalls et al. (2004)	/p^0, t^0, k^0/ /p^h, t^h, k^h/	Δ/p^h/ 5 ms Δ/t^h/ 11 ms Δ/k^h/ 11 ms	results for aspirated stops; all variants pooled together for significance test; results non-significant
Sweeting & Baken (1982)	/p^0/ /p^h/	Δ/p^0/ 1 ms (women < men) Δ/p^h/ 8 ms (women > men)	all variants individually; results non-signficant
Benjamin (1982)		Δ 5 ms (women > men)	results for aspirated stops; no indication of place of articulation; no (statistical) discussion provided
Morris et al. (2008)	/p^0, t^0, k^0/ /p^h, t^h, k^h/	Δ/p^0, t^0, k^0/ 1 ms (women > men) Δ/p^h, t^h, k^h/ 5 ms (women > men)	/p^0, t^0, k^0/ pooled together, /p^h, t^h, k^h/ pooled together; results non-signficant
Yu et al. (2014)	/p^h, k^h/		all variants individually; results non-signficant, no values provided
Women < men			
B. L. Smith (1978)	/p^0, t^0, k^0/	Δ 4 ms	all variants pooled together
Interaction			
Torre & Barlow (2009)	/p^0, t^0, k^0/ /p^h, t^h, k^h/	sex ∩ age	all variants individually

A.11.2 VOT and age

Table A.5: Previous research on VOT and *Age*. Column *VOT ∩ age:* positive values indicate an increase across age groups; negative values indicate a decrease.

Author(s)	Variant(s)	Age groups	VOT ∩ age	Notes
Decrease				
Morris & Brown (1994)	/p^0, t^0/ /p^h, t^h/	20-35 75-90		all variants pooled together; no values provided
Smith et al. (1987)	/p^h, t^h, k^h/	24-27 66-75	Δ -2 ms	all variants pooled together
Liss et al. (1990)	/p^h/	65-80 87-93	Δ -8 ms	comparisons of medians
Benjamin (1982)		21-32 68-82	Δ -16 ms	results for aspirated stops; no indication of place of articulation
Ryalls et al. (2004)	/p^0, t^0, k^0/ /p^h, t^h, k^h/	20-30 55-69	Δ/p^h/ -12 ms Δ/t^h/ -19 ms Δ/k^h/ -20 ms	results for aspirated stops; all variants pooled together for significance test
Morris & Brown (1987)	/p^0, t^0, k^0/ /p^h, t^h, k^h/	20-35 75+	Δ/p^h/ -15 ms Δ/t^h/ -20 ms Δ/k^h/ -10 ms	all variants individually; data only presented in figures, values represent estimates
Weismer & Fromm (1983)	/p^h, t^h, k^h/	19-27 63-85	Δ -23 ms	all variants pooled together; no (statistical) discussion provided
No effect				
Sweeting & Baken (1982)	/p^0/ /p^h/	25-39 65-74 75+	Δ +2 ms Δ -9 ms	all variants individually; indicated differences for /p^h/, results non-signficant
Petrosino (1993)	/k^0/ /k^h/	20-30 70-87		all variants individually; results non-signficant, no values provided
Thomas (2012)	/p^0, t^0, k^0/ /p^h, t^h, k^h/	5-75 (7 groups)		significant inter-group differences but no apparent age-grading
Interaction				
Torre & Barlow (2009)	/p^0, t^0, k^0/ /p^h, t^h, k^h/	20-35 60-89	age ∩ sex	all variants individually
Neiman et al. (1983)	/p^0, k^0/ /p^h, k^h/	20-30 70-80	age ∩ foll. vowel	all variants pooled together

A.12 Statistical appendices

A.12.1 Variant choices

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A.12.1 Variant choices

Table A.5: Variant choices and *Speaker*, ordered by *Age* (summaries). Effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Speaker										
(33 levels)										

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Speaker										
(33 levels)										

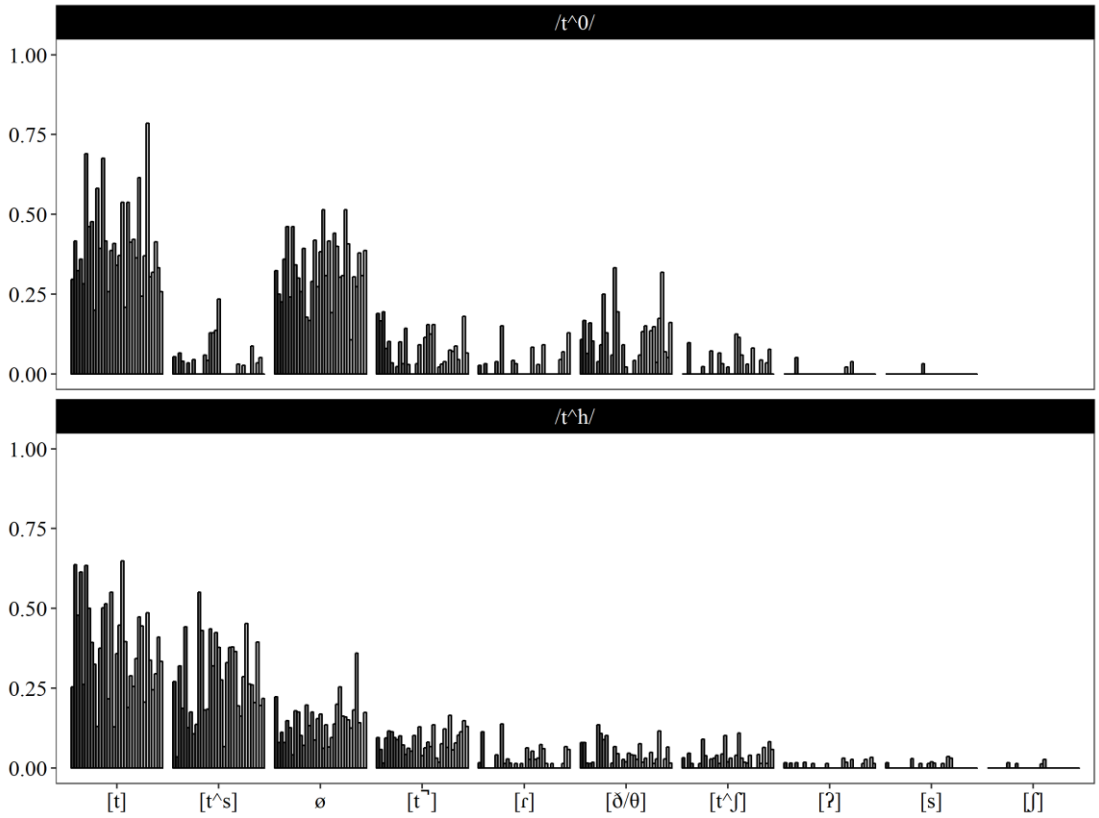


Table A.6: Variant choices and *Sex*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Sex										
female	216	20	190	30	12	49	16	4		
male	189	20	147	38	9	44	11		1	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Sex										
female	370	388	186	104	23	29	39	12	9	3
male	521	241	137	87	41	69	35	5	3	2

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Sex										
female	0.402	0.037	0.354	0.056	0.022	0.091	0.030	0.007	0.000	
male	0.412	0.044	0.320	0.083	0.020	0.096	0.024	0.000	0.002	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Sex										
female	0.318	0.334	0.160	0.089	0.020	0.025	0.034	0.010	0.008	0.003
male	0.457	0.211	0.120	0.076	0.036	0.060	0.031	0.004	0.003	0.002

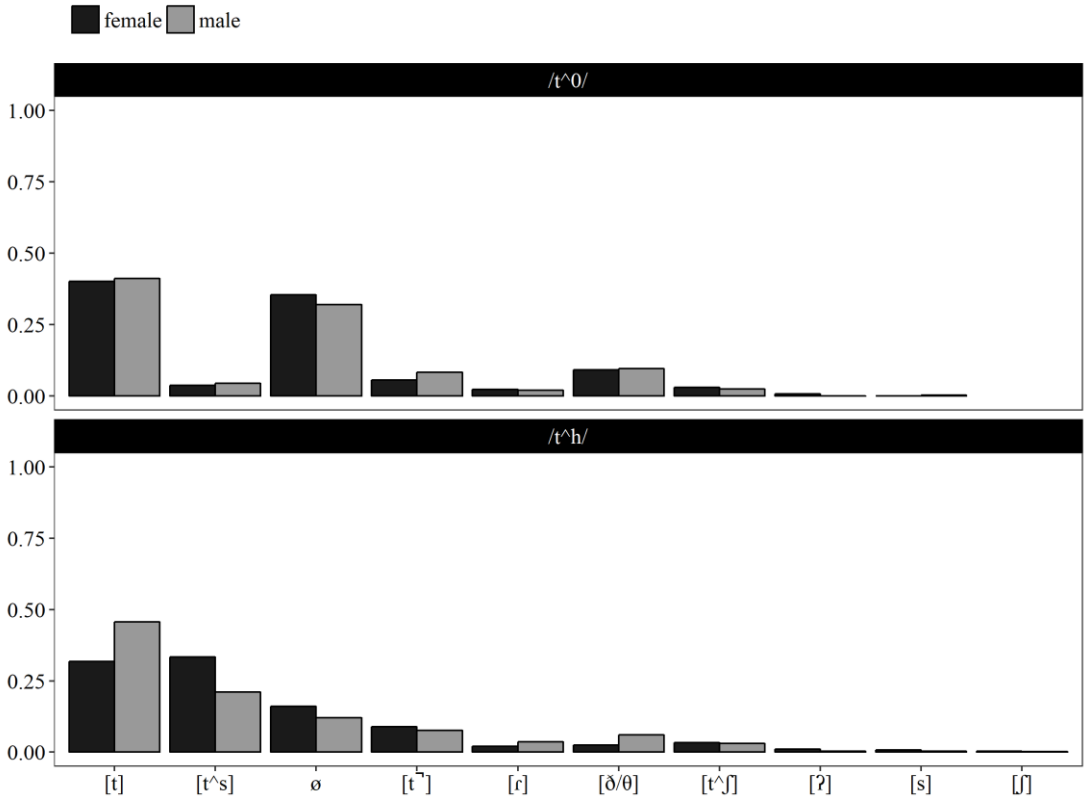


Table A.7: Variant choices and *Occupation*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Occupation										
non-monetary	20	1	37	4		9	3	2		
monetary (local)	195	27	155	32	14	45	18		1	
university student	93	5	70	20	7	25	5			
monetary (international)	97	7	75	12		14	1	2		

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Occupation										
non-monetary	44	45	19	11		4		1		
monetary (local)	384	335	151	88	32	59	43	7	9	5
university student	212	148	94	62	12	22	19	6		
monetary (international)	251	101	59	30	20	13	12	3	3	

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Occupation										
non-monetary	0.263	0.013	0.487	0.053	0.000	0.118	0.039	0.026	0.000	
monetary (local)	0.400	0.055	0.318	0.066	0.029	0.092	0.037	0.000	0.002	
university student	0.413	0.022	0.311	0.089	0.031	0.111	0.022	0.000	0.000	
monetary (international)	0.466	0.034	0.361	0.058	0.000	0.067	0.005	0.010	0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Occupation										
non-monetary	0.355	0.363	0.153	0.089	0.000	0.032	0.000	0.008	0.000	0.000
monetary (local)	0.345	0.301	0.136	0.079	0.029	0.053	0.039	0.006	0.008	0.004
university student	0.369	0.257	0.163	0.108	0.021	0.038	0.033	0.010	0.000	0.000
monetary (international)	0.510	0.205	0.120	0.061	0.041	0.026	0.024	0.006	0.006	0.000

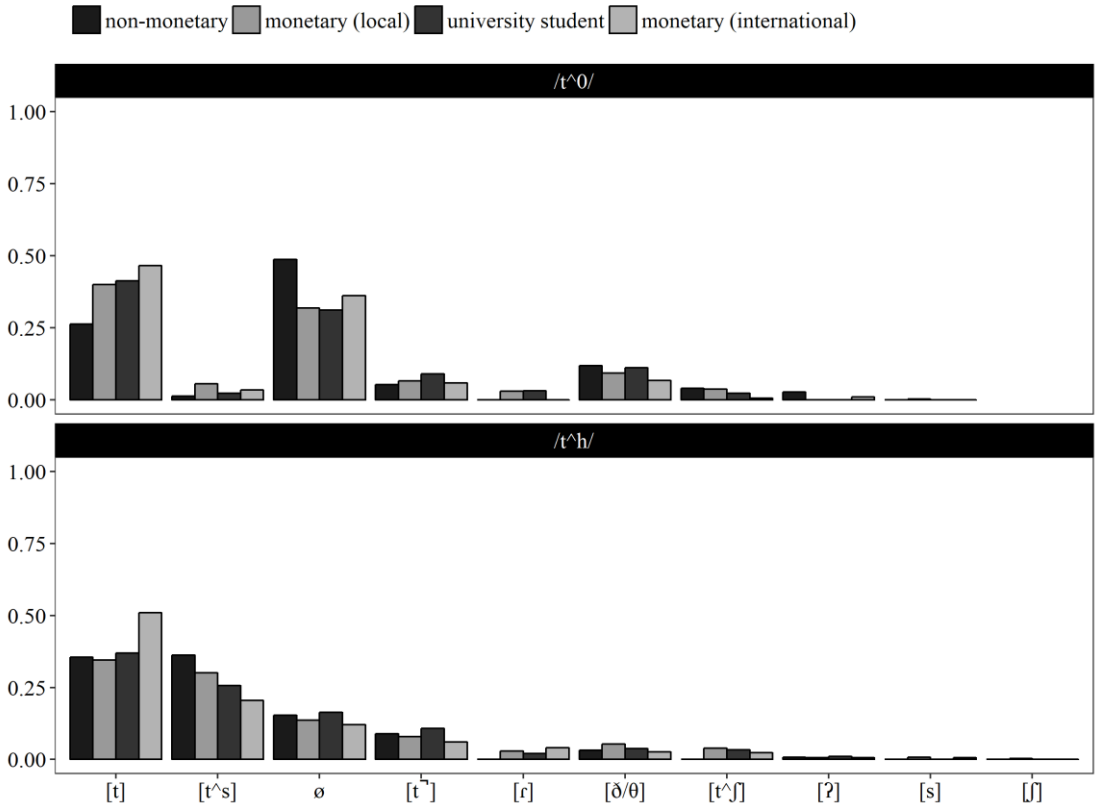


Table A.8: Variant choices and *Time abroad*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Time abroad										
none	129	19	103	18	7	27	8			
short	33	5	56	7	3	16	8	2	1	
several short	87	4	67	15	1	12	3	2		
long	58		42	13	2	8	5			
several long	98	12	69	15	8	30	3			

	/tʰ/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Time abroad										
none	202	243	93	67	14	34	25	7	4	
short	89	100	36	23	5	10	4	1		1
several short	202	95	50	30	9	6	10	4	3	
long	145	93	53	34	9	15	16	3	1	3
several long	253	98	91	37	27	33	19	2	4	1

	/t^h/									
	[t]	[t^s]	ø	[t$^\urcorner$]	[ɾ]	[ð/θ]	[t^ʃ]	[ʔ]	[s]	[ʃ]
Time abroad										
none	0.415	0.061	0.331	0.058	0.023	0.087	0.026	0.000	0.000	
short	0.252	0.038	0.427	0.053	0.023	0.122	0.061	0.015	0.008	
several short	0.455	0.021	0.351	0.079	0.005	0.063	0.016	0.010	0.000	
long	0.453	0.000	0.328	0.102	0.016	0.062	0.039	0.000	0.000	
several long	0.417	0.051	0.294	0.064	0.034	0.128	0.013	0.000	0.000	

	/t^h/									
	[t]	[t^s]	ø	[t$^\urcorner$]	[ɾ]	[ð/θ]	[t^ʃ]	[ʔ]	[s]	[ʃ]
Time abroad										
none	0.293	0.353	0.135	0.097	0.020	0.049	0.036	0.010	0.006	0.000
short	0.331	0.372	0.134	0.086	0.019	0.037	0.015	0.004	0.000	0.004
several short	0.494	0.232	0.122	0.073	0.022	0.015	0.024	0.010	0.007	0.000
long	0.390	0.250	0.142	0.091	0.024	0.040	0.043	0.008	0.003	0.008
several long	0.448	0.173	0.161	0.065	0.048	0.058	0.034	0.004	0.007	0.002

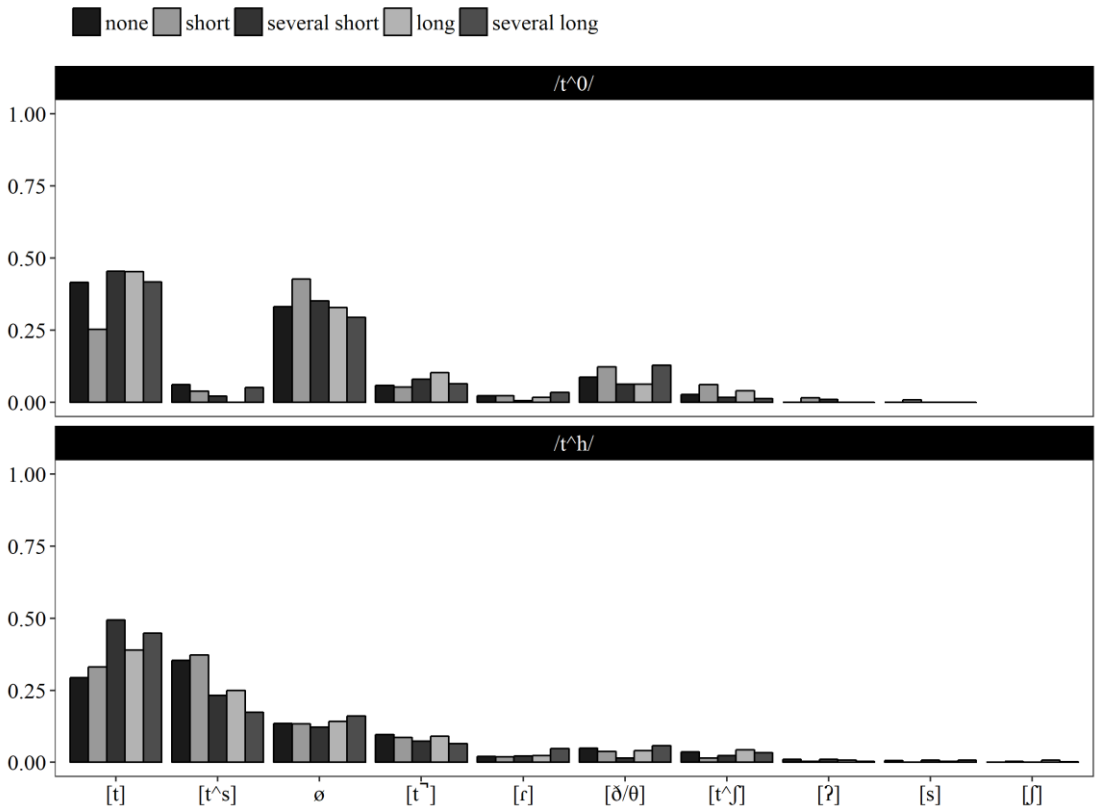


Table A.9: Variant choices and *Exposure and usage*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Exposure and usage										
low	38	4	52	7	4	13	7	2	1	
moderate	54	14	43	7		7	3			
high	313	22	242	54	17	73	17	2		

	/tʰ/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Exposure and usage										
low	80	107	35	21	7	12	6	3		1
moderate	65	122	33	20	4	10	11	2	4	1
high	746	400	255	150	53	76	57	12	8	3

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Exposure and usage										
low	0.297	0.031	0.406	0.055	0.031	0.102	0.055	0.016	0.008	
moderate	0.422	0.109	0.336	0.055	0.000	0.055	0.023	0.000	0.000	
high	0.423	0.030	0.327	0.073	0.023	0.099	0.023	0.003	0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Exposure and usage										
low	0.294	0.393	0.129	0.077	0.026	0.044	0.022	0.011	0.000	0.004
moderate	0.239	0.449	0.121	0.074	0.015	0.037	0.040	0.007	0.015	0.004
high	0.424	0.227	0.145	0.085	0.030	0.043	0.032	0.007	0.005	0.002

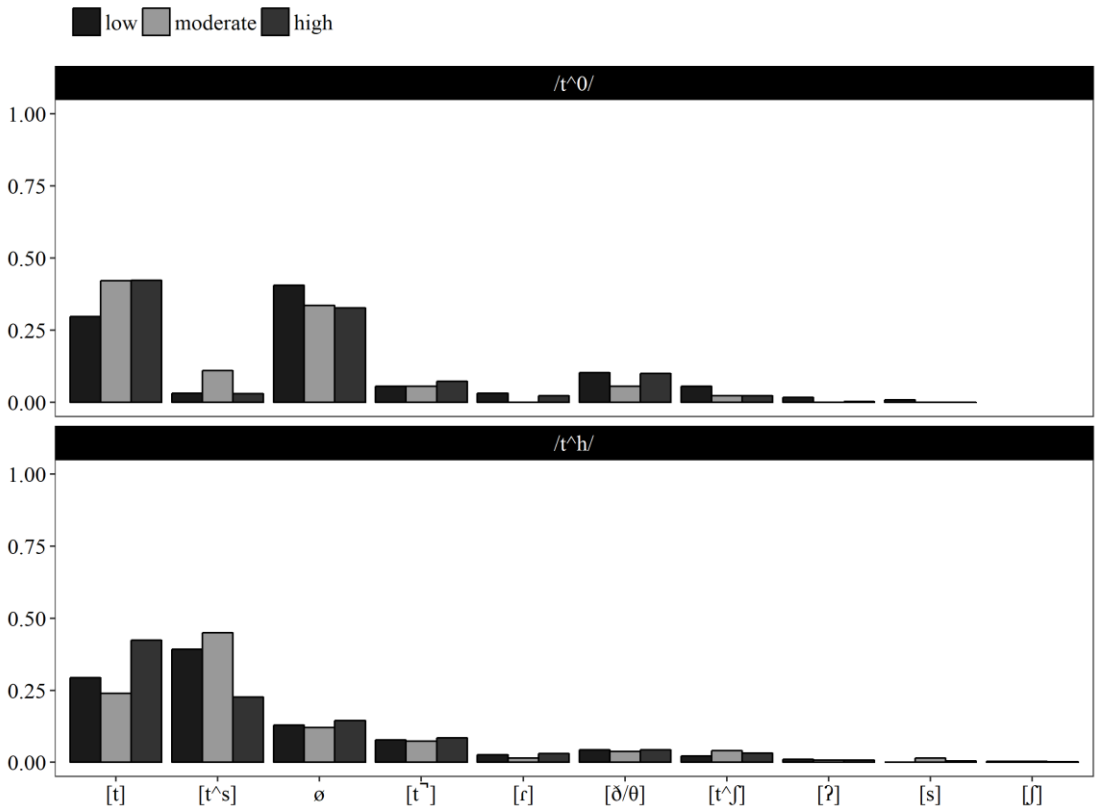


Table A.10: Variant choices and *Preceding environment: sound inventory*. Left: absolute numbers; right: effects.

/t^{0}/

	[t]	[t^{s}]	ø	[t$^{\neg}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
PE: sound inventory										
sound in Ki inventory	223	25	316	44	9	37	17	4		
sound not in Ki inventory	166	15	21	24	12	56	10		1	

/t^{h}/

	[t]	[t^{s}]	ø	[t$^{\neg}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
PE: sound inventory										
sound in Ki inventory	590	444	282	127	52	53	44	13	7	3
sound not in Ki inventory	275	168	41	64	12	45	25	4	5	2

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE: sound inventory										
sound in Ki inventory	0.330	0.037	0.468	0.065	0.013	0.055	0.025	0.006	0.000	
sound not in Ki inventory	0.544	0.049	0.069	0.079	0.039	0.184	0.033	0.000	0.003	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE: sound inventory										
sound in Ki inventory	0.365	0.275	0.175	0.079	0.032	0.033	0.027	0.008	0.004	0.002
sound not in Ki inventory	0.429	0.262	0.064	0.100	0.019	0.070	0.039	0.006	0.008	0.003

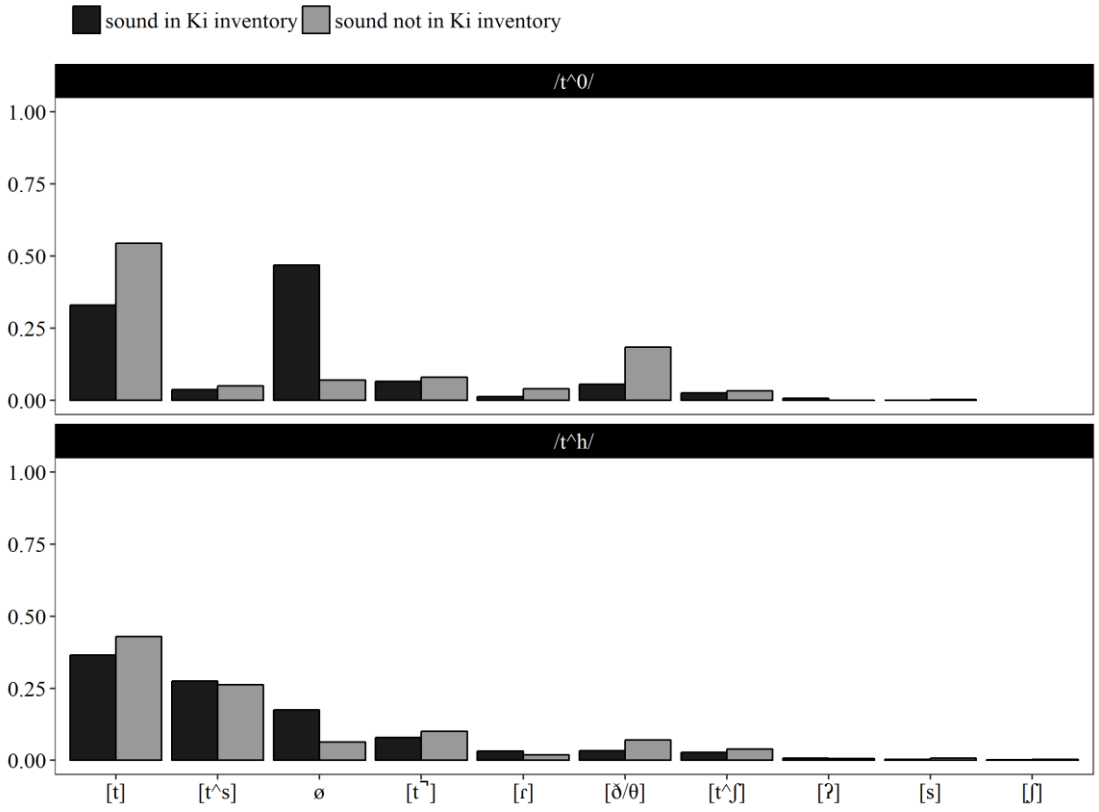


Table A.11: Variant choices and *Preceding environment: distribution rule*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE: distribution rule										
permissible in Ki	200	23	24	25	8	33	17			
non-permissible in Ki	189	17	313	43	13	60	10	4	1	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE: distribution rule										
permissible in Ki	499	346	163	110	52	51	40	12	7	3
non-permissible in Ki	366	266	160	81	12	47	29	5	5	2

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE: distribution rule										
permissible in Ki	0.606	0.070	0.073	0.076	0.024	0.100	0.052	0.000	0.000	
non-permissible in Ki	0.291	0.026	0.482	0.066	0.020	0.092	0.015	0.006	0.002	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE: distribution rule										
permissible in Ki	0.389	0.270	0.127	0.086	0.041	0.040	0.031	0.009	0.005	0.002
non-permissible in Ki	0.376	0.273	0.164	0.083	0.012	0.048	0.030	0.005	0.005	0.002

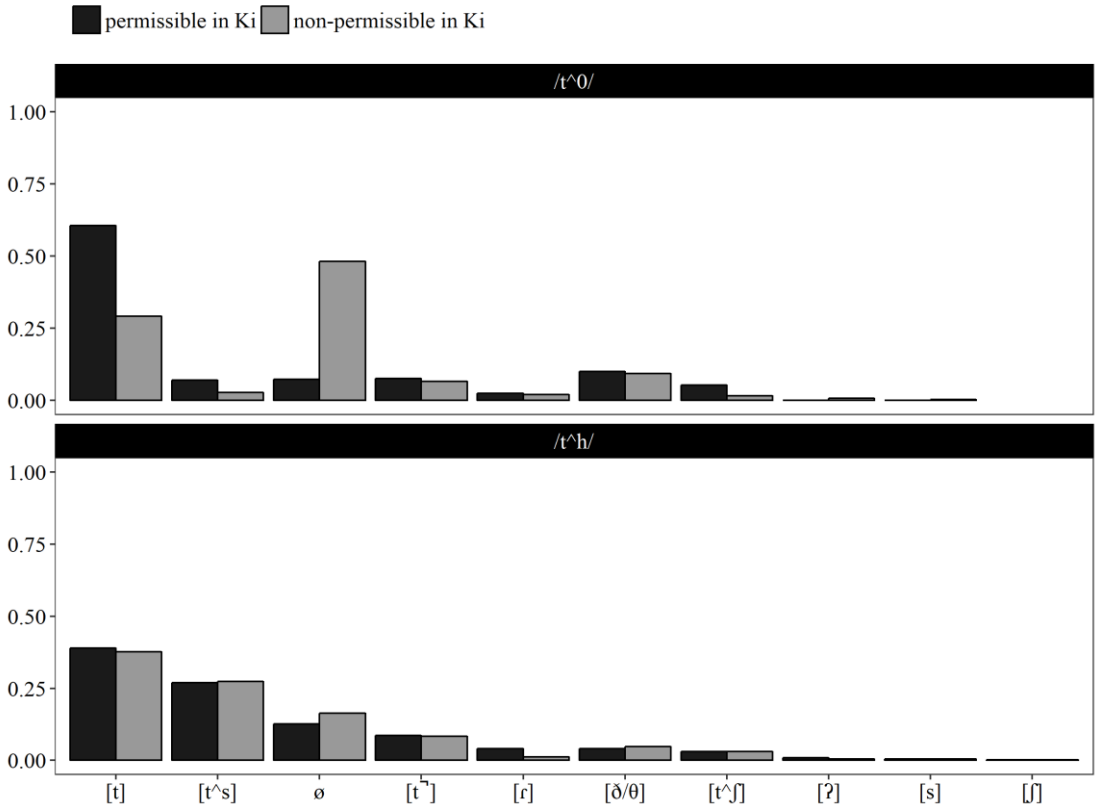


Table A.12: Variant choices and *Preceding environment: sound type*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE: sound type										
vowel	250	26	18	43	21	73	7		1	
consonant	101	14	319	25		18	18	4		
pause	38					2	2			

	/tʰ/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE: sound type										
vowel	392	256	74	162	64	78	39	14	8	2
consonant	407	309	249	29		20	24	3	4	2
pause	66	47					6			1

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE: sound type										
vowel	0.571	0.059	0.041	0.098	0.046	0.167	0.016	0.000	0.002	
consonant	0.202	0.028	0.638	0.050	0.000	0.036	0.036	0.008	0.000	
pause	0.905	0.000	0.000	0.000	0.000	0.048	0.048	0.000	0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE: sound type										
vowel	0.360	0.235	0.068	0.149	0.059	0.072	0.036	0.013	0.007	0.002
consonant	0.389	0.295	0.238	0.028	0.000	0.019	0.023	0.003	0.004	0.002
pause	0.550	0.392	0.000	0.000	0.000	0.000	0.050	0.000	0.000	0.008

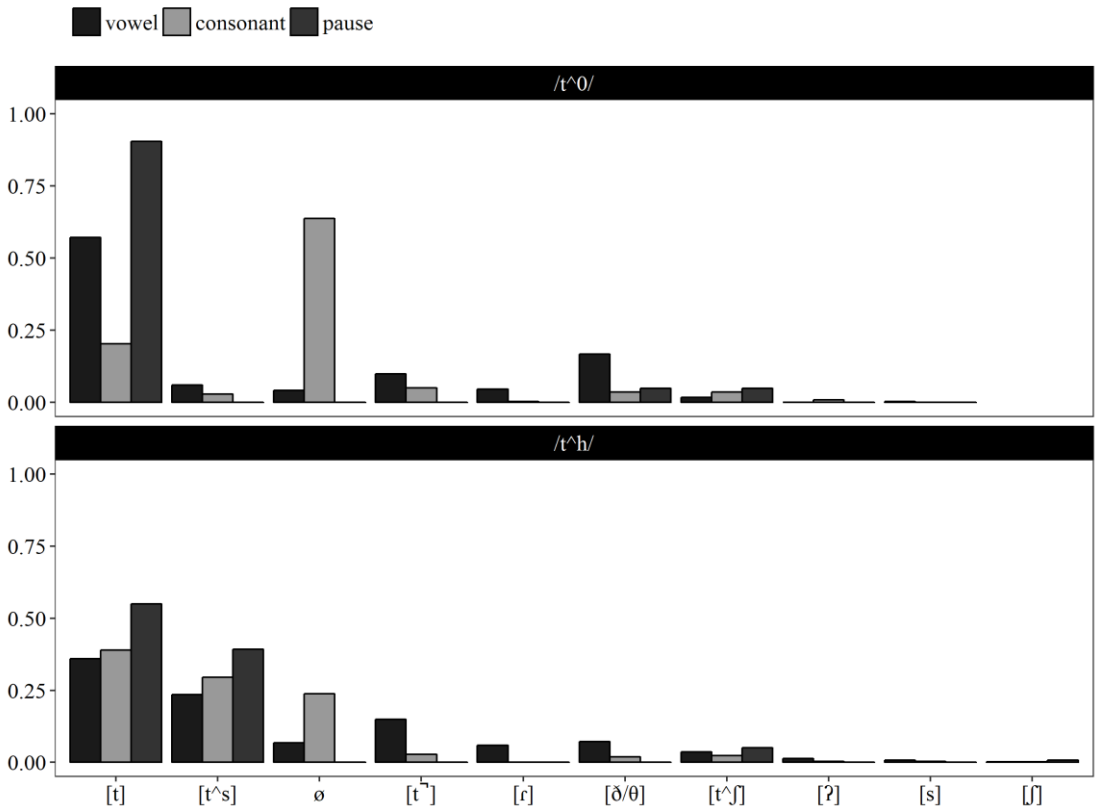


Table A.13: Variant choices and *Preceding vowel: lip-rounding*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-V: lip-rounding										
unrounded	219	23	13	35	16	69	6		1	
rounded	31	3	5	8	4	4	1			

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-V: lip-rounding										
unrounded	326	230	62	135	40	63	35	11	7	2
rounded	66	26	12	27	24	15	4	3	1	

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-V: lip-rounding										
unrounded	0.573	0.060	0.034	0.092	0.042	0.181	0.016		0.003	
rounded	0.554	0.054	0.089	0.143	0.071	0.071	0.018		0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-V: lip-rounding										
unrounded	0.358	0.252	0.068	0.148	0.044	0.069	0.038	0.012	0.008	0.002
rounded	0.371	0.146	0.067	0.152	0.135	0.084	0.022	0.017	0.006	0.000

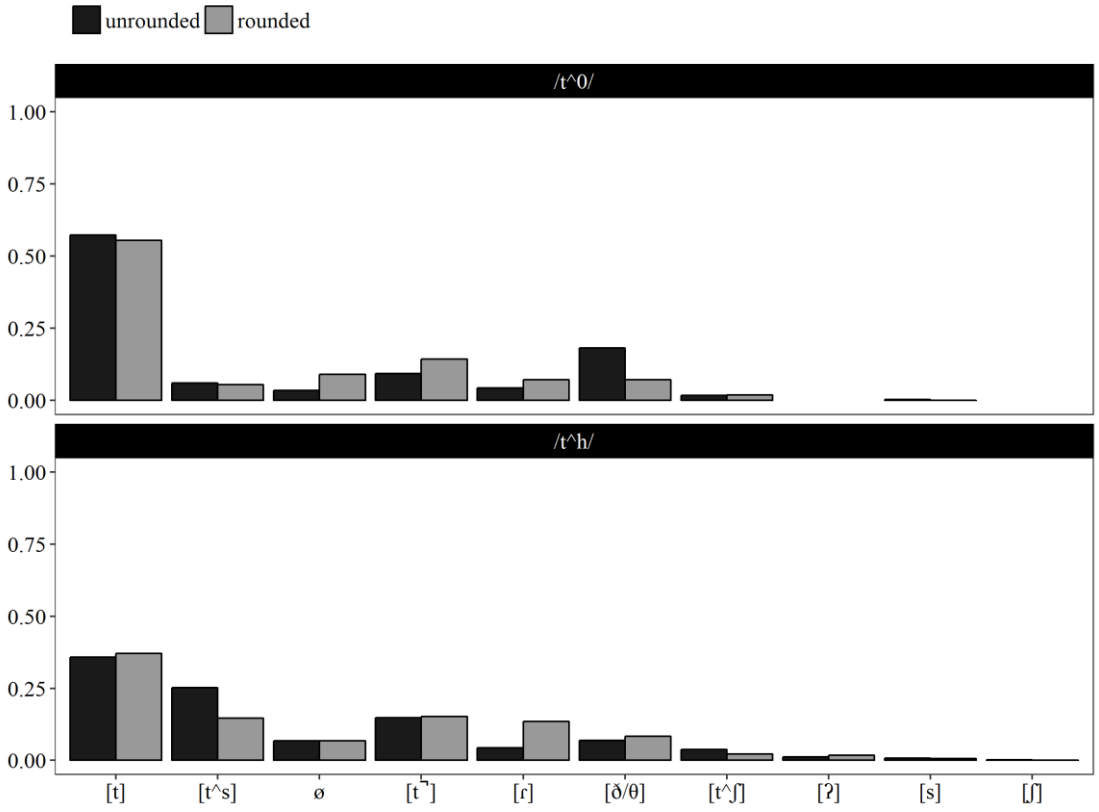


Table A.14: Variant choices and *Preceding vowel: height*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-V: height										
high	39	4	2	9	2	8				
near-high	77	10	6	17	7	37	4			
mid-high	15	3	2	1		6	1		1	
mid	49	4	2	8	3	13	1			
mid-low	47	3	4	7	7	5	1			
near-low	2	1	1			1				
low	21	1	1	1	1	3				

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-V: height										
high	51	32	4	5	2	6	4	1	1	
near-high	127	73	16	29	7	23	10	3	1	1
mid-high	15	8	3	3		5	5		1	
mid	39	54	5	14	2	7	9	3		1
mid-low	100	51	40	69	33	26	5	5	4	
near-low	16	12	3	12	3	2	1		1	
low	44	26	3	30	17	9	5	2		

	/t⁰/									
	[t]	[tˢ]	ø	[t͡]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-V: height										
high	0.609	0.062	0.031	0.141	0.031	0.125	0.000		0.000	
near-high	0.487	0.063	0.038	0.108	0.044	0.234	0.025		0.000	
mid-high	0.517	0.103	0.069	0.034	0.000	0.207	0.034		0.034	
mid	0.612	0.050	0.025	0.100	0.038	0.162	0.012		0.000	
mid-low	0.635	0.041	0.054	0.095	0.095	0.068	0.014		0.000	
near-low	0.400	0.200	0.200	0.000	0.000	0.200	0.000		0.000	
low	0.750	0.036	0.036	0.036	0.036	0.107	0.000		0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t͡]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-V: height										
high	0.481	0.302	0.038	0.047	0.019	0.057	0.038	0.009	0.009	0.000
near-high	0.438	0.252	0.055	0.100	0.024	0.079	0.034	0.010	0.003	0.003
mid-high	0.375	0.200	0.075	0.075	0.000	0.125	0.125	0.000	0.025	0.000
mid	0.291	0.403	0.037	0.104	0.015	0.052	0.067	0.022	0.000	0.007
mid-low	0.300	0.153	0.120	0.207	0.099	0.078	0.015	0.015	0.012	0.000
near-low	0.320	0.240	0.060	0.240	0.060	0.040	0.020	0.000	0.020	0.000
low	0.324	0.191	0.022	0.221	0.125	0.066	0.037	0.015	0.000	0.000

Table A.14 (continued): Variant choices and *Preceding vowel: height*. Left: absolute numbers; right: effects.

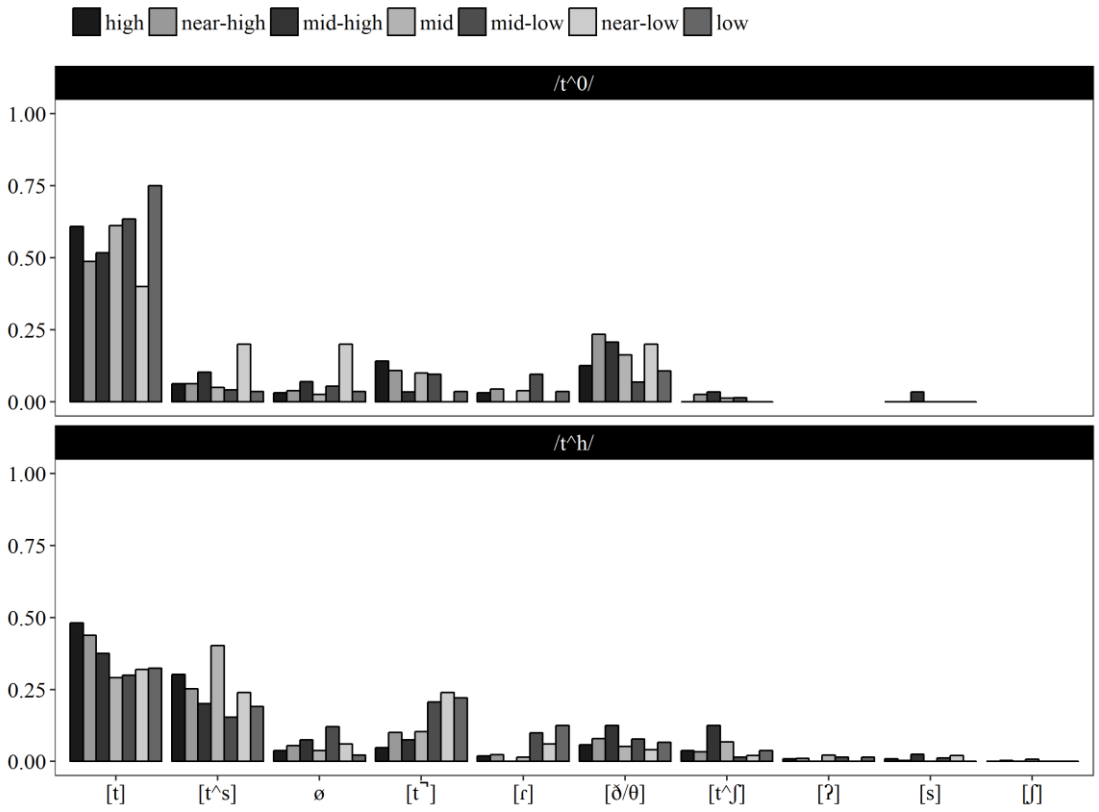

high
near-high
mid-high
mid
mid-low
near-low
low
/t^0/
/t^h/
1.00
0.75
0.50
0.25
0.00
[t]
[t^s]
ø
[tˠ]
[ɾ]
[ð/θ]
[t^ʃ]
[ʔ]
[s]
[ʃ]

Table A.15: Variant choices and *Preceding vowel: fronting*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-V: fronting										
front	137	15	7	18	5	52	5		1	
centre	53	4	3	9	4	14	1			
back	60	7	8	16	11	7	1			

	/tʰ/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-V: fronting										
front	215	142	36	76	29	43	23	6	6	1
centre	42	57	6	14	3	7	9	3		1
back	135	57	32	72	32	28	7	5	2	

	/t^0/									
	[t]	[t^s]	ø	[t$^\neg$]	[ɾ]	[ð/θ]	[t^ʃ]	[ʔ]	[s]	[ʃ]
PE-V: fronting										
front	0.571	0.062	0.029	0.075	0.021	0.217	0.021		0.004	
centre	0.602	0.045	0.034	0.102	0.045	0.159	0.011		0.000	
back	0.545	0.064	0.073	0.145	0.100	0.064	0.009		0.000	

	/t^h/									
	[t]	[t^s]	ø	[t$^\neg$]	[ɾ]	[ð/θ]	[t^ʃ]	[ʔ]	[s]	[ʃ]
PE-V: fronting										
front	0.373	0.246	0.062	0.132	0.050	0.075	0.040	0.010	0.010	0.002
centre	0.296	0.401	0.042	0.099	0.021	0.049	0.063	0.021	0.000	0.007
back	0.365	0.154	0.086	0.195	0.086	0.076	0.019	0.014	0.005	0.000

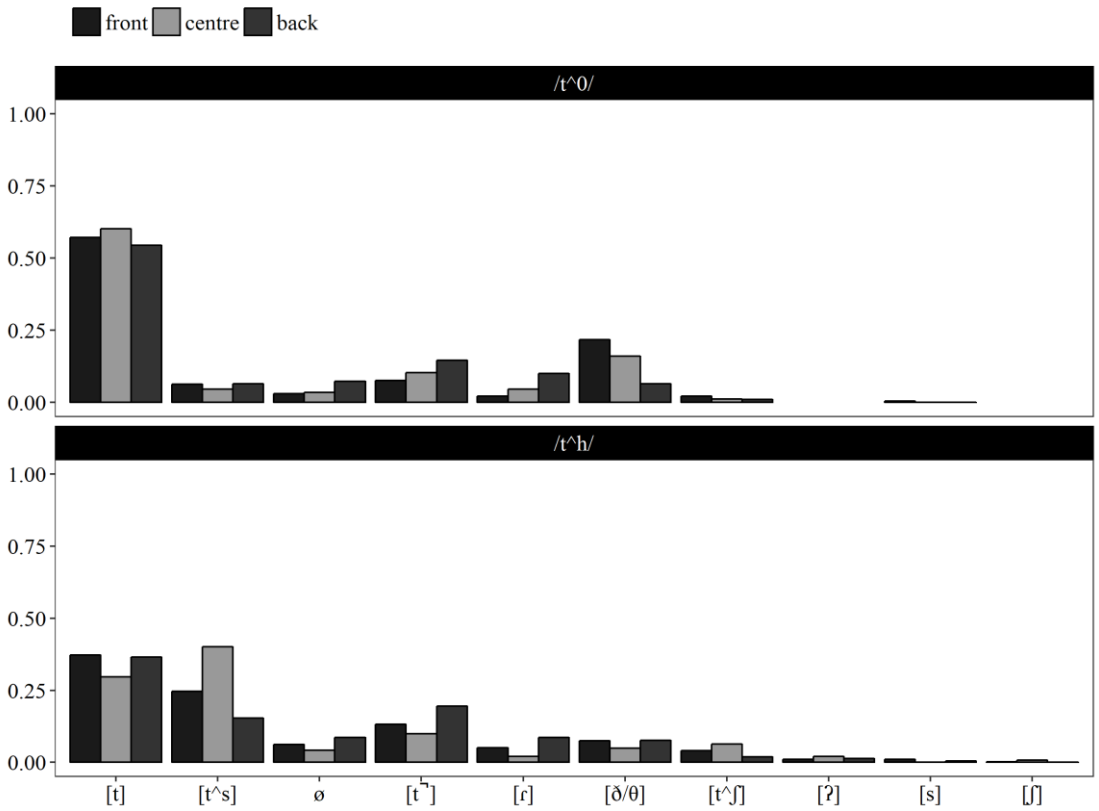


Table A.16: Variant choices and *Preceding consonant: voicing*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-C: voicing										
unvoiced	13	6	6	3		1	1			
voiced	88	8	313	22	1	17	17	4		

	/tʰ/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-C: voicing										
unvoiced	229	152	125	11		16	6	2	2	
voiced	178	157	124	18		4	18	1	2	2

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-C: voicing										
unvoiced	0.434	0.200	0.200	0.100	0.000	0.033	0.033	0.000		
voiced	0.187	0.017	0.666	0.047	0.002	0.036	0.036	0.009		

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-C: voicing										
unvoiced	0.422	0.280	0.230	0.020		0.029	0.011	0.004	0.004	0.000
voiced	0.353	0.312	0.246	0.036		0.008	0.036	0.002	0.004	0.004

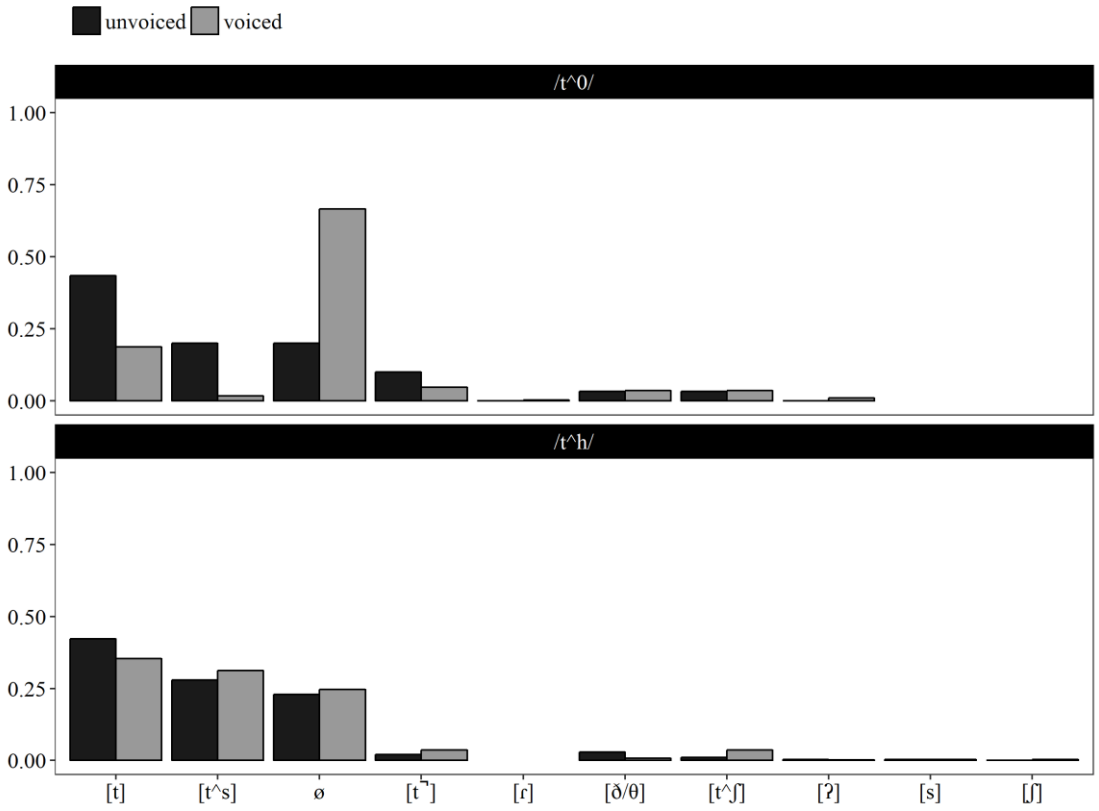


Table A.17: Variant choices and *Preceding consonant: place*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-C: place										
bilabial	3	1	2							
labio-dental	1	3			1	2				
interdental	3									
alveolar	92	10	316	24		16	17	4		
post-alveolar	1						1			
velar	1		1	1						

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-C: place										
bilabial	30	24					1		2	
labio-dental	51	32	1			9	2		2	
interdental										
alveolar	283	217	241	28		10	19	3		2
post-alveolar	4	3	5				1			
velar	39	33	2	1		1	1			

	/t⁰/									
	[t]	[tˢ]	ø	[t¯]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-C: place										
bilabial	0.500	0.167	0.333	0.000	0.000	0.000	0.000	0.000		
labio-dental	0.143	0.429	0.000	0.000	0.143	0.286	0.000	0.000		
interdental	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
alveolar	0.192	0.021	0.660	0.050	0.000	0.033	0.035	0.008		
post-alveolar	0.500	0.000	0.000	0.000	0.000	0.000	0.500	0.000		
velar	0.333	0.000	0.333	0.333	0.000	0.000	0.000	0.000		

	/tʰ/									
	[t]	[tˢ]	ø	[t¯]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-C: place										
bilabial	0.526	0.421	0.000	0.000		0.000	0.018	0.000	0.035	0.000
labio-dental	0.526	0.330	0.010	0.000		0.093	0.021	0.000	0.021	0.000
interdental										
alveolar	0.352	0.270	0.300	0.035		0.012	0.024	0.004	0.000	0.002
post-alveolar	0.308	0.231	0.385	0.000		0.000	0.077	0.000	0.000	0.000
velar	0.506	0.429	0.026	0.013		0.013	0.013	0.000	0.000	0.000

Table A.17 (continued): Variant choices and *Preceding consonant: place*. Left: absolute numbers; right: effects.

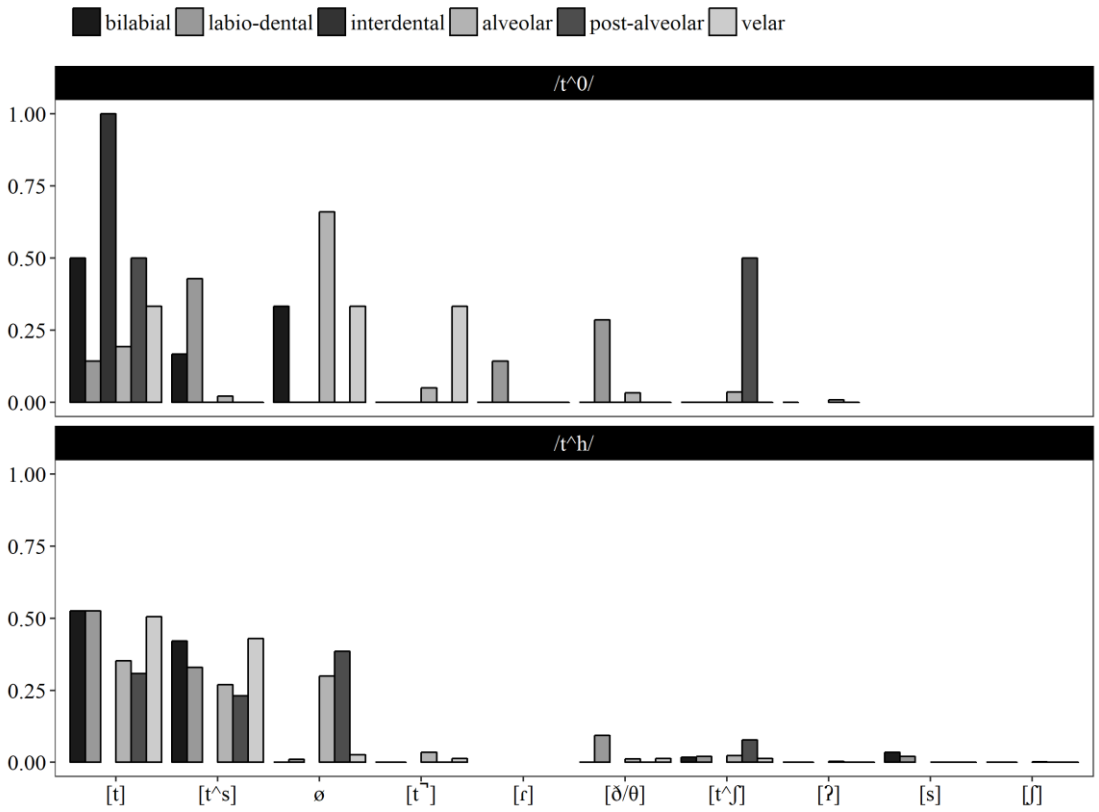

bilabial
labio-dental
interdental
alveolar
post-alveolar
velar
/t^0/
/t^h/
1.00
0.75
0.50
0.25
0.00
[t]
[t^s]
ø
[tˀ]
[ɾ]
[ð/θ]
[t^ʃ]
[ʔ]
[s]
[ʃ]

Table A.18: Variant choices and *Preceding consonant: manner*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-C: manner										
oral stop	1		1	1		1				
nasal stop	67	5	300	17		12	15	4		
fricative	14	8	6	2	1	2	1			
flap				1						
roll	2									
lateral approximant	14	1	12	4		3	2			
approximant	3									

	/tʰ/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-C: manner										
oral stop	36	41	1	1		1	3			
nasal stop	155	142	124	16		4	17	1	2	2
fricative	210	123	124	10		15	3	2	2	
flap										
roll										
lateral approximant	6	3		2			1			
approximant										

	/t⁰/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-C: manner										
oral stop	0.250	0.000	0.250	0.250	0.000	0.250	0.000	0.000		
nasal stop	0.160	0.012	0.714	0.040	0.000	0.029	0.036	0.010		
fricative	0.412	0.235	0.176	0.059	0.029	0.059	0.029	0.000		
flap	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000		
roll	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
lateral approximant	0.389	0.028	0.333	0.111	0.000	0.083	0.056	0.000		
approximant	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		

	/tʰ/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
PE-C: manner										
oral stop	0.434	0.494	0.012	0.012		0.012	0.036	0.000	0.000	0.000
nasal stop	0.335	0.307	0.268	0.035		0.009	0.037	0.002	0.004	0.004
fricative	0.429	0.252	0.254	0.020		0.031	0.006	0.004	0.004	0.000
flap										
roll										
lateral approximant	0.500	0.250	0.000	0.167		0.000	0.083	0.000	0.000	0.000
approximant										

Table A.18 (continued): Variant choices and *Preceding consonant: manner*. Left: absolute numbers; right: effects.

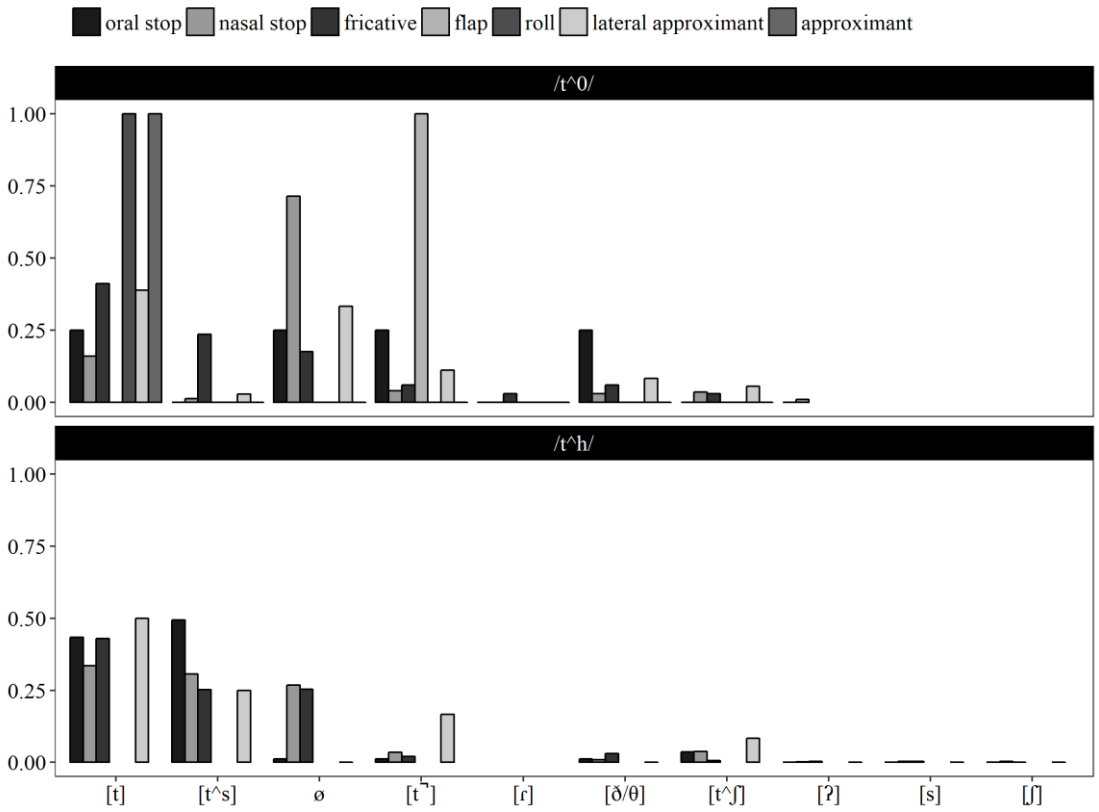

oral stop
nasal stop
fricative
flap
roll
lateral approximant
approximant
/t^0/
/t^h/
1.00
0.75
0.50
0.25
0.00
[t]
[t^s]
ø
[tˤ]
[ɾ]
[ð/θ]
[t^ʃ]
[ʔ]
[s]
[ʃ]

Table A.19: Variant choices and *Following environment: sound inventory*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE: sound inventory										
sound in Ki inventory	229	18	180	18	15	60	6	3	1	
sound not in Ki inventory	167	21	129	37	6	33	20			

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE: sound inventory										
sound in Ki inventory	560	336	202	71	51	71	17	5	7	1
sound not in Ki inventory	311	276	102	63	13	24	56	3	4	4

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE: sound inventory										
sound in Ki inventory	0.432	0.034	0.340	0.034	0.028	0.113	0.011	0.006	0.002	
sound not in Ki inventory	0.404	0.051	0.312	0.090	0.015	0.080	0.048	0.000	0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE: sound inventory										
sound in Ki inventory	0.424	0.254	0.153	0.054	0.039	0.054	0.013	0.004	0.005	0.001
sound not in Ki inventory	0.363	0.322	0.119	0.074	0.015	0.028	0.065	0.004	0.005	0.005

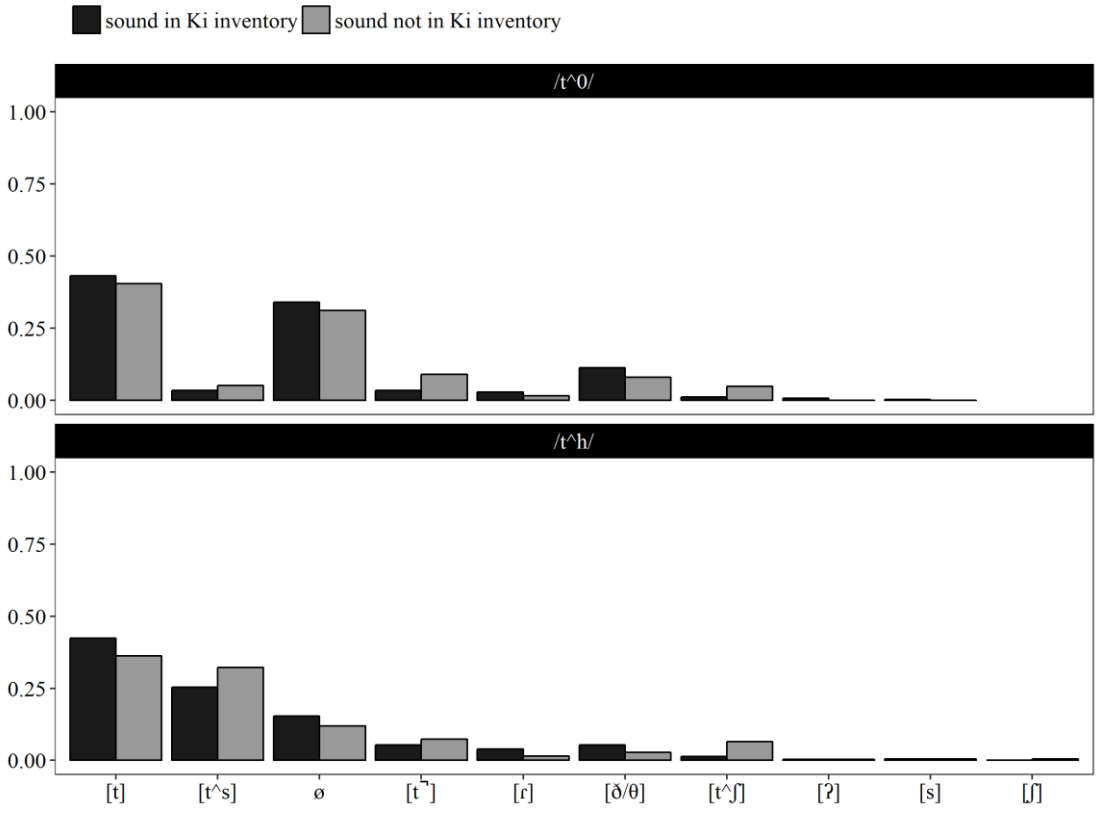


Table A.20: Variant choices and *Following environment: distribution rule*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE: distribution rule										
permissible in Ki	196	15	72		15	58	4	3		
non-permissible in Ki	200	24	237	55	6	35	22		1	

	/tʰ/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE: distribution rule										
permissible in Ki	475	306	49	4	50	68	13	4	6	1
non-permissible in Ki	396	306	255	130	14	27	60	4	5	4

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE: distribution rule										
permissible in Ki	0.540	0.041	0.198	0.000	0.041	0.160	0.011	0.008	0.000	
non-permissible in Ki	0.345	0.041	0.409	0.095	0.010	0.060	0.038	0.000	0.002	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE: distribution rule										
permissible in Ki	0.487	0.314	0.050	0.004	0.051	0.070	0.013	0.004	0.006	0.001
non-permissible in Ki	0.330	0.255	0.212	0.108	0.012	0.022	0.050	0.003	0.004	0.003

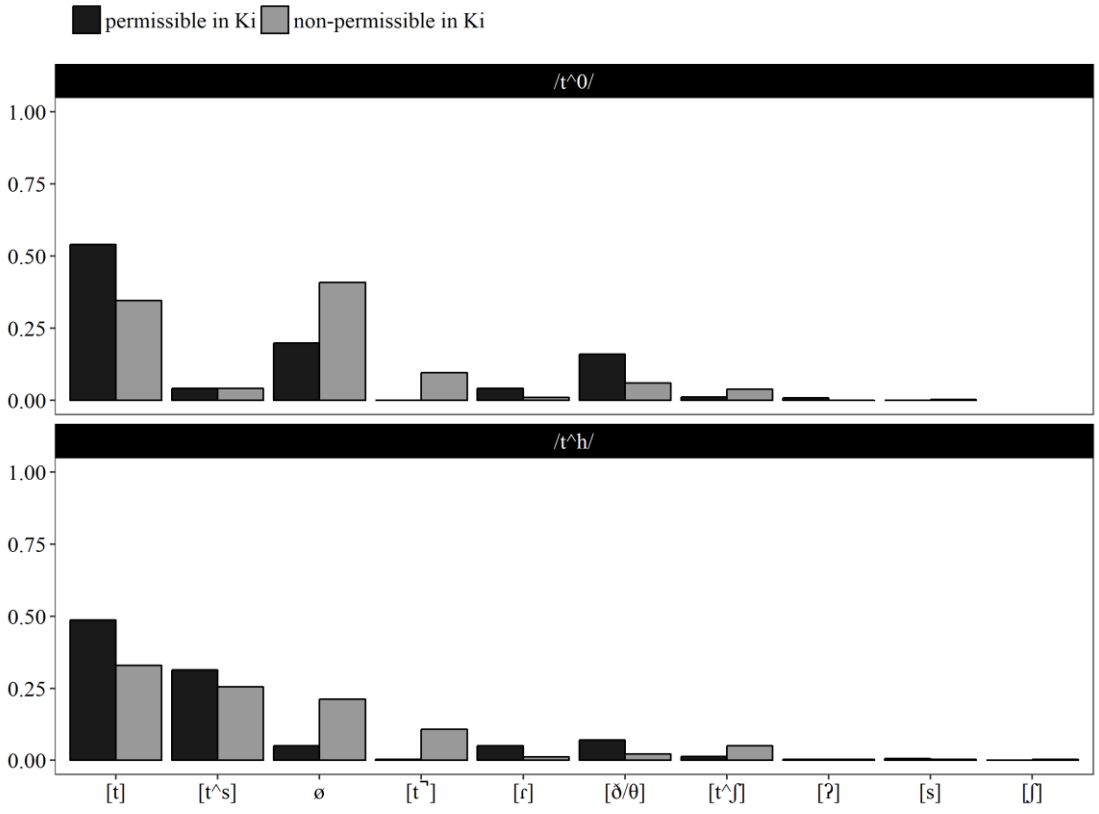


Table A.21: Variant choices and *Following environment: sound type*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE: sound type										
vowel	310	29	92	2	21	89	5	3		
consonant	64	4	152	38		3	18		1	
pause	22	6	65	15		1	3			

	/tʰ/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE: sound type										
vowel	689	507	63	9	64	90	26	5	7	1
consonant	133	44	222	99		5	41	1	2	4
pause	49	61	19	26			6	2	2	

	/t^0/									
	[t]	[t^s]	ø	[t$^{\neg}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
FE: sound type										
vowel	0.563	0.053	0.167	0.004	0.038	0.162	0.009	0.005	0.000	
consonant	0.229	0.014	0.543	0.136	0.000	0.011	0.064	0.000	0.004	
pause	0.196	0.054	0.580	0.134	0.000	0.009	0.027	0.000	0.000	

	/t^h/									
	[t]	[t^s]	ø	[t$^{\neg}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
FE: sound type										
vowel	0.472	0.347	0.043	0.006	0.043	0.062	0.018	0.003	0.005	0.001
consonant	0.241	0.080	0.402	0.179	0.000	0.009	0.074	0.002	0.004	0.007
pause	0.297	0.370	0.115	0.158	0.000	0.000	0.036	0.012	0.012	0.000

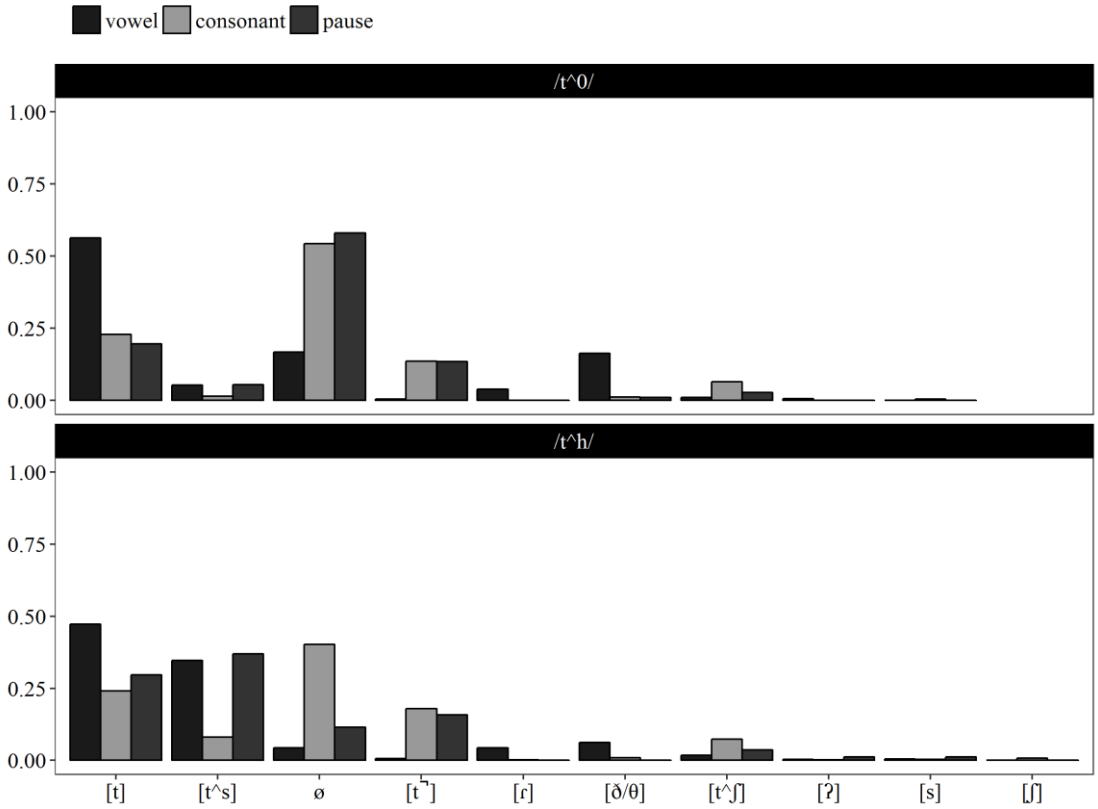


Table A.22: Variant choices and *Following vowel: lip-rounding*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-V: lip-rounding										
unrounded	231	24	78	2	19	70	5	3		
rounded	79	5	14		2	19				

	/tʰ/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-V: lip-rounding										
unrounded	534	399	43	8	48	80	21	5	7	1
rounded	155	108	20	1	15	10	5			

	/t^0/									
	[t]	[t^s]	ø	[t$^{\urcorner}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
FE-V: lip-rounding										
unrounded	0.535	0.056	0.181	0.005	0.044	0.162	0.012	0.007		
rounded	0.664	0.042	0.118	0.000	0.017	0.160	0.000	0.000		

	/t^h/									
	[t]	[t^s]	ø	[t$^{\urcorner}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
FE-V: lip-rounding										
unrounded	0.466	0.348	0.038	0.007	0.042	0.070	0.018	0.004	0.006	0.001
rounded	0.494	0.344	0.064	0.003	0.048	0.032	0.016	0.000	0.000	0.000

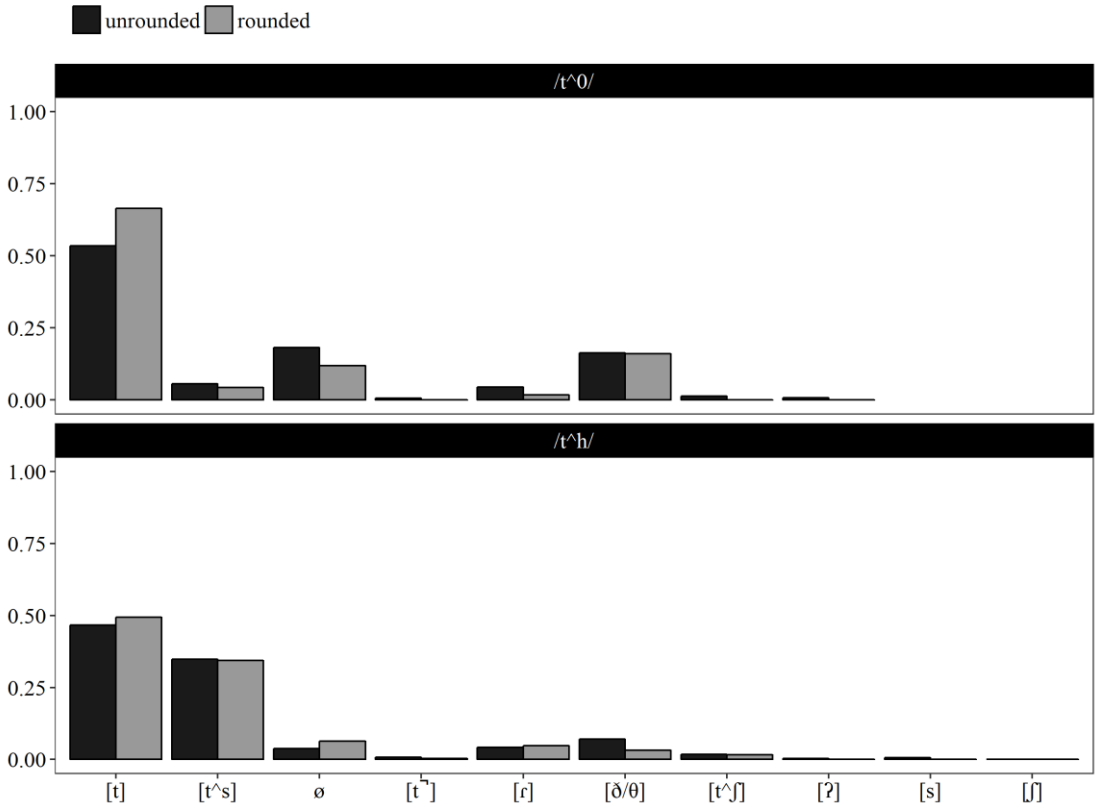


Table A.23: Variant choices and *Following vowel: height*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-V: height										
high	76	10	9		2	5	3			
near-high	73	11	16	1	3	19	1			
mid-high	37	1	2	1	2	11				
mid	32		14		6	22	1			
mid-low	70	6	24		7	19				
near-low	3		1			4				
low	19	1	26		1	9		3		

	/tʰ/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-V: height										
high	216	178	7		9	6	17	1	3	1
near-high	137	146	7	2	11	10	7		1	
mid-high	57	45	3	2	2	10	1	1		
mid	97	44	7	1	11	23			1	
mid-low	68	51	25	3	17	17		2		
near-low	15	7	1		3	2				
low	99	36	13	1	10	22	1	1	2	

	/t⁰/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-V: height										
high	0.724	0.095	0.086	0.000	0.019	0.048	0.029	0.000		
near-high	0.589	0.089	0.129	0.008	0.024	0.153	0.008	0.000		
mid-high	0.685	0.019	0.037	0.019	0.037	0.204	0.000	0.000		
mid	0.427	0.000	0.187	0.000	0.080	0.293	0.013	0.000		
mid-low	0.556	0.048	0.190	0.000	0.056	0.151	0.000	0.000		
near-low	0.375	0.000	0.125	0.000	0.000	0.500	0.000	0.000		
low	0.322	0.017	0.441	0.000	0.017	0.153	0.000	0.051		

	/tʰ/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-V: height										
high	0.493	0.406	0.016	0.000	0.021	0.014	0.039	0.002	0.007	0.002
near-high	0.427	0.455	0.022	0.006	0.034	0.031	0.022	0.000	0.003	0.000
mid-high	0.471	0.372	0.025	0.017	0.017	0.083	0.008	0.008	0.000	0.000
mid	0.527	0.239	0.038	0.005	0.060	0.125	0.000	0.000	0.005	0.000
mid-low	0.372	0.279	0.137	0.016	0.093	0.093	0.000	0.011	0.000	0.000
near-low	0.536	0.250	0.036	0.000	0.107	0.071	0.000	0.000	0.000	0.000
low	0.535	0.195	0.070	0.005	0.054	0.119	0.005	0.005	0.011	0.000

Table A.23 (continued): Variant choices and *Following vowel: height*. Left: absolute numbers; right: effects.

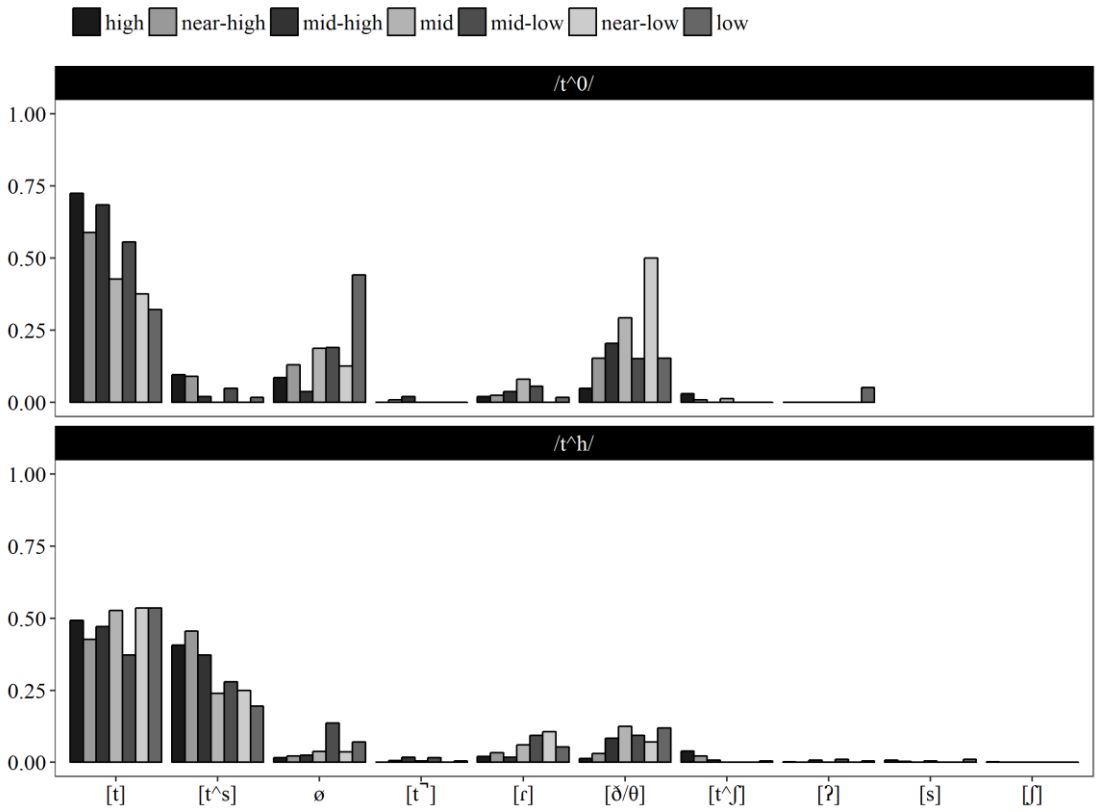

high
near-high
mid-high
mid
mid-low
near-low
low
/t^0/
/t^h/
1.00
0.75
0.50
0.25
0.00
[t]
[t^s]
ø
[tˠ]
[ɾ]
[ð/θ]
[t^ʃ]
[ʔ]
[s]
[ʃ]

Table A.24: Variant choices and *Following vowel: fronting*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-V: fronting										
front	177	23	62	2	12	45	4	3		
centre	33		14		6	22	1			
back	100	6	16		3	22				

	/tʰ/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-V: fronting										
front	317	251	31	6	32	50	22	5	6	1
centre	98	44	7	2	11	23			1	
back	274	212	25	1	20	17	4			

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-V: fronting										
front	0.540	0.070	0.189	0.006	0.037	0.137	0.012	0.009		
centre	0.434	0.000	0.184	0.000	0.079	0.289	0.013	0.000		
back	0.680	0.041	0.109	0.000	0.020	0.150	0.000	0.000		

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-V: fronting										
front	0.440	0.348	0.043	0.008	0.044	0.069	0.031	0.007	0.008	0.001
centre	0.527	0.237	0.038	0.011	0.059	0.124	0.000	0.000	0.005	0.000
back	0.495	0.383	0.045	0.002	0.036	0.031	0.007	0.000	0.000	0.000

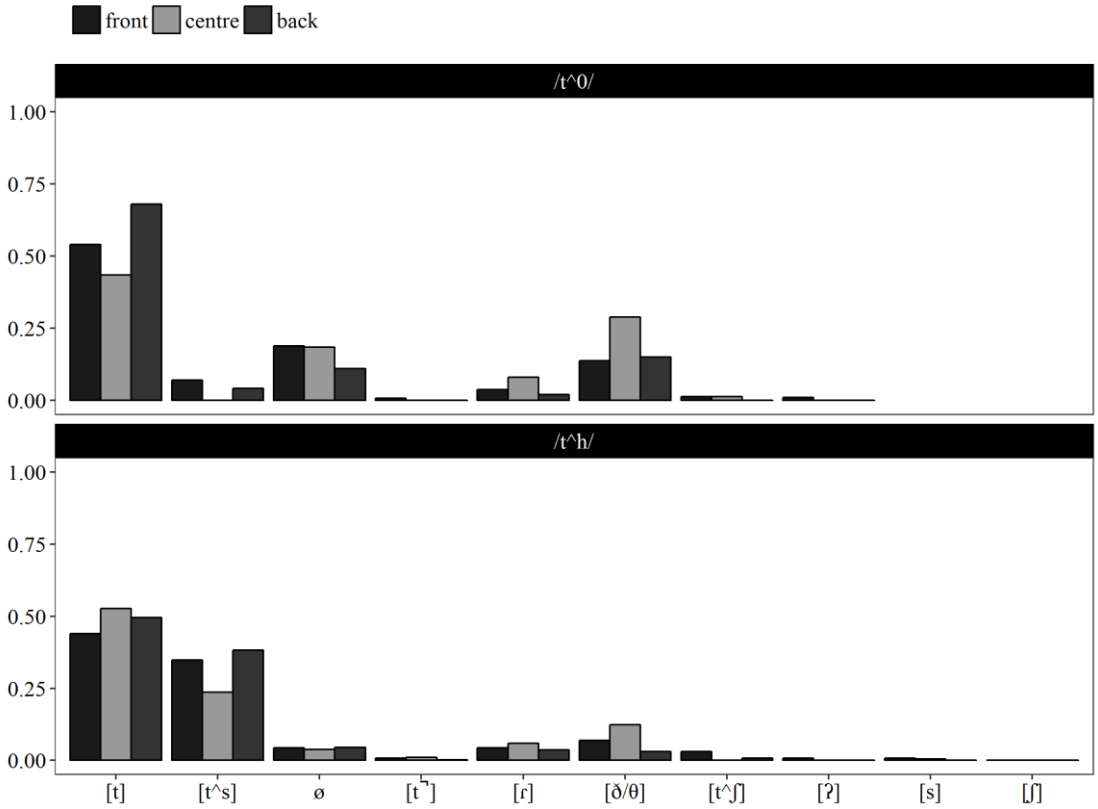


Table A.25: Variant choices and *Following consonant: voicing*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-C: voicing										
unvoiced	18	1	74	11					1	
voiced	46	3	78	27		3	18			

	/tʰ/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-C: voicing										
unvoiced	41	11	91	25			3			
voiced	92	33	131	74	1	5	38	1	2	4

	/t^0/									
	[t]	[t^s]	ø	[t$^{\urcorner}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
FE-C: voicing										
unvoiced	0.171	0.010	0.705	0.105		0.000	0.000		0.010	
voiced	0.263	0.017	0.446	0.154		0.017	0.103		0.000	

	/t^h/									
	[t]	[t^s]	ø	[t$^{\urcorner}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
FE-C: voicing										
unvoiced	0.240	0.064	0.532	0.146	0.000	0.000	0.018	0.000	0.000	0.000
voiced	0.241	0.087	0.344	0.194	0.003	0.013	0.100	0.003	0.005	0.010

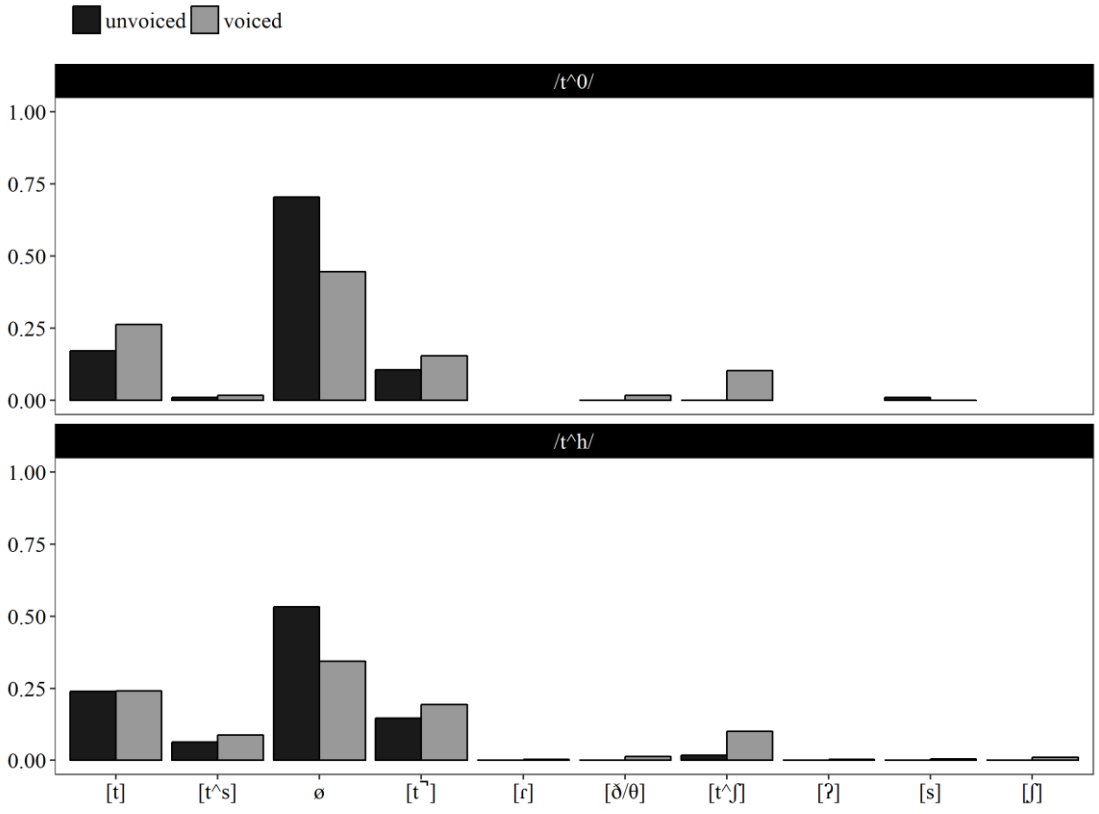


Table A.26: Variant choices and *Following consonant: place*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-C: place										
bilabial	12	2	58	14		2				
labio-dental	11	1	16	6						
interdental	1		1							
alveolar	28		58	9		1	16		1	
post-alveolar			2	1						
palatal	8	1	6				1			
velar	1		5	6			1			
uvular			1							
glottal	3		5	2						

	/tʰ/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-C: place										
bilabial	57	19	58	50	1	4			1	
labio-dental	9	2	14	5						
interdental		1	1							
alveolar	31	9	112	24		1	37		1	4
post-alveolar			7							
palatal	9	6	10	4			1	1		
velar	11	5	20	14			2			
uvular										
glottal	16	2		2			1			

	/t⁰/									
	[t]	[tˢ]	ø	[t¯]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-C: place										
bilabial	0.136	0.023	0.659	0.159		0.023	0.000		0.000	
labio-dental	0.324	0.029	0.471	0.176		0.000	0.000		0.000	
interdental	0.500	0.000	0.500	0.000		0.000	0.000		0.000	
alveolar	0.248	0.000	0.513	0.080		0.009	0.142		0.009	
post-alveolar	0.000	0.000	0.667	0.333		0.000	0.000		0.000	
palatal	0.500	0.062	0.375	0.000		0.000	0.063		0.000	
velar	0.077	0.000	0.385	0.462		0.000	0.077		0.000	
uvular	0.000	0.000	1.000	0.000		0.000	0.000		0.000	
glottal	0.300	0.000	0.500	0.200		0.000	0.000		0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t¯]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-C: place										
bilabial	0.300	0.100	0.305	0.263	0.005	0.021	0.000	0.000	0.005	0.000
labio-dental	0.300	0.067	0.467	0.167	0.000	0.000	0.000	0.000	0.000	0.000
interdental	0.000	0.500	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000
alveolar	0.142	0.041	0.511	0.110	0.000	0.005	0.169	0.000	0.005	0.018
post-alveolar	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
palatal	0.290	0.194	0.323	0.129	0.000	0.000	0.032	0.032	0.000	0.000
velar	0.212	0.096	0.385	0.269	0.000	0.000	0.038	0.000	0.000	0.000
uvular										
glottal	0.762	0.095	0.000	0.095	0.000	0.000	0.048	0.000	0.000	0.000

Table A.26 (continued): Variant choices and *Following consonant: place*. Left: absolute numbers; right: effects.

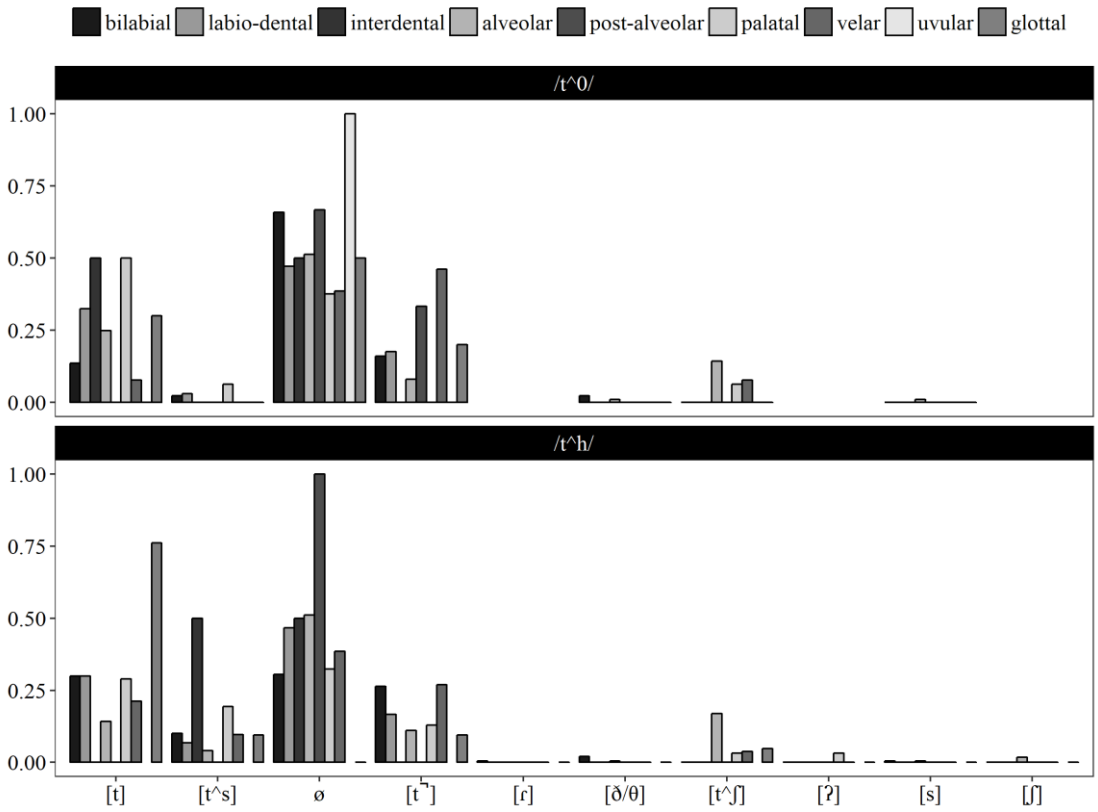

bilabial
labio-dental
interdental
alveolar
post-alveolar
palatal
velar
uvular
glottal
/t^0/
/t^h/
1.00
0.75
0.50
0.25
0.00
[t]
[t^s]
ø
[tˠ]
[ɾ]
[ð/θ]
[t^ʃ]
[ʔ]
[s]
[ʃ]

Table A.27: Variant choices and *Following consonant: manner*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-C: manner										
oral stop	8		24	15		1	1			
nasal stop	2		32	14						
fricative	17	1	58	8					1	
flap	2									
roll	6					1	1			
lateral approximant	3		2	1						
approximant	26	3	36			1	16			

	/tʰ/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
FE-C: manner										
oral stop	23	15	43	35		1	2			
nasal stop	4	6	50	32		2				
fricative	24	4	70	10			1			
flap										
roll	1						1			
lateral approximant	4	1	14	4		1			1	
approximant	77	18	45	18	1	1	37	1	1	4

/t^{0}/

	[t]	[t^{s}]	ø	[t$^{\neg}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
FE-C: manner										
oral stop	0.163	0.000	0.490	0.306		0.020	0.020		0.000	
nasal stop	0.042	0.000	0.667	0.292		0.000	0.000		0.000	
fricative	0.200	0.012	0.682	0.094		0.000	0.000		0.012	
flap	1.000	0.000	0.000	0.000		0.000	0.000		0.000	
roll	0.750	0.000	0.000	0.000		0.125	0.125		0.000	
lateral approximant	0.500	0.000	0.333	0.167		0.000	0.000		0.000	
approximant	0.317	0.037	0.439	0.000		0.012	0.195		0.000	

/t^{h}/

	[t]	[t^{s}]	ø	[t$^{\neg}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
FE-C: manner										
oral stop	0.193	0.126	0.361	0.294	0.000	0.008	0.017	0.000	0.000	0.000
nasal stop	0.043	0.064	0.532	0.340	0.000	0.021	0.000	0.000	0.000	0.000
fricative	0.220	0.037	0.642	0.092	0.000	0.000	0.009	0.000	0.000	0.000
flap										
roll	0.500	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000
lateral approximant	0.160	0.040	0.560	0.160	0.000	0.040	0.000	0.000	0.040	0.000
approximant	0.379	0.089	0.222	0.089	0.005	0.005	0.182	0.005	0.005	0.020

Table A.27 (continued): Variant choices and *Following consonant: manner*. Left: absolute numbers; right: effects.

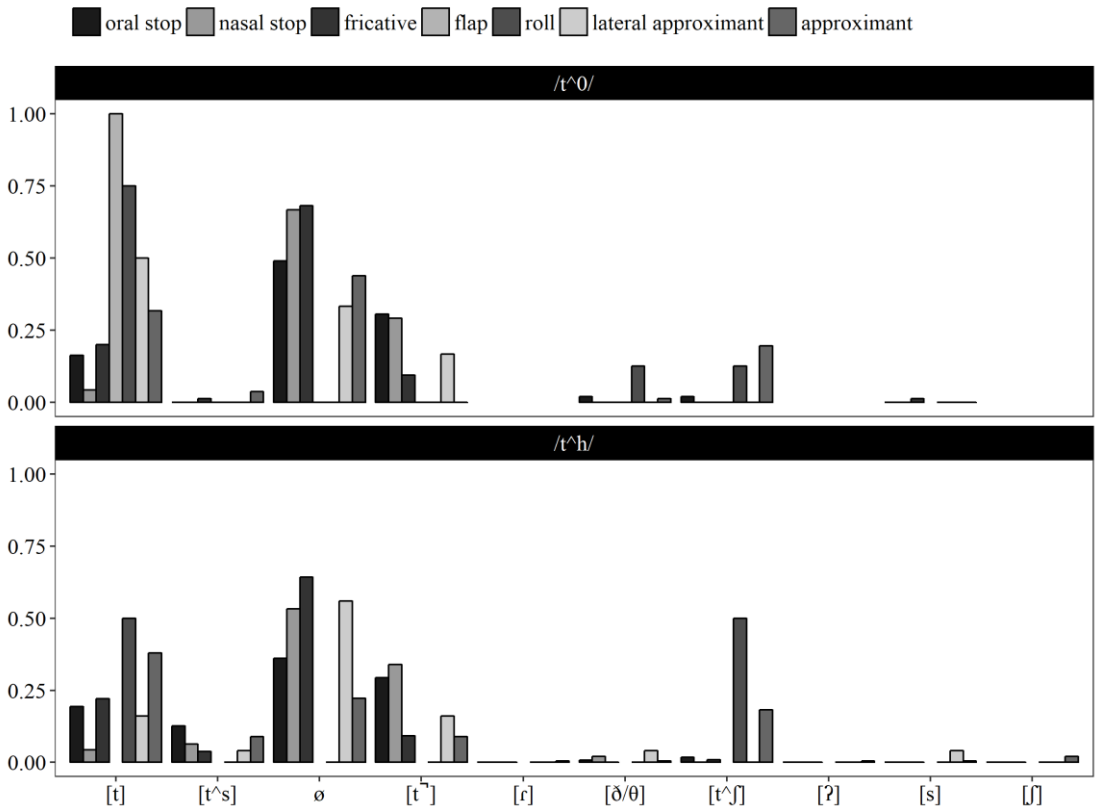

oral stop
nasal stop
fricative
flap
roll
lateral approximant
approximant
/t^0/
/t^h/
1.00
0.75
0.50
0.25
0.00
[t]
[t^s]
ø
[tˠ]
[ɾ]
[ð/θ]
[t^ʃ]
[ʔ]
[s]
[ʃ]

Table A.28: Variant choices and *Speaking rate:*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Speaking rate										
slow rate	27	4	21	15	2	1	1			
medium rate	362	36	291	52	15	80	25	4	1	
fast rate	16		25	1	4	12	1			

	/tʰ/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Speaking rate										
slow rate	65	63	4	22	1	5	8	2		1
medium rate	784	531	280	167	52	77	59	15	8	4
fast rate	42	35	39	2	11	16	7		4	

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Speaking rate										
slow rate	0.380	0.056	0.296	0.211	0.028	0.014	0.014	0.000	0.000	
medium rate	0.418	0.042	0.336	0.060	0.017	0.092	0.029	0.005	0.001	
fast rate	0.271	0.000	0.424	0.017	0.068	0.203	0.017	0.000	0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Speaking rate										
slow rate	0.380	0.368	0.023	0.129	0.006	0.029	0.047	0.012	0.000	0.006
medium rate	0.397	0.269	0.142	0.084	0.026	0.039	0.030	0.008	0.004	0.002
fast rate	0.269	0.224	0.250	0.013	0.071	0.103	0.045	0.000	0.026	0.000

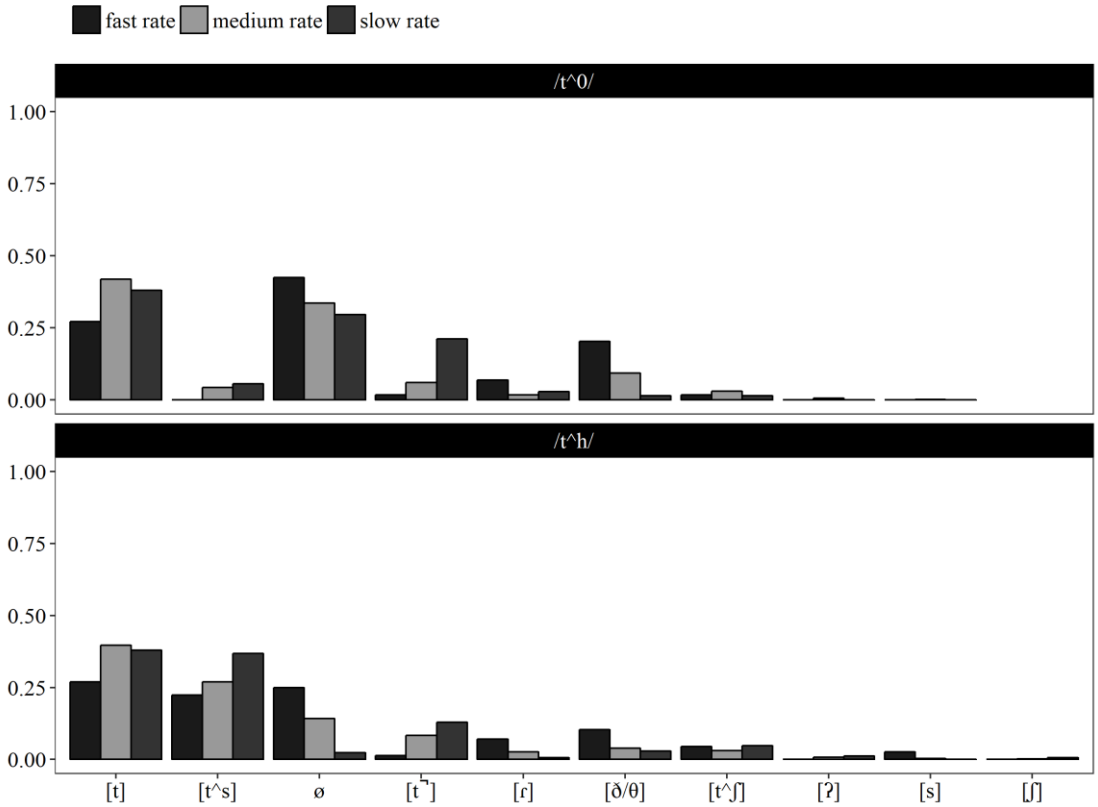


Table A.29: Variant choices and *Hesitation*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Hesitation										
no hesitation	378	37	312	51	18	88	27	3		
hesitation	27	3	25	17	3	5		1	1	

	/tʰ/									
	[t]	[tˢ]	ø	[t̚]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Hesitation										
no hesitation	790	565	294	140	55	87	73	10	12	5
hesitation	101	64	29	51	9	11	1	7		

	/t^0/									
	[t]	[t^s]	ø	[t$^{\urcorner}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
Hesitation										
no hesitation	0.414	0.040	0.341	0.056	0.020	0.096	0.030	0.003	0.000	
hesitation	0.329	0.037	0.305	0.207	0.037	0.061	0.000	0.012	0.012	

	/t^h/									
	[t]	[t^s]	ø	[t$^{\urcorner}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
Hesitation										
no hesitation	0.389	0.278	0.145	0.069	0.027	0.043	0.036	0.005	0.006	0.002
hesitation	0.370	0.234	0.106	0.187	0.033	0.040	0.004	0.026	0.000	0.000

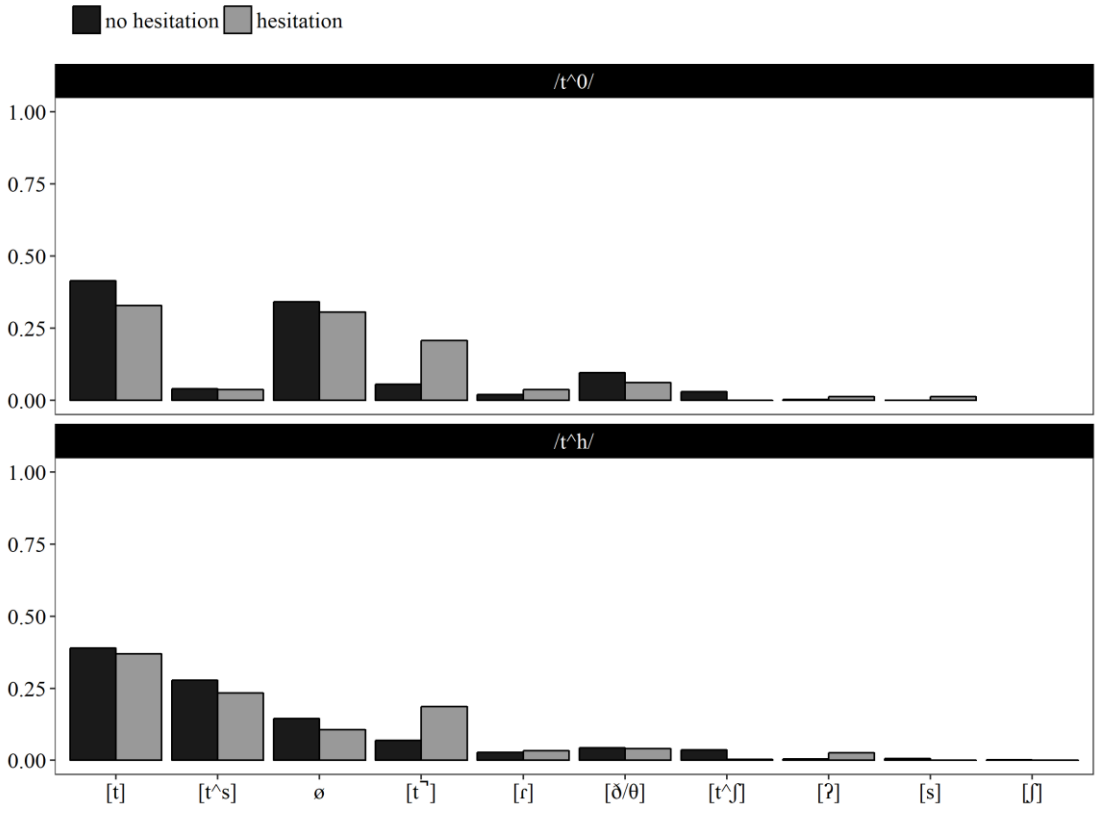


Table A.30: Variant choices and *Word stress*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Word stress										
particularly unstressed	17	2	22	2	1	4	2			
normally stressed	388	38	315	66	20	89	25	4	1	

	/tʰ/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Word stress										
particularly unstressed	35	18	11	1	2	7	1			
normally stressed	856	611	312	190	62	91	73	17	12	5

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Word stress										
particularly unstressed	0.340	0.040	0.440	0.040	0.020	0.080	0.040	0.000	0.000	
normally stressed	0.410	0.040	0.333	0.070	0.021	0.094	0.026	0.004	0.001	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Word stress										
particularly unstressed	0.467	0.240	0.147	0.013	0.027	0.093	0.013	0.000	0.000	0.000
normally stressed	0.384	0.274	0.140	0.085	0.028	0.041	0.033	0.008	0.005	0.002

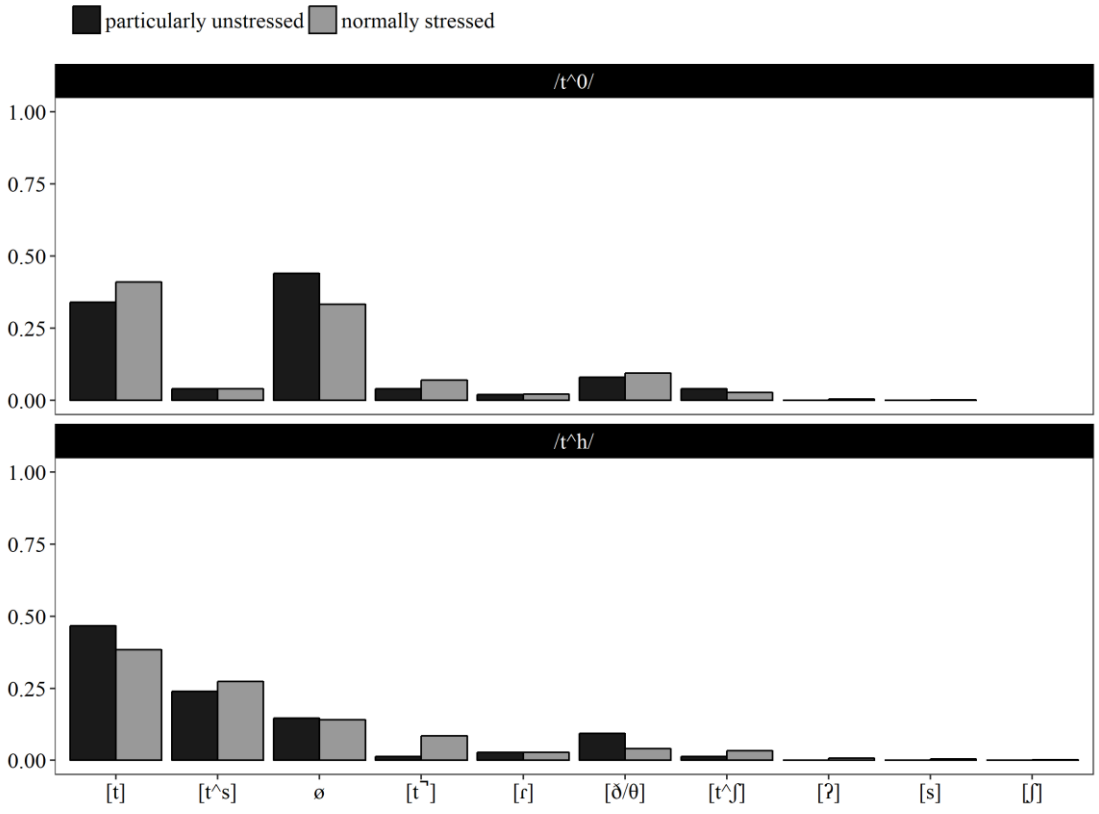


Table A.31: Variant choices and *Phrasal accent*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Phrasal accent										
particularly unaccented	16		19	1	3	11				
normally accented	389	40	318	67	18	82	26	4	1	
particularly accented							1			

	/tʰ/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Phrasal accent										
particularly unaccented	45	20	47	11	2	4		1		
normally accented	844	601	276	179	62	94	72	15	12	5
particularly accented	2	8		1			2	1		

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Phrasal accent										
particularly unaccented	0.320	0.000	0.380	0.020	0.060	0.220	0.000	0.000	0.000	
normally accented	0.412	0.042	0.337	0.071	0.019	0.087	0.028	0.004	0.001	
particularly accented	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Phrasal accent										
particularly unaccented	0.346	0.154	0.362	0.085	0.015	0.031	0.000	0.008	0.000	0.000
normally accented	0.391	0.278	0.128	0.083	0.029	0.044	0.033	0.007	0.006	0.002
particularly accented	0.143	0.571	0.000	0.071	0.000	0.000	0.143	0.071	0.000	0.000

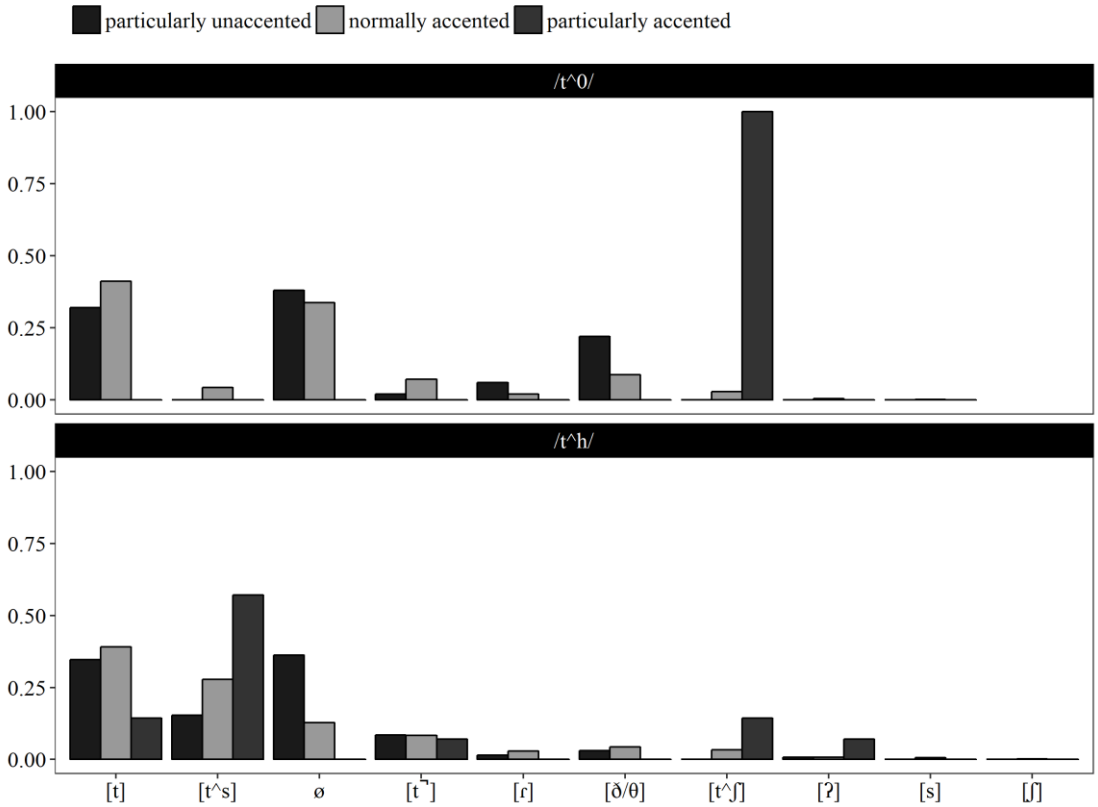


Table A.32: Variant choices and *Word category*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Word category										
lexical	334	39	178	50	14	66	27	2	1	
function	71	1	159	18	7	27		2		

	/tʰ/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Word category										
lexical	687	501	209	97	39	71	70	9	7	5
function	204	128	114	94	25	27	4	8	5	

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Word category										
lexical	0.470	0.055	0.250	0.070	0.020	0.093	0.038	0.003	0.001	
function	0.249	0.004	0.558	0.063	0.025	0.095	0.000	0.007	0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Word category										
lexical	0.405	0.296	0.123	0.057	0.023	0.042	0.041	0.005	0.004	0.003
function	0.335	0.210	0.187	0.154	0.041	0.044	0.007	0.013	0.008	0.000

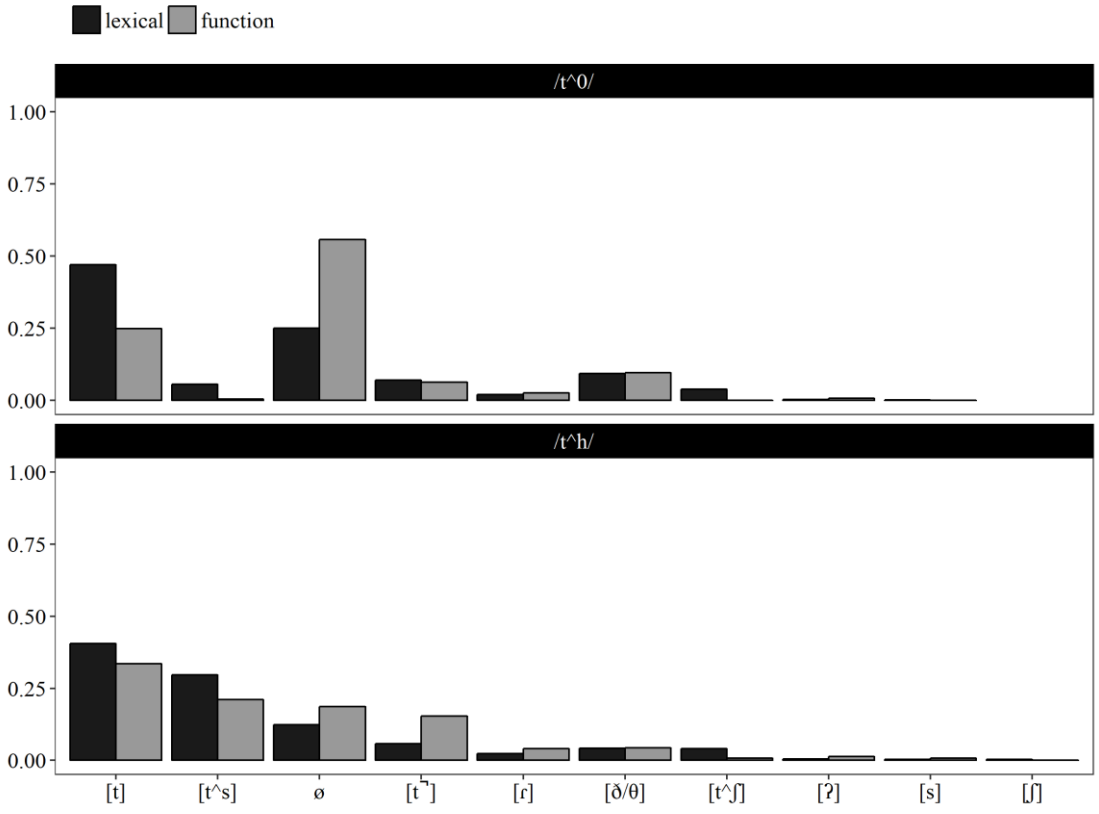


Table A.33: Variant choices and *Part of speech*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Part of speech										
N	127	8	104	10	3	25	5	2	1	
Pro					1					
Det	1									
V	98	15	30	20	5	28	3			
Aux	65	1	7	7	5	26				
Inf marker										
Part	1		2							
Adj	86	13	29	18	4	8	15			
Adv	20	3	13	2	2	5	4			
Prep	2									
Conj	5		152	11	1	1		2		

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Part of speech										
N	220	142	46	27	15	18	33	3	1	4
Pro	47	15	22	29	12	8	2	3	3	
Det	15	6	4	7	1	1			1	
V	160	92	21	16	13	19	24	2	1	1
Aux	6	7	65	10		1				
Inf marker	111	82	2			3	1			
Part	1	1		1						
Adj	126	94	59	9	4	16	7		2	
Adv	92	91	80	30	1	13	5	4	3	
Prep	88	81	3	14	6	5	1			
Conj	25	18	21	48	12	14	1	5	1	

	/t⁰/									
	[t]	[tˢ]	ø	[t¯]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Part of speech										
N	0.446	0.028	0.365	0.035	0.011	0.088	0.018	0.007	0.004	
Pro	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	
Det	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
V	0.492	0.075	0.151	0.101	0.025	0.141	0.015	0.000	0.000	
Aux	0.586	0.009	0.063	0.063	0.045	0.234	0.000	0.000	0.000	
Inf marker	0.446	0.028	0.365	0.035	0.011	0.088	0.018	0.007	0.004	
Part	0.333	0.000	0.667	0.000	0.000	0.000	0.000	0.000	0.000	
Adj	0.497	0.075	0.168	0.104	0.023	0.046	0.087	0.000	0.000	
Adv	0.408	0.061	0.265	0.041	0.041	0.102	0.082	0.000	0.000	
Prep	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Conj	0.029	0.000	0.884	0.064	0.006	0.006	0.000	0.012	0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t¯]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Part of speech										
N	0.432	0.279	0.090	0.053	0.029	0.035	0.065	0.006	0.002	0.008
Pro	0.333	0.106	0.156	0.206	0.085	0.057	0.014	0.021	0.021	0.000
Det	0.429	0.171	0.114	0.200	0.029	0.029	0.000	0.000	0.029	0.000
V	0.458	0.264	0.060	0.046	0.037	0.054	0.069	0.006	0.003	0.003
Aux	0.067	0.079	0.730	0.112	0.000	0.011	0.000	0.000	0.000	0.000
Inf marker	0.558	0.412	0.010	0.000	0.000	0.015	0.005	0.000	0.000	0.000
Part	0.333	0.333	0.000	0.333	0.000	0.000	0.000	0.000	0.000	0.000
Adj	0.397	0.297	0.186	0.028	0.013	0.050	0.022	0.000	0.006	0.000
Adv	0.288	0.285	0.251	0.094	0.003	0.041	0.016	0.013	0.009	0.000
Prep	0.444	0.409	0.015	0.071	0.030	0.025	0.005	0.000	0.000	0.000
Conj	0.172	0.124	0.145	0.331	0.083	0.097	0.007	0.034	0.007	0.000

Table A.33 (continued): Variant choices and *Part of speech*. Left: absolute numbers; right: effects.

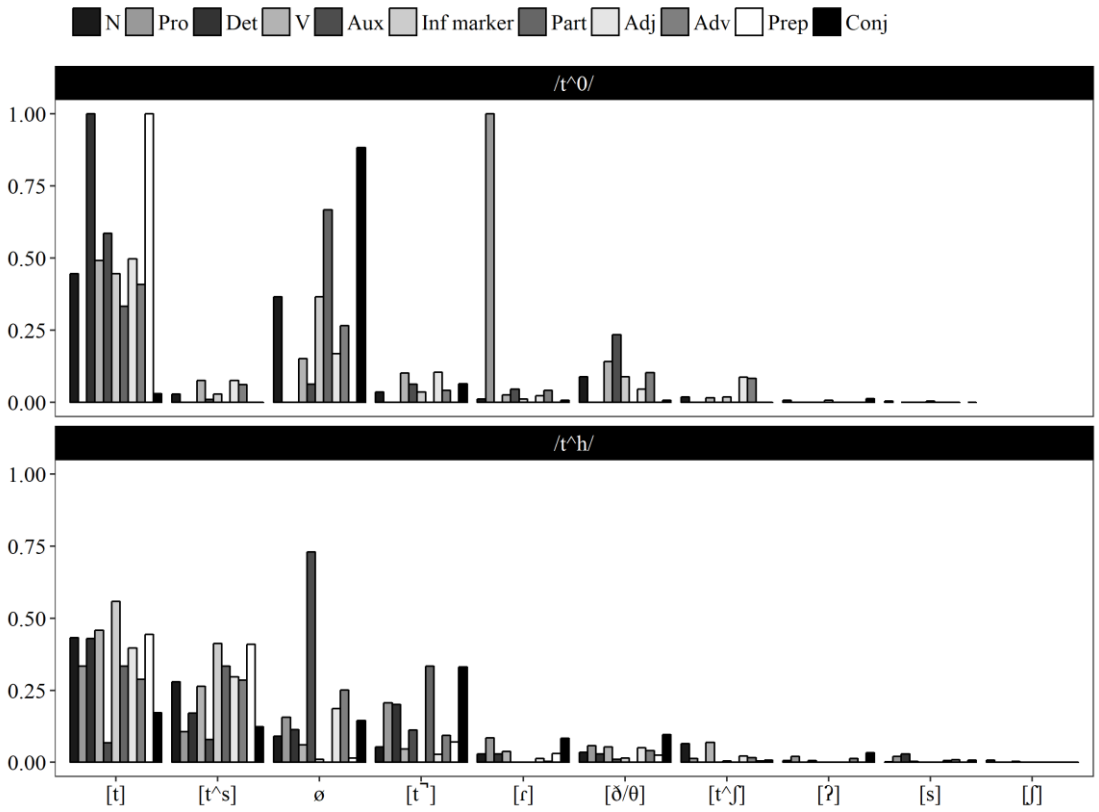

N
Pro
Det
V
Aux
Inf marker
Part
Adj
Adv
Prep
Conj
/t^0/
/t^h/
1.00
0.75
0.50
0.25
0.00
[t]
[t^s]
ø
[tˠ]
[ɾ]
[ð/θ]
[t^ʃ]
[ʔ]
[s]
[ʃ]

Table A.34: Variant choices and *Past inflection*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t͡]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Past inflection										
past inflection	4	1	2	2	0	5	0	0	0	
other environment	401	39	335	66	21	88	27	4	1	

	/t⁰/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Past inflection										
past inflection	0.575	0.000	0.382	0.006	0.000	0.037	0.000	0.000	0.000	
other environment	0.541	0.000	0.452	0.001	0.000	0.006	0.000	0.000	0.000	

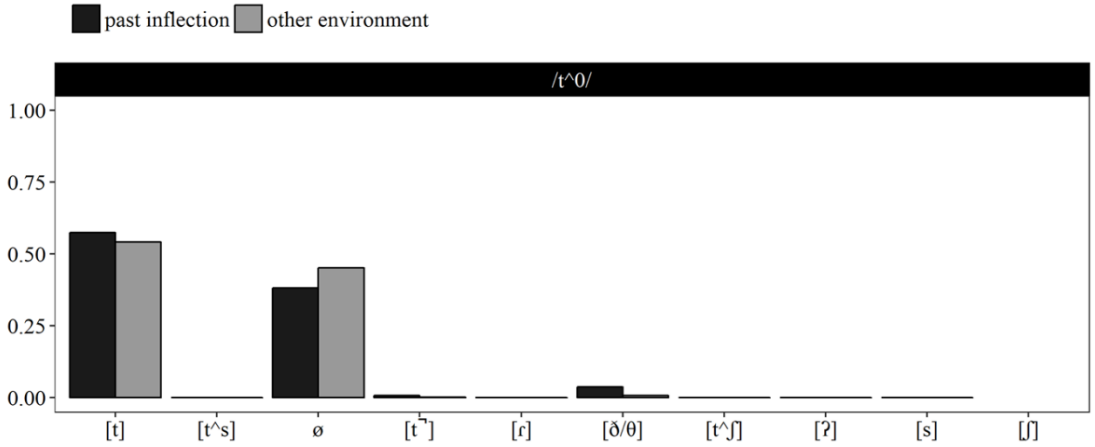


Table A.35: Variant choices and *Position in syllable*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Position in syllable										
onset	284	28	16	2	15	71	22			
coda	121	12	321	66	6	22	5	4	1	

	/tʰ/									
	[t]	[tˢ]	ø	[t‾]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Position in syllable										
onset	636	474	23		15	49	62		5	5
coda	255	155	300	191	49	49	12	17	7	

	/t^0/									
	[t]	[t^s]	ø	[t$^{\urcorner}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
Position in syllable										
onset	0.648	0.064	0.037	0.005	0.034	0.162	0.050	0.000	0.000	
coda	0.217	0.022	0.575	0.118	0.011	0.039	0.009	0.007	0.002	

	/t^h/									
	[t]	[t^s]	ø	[t$^{\urcorner}$]	[ɾ]	[ð/θ]	[t^{ʃ}]	[ʔ]	[s]	[ʃ]
Position in syllable										
onset	0.501	0.374	0.018	0.000	0.012	0.039	0.049	0.000	0.004	0.004
coda	0.246	0.150	0.290	0.184	0.047	0.047	0.012	0.016	0.007	0.000

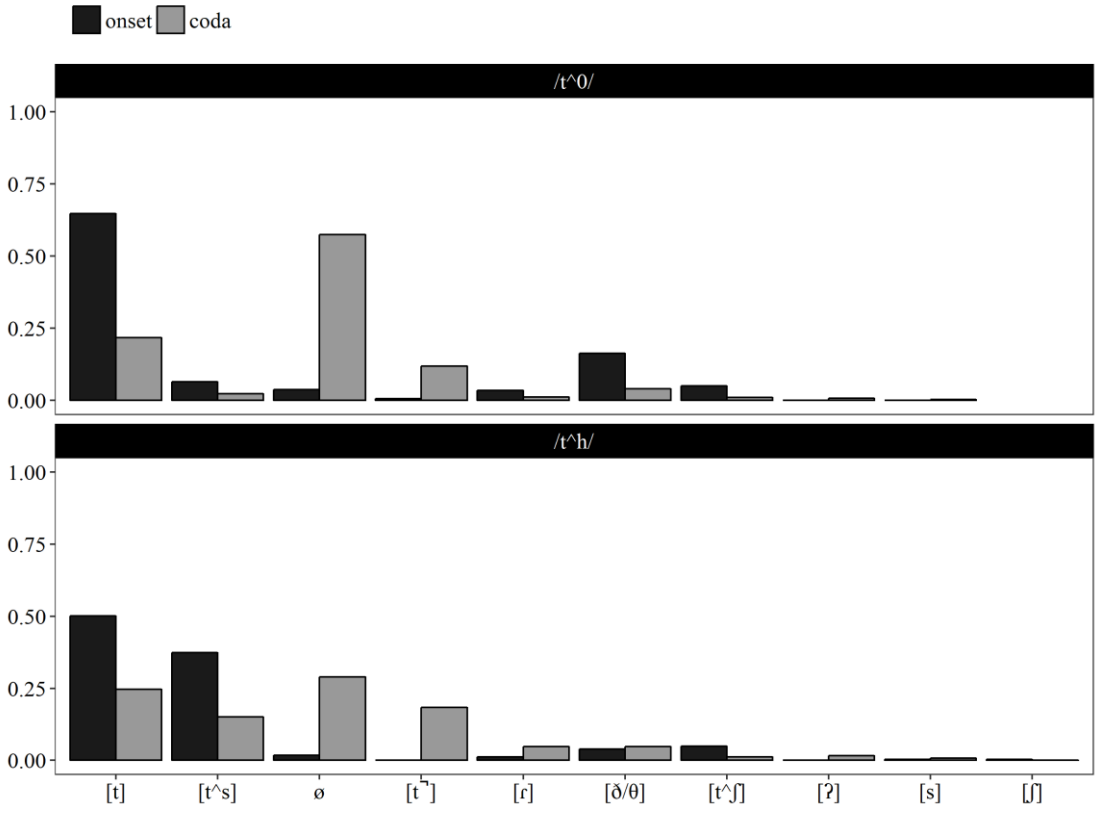


Table A.36: Variant choices and *Position in onset/coda*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Position in onset/coda										
onset singleton	263	28	8	2	15	69	3			
onset-initial	20		6			1	19			
onset-medial										
onset-final	1		2			1				
coda singleton	75	10	12	41	4	13	3			
coda-initial	13		2			1			1	
coda-medial	2		13							
coda-final	31	2	294	25	2	8	2	4		

	/tʰ/									
	[t]	[tˢ]	ø	[t˞]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Position in onset/coda										
onset singleton	495	422	5		14	45	25		5	1
onset-initial	28	10	2				35			3
onset-medial	4		3							1
onset-final	109	42	13		1	4	2			
coda singleton	178	90	58	161	48	46	10	14	7	
coda-initial	13	1	14			1				
coda-medial	14		13							
coda-final	50	64	215	30	1	2	2	3		

	/t⁰/									
	[t]	[tˢ]	ø	[t¯]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Position in onset/coda										
onset singleton	0.678	0.072	0.021	0.005	0.039	0.178	0.008	0.000	0.000	
onset-initial	0.435	0.000	0.130	0.000	0.000	0.022	0.413	0.000	0.000	
onset-medial										
onset-final	0.250	0.000	0.500	0.000	0.000	0.250	0.000	0.000	0.000	
coda singleton	0.475	0.063	0.076	0.259	0.025	0.082	0.019	0.000	0.000	
coda-initial	0.765	0.000	0.118	0.000	0.000	0.059	0.000	0.000	0.059	
coda-medial	0.133	0.000	0.867	0.000	0.000	0.000	0.000	0.000	0.000	
coda-final	0.084	0.005	0.799	0.068	0.005	0.022	0.005	0.011	0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t¯]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Position in onset/coda										
onset singleton	0.489	0.417	0.005	0.000	0.014	0.044	0.025	0.000	0.005	0.001
onset-initial	0.359	0.128	0.026	0.000	0.000	0.000	0.449	0.000	0.000	0.038
onset-medial	0.500	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.125
onset-final	0.637	0.246	0.076	0.000	0.006	0.023	0.012	0.000	0.000	0.000
coda singleton	0.291	0.147	0.095	0.263	0.078	0.075	0.016	0.023	0.011	0.000
coda-initial	0.448	0.034	0.483	0.000	0.000	0.034	0.000	0.000	0.000	0.000
coda-medial	0.519	0.000	0.481	0.000	0.000	0.000	0.000	0.000	0.000	0.000
coda-final	0.136	0.174	0.586	0.082	0.003	0.005	0.005	0.008	0.000	0.000

Table A.36 (continued): Variant choices and *Position in onset/coda*. Left: absolute numbers; right: effects.

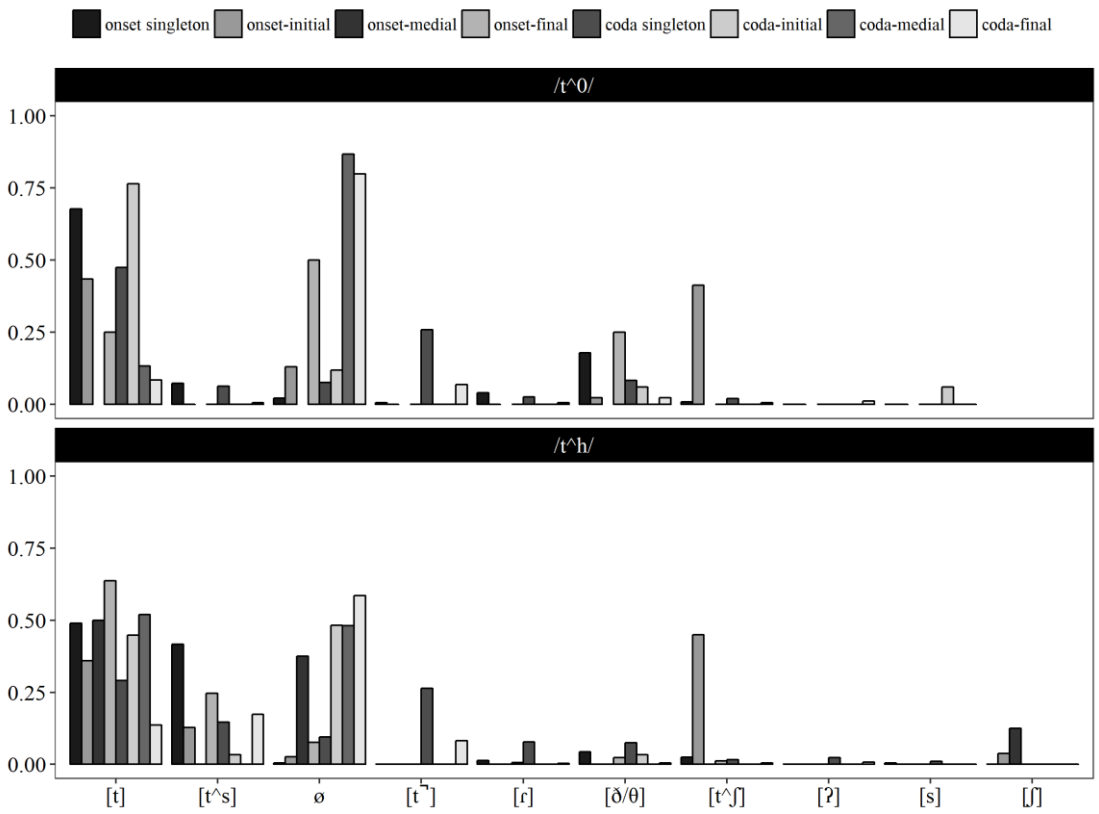

onset singleton
onset-initial
onset-medial
onset-final
coda singleton
coda-initial
coda-medial
coda-final
/t^0/
/t^h/
1.00
0.75
0.50
0.25
0.00
[t]
[t^s]
ø
[tˠ]
[ɾ]
[ð/θ]
[t^ʃ]
[ʔ]
[s]
[ʃ]

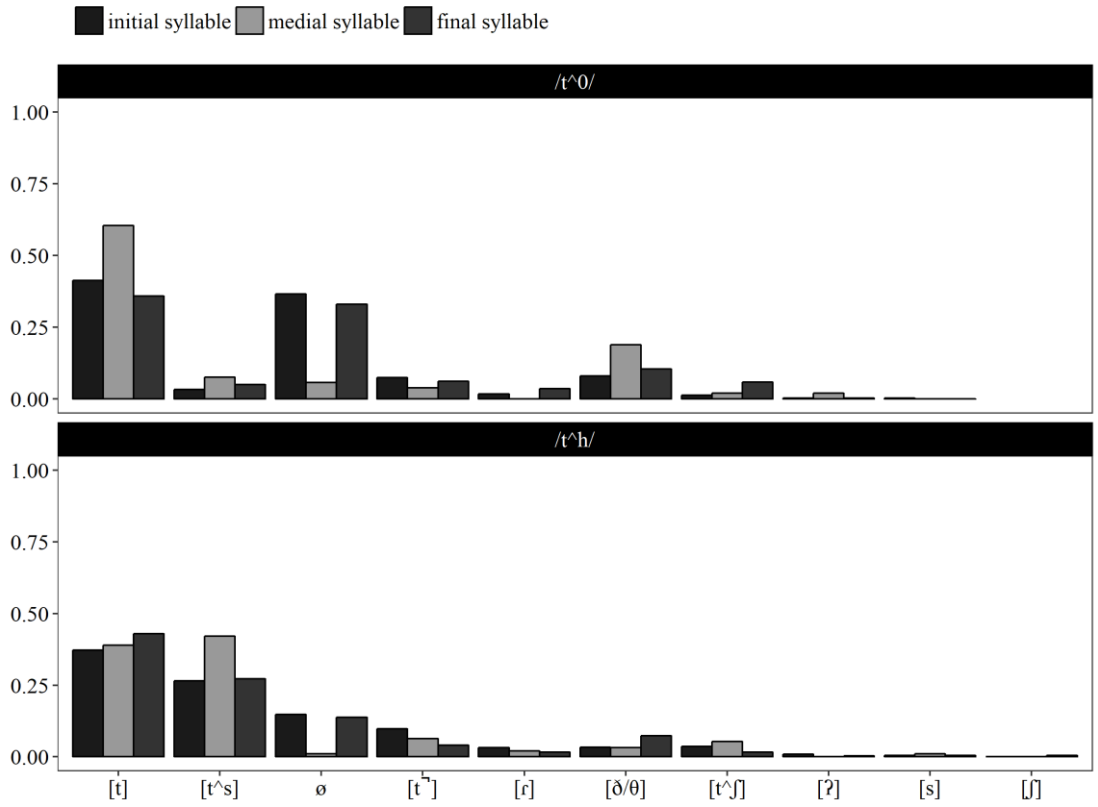
Table A.37: Variant choices and *Position in word*. Left: absolute numbers; right: effects.

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Position in word										
initial syllable	262	21	232	47	10	51	8	2	1	
medial syllable	32	4	3	2		10	1	1		
final syllable	111	15	102	19	11	32	18	1		

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Position in word										
initial syllable	617	439	246	163	53	54	60	15	8	2
medial syllable	37	40	1	6	2	3	5		1	
final syllable	237	150	76	22	9	41	9	2	3	3

	/t⁰/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Position in word										
initial syllable	0.413	0.033	0.366	0.074	0.016	0.080	0.013	0.003	0.002	
medial syllable	0.604	0.075	0.057	0.038	0.000	0.189	0.019	0.019	0.000	
final syllable	0.359	0.049	0.330	0.061	0.036	0.104	0.058	0.003	0.000	

	/tʰ/									
	[t]	[tˢ]	ø	[t˺]	[ɾ]	[ð/θ]	[tʃ]	[ʔ]	[s]	[ʃ]
Position in word										
initial syllable	0.372	0.265	0.148	0.098	0.032	0.033	0.036	0.009	0.005	0.001
medial syllable	0.389	0.421	0.011	0.063	0.021	0.032	0.053	0.000	0.011	0.000
final syllable	0.429	0.272	0.138	0.040	0.016	0.074	0.016	0.004	0.005	0.005



A.12.2 Alveolar plosive affrication

Table A.38: Alveolar plosive affrication and physiology: *Speaker*

	/t^s/ vs /t^h/		
	n	%	logodds
Speaker			
Ki01f1956	55	40.0%	-0.023
Ki02f1969	58	53.4%	0.521
Ki03f1977	39	51.3%	0.434
Ki04m1969	45	26.7%	-0.629
Ki05m1974	60	36.7%	-0.164
Ki06m1986	55	45.5%	0.200
Ki07f1990	44	56.8%	0.657
Ki08f1967	47	80.9%	1.823
Ki08m1963	50	26.0%	-0.663
Ki09f1991	47	25.5%	-0.688
Ki10f1990	34	58.8%	0.739
Ki11m1980	47	38.3%	-0.094
Ki12m1949	33	51.5%	0.443
Ki13f1991	46	39.1%	-0.059
Ki14m1965	37	29.7%	-0.478
Ki15f1988	42	66.7%	1.076
Ki16m1963	28	21.4%	-0.917
Ki17f1976	43	76.7%	1.577
Ki18f1990	36	36.1%	-0.188
Ki19m1955	59	5.1%	-2.544
Ki20f1959	43	62.8%	0.906
Ki21m1985	53	9.4%	-1.879
Ki22f1962	54	16.7%	-1.227
Ki23f1992	48	68.8%	1.171
Ki24m1970	53	26.4%	-0.642
Ki25m1972	45	66.7%	1.076
Ki26f1995a	49	57.1%	0.670
Ki26f1995b	35	45.7%	0.211
Ki27m1995	37	32.4%	-0.351
Ki28m1994	54	35.2%	-0.228
Ki29f1996	38	39.5%	-0.045
Ki29m1994	46	43.5%	0.120
Ki30m1957	60	23.3%	-0.807
(33 levels)			
input probability	*0.405*		
effect size	*4.367*		
p	*5.84E-34*	***	
R^2	*0.20*		

Table A.39: Alveolar plosive affrication and physiology: *Age* and *Sex*.

	/t^{s}/ vs /t^{h}/		
	n		logodds
Age			
19-66 (1949-1996)	1'520		0.013
p	*0.00045*	***	
R^2	*0.01*		

	/t^{s}/ vs /t^{h}/		
	n	%	logodds
Sex			
female	758	51.2%	0.443
male	762	31.6%	-0.443
input probability	*0.406*		
effect size	*0.886*		
p	*0.00186*	**	
R^2	*0.17*		

Table A.40: Alveolar plosive affrication and language background: *Occupation*, *Time abroad* and *Exposure and usage*.

	/t^s/ vs /t^h/ n	%	logodds	
Occupation				
non-monetary	89	50.6%	0.404	
monetary (local)	719	46.6%	0.216	
university student	360	41.1%	-0.038	
monetary (international)	352	28.7%	-0.581	
input probability		*0.410*		
effect size		*0.985*		
p		*0.192*		
R^2		*0.17*		

	/t^s/ vs /t^h/ n	%	logodds	
Time abroad				
none	445	54.6%	0.570	
short	189	52.9%	0.520	
several short	297	32.0%	-0.367	
long	238	39.1%	-0.112	
several long	351	27.9%	-0.611	
input probability		*0.407*		
effect size		*1.181*		
p		*0.0123*	*	
R^2		*0.17*		

	/t^s/ vs /t^h/ n	%	logodds	
Exposure and usage				
low	187	57.2%	0.202	
moderate	187	65.2%	0.570	
high	1'146	34.9%	-0.772	
input probability		*0.531*		
effect size		*1.342*		
p		*0.00118*	**	
R^2		*0.17*		

Table A.41: Alveolar plosive affrication and preceding environment: *Sound inventory* and *Distribution rule*.

	/t^s/ vs /t^h/		
	n	%	logodds
PE: sound inventory			
sound in Ki inventory	1'034	42.9%	0.102
sound not in Ki inventory	443	37.9%	-0.102
input probability		*0.399*	
effect size		*0.204*	
p		*0.105*	
R^2		*0.17*	

	/t^s/ vs /t^h/		
	n	%	logodds
PE: distribution rule			
permissible in Ki	845	40.9%	-0.031
non-permissible in Ki	675	41.9%	0.031
input probability		*0.409*	
effect size		*0.062*	
p		*0.593*	
R^2		*0.17*	

Table A.42: Alveolar plosive affrication and preceding environment: *Sound type.*

	/t^{s}/ vs /t^{h}/		
	n	%	logodds
PE: sound type			
vowel	648	39.5%	-0.023
consonant	716	43.2%	0.090
pause	113	41.6%	-0.067
input probability		*0.403*	
effect size		*0.157*	
p		*0.563*	
R^2		*0.17*	

Table A.43: Alveolar plosive affrication and preceding vowel: *Lip-rounding*, *Height* and *Fronting*.

	/t^s/ vs /t^h/ n	%	logodds	
PE-V: lip-rounding				
unrounded	556	41.4%	0.318	
rounded	92	28.3%	-0.318	
input probability		*0.340*		
effect size		*0.636*		
p		*0.019*	*	
R^2		*0.23*		

	/t^s/ vs /t^h/ n	%	logodds	
PE-V: fronting				
front	357	39.8%	-0.017	
centre	99	57.6%	0.574	
back	192	29.7%	-0.556	
input probability		*0.411*		
effect size		*1.130*		
p		*0.000277*	***	
R^2		*0.24*		

	/t^s/ vs /t^h/ n	%	logodds	
PE-V: height				
high	83	38.6%	0.007	
near-high	200	36.5%	-0.113	
mid-high	23	34.8%	-0.332	
mid	93	58.1%	0.644	
mid-low	151	33.8%	-0.198	
near-low	28	42.9%	0.190	
low	70	37.1%	-0.199	
input probability		*0.396*		
effect size		*0.976*		
p		*0.105*		
R^2		*0.23*		

Table A.44: Alveolar plosive affrication and preceding consonant: *Voicing*, *Place* and *Manner*.

	/t^{s}/ vs /t^{h}/ n	%	logodds
PE-C: voicing			
unvoiced	381	39.9%	-0.114
voiced	335	46.9%	0.114
input probability		*0.429*	
effect size		*0.228*	
p		*0.156*	
R^2		*0.13*	

	/t^{s}/ vs /t^{h}/ n	%	logodds
PE-C: place			
bilabial	54	44.4%	-0.079
labio-dental	83	38.6%	-0.100
alveolar	500	43.4%	-0.013
post-alveolar	7	42.9%	0.073
velar	72	45.8%	0.118
input probability		*0.430*	
effect size		*0.218*	
p		*0.978*	
R^2		*0.13*	

	/t^{s}/ vs /t^{h}/ n	%	logodds	
PE-C: manner				
oral stop	77	53.2%	0.427	
nasal stop	297	47.8%	0.141	
fricative	333	36.9%	-0.224	
lateral approximant	9	33.3%	-0.345	
input probability		*0.427*		
effect size		*0.772*		
p		*0.0462*	*	
R^2		*0.14*		

Table A.45: Alveolar plosive affrication and following environment: *Sound inventory* and *Distribution rule.*

	/t^s/ vs /t^h/		
	n	%	logodds
FE: sound inventory			
sound in Ki inventory	896	37.5%	-0.206
sound not in Ki inventory	587	47.0%	0.206
input probability		*0.418*	
effect size		*0.412*	
p		*0.000401*	***
R^2		*0.17*	

	/t^s/ vs /t^h/		
	n	%	logodds
FE: distribution rule			
permissible in Ki	781	39.2%	-0.086
non-permissible in Ki	702	43.6%	0.086
input probability		*0.409*	
effect size		*0.172*	
p		*0.134*	
R^2		*0.17*	

Table A.46: Alveolar plosive affrication and following environment: *Sound type*.

	/t^{s}/ vs /t^{h}/		
	n	%	logodds
FE: sound type			
vowel	1'196	42.4%	0.119
consonant	177	24.9%	-0.758
pause	110	55.5%	0.639
input probability		*0.393*	
effect size		*1.397*	
p		*2.39E-07*	***
R^2		*0.19*	

Table A.47: Alveolar plosive affrication and following vowel: *Lip-rounding*, *Height* and *Fronting*.

	/t^{s}/ vs /t^{h}/		
	n	%	logodds
FE-V: lip-rounding			
unrounded	933	42.8%	-0.005
rounded	263	41.1%	0.005
input probability		*0.422*	
effect size		*0.010*	
p		*0.944*	
R^2		*0.19*	

	/t^{s}/ vs /t^{h}/		
	n	%	logodds
FE-V: height			
high	394	45.2%	0.280
near-high	283	51.6%	0.616
mid-high	102	44.1%	0.255
mid	141	31.2%	-0.349
mid-low	119	42.9%	0.322
near-low	22	31.8%	-0.478
low	135	26.7%	-0.647
input probability		*0.379*	
effect size		*1.263*	
p		*1.47E-06*	***
R^2		*0.23*	

	/t^{s}/ vs /t^{h}/		
	n	%	logodds
FE-V: fronting			
front	568	44.2%	0.172
centre	142	31.0%	-0.410
back	486	43.6%	0.238
input probability		*0.390*	
effect size		*0.648*	
p		*0.0101*	*
R^2		*0.20*	

Table A.48: Alveolar plosive affrication and following consonant: *Voicing*, *Place* and *Manner*.

	/t^{s}/ vs /t^{h}/ n	%	logodds
FE-C: voicing			
unvoiced	52	21.2%	-0.145
voiced	125	26.4%	0.145
input probability		*0.237*	
effect size		*0.290*	
p		*0.457*	
R^2		*0.01*	

	/t^{s}/ vs /t^{h}/ n	%	logodds
FE-C: manner			
oral stop	38	39.5%	0.503
nasal stop	10	60.0%	1.336
fricative	28	14.3%	-0.861
roll	1	100.0%	
lateral approximant	5	20.0%	-0.456
approximant	95	18.9%	-0.523
input probability		*0.258*	
effect size		*2.197*	
p		*0.0094*	**
R^2		*0.10*	

	/t^{s}/ vs /t^{h}/ n	%	logodds
FE-C: place			
bilabial	76	25.0%	0.087
labio-dental	11	18.2%	-0.319
inter-dental	1	100.0%	
alveolar	40	22.5%	-0.051
palatal	15	40.0%	0.780
velar	16	31.2%	0.397
glottal	18	11.1%	-0.894
input probability		*0.234*	
effect size		*1.674*	
p		*0.5*	
R^2		*0.05*	

Table A.49: Alveolar plosive affrication and following environment: *Assibilation environment.*

	/t^{s}/ vs /t^{h}/		
	n	%	logodds
FE: assibilation env.			
_i / _u	626	48.4%	0.479
_#i / _#u	32	31.2%	-0.384
other environment	825	36.2%	-0.095
input probability		*0.374*	
effect size		*0.863*	
p		*3.40E-06*	***
R^2		*0.19*	

Table A.50: Alveolar plosive affrication and fluency: *Speaking rate* and *Hesitation*.

	/t^s/ vs /t^h/		
	n	%	logodds
Speaking rate			
slow rate	128	49.2%	0.208
medium rate	1'315	40.4%	-0.207
fast rate	77	45.5%	-0.001
input probability		*0.448*	
effect size		*0.415*	
p		*0.0975*	
R^2		*0.17*	

	/t^s/ vs /t^h/		
	n	%	logodds
Hesitation			
no hesitation	1'355	41.7%	0.056
hesitation	165	38.8%	-0.056
input probability		*0.398*	
effect size		*0.112*	
p		*0.544*	
R^2		*0.17*	

Table A.51: Alveolar plosive affrication and isochrony: *Word stress* and *Phrasal accent*.

	/t^s/ vs /t^h/		
	n	%	logodds
Word stress			
particularly unstressed	53	34.0%	-0.227
normally stressed	1467	41.6%	0.227
input probability		*50.100*	
effect size		*0.454*	
p		*0.493*	
R^2		*0.17*	

	/t^s/ vs /t^h/			
	n	%	logodds	
Phrasal accent				
particularly unaccented	65	30.8%	-0.980	
normally accented	1445	41.6%	-0.238	
particularly accented	10	80.0%	1.218	
input probability		*0.473*		
effect size		*2.198*		
p		*0.00456*	**	
R^2		*0.18*		

Table A.52: Alveolar plosive affrication and grammar: *Word category* and *Part of speech*.

	/t^s/ vs /t^h/		
	n	%	logodds
Word category			
lexical	1'188	42.2%	0.037
function	332	38.6%	-0.037
input probability		*0.404*	
effect size		*0.074*	
p		*0.594*	
R^2		*0.17*	

	/t^s/ vs /t^h/			
	n	%	logodds	
Part of speech				
N	362	39.2%	-0.079	
Pro	62	24.2%	-0.966	
Det	21	28.6%	-0.401	
V	252	36.5%	-0.267	
Aux	13	53.8%	0.493	
Inf marker	193	42.5%	0.105	
Part	2	50.0%	0.633	
Adj	220	42.7%	-0.130	
Adv	183	49.7%	0.379	
Prep	169	47.9%	0.150	
Conj	43	41.9%	0.084	
input probability		*0.417*		
effect size		*1.599*		
p		*0.0132*	*	
R^2		*0.19*		

Table A.53: Alveolar plosive affrication and plosive position: *Position in word*, *Position in* syllable, *Position in* onset/*coda*.

	/t^s/ vs /t^h/		
	n	%	logodds
Position in word			
initial syllable	1'056	41.6%	-0.085
medial syllable	77	51.9%	0.288
final syllable	387	38.8%	-0.202
input probability		*0.432*	
effect size		*0.490*	
p		*0.196*	
R^2		*0.17*	

	/t^s/ vs /t^h/		
	n	%	logodds
Position in syllable			
onset	1'110	0.427	0.108
coda	410	0.378	-0.108
input probability		*0.397*	
effect size		*0.216*	
p		*0.0938*	
R^2		*0.17*	

	/t^s/ vs /t^h/		
	n	%	logodds
Position in onset/coda			
onset singleton	917	46.0%	0.405
onset-initial	41	26.8%	-0.539
onset-medial	4	0.0%	
onset-final	148	27.7%	-0.448
coda singleton	269	33.8%	-0.101
coda-initial	13	0.0%	
coda-medial	14	0.0%	
coda-final	114	56.1%	0.683
input probability		*0.362*	
effect size		*1.222*	
p		*8.46E-07*	***
R^2		*0.19*	

A.12.3 Acoustic and durational properties

Table A.54: VOT and *Speaker*: all variants combined.

		alveolar plosives		
		n	mean	coef
Speaker				
Ki01f1956		54	0.044	0.000
Ki02f1969		47	0.059	0.014
Ki03f1977		39	0.047	0.002
Ki04m1969		63	0.034	-0.011
Ki05m1974		59	0.042	-0.002
Ki06m1986		46	0.046	0.002
Ki07f1990		40	0.050	0.005
Ki08f1967		38	0.043	-0.002
Ki08m1963		30	0.050	0.005
Ki09f1991		46	0.038	-0.006
Ki10f1990		45	0.050	0.006
Ki11m1980		45	0.034	-0.010
Ki12m1949		31	0.036	-0.009
Ki13f1991		46	0.055	0.010
Ki14m1965		31	0.045	0.000
Ki15f1988		45	0.061	0.017
Ki16m1963		27	0.023	-0.022
Ki17f1976		41	0.061	0.016
Ki18f1990		39	0.045	0.000
Ki19m1955		40	0.036	-0.008
Ki20f1959		46	0.039	-0.006
Ki21m1985		59	0.031	-0.014
Ki22f1962		46	0.031	-0.014
Ki23f1992		45	0.070	0.025
Ki24m1970		42	0.044	0.000
Ki25m1972		39	0.040	-0.005
Ki26f1995a		30	0.043	-0.001
Ki26f1995b		24	0.042	-0.003
Ki27m1995		38	0.051	0.007
Ki28m1994		59	0.054	0.009
Ki29f1996		22	0.053	0.008
Ki29m1994		36	0.042	-0.003
Ki30m1957		43	0.033	-0.011
(33 levels)				
intercept			*0.045*	
effect size			*0.047*	
p			*2.18E-33*	***
R^2			*0.16*	

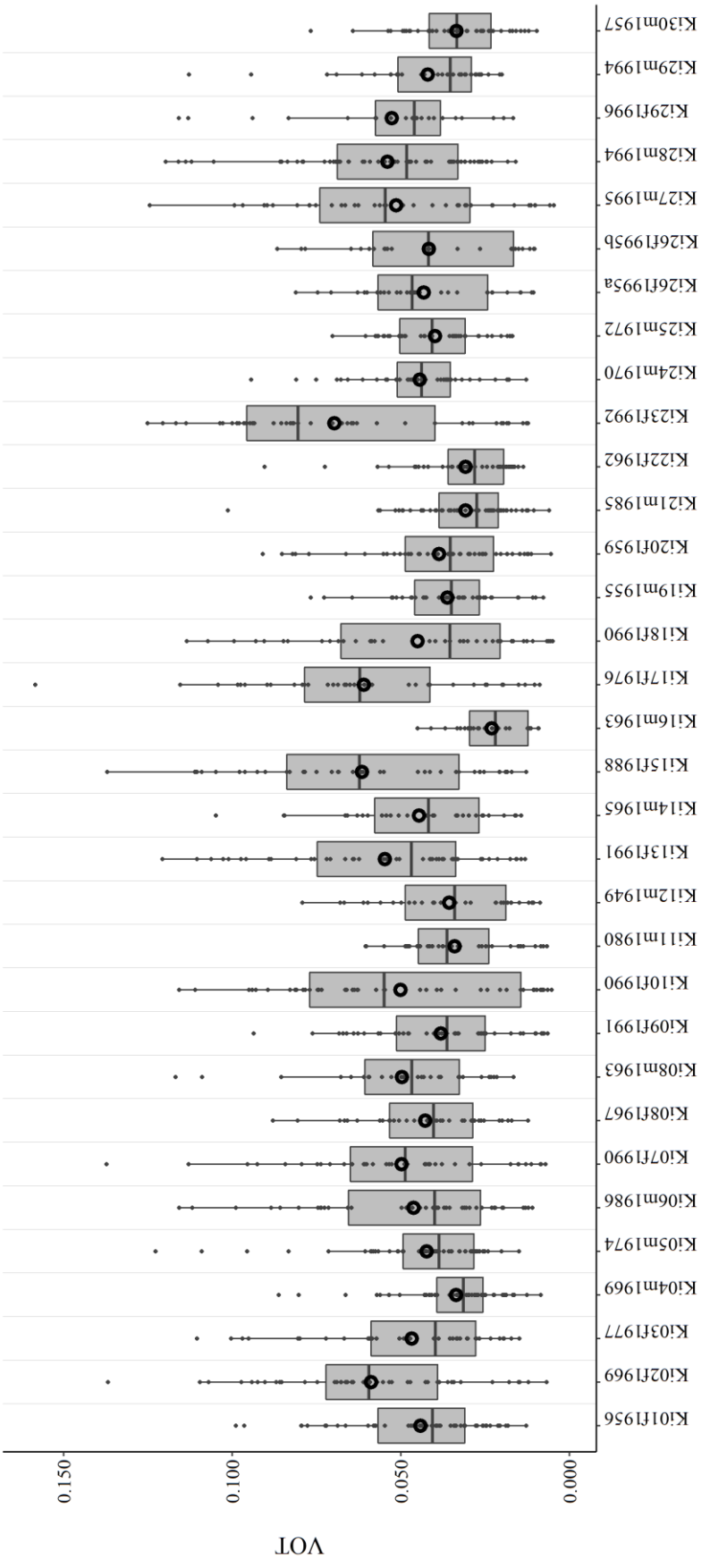

Ki01f1956
Ki02f1969
Ki03f1977
Ki04m1969
Ki05m1974
Ki06m1986
Ki07f1990
Ki08f1967
Ki08m1963
Ki09f1991
Ki10f1990
Ki11m1980
Ki12m1949
Ki13f1991
Ki14m1965
Ki15f1988
Ki16m1963
Ki17f1976
Ki18f1990
Ki19m1955
Ki20f1959
Ki21m1985
Ki22f1962
Ki23f1992
Ki24m1970
Ki25m1972
Ki26f1995a
Ki26f1995b
Ki27m1995
Ki28m1994
Ki29f1996
Ki29m1994
Ki30m1957
0.150
0.100
0.050
0.000
VOT

Table A.55: VOT and *Speaker*: /t^0/ versus /t^h/.

	/t$^{0/}$			/t^h/		
	n	mean	coef	n	mean	coef
Speaker						
Ki01f1956	13	0.032	0.007	41	0.048	-0.003
Ki02f1969	9	0.023	-0.002	38	0.067	0.016
Ki03f1977	13	0.028	0.003	26	0.056	0.004
Ki04m1969	23	0.027	0.002	40	0.037	-0.014
Ki05m1974	7	0.033	0.008	52	0.044	-0.008
Ki06m1986	6	0.023	-0.002	40	0.050	-0.002
Ki07f1990	7	0.015	-0.010	33	0.057	0.006
Ki08f1967	9	0.026	0.001	29	0.048	-0.004
Ki08m1963	7	0.036	0.011	23	0.054	0.002
Ki09f1991	14	0.020	-0.005	32	0.046	-0.005
Ki10f1990	18	0.022	-0.003	27	0.069	0.018
Ki11m1980	9	0.014	-0.011	36	0.039	-0.012
Ki12m1949	9	0.015	-0.010	22	0.044	-0.007
Ki13f1991	12	0.031	0.006	34	0.063	0.012
Ki14m1965	5	0.028	0.003	26	0.048	-0.004
Ki15f1988	14	0.026	0.001	31	0.077	0.026
Ki16m1963	13	0.018	-0.007	14	0.028	-0.023
Ki17f1976	8	0.025	0.000	33	0.070	0.018
Ki18f1990	12	0.019	-0.006	27	0.057	0.005
Ki19m1955	6	0.024	-0.001	34	0.038	-0.013
Ki20f1959	9	0.017	-0.008	37	0.044	-0.008
Ki21m1985	22	0.024	-0.001	37	0.035	-0.017
Ki22f1962	15	0.023	-0.002	31	0.034	-0.017
Ki23f1992	12	0.030	0.005	33	0.084	0.033
Ki24m1970	10	0.046	0.021	32	0.044	-0.007
Ki25m1972	4	0.022	-0.003	35	0.042	-0.010
Ki26f1995a	8	0.017	-0.008	22	0.053	0.001
Ki26f1995b	7	0.018	-0.007	17	0.051	0.000
Ki27m1995	12	0.024	-0.001	26	0.064	0.013
Ki28m1994	26	0.035	0.010	33	0.069	0.017
Ki29f1996	4	0.023	-0.002	18	0.059	0.008
Ki29m1994	8	0.037	0.012	28	0.043	-0.008
Ki30m1957	9	0.023	-0.002	34	0.036	-0.015
(33 levels)						
intercept		*0.025*			*0.051*	
effect size		*0.032*			*0.056*	
p		*2.64E-09*	***		*4.95E-52*	***
R^2		*0.23*			*0.27*	

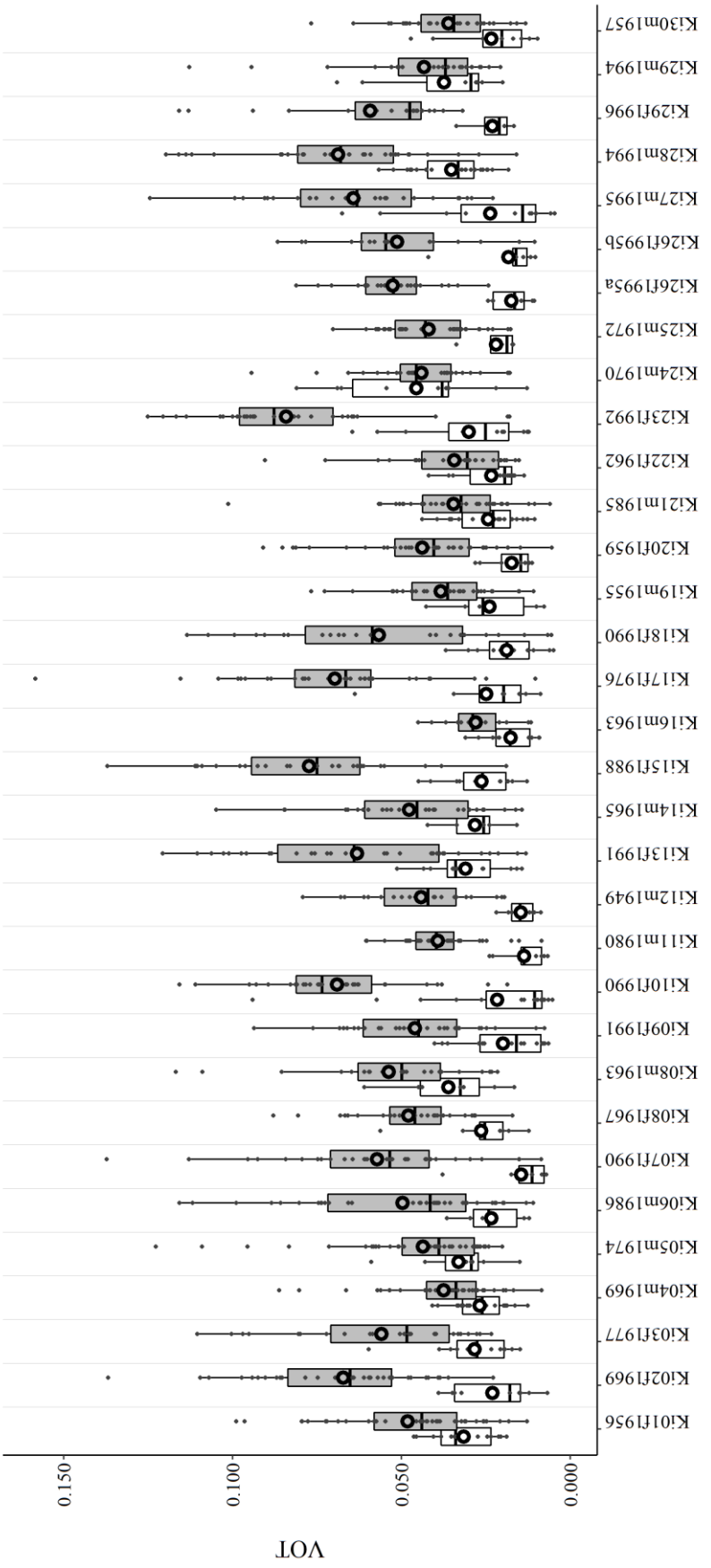

Ki30m1957
Ki29m1994
Ki29f1996
Ki28m1994
Ki27m1995
Ki26f1995b
Ki26f1995a
Ki25m1972
Ki24m1970
Ki23f1992
Ki22f1962
Ki21m1985
Ki20f1959
Ki19m1955
Ki18f1990
Ki17f1976
Ki16m1963
Ki15f1988
Ki14m1965
Ki13f1991
Ki12m1949
Ki11m1980
Ki10f1990
Ki09f1991
Ki08m1963
Ki08f1967
Ki07f1990
Ki06m1986
Ki05m1974
Ki04m1969
Ki03f1977
Ki02f1969
Ki01f1956
0.150
0.100
0.050
0.000
VOT

Table A.56: VOT and *Speaker*: /t^0/ versus /t^h/ versus t^s/.

	/t$^{0/}$			/t^h/			/t^s/		
	n	mean	coef	n	mean	coef	n	mean	coef
Speaker									
Ki01f1956	13	0.032	0.007	25	0.045	0.001	16	0.054	-0.004
Ki02f1969	9	0.023	-0.002	22	0.063	0.019	16	0.073	0.015
Ki03f1977	13	0.028	0.003	8	0.051	0.007	18	0.058	0.000
Ki04m1969	23	0.027	0.002	27	0.034	-0.010	13	0.045	-0.013
Ki05m1974	7	0.033	0.008	31	0.040	-0.004	21	0.049	-0.009
Ki06m1986	6	0.023	-0.002	22	0.037	-0.007	18	0.065	0.007
Ki07f1990	7	0.015	-0.010	14	0.052	0.008	19	0.061	0.003
Ki08f1967	9	0.026	0.001		0.000	0.000	29	0.048	-0.010
Ki08m1963	7	0.036	0.011	15	0.051	0.007	8	0.058	0.000
Ki09f1991	14	0.020	-0.005	20	0.042	-0.002	12	0.052	-0.006
Ki10f1990	18	0.022	-0.003	10	0.054	0.010	17	0.078	0.020
Ki11m1980	9	0.014	-0.011	22	0.035	-0.009	14	0.045	-0.013
Ki12m1949	9	0.015	-0.010	10	0.036	-0.008	12	0.051	-0.007
Ki13f1991	12	0.031	0.006	21	0.054	0.010	13	0.078	0.020
Ki14m1965	5	0.028	0.003	16	0.039	-0.005	10	0.062	0.003
Ki15f1988	14	0.026	0.001	5	0.058	0.014	26	0.081	0.023
Ki16m1963	13	0.018	-0.007	9	0.024	-0.020	5	0.035	-0.023
Ki17f1976	8	0.025	0.000	5	0.044	0.000	28	0.074	0.016
Ki18f1990	12	0.019	-0.006	15	0.050	0.006	12	0.065	0.007
Ki19m1955	6	0.024	-0.001	33	0.038	-0.006	1	0.036	-0.022
Ki20f1959	9	0.017	-0.008	13	0.031	-0.013	24	0.051	-0.007
Ki21m1985	22	0.024	-0.001	33	0.034	-0.010	4	0.038	-0.020
Ki22f1962	15	0.023	-0.002	26	0.033	-0.011	5	0.043	-0.015
Ki23f1992	12	0.030	0.005	8	0.059	0.015	25	0.092	0.034
Ki24m1970	10	0.046	0.021	22	0.042	-0.002	10	0.049	-0.009
Ki25m1972	4	0.022	-0.003	8	0.034	-0.010	27	0.044	-0.014
Ki26f1995a	8	0.017	-0.008	7	0.044	0.000	15	0.057	-0.002
Ki26f1995b	7	0.018	-0.007	6	0.033	-0.011	11	0.061	0.003
Ki27m1995	12	0.024	-0.001	19	0.058	0.014	7	0.082	0.024
Ki28m1994	26	0.035	0.010	19	0.062	0.018	14	0.077	0.019
Ki29f1996	4	0.023	-0.002	13	0.058	0.014	5	0.064	0.006
Ki29m1994	8	0.037	0.012	12	0.037	-0.007	16	0.048	-0.010
Ki30m1957	9	0.023	-0.002	27	0.035	-0.009	7	0.039	-0.019
(33 levels)									
intercept		*0.025*			*0.044*			*0.58*	
effect size		*0.032*			*0.039*			*0.057*	
p		*2.64E-09*	***		*5.91E-13*	***		*7.95E-27*	***
R^2		*0.23*			*0.19*			*0.33*	

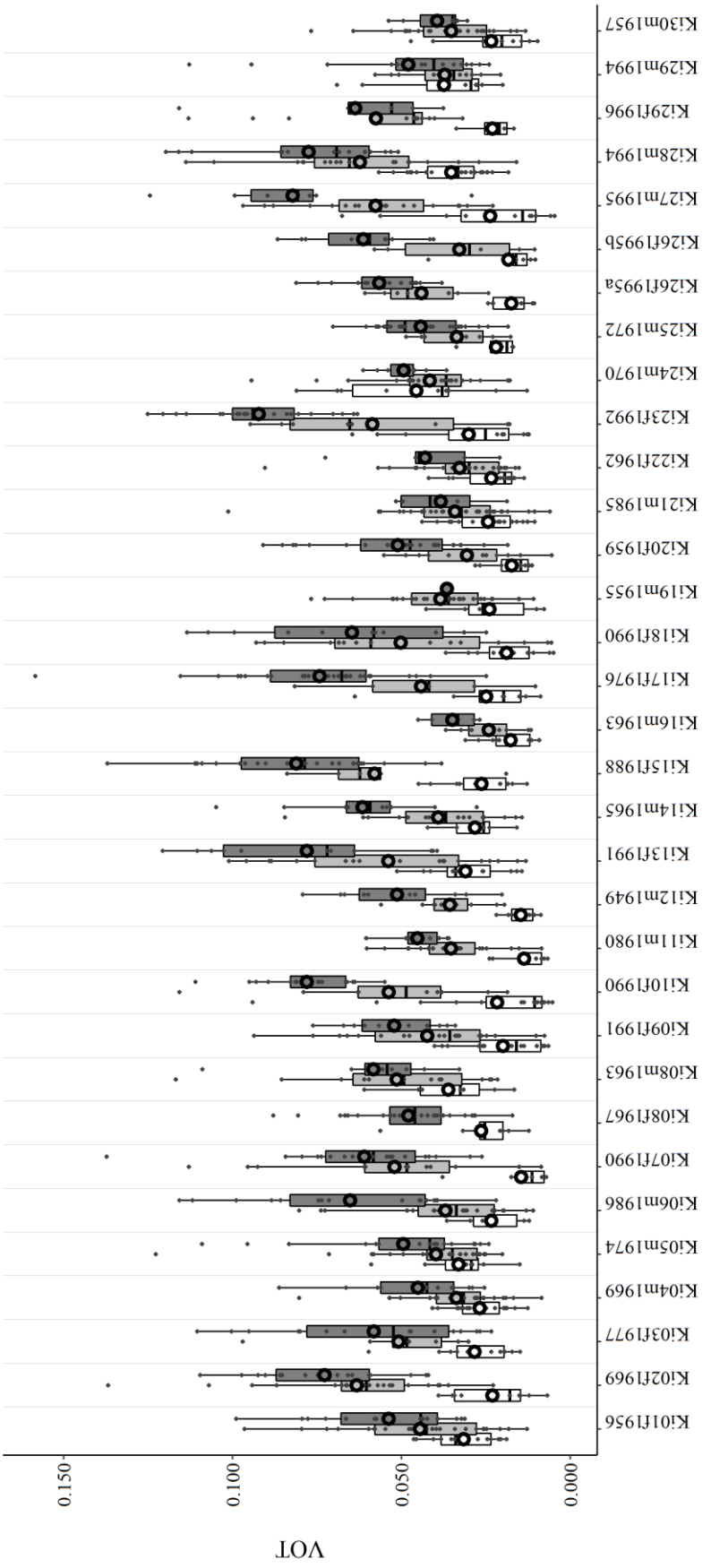
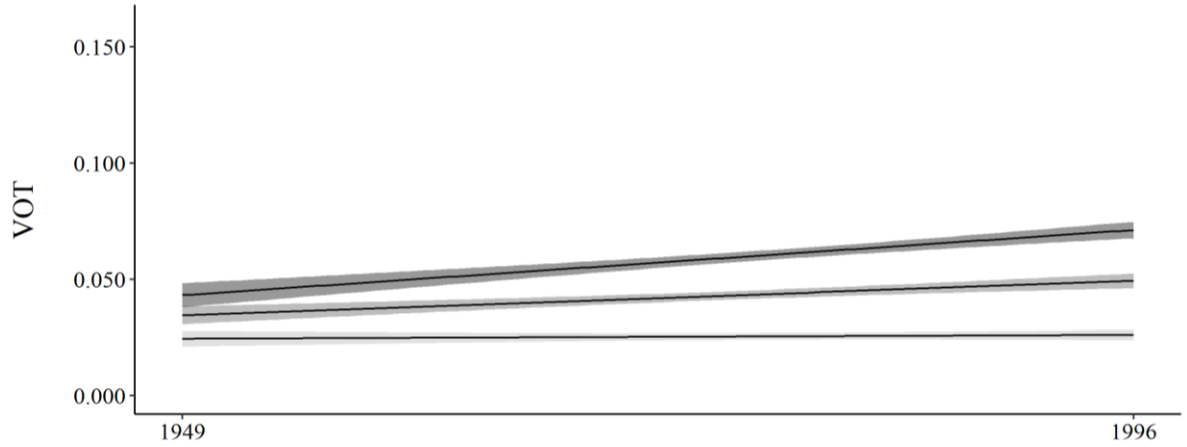

Ki30m1957
Ki29m1994
Ki29f1996
Ki28m1994
Ki27m1995
Ki26f1995b
Ki26f1995a
Ki25m1972
Ki24m1970
Ki23f1992
Ki22f1962
Ki21m1985
Ki20f1959
Ki19m1955
Ki18f1990
Ki17f1976
Ki16m1963
Ki15f1988
Ki14m1965
Ki13f1991
Ki12m1949
Ki11m1980
Ki10f1990
Ki09f1991
Ki08m1963
Ki08f1967
Ki07f1990
Ki06m1986
Ki05m1974
Ki04m1969
Ki03f1977
Ki02f1969
Ki01f1956
0.150
0.100
0.050
0.000
VOT

Table A.57: VOT and physiology: *Age* and *Sex*..

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Age									
	360	0.025		543	0.043		478	0.061	
m		*0.0000*			*0.0003*			*0.0006*	
r		*0.04*			*0.20*			*0.32*	
p		*0.5077*			*1.495E-06*	***		*1.257E-12*	***
R^2		*0.00*			*0.04*			*0.10*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Sex									
female	184	0.024	-0.002	218	0.048	0.004	291	0.066	0.006
male	176	0.027	0.002	325	0.040	-0.004	187	0.053	-0.006
intercept		*0.025*			*0.044*			*0.059*	
effect size		*0.004*			*0.008*			*0.012*	
p		*0.166*			*0.0212*	*		*0.0136*	*
R^2		*0.19*			*0.17*			*0.30*	


VOT
0.150
0.100
0.050
0.000
1949
1996

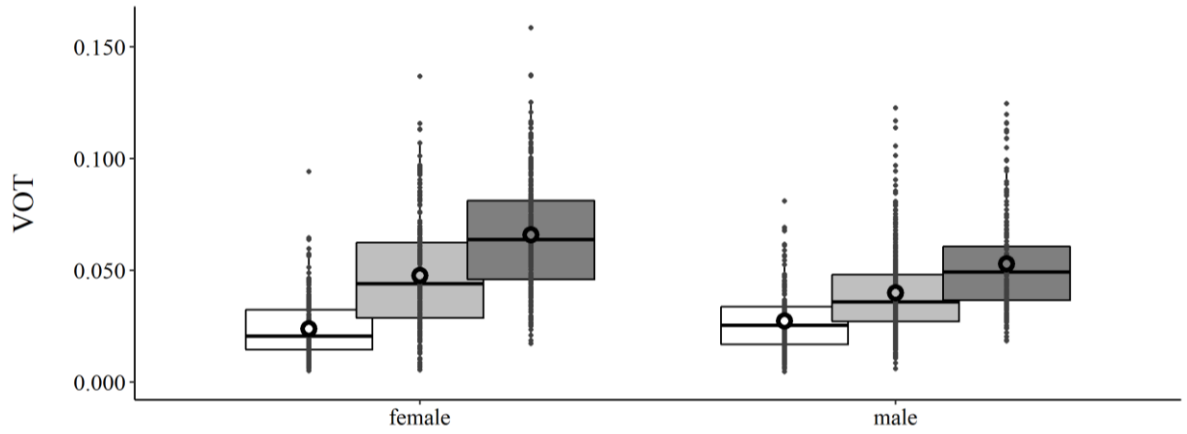
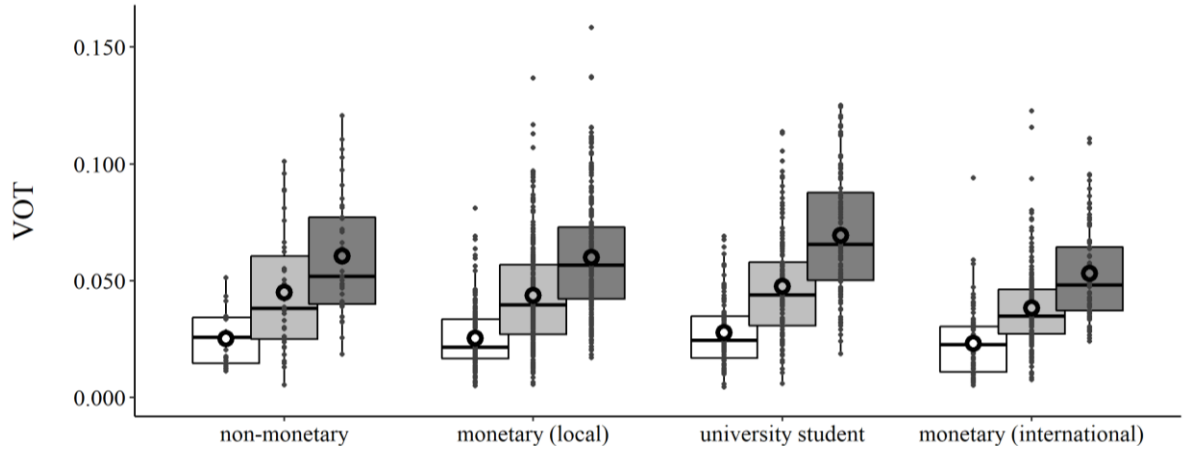

VOT
0.150
0.100
0.050
0.000
female
male

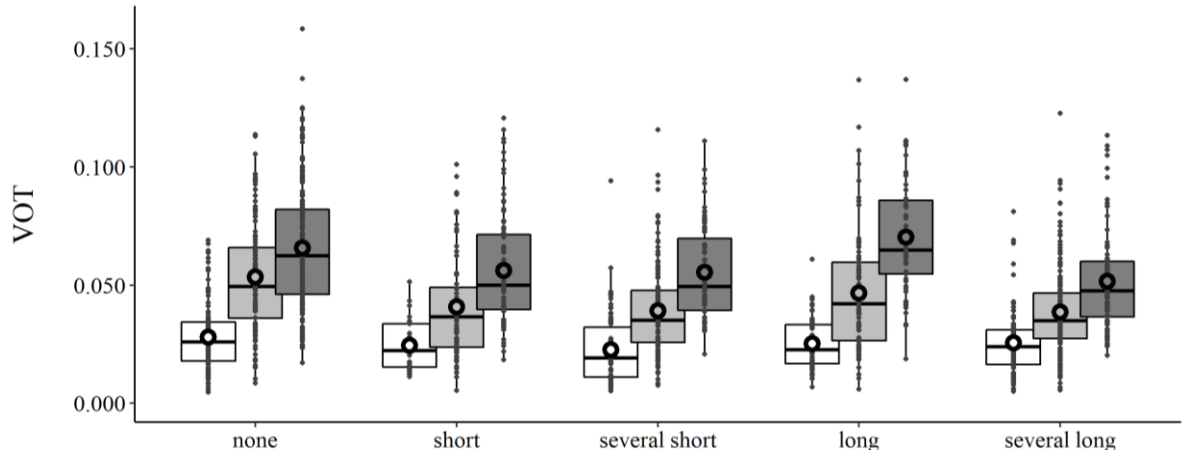
Table A.58: VOT and language background: *Occupation*, *Time abroad* and *Exposure and usage*.

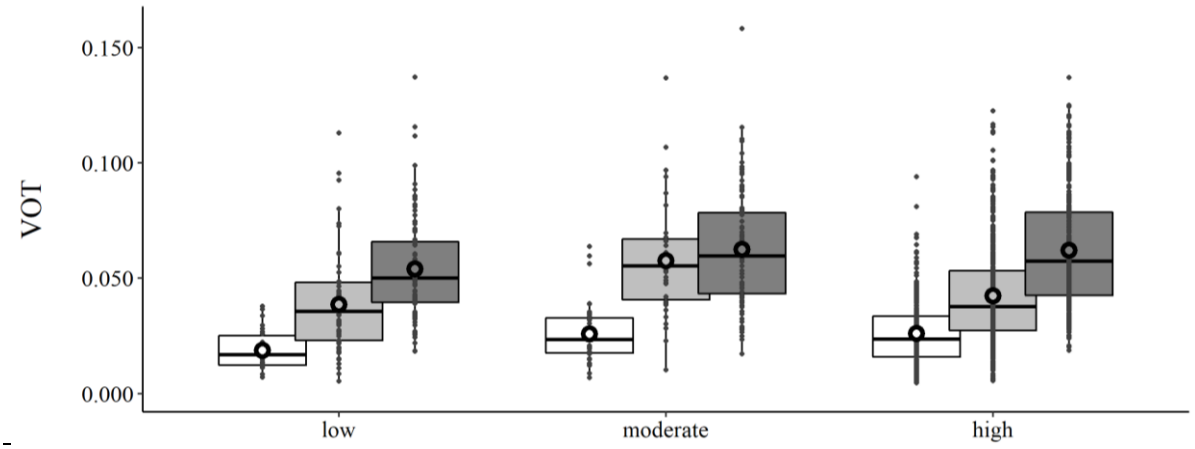
	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Occupation									
non-monetary	21	0.025	0.000	34	0.045	-0.001	37	0.060	0.004
monetary (local)	154	0.025	0.000	222	0.044	0.000	259	0.060	-0.002
university student	99	0.028	0.002	117	0.048	0.005	97	0.069	0.006
monetary (international)	86	0.023	-0.002	170	0.038	-0.004	85	0.053	-0.009
intercept		*0.025*			*0.044*			*0.60*	
effect size		*0.004*			*0.009*			*0.015*	
p		*0.796*			*0.36*			*0.233*	
R^2		*0.20*			*0.18*			*0.31*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Time abroad									
none	107	0.028	0.002	105	0.053	0.009	176	0.066	0.007
short	31	0.024	-0.001	64	0.041	-0.004	82	0.056	0.001
several short	78	0.023	-0.002	130	0.039	-0.004	71	0.055	-0.006
long	59	0.025	0.001	81	0.047	0.004	65	0.070	0.006
several long	85	0.026	0.001	163	0.038	-0.005	84	0.052	-0.008
intercept		*0.025*			*0.044*			*0.059*	
effect size		*0.004*			*0.014*			*0.015*	
p		*0.795*			*0.0131*	*		*0.12*	
R^2		*0.21*			*0.17*			*0.32*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Exposure and usage									
low	26	0.019	-0.004	57	0.039	-0.007	88	0.054	-0.004
moderate	39	0.026	0.002	35	0.058	0.009	91	0.062	0.004
high	295	0.026	0.002	451	0.042	-0.002	299	0.062	0.000
intercept		*0.024*			*0.045*			*0.059*	
effect size		*0.006*			*0.016*			*0.008*	
p		*0.238*			*0.123*			*0.712*	
R^2		*0.19*			*0.17*			*0.31*	


VOT
0.150
0.100
0.050
0.000
non-monetary
monetary (local)
university student
monetary (international)


VOT
0.150
0.100
0.050
0.000
none
short
several short
long
several long


VOT
0.150
0.100
0.050
0.000
low
moderate
high

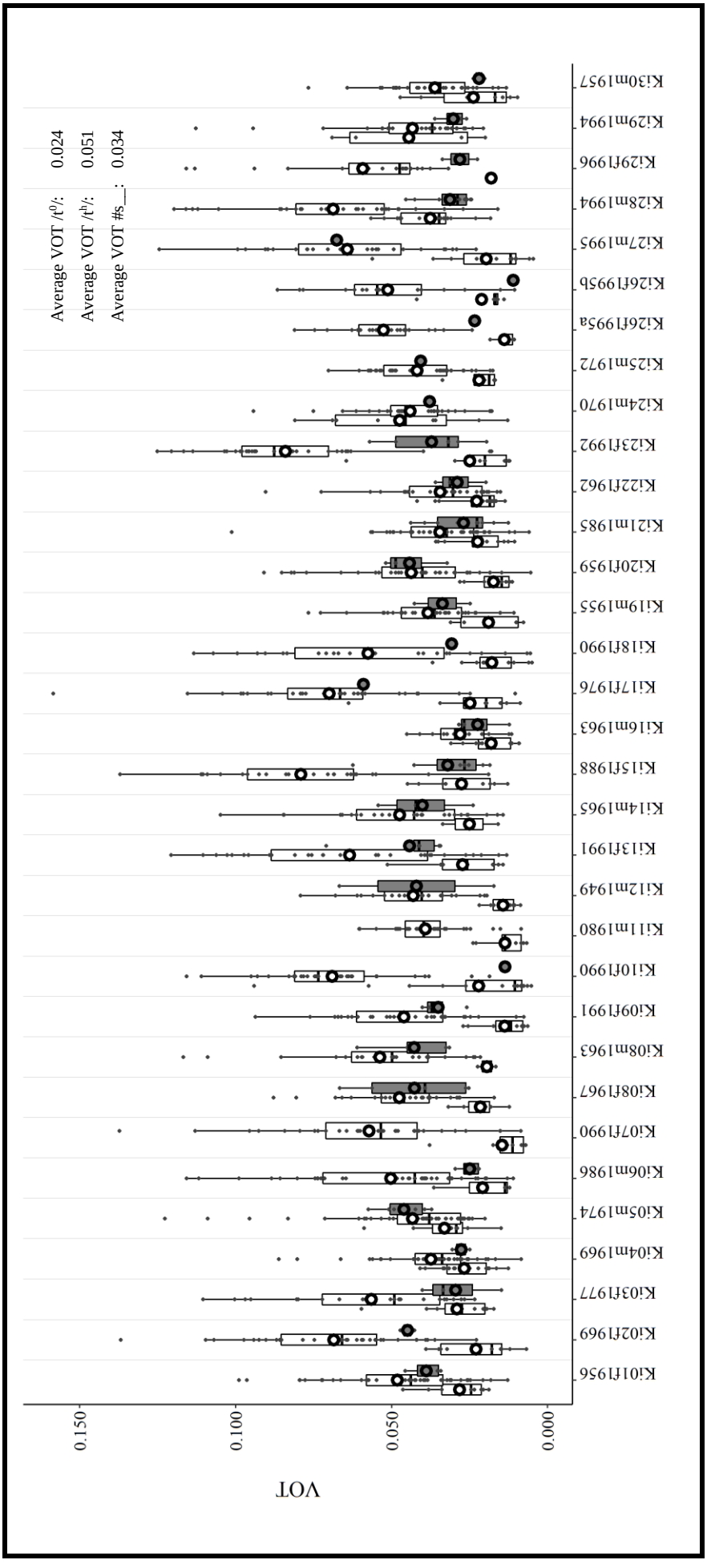


Figure A.10: VOT production in /s/-initial onset clusters. White: /t⁰/ variants (left) and /tʰ/ variants (right); grey: #s__ contexts.

Table A.59: VOT and closure duration. Top: all variants combined; bottom: /t^0/, /t^h/ and /t^s/ individually.

	alveolar plosives		
	n	m	r
Closure duration			
voiced closure phase	306	-0.468	-0.26
unvoiced closure phase	346	-0.028	-0.02
entire closure phase	843	-0.063	-0.06

	/t^0/			/t^h/			/t^s/		
	n	m	r	n	m	r	n	m	r
Closure duration									
voiced closure phase	60	-0.136	-0.11	132	-0.373	-0.24	114	-0.695	-0.37
unvoiced closure phase	64	-0.162	-0.19	152	0.015	0.01	130	-0.106	-0.10
entire closure phase	236	-0.047	-0.08	327	0.010	0.01	280	-0.108	-0.10

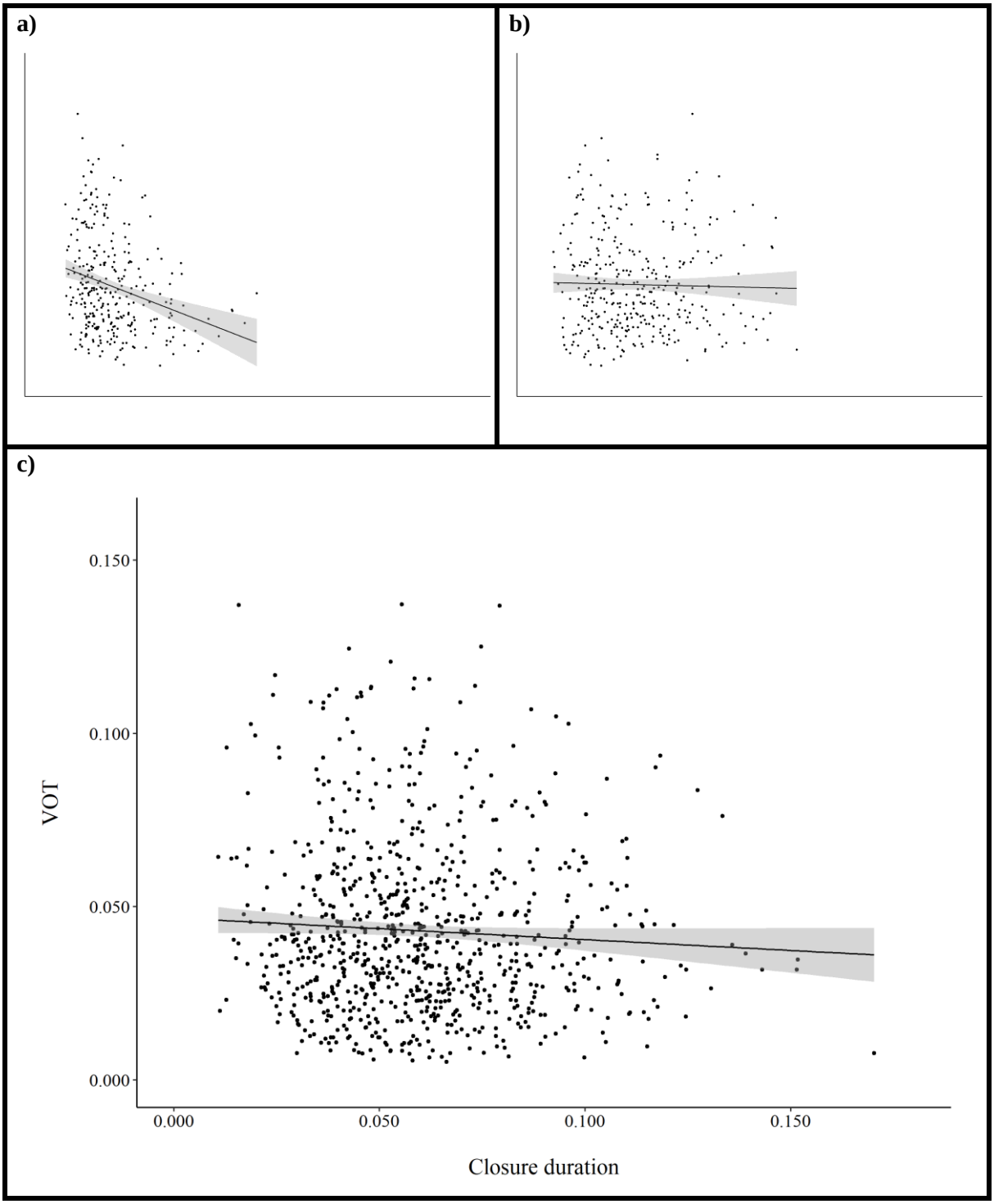


Figure A.11: VOT and closure duration correlation plots for all variants combined: a) with voiced closure phase; b) with unvoiced closure phase; c) with entire closure phase.

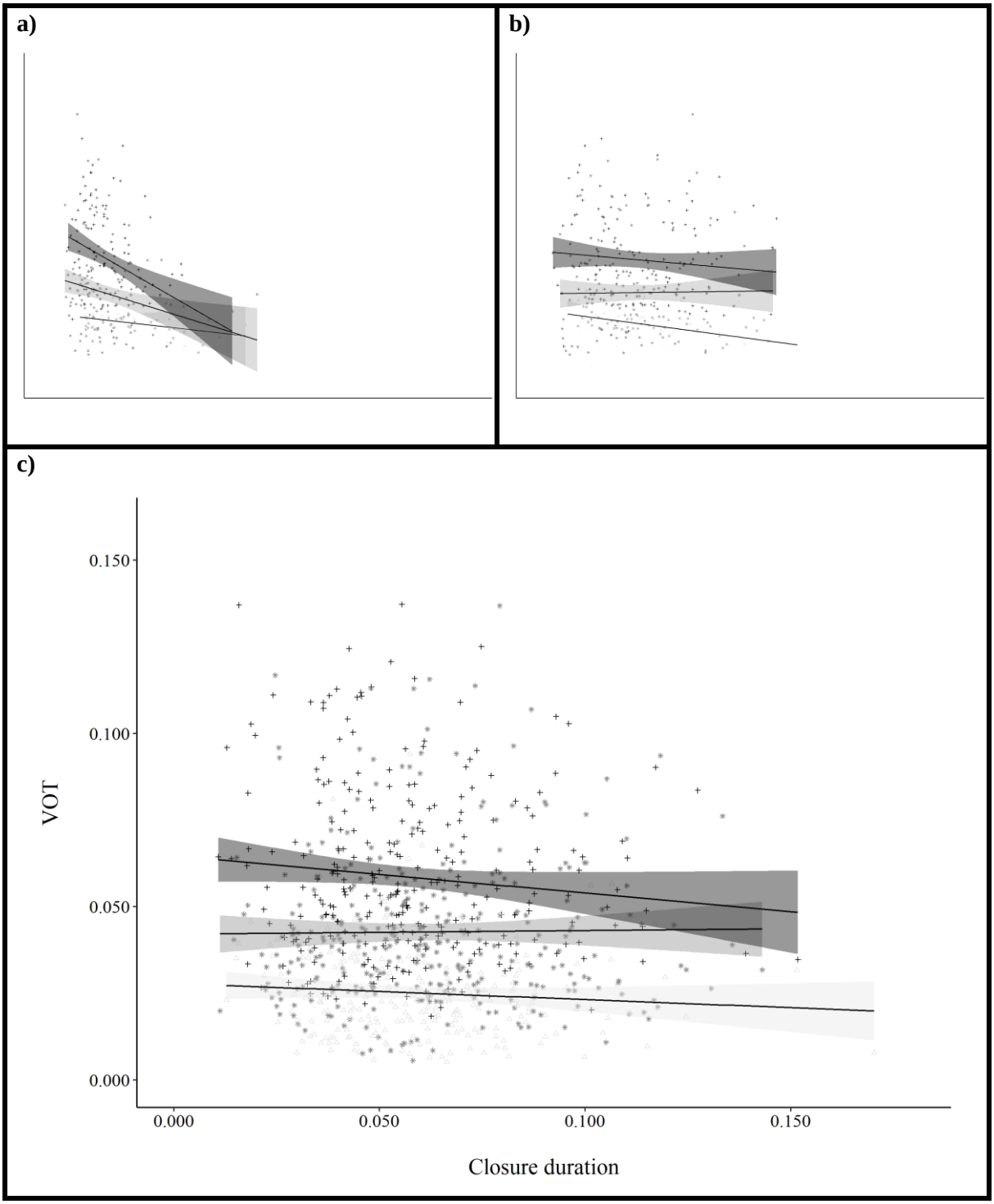


Figure A.12: VOT and closure duration correlation plots for individual variant groups: a) with voiced closure phase; b) with unvoiced closure phase; c) with entire closure phase. Triangles, light-grey: /t^0/ variants; stars, dark-grey: /t^h/ variants; crosses, black: /t^s/ variants.

Table A.60: Relative VOT and preceding environment: *Sound inventory* and *Distribution rule*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE: sound inventory									
sound in Ki inventory	231	17.7	1.1	314	34.9	-0.9	320	51.6	-0.5
sound not in Ki inventory	118	15.0	-1.1	206	37.4	0.9	143	52.6	0.5
intercept		*16.0*			*36.3*			*52.3*	
effect size		*2.3*			*1.8*			*1.0*	
p		*0.155*			*0.373*			*0.638*	
R^2		*0.10*			*0.08*			*0.16*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE: distribution rule									
permissible in Ki	225	18.0	1.5	260	35.6	0.1	268	51.5	-0.1
non-permissible in Ki	124	14.5	-1.5	260	36.2	-0.1	195	52.4	0.1
intercept		*16.8*			*36.1*			*52.1*	
effect size		*3.1*			*0.2*			*0.2*	
p		*0.0529*			*0.934*			*0.934*	
R^2		*0.10*			*0.08*			*0.16*	

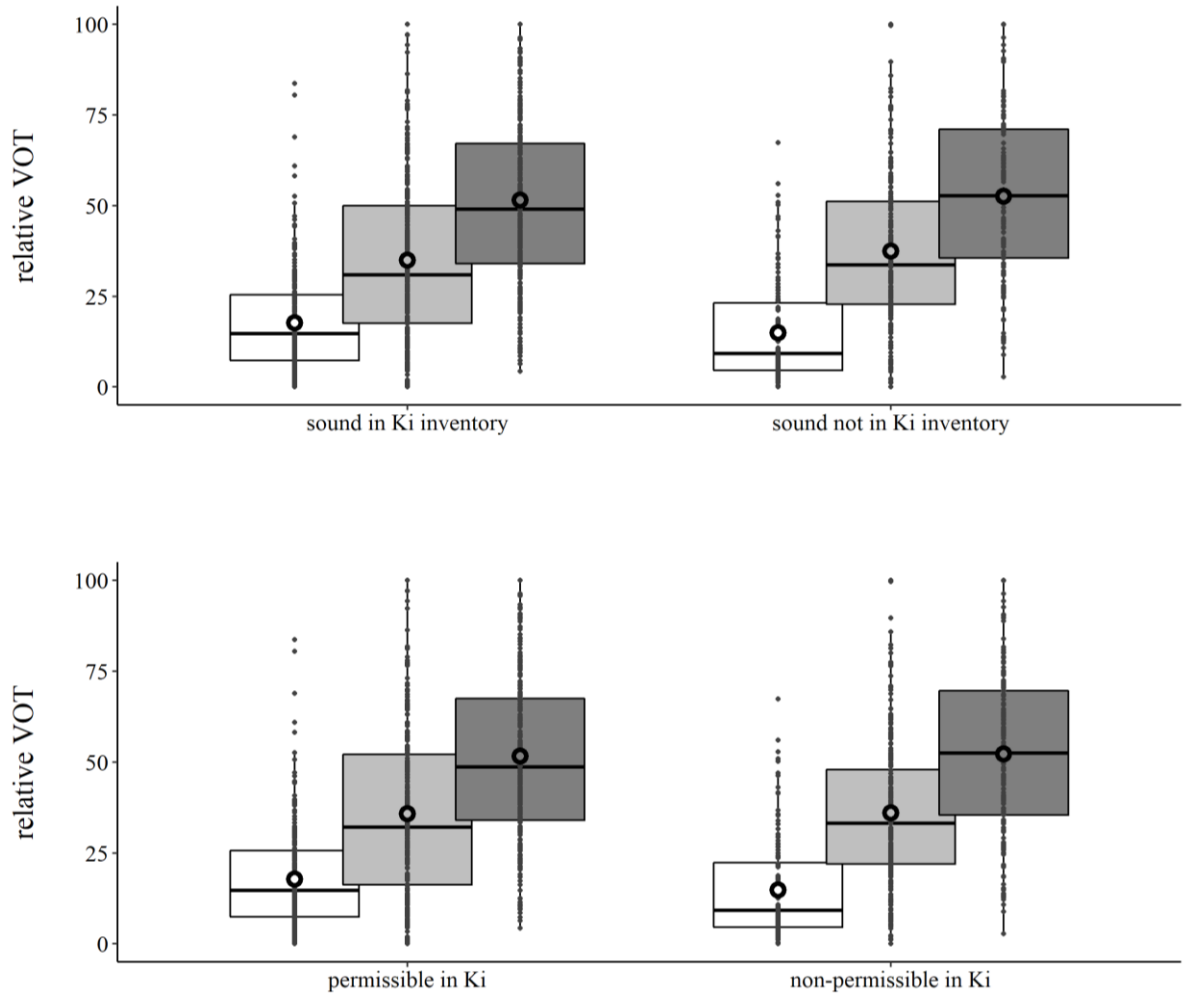

relative VOT
100
75
50
25
0
sound in Ki inventory
sound not in Ki inventory
relative VOT
100
75
50
25
0
permissible in Ki
non-permissible in Ki

Table A.61: Relative VOT and preceding environment: *Sound type*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE: sound type									
vowel	170	15.0	-1.9	246	34.8	-2.5	190	51.2	-1.9
consonant	147	18.9	2.0	211	35.0	-2.3	230	50.3	-4.0
pause	32	16.6	-0.2	63	43.2	4.8	43	63.3	5.9
intercept		*16.4*			*37.6*			*54.3*	
effect size		*3.9*			*7.4*			*9.9*	
p		*0.0465*	*		*0.0514*			*0.0278*	*
R^2		*0.11*			*0.08*			*0.16*	

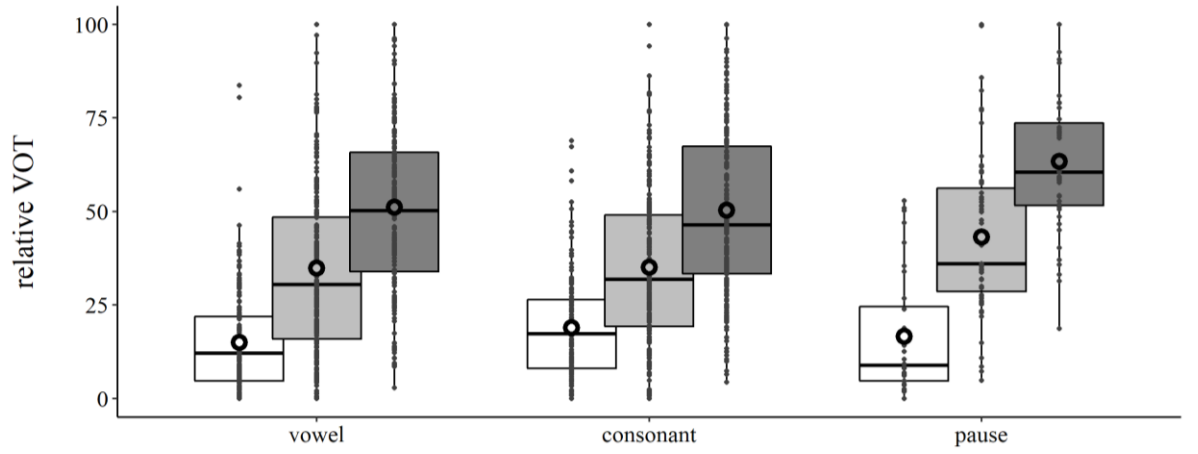
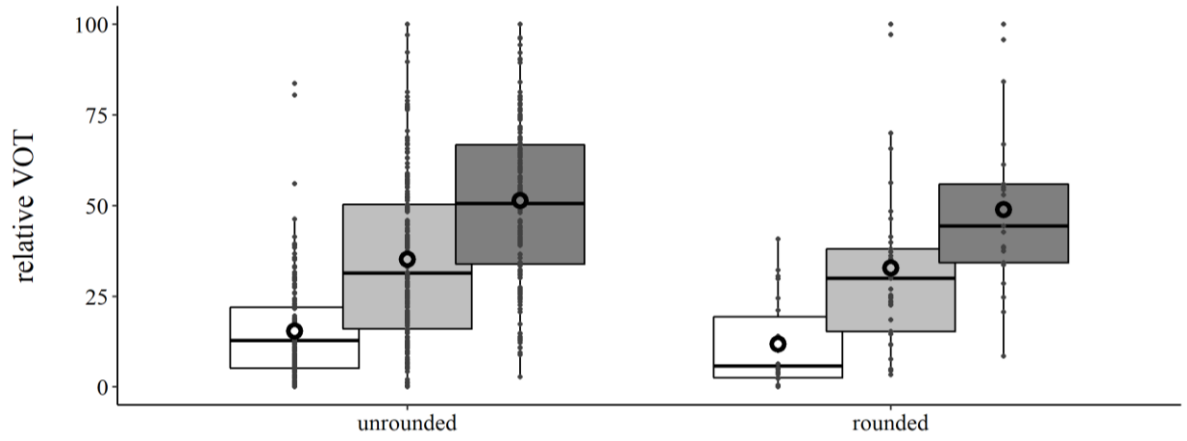

relative VOT
100
75
50
25
0
vowel
consonant
pause

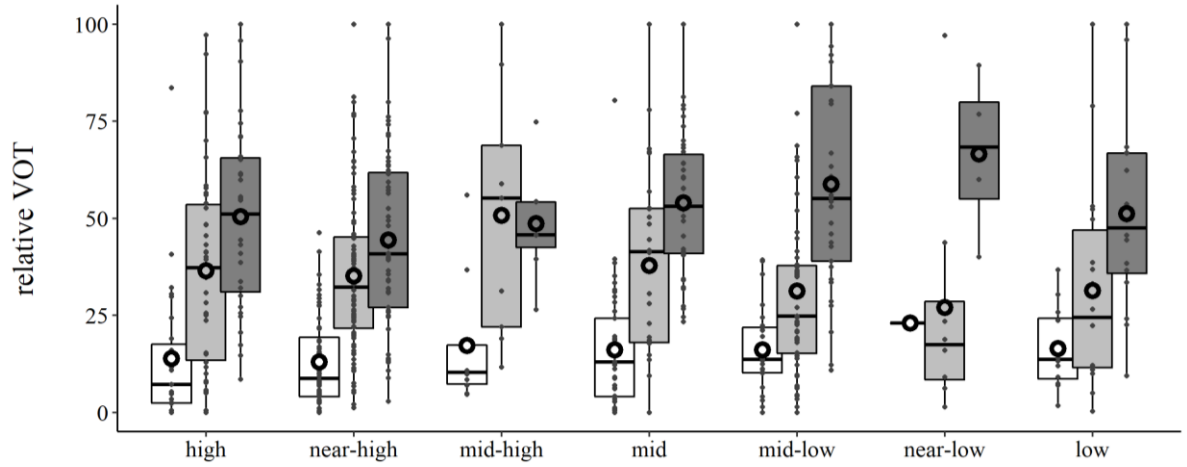
Table A.62: Relative VOT and preceding vowel: *Lip-rounding*, *Height* and *Fronting*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE-V: lip-rounding									
unrounded	148	15.4	2.2	205	35.2	1.2	169	51.5	2.8
rounded	22	11.9	-2.2	41	32.8	-1.2	21	49.0	-2.8
intercept		*12.9*			*33.9*			*51.3*	
effect size		*4.3*			*2.5*			*5.6*	
p		*0.181*			*0.559*			*0.286*	
R^2		*0.07*			*0.02*			*0.25*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE-V: height									
high	27	13.8	-2.7	42	36.5	0.8	31	50.4	-6.1
near-high	52	13.0	-3.2	84	35.2	-0.5	57	44.4	-8.8
mid-high	10	17.2	0.8	9	50.7	15.2	7	48.7	-2.2
mid	41	16.2	-0.7	26	37.9	2.2	42	54.0	-2.4
mid-low	27	16.1	-0.8	59	31.3	-4.6	33	58.7	2.1
near-low	1	23.0	6.8	8	27.0	-8.8	4	66.5	19.1
low	12	16.5	-0.1	18	31.4	-4.2	16	51.1	-1.6
intercept		*16.3*			*35.7*			*56.7*	
effect size		*10.0*			*24.0*			*28.0*	
p		*0.922*			*0.295*			*0.101*	
R^2		*0.05*			*0.05*			*0.27*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE-V: fronting									
front	89	15.5	1.3	133	36.1	1.3	100	51.2	1.3
centre	42	15.8	0.9	28	37.0	2.1	45	55.7	2.8
back	39	12.7	-2.3	85	32.0	-3.3	45	46.7	-4.1
intercept		*14.1*			*34.9*			*53.0*	
effect size		*3.6*			*5.4*			*6.8*	
p		*0.403*			*0.364*			*0.286*	
R^2		*0.07*			*0.03*			*0.24*	


relative VOT
100
75
50
25
0
unrounded
rounded


relative VOT
100
75
50
25
0
high
near-high
mid-high
mid
mid-low
near-low
low

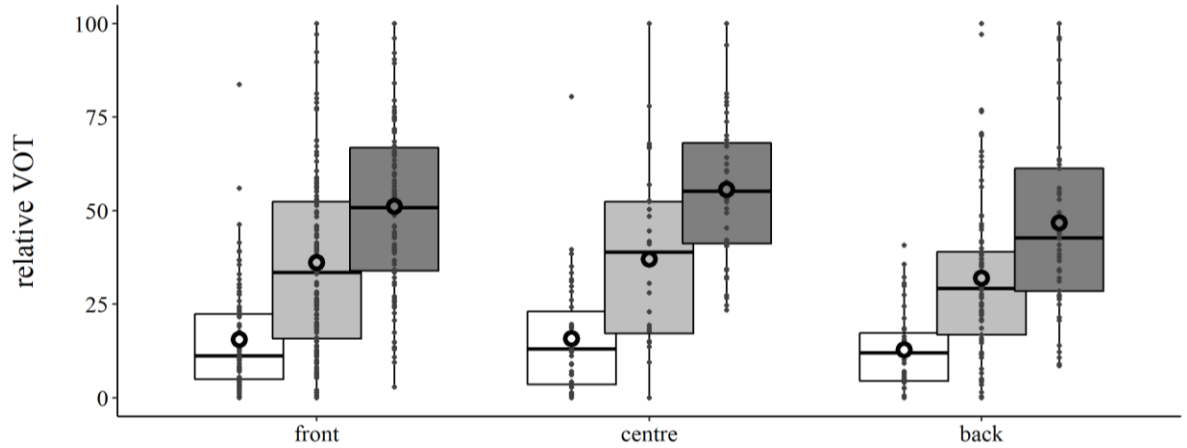
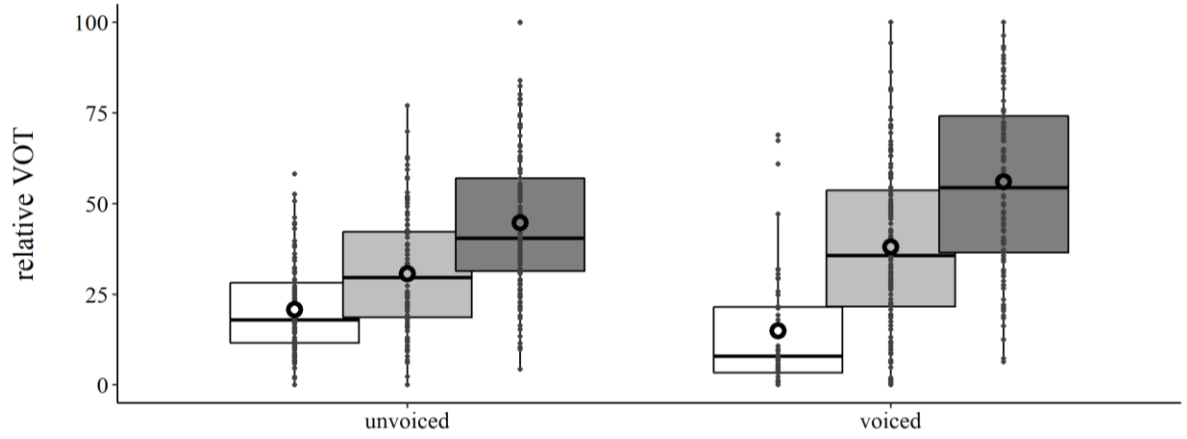

relative VOT
100
75
50
25
0
front
centre
back

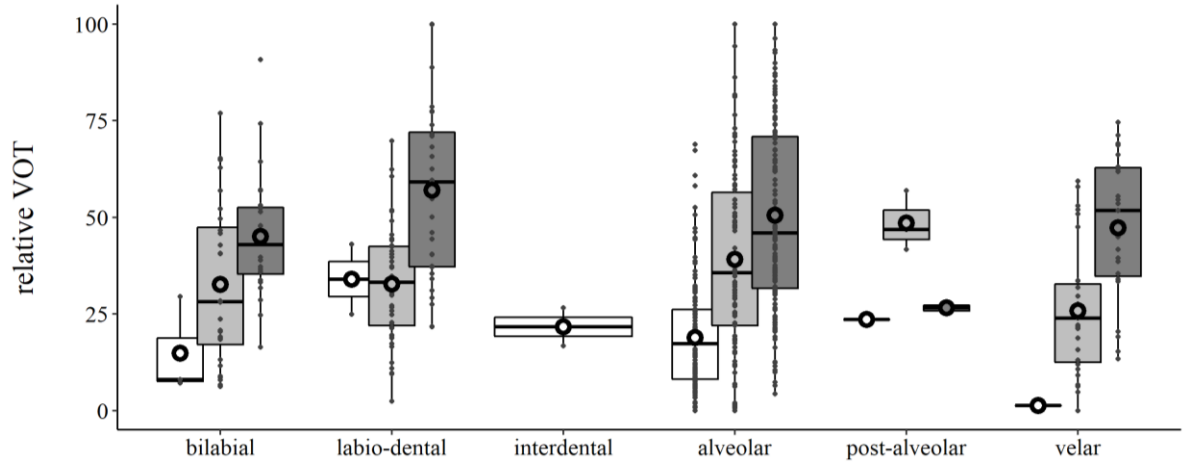
Table A.63: Relative VOT and preceding consonant: *Voicing*, *Place* and *Manner*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE-C: voicing									
unvoiced	100	20.8	3.3	87	30.6	-4.7	117	44.8	-5.4
voiced	47	14.9	-3.3	124	38.1	4.7	113	56.1	5.4
intercept		*17.7*			*34.9*			*50.1*	
effect size		*6.6*			*9.5*			*10.8*	
p		*0.00917*	**		*0.000613*	***		*0.000263*	***
R^2		*0.16*			*0.26*			*0.20*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE-C: place									
bilabial	3	14.9	-7.1	28	32.6	-0.3	24	45.0	-1.5
labio-dental	2	34.0	15.5	47	32.7	-2.3	32	57.0	10.5
interdental	2	21.7	5.6						
alveolar	138	18.8	-1.1	102	39.2	5.9	149	50.5	7.5
post-alveolar	1	23.6	6.0	3	48.5	7.0	2	26.5	-17.6
velar	1	1.3	-18.9	31	25.8	-10.4	23	47.3	1.2
intercept		*19.8*			*34.9*			*43.7*	
effect size		*34.4*			*17.4*			*28.1*	
p		*0.363*			*0.00116*	**		*0.101*	
R^2		*0.15*			*0.26*			*0.20*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
PE-C: manner									
oral stop	1	29.5	7.1	30	28.1	-10.7	32	48.2	-2.9
nasal stop	35	14.8	-4.1	104	38.3	2.0	95	56.1	6.6
fricative	100	20.8	2.8	73	32.3	-5.5	99	45.6	-3.1
roll	2	6.6	-15.7						
lateral approximant	8	14.4	-4.1	4	52.1	14.2	4	48.4	-0.6
approximant	1	25.8	14.0						
intercept		*18.3*			*37.9*			*49.0*	
effect size		*29.7*			*24.9*			*9.7*	
p		*0.0587*			*0.00159*	**		*0.0146*	*
R^2		*0.20*			*0.26*			*0.19*	


relative VOT
100
75
50
25
0
unvoiced
voiced


relative VOT
100
75
50
25
0
bilabial
labio-dental
interdental
alveolar
post-alveolar
velar

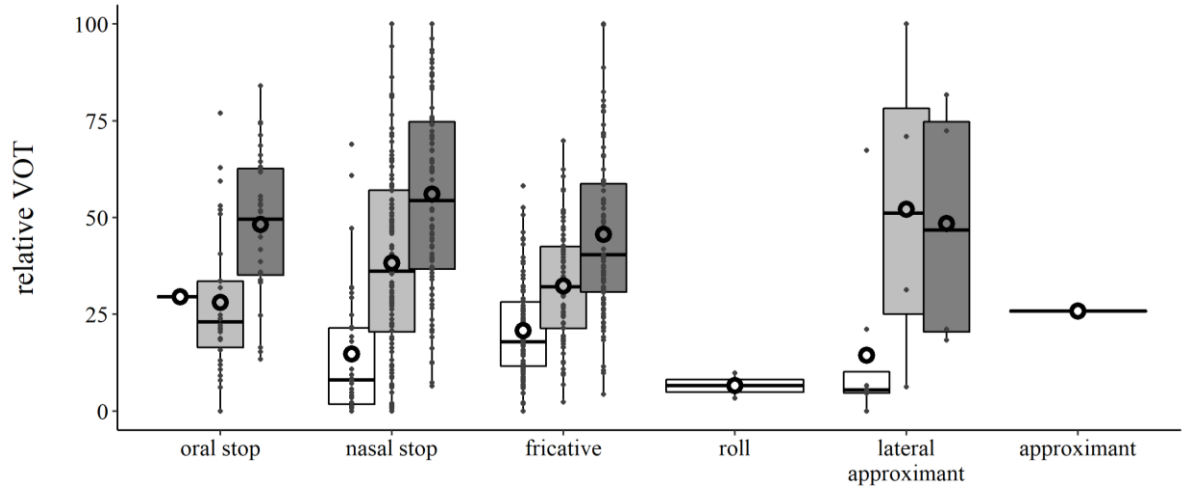

relative VOT
100
75
50
25
0
oral stop
nasal stop
fricative
roll
lateral approximant
approximant

Table A.64: Relative VOT and following environment: *Sound inventory* and *Distribution rule*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE: sound inventory									
sound in Ki inventory	226	15.8	-1.2	371	35.6	-0.8	293	52.8	1.7
sound not in Ki inventory	134	18.1	1.2	172	36.5	0.8	185	50.6	-1.7
intercept		*16.5*			*36.3*			*51.7*	
effect size		*2.4*			*1.6*			*3.4*	
p		*0.108*			*0.442*			*0.0987*	
R^2		*0.11*			*0.08*			*0.17*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE: distribution rule									
permissible in Ki	210	14.8	-2.1	331	33.6	-3.3	272	51.3	-0.1
non-permissible in Ki	150	19.2	2.1	212	39.5	3.3	206	52.9	0.1
intercept		*16.6*			*36.8*			*52.1*	
effect size		*4.2*			*6.7*			*0.2*	
p		*0.0046*	**		*0.000578*	***		*0.918*	
R^2		*0.12*			*0.11*			*0.16*	

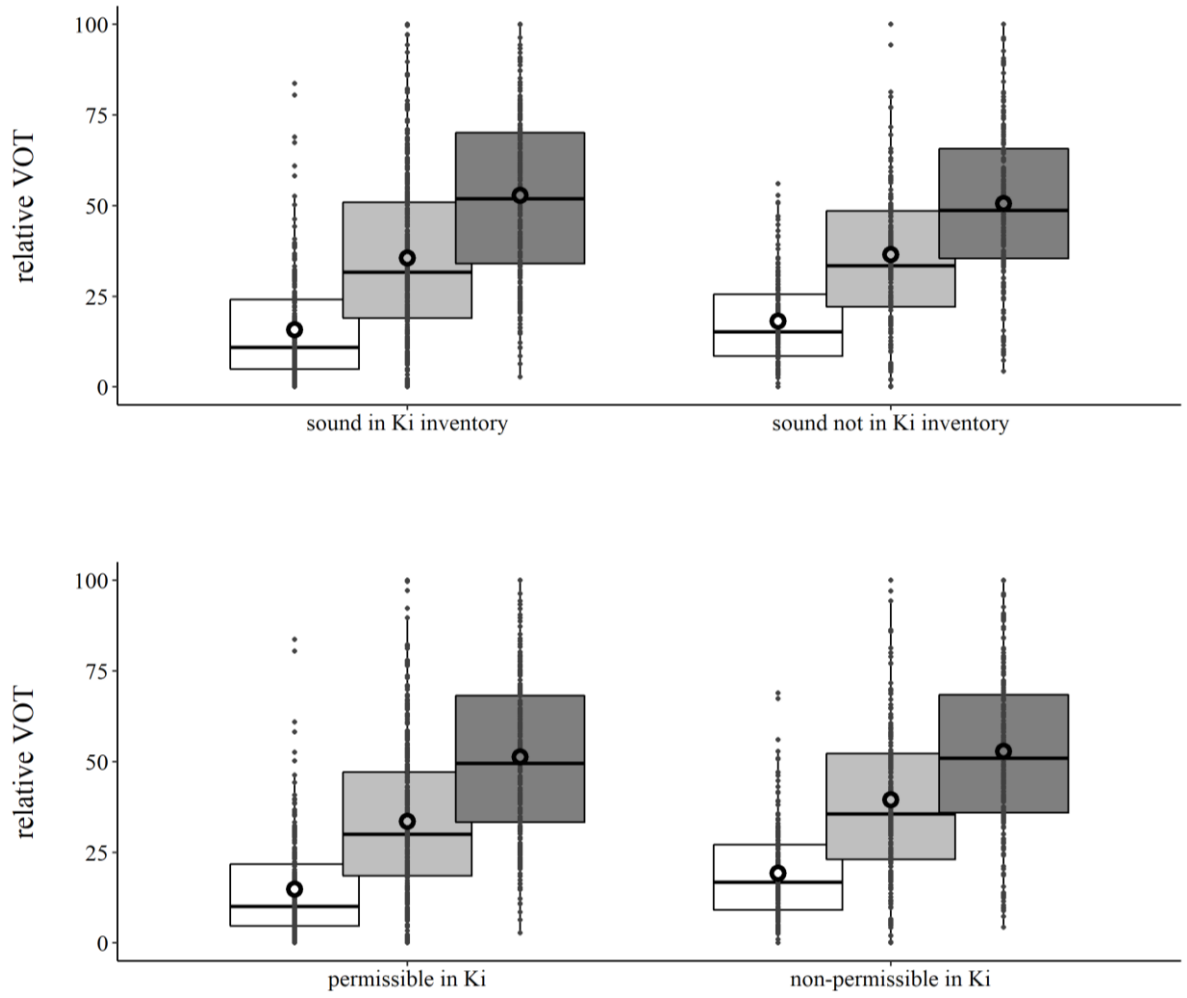

relative VOT
100
75
50
25
0
sound in Ki inventory
sound not in Ki inventory
relative VOT
100
75
50
25
0
permissible in Ki
non-permissible in Ki

Table A.65: Relative VOT and following environment: *Sound type*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE: sound type									
vowel	333	15.9	-4.9	486	34.1	-8.6	456	51.0	-9.4
consonant	27	26.4	4.9	57	50.9	8.6	22	72.1	9.4
intercept		*20.4*			*42.8*			*60.6*	
effect size		*9.9*			*17.2*			*18.9*	
p		*0.000383*	***		*1.42E-08*	***		*0.0000573*	***
R^2		*0.13*			*0.14*			*0.19*	

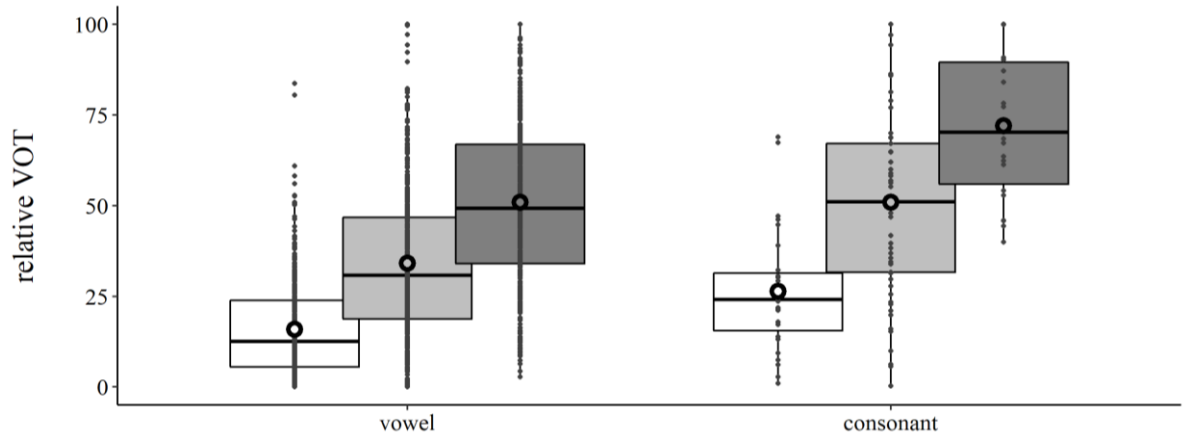
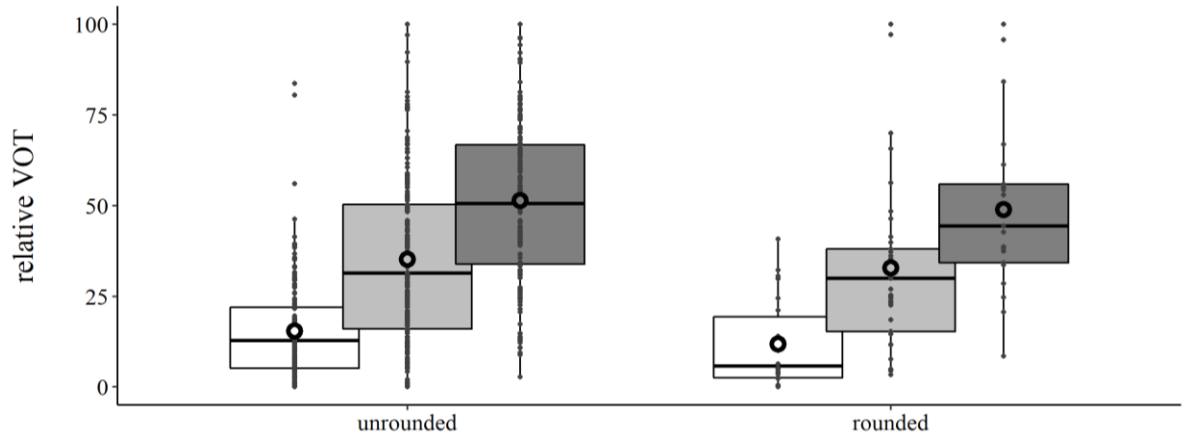

relative VOT
100
75
50
25
0
vowel
consonant

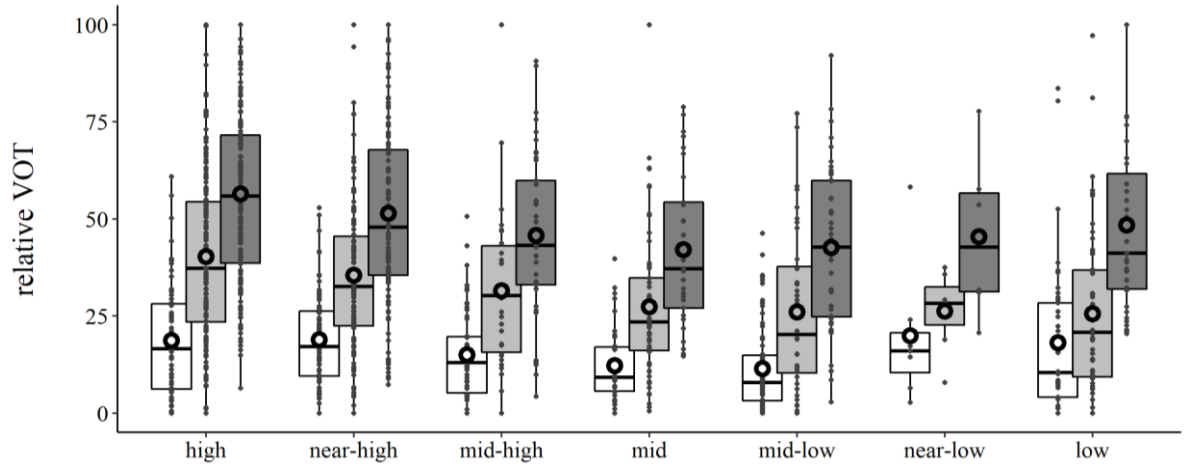
Table A.66: Relative VOT and following vowel: *Lip-rounding*, *Height* and *Fronting*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE-V: lip-rounding									
unrounded	265	16.9	2.4	359	33.3	-1.2	358	50.6	-0.9
rounded	68	11.7	-2.4	127	36.3	1.2	98	52.2	0.9
intercept		*14.2*			*35.0*			*51.6*	
effect size		*4.8*			*2.5*			*1.9*	
p		*0.00929*	**		*0.242*			*0.45*	
R^2		*0.07*			*0.13*			*0.18*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE-V: height									
high	62	18.7	2.1	182	40.3	10.1	167	56.5	9.1
near-high	63	18.9	2.3	117	35.5	6.2	131	51.5	2.2
mid-high	50	15.0	-1.3	30	31.5	2.2	41	45.8	-0.2
mid	34	12.2	-4.2	59	27.4	-3.9	29	42.1	-5.1
mid-low	73	11.4	-4.6	36	26.1	-5.9	47	42.7	-3.3
near-low	7	19.9	4.2	7	26.3	-4.9	6	45.4	-0.6
low	44	18.1	1.5	55	25.5	-3.9	35	48.4	-2.2
intercept		*16.2*			*30.5*			*48.0*	
effect size		*8.7*			*16.0*			*14.2*	
p		*0.0133*	*		*2.57E-08*	***		*3.16E-04*	***
R^2		*0.09*			*0.22*			*0.22*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE-V: fronting									
front	201	17.7	3.1	201	34.7	2.7	240	50.5	2.5
centre	34	12.2	-2.3	60	27.2	-6.2	29	42.1	-5.9
back	98	13.3	-0.8	225	35.4	3.5	187	53.0	3.5
intercept		*14.2*			*32.5*			*48.0*	
effect size		*5.4*			*9.7*			*9.4*	
p		*0.0156*	*		*0.00402*	**		*0.0889*	
R^2		*0.07*			*0.15*			*0.18*	


relative VOT
100
75
50
25
0
unrounded
rounded


relative VOT
100
75
50
25
0
high
near-high
mid-high
mid
mid-low
near-low
low

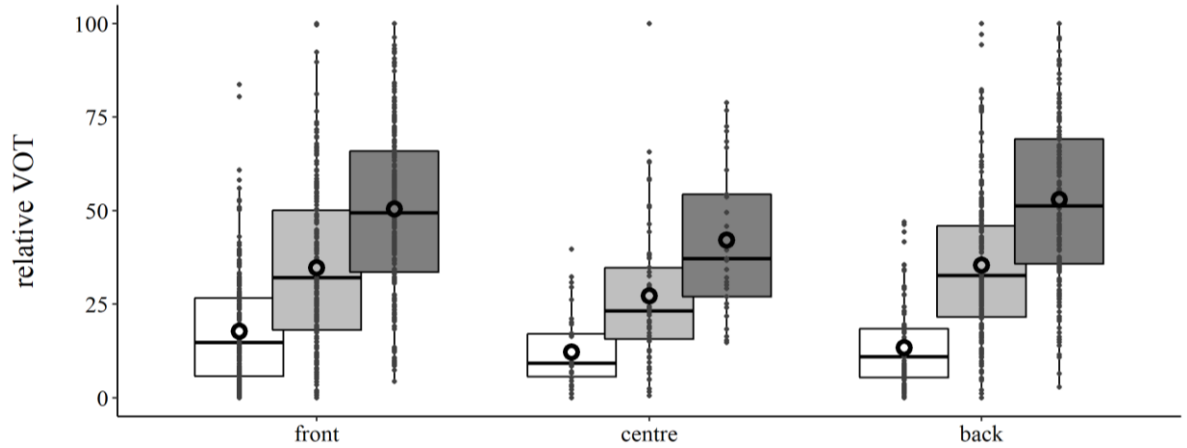

relative VOT
100
75
50
25
0
front
centre
back

Table A.67: Relative VOT and following consonant: *Place* and *Manner*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE-C: place									
bilabial	4	45.7	18.5	34	53.8	7.0	13	73.3	0.2
labio-dental	2	10.0	-15.5	1	49.8	2.2			
alveolar	15	24.3	-2.7	14	48.9	1.9	4	71.4	-3.6
palatal	6	24.4	-0.4	5	48.3	2.1	5	69.5	3.4
glottal				3	32.3	-13.2			
intercept		*25.5*			*46.7*			*71.1*	
effect size		*34.0*			*20.2*			*7.1*	
p		*0.0705*			*0.732*			*0.9*	
R^2		*0.60*			*0.09*			*0.61*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE-C: manner									
oral stop				2	7.8	-15.6	1	45.7	-24.6
nasal stop	1	25.7	7.8	1	6.3	-27.8	3	95.7	25.8
fricative	2	10.0	-8.0	3	51.5	26.5			
roll	3	28.0	1.9						
lateral approximant	2	3.6	-14.4	3	17.7	-12.3			
approximant	19	30.3	12.7	48	55.7	29.2	18	69.6	-1.2
intercept		*17.3*			*26.9*			*70.4*	
effect size		*27.1*			*57.0*			*50.5*	
p		*0.149*			*0.000606*	***		*0.0321*	*
R^2		*0.55*			*0.46*			*0.59*	

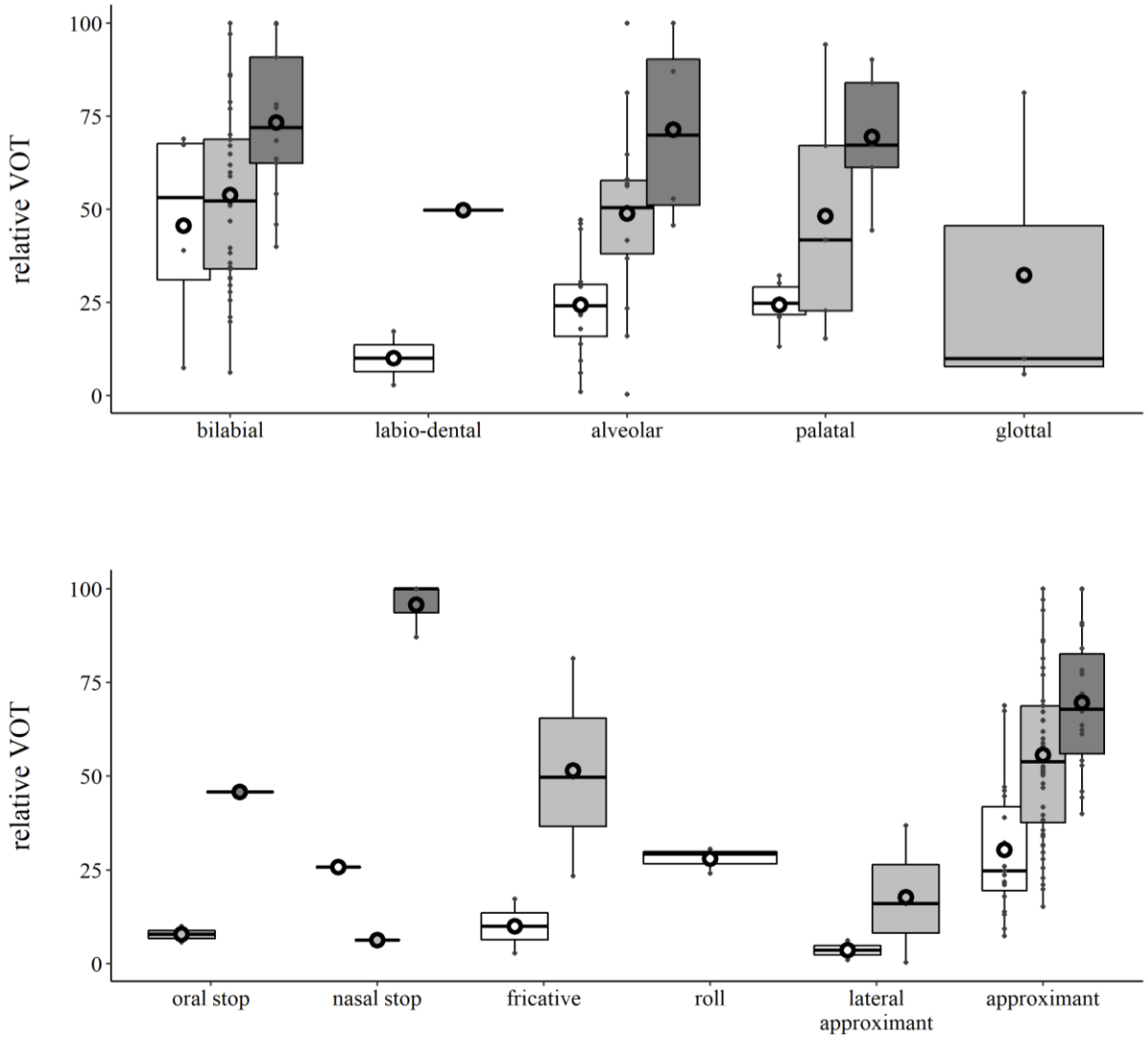

relative VOT
100
75
50
25
0
bilabial
labio-dental
alveolar
palatal
glottal
relative VOT
100
75
50
25
0
oral stop
nasal stop
fricative
roll
lateral approximant
approximant

Table A.68: Relative VOT and preceding environment: *Sound type*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
FE: assibilation env.									
_i / _u	110	18.2	-1.0	276	39.0	6.7	276	54.1	-0.1
_#i / _#u	10	21.8	3.8	16	26.3	-6.6	10	56.7	5.6
other environment	240	15.8	-2.9	251	33.0	-0.1	192	48.6	-5.5
intercept		*18.3*			*33.0*			*54.3*	
effect size		*6.7*			*13.3*			*11.1*	
p		*0.2*			*0.000295*	***		*0.0157*	*
R^2		*0.11*			*0.12*			*0.18*	

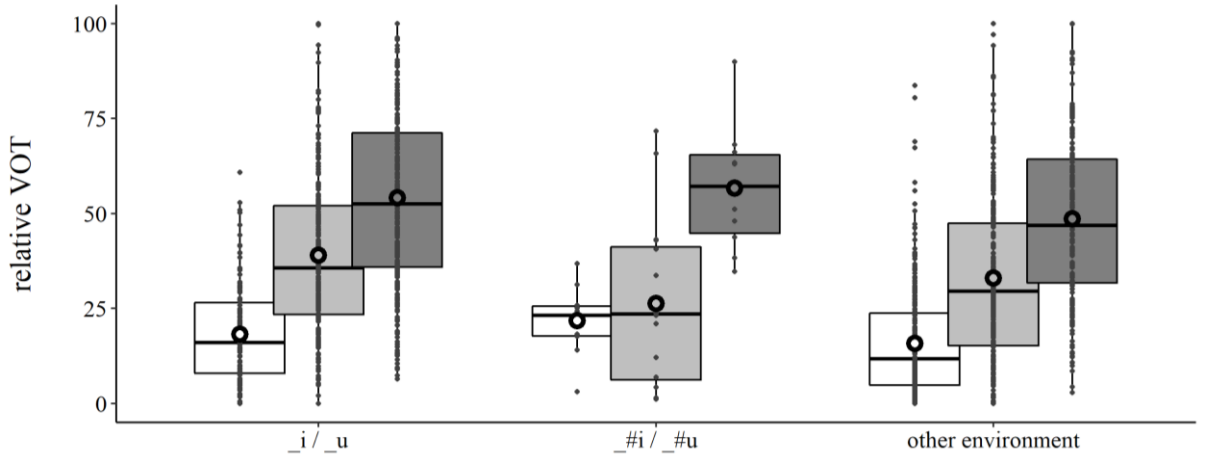
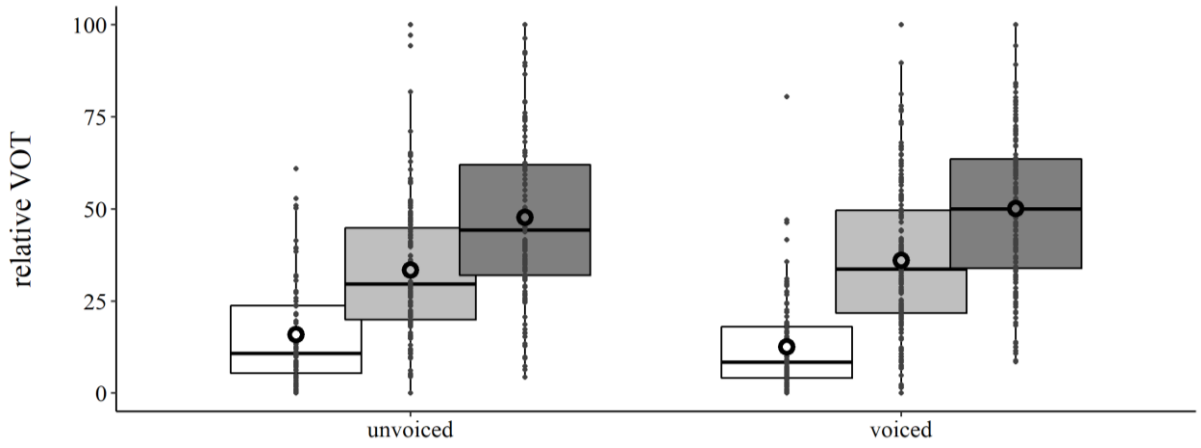

relative VOT
100
75
50
25
0
_i / _u
_#i / _#u
other environment

Table A.69: Relative VOT and coda-consonant: *Voicing*, *Place* and *Manner*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Coda-C: voicing									
unvoiced	67	15.9	1.6	134	33.4	-1.3	104	47.7	-0.2
voiced	99	12.6	-1.6	168	36.1	1.3	156	50.1	0.2
intercept		*13.6*			*35.1*			*49.0*	
effect size		*3.2*			*2.6*			*0.4*	
p		*0.137*			*0.236*			*0.854*	
R^2		*0.12*			*0.14*			*0.21*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Coda-C: place									
bilabial	19	10.9	-6.3	40	30.1	-8.2	28	51.2	-0.4
labio-dental	26	20.8	3.6	24	29.4	-7.1	15	44.0	-2.7
interdental	10	17.0	0.9	19	36.1	0.3	16	40.1	-7.8
alveolar	78	11.0	-5.8	150	36.6	-0.9	133	50.8	2.0
post-alveolar	4	27.5	5.6	4	37.2	-1.6	7	46.9	-8.6
palatal	22	15.1	-2.3	3	51.7	14.2	7	56.2	3.4
velar	6	11.6	-5.8	56	33.6	-4.2	48	44.1	-3.0
uvular							1	34.1	-17.7
glottal	1	23.7	10.2	6	44.8	7.5	5	83.5	34.8
intercept		*16.6*			*37.7*			*48.8*	
effect size		*16.4*			*22.3*			*52.5*	
p		*0.0343*	*		*0.138*			*0.00572*	**
R^2		*0.16*			*0.17*			*0.27*	


relative VOT
100
75
50
25
0
unvoiced
voiced

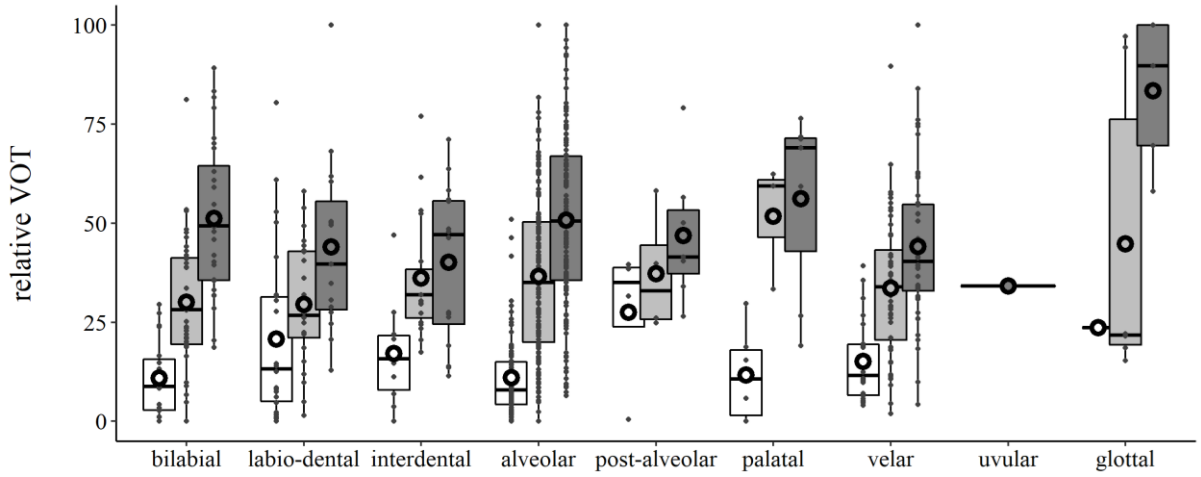

relative VOT
100
75
50
25
0
bilabial
labio-dental
interdental
alveolar
post-alveolar
palatal
velar
uvular
glottal

Table A.69 (continued): Relative VOT and coda-consonant: *Voicing*, *Place* and *Manner*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Coda-C: manner									
oral stop	51	10.6	-4.1	120	30.4	-5.7	81	50.0	-2.0
nasal stop	47	11.8	-3.0	60	42.1	5.6	83	50.4	-2.2
fricative	54	19.1	4.2	97	34.8	-1.9	69	43.8	-7.8
flap	1	16.3	1.9	4	34.2	-4.7	2	61.5	2.2
roll	2	29.7	10.0	1	37.3	-1.0			
lateral approximant	2	10.3	-3.8	9	34.5	0.8	10	55.9	6.0
approximant	9	9.8	-5.2	11	45.0	7.0	15	55.6	3.8
intercept		*14.3*			*36.8*			*52.0*	
effect size		*15.3*			*12.7*			*13.8*	
p		*0.0205*	*		*0.00827*	**		*0.186*	
R^2		*0.16*			*0.18*			*0.23*	

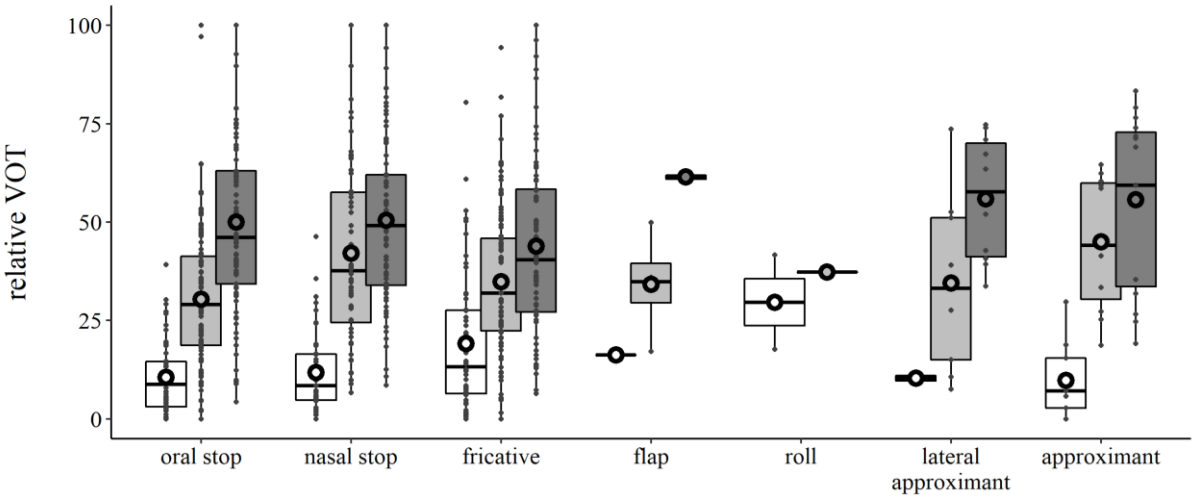

relative VOT
100
75
50
25
0
oral stop
nasal stop
fricative
flap
roll
lateral approximant
approximant

Table A.70: Relative VOT and fluency: *Speaking rate* and *Hesitation*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Speaking rate									
slow rate	24	15.8	-1.1	38	41.5	6.5	42	59.2	5.9
medium rate	322	16.6	-0.4	478	36.0	1.7	408	51.6	-0.9
fast rate	14	19.3	1.5	27	26.4	-8.2	28	45.6	-5.0
intercept		*16.6*			*34.5*			*52.6*	
effect size		*2.6*			*14.8*			*10.9*	
p		*0.856*			*0.0267*	*		*0.0802*	
R^2		*0.10*			*0.09*			*0.17*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Hesitation									
no hesitation	338	16.6	0.0	481	36.6	2.1	434	51.1	-5.6
hesitation	22	17.7	0.0	62	30.7	-2.1	44	60.3	5.6
intercept		*16.2*			*34.4*			*56.7*	
effect size		*0.1*			*4.2*			*11.3*	
p		*0.974*			*0.166*			*0.00116*	**
R^2		*0.10*			*0.08*			*0.19*	

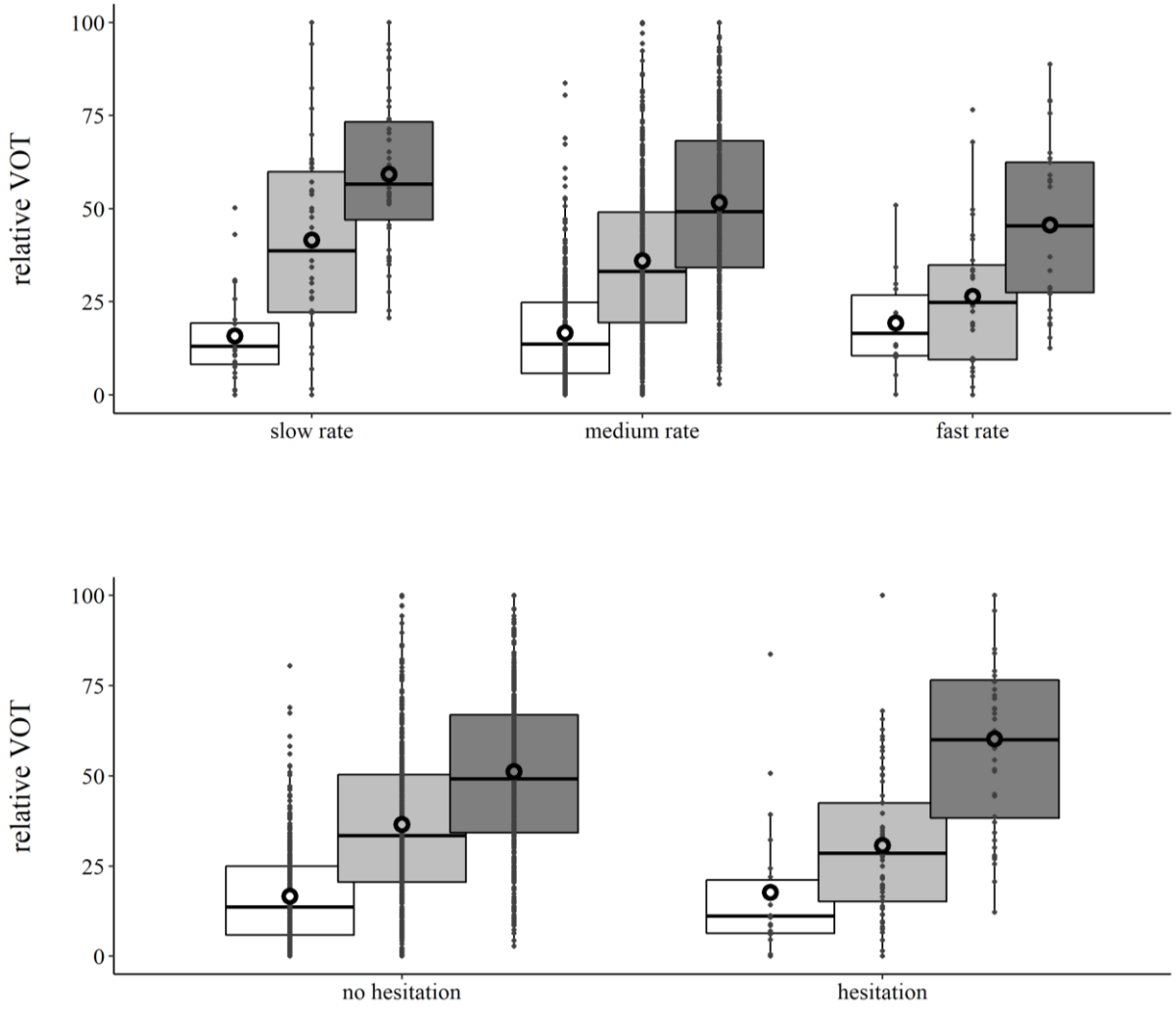
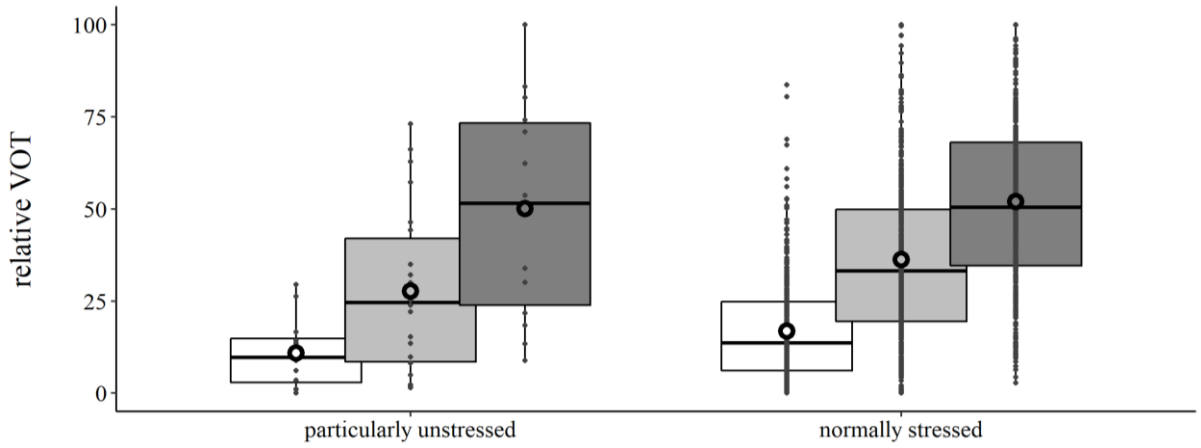

relative VOT
100
75
50
25
0
slow rate
medium rate
fast rate
relative VOT
100
75
50
25
0
no hesitation
hesitation

Table A.71: Relative VOT and isochrony: *Word stress* and *Phrasal accent*.

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Word stress									
particularly unstressed	12	10.9	-2.4	22	27.7	-4.3	14	50.0	-2.1
normally stressed	348	16.9	2.4	521	36.2	4.3	464	52.0	2.1
intercept		*14.0*			*32.1*			*50.1*	
effect size		*4.8*			*8.7*			*4.1*	
p		*0.237*			*0.0713*			*0.493*	
R^2		*0.10*			*0.09*			*0.17*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Phrasal accent									
particularly unaccented	12	10.1	-2.5	35	29.2	-7.5	15	57.1	5.6
normally accented	348	16.9	2.5	507	36.3	0.2	457	51.9	1.0
particularly accented				1	48.3	7.3	6	44.6	-6.6
intercept		*13.9*			*36.4*			*51.0*	
effect size		*5.1*			*14.9*			*12.2*	
p		*0.226*			*0.125*			*0.491*	
R^2		*0.10*			*0.09*			*0.17*	


relative VOT
100
75
50
25
0
particularly unstressed
normally stressed

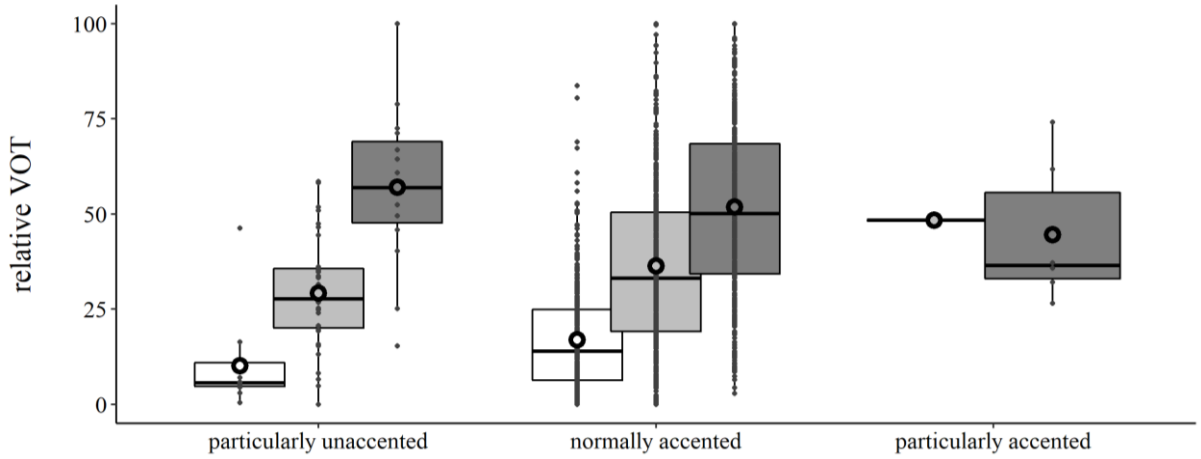

relative VOT
100
75
50
25
0
particularly unaccented
normally accented
particularly accented

Table A.72: Relative VOT and grammar: *Word frequency*, *Word category* and *Part of speech.*

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Word frequency									
infrequent	218	16.4	1.4	219	36.8	2.0	194	50.3	0.0
frequent	18	13.5	-1.4	108	32.4	-2.0	86	50.8	0.0
intercept		*14.6*			*34.7*			*51.2*	
effect size		*2.8*			*4.0*			*0.1*	
p		*0.1415*			*0.124*			*0.9870000*	
R^2		*0.10*			*0.07*			*0.13*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Word category									
lexical	310	17.7	3.2	398	37.6	2.7	390	52.1	0.5
function	50	10.4	-3.2	145	31.0	-2.7	88	51.2	-0.5
intercept		*14.0*			*34.8*			*51.2*	
effect size		*6.4*			*5.3*			*0.9*	
p		*0.00305*	**		*0.0129*	*		*0.725*	
R^2		*0.11*			*0.09*			*0.17*	

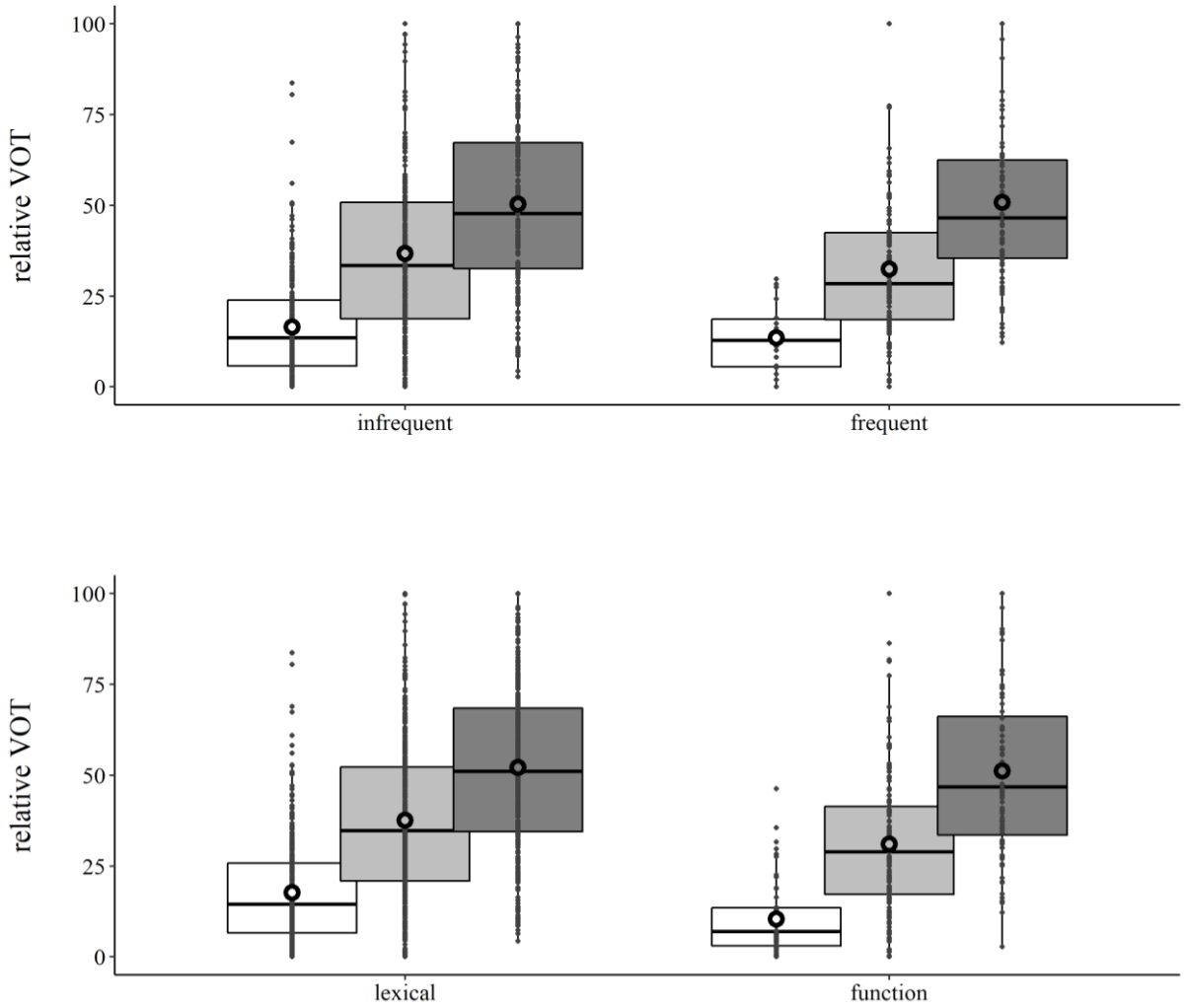

relative VOT
100
75
50
25
0
infrequent
frequent
relative VOT
100
75
50
25
0
lexical
function

Table A.72 (continued): Relative VOT and grammar: *Word frequency*, *Word category* and *Part of speech.*

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Part of speech									
N	106	17.3	4.2	114	40.4	6.8	93	49.7	-6.7
Pro				20	40.2	8.7	5	64.7	11.9
Det				8	23.9	-6.8	2	94.7	42.8
V	121	17.7	4.0	69	30.8	-1.6	83	44.0	-12.3
Aux	49	10.4	-2.3	2	21.8	-9.2	3	51.0	-9.3
Inf marker				101	32.2	-0.2	70	48.6	-11.7
Part							1	44.3	-7.1
Adj	62	18.3	4.3	85	39.8	7.8	80	56.5	-2.6
Adv	20	18.5	4.3	58	39.4	5.6	67	56.1	-5.7
Prep	1	2.2	-10.8	72	35.9	3.1	66	56.7	-3.4
Conj	1	9.3	-3.7	14	15.3	-14.2	8	54.4	4.1
intercept		*13.1*			*32.7*			*58.1*	
effect size		*15.2*			*23.0*			*55.1*	
p		*0.125*			*0.00247*	**		*0.00065*	***
R^2		*0.11*			*0.11*			*0.22*	

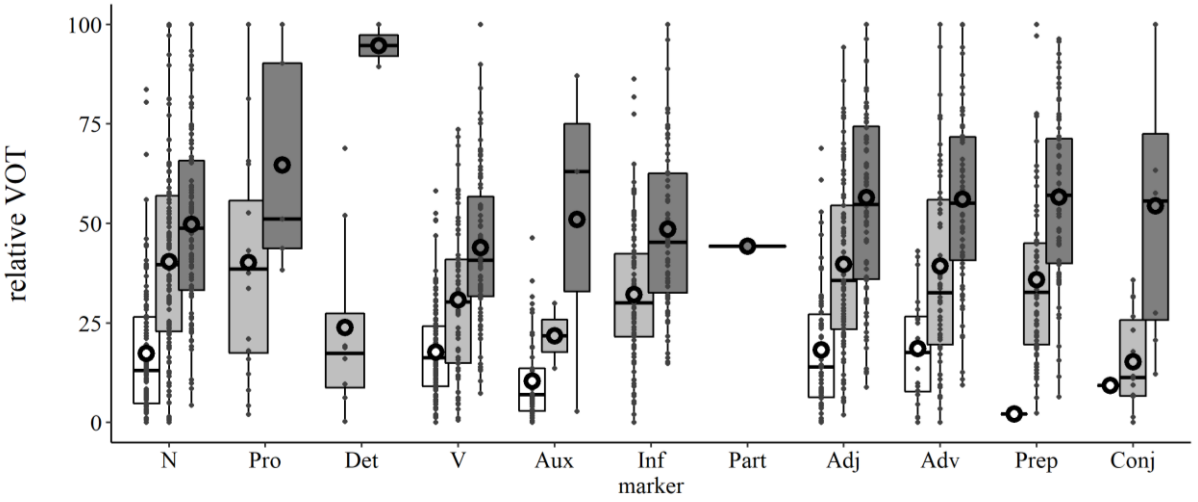
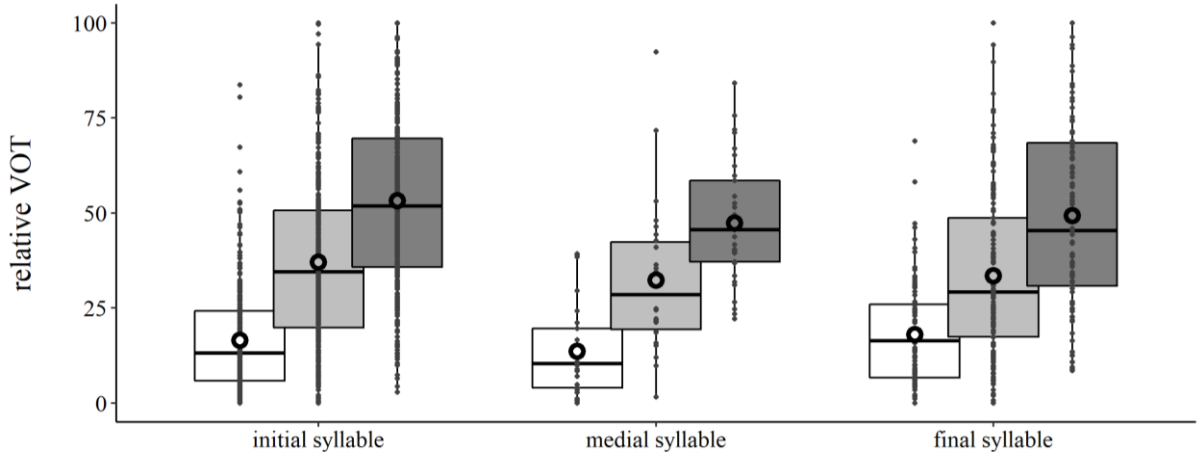

relative VOT
100
75
50
25
0
N
Pro
Det
V
Aux
Inf
Part
Adj
Adv
Prep
Conj
marker

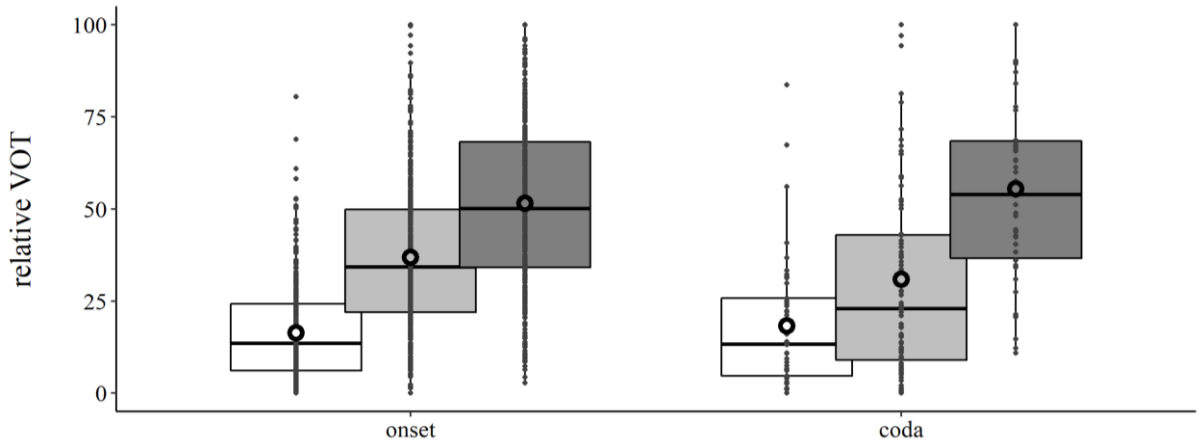
Table A.73: Relative VOT and plosive position: *Position in word*, *syllable*, and *Position in onset/coda*.

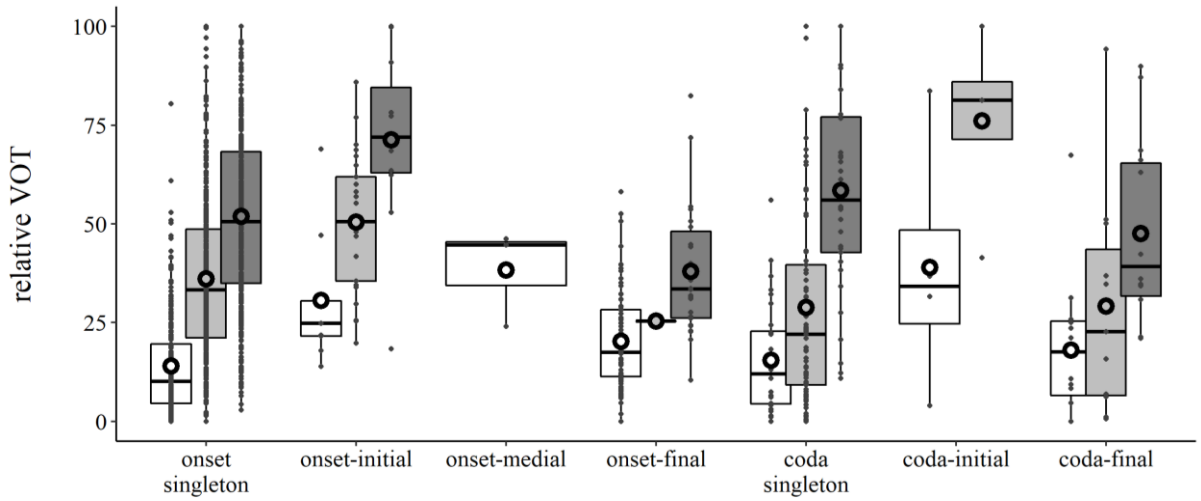
	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Position in word									
initial syllable	244	16.5	0.8	380	37.0	2.8	344	53.2	1.7
medial syllable	25	13.6	-2.3	26	32.3	-1.4	33	47.3	-1.5
final syllable	91	17.9	1.5	137	33.5	-1.4	101	49.3	-0.3
intercept		*15.5*			*34.5*			*51.0*	
effect size		*3.7*			*4.3*			*3.2*	
p		*0.485*			*0.117*			*0.582*	
R^2		*0.10*			*0.09*			*0.16*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Position in syllable									
onset	313	16.4	-0.9	451	36.9	2.6	428	51.5	-4.5
coda	47	18.3	0.9	92	30.9	-2.6	50	55.4	4.5
intercept		*16.9*			*34.3*			*55.5*	
effect size		*1.9*			*5.3*			*9.0*	
p		*0.389*			*0.0352*	*		*0.00772*	**
R^2		*0.10*			*0.09*			*0.20*	

	/t⁰/			/tʰ/			/tˢ/		
	n	mean	coef	n	mean	coef	n	mean	coef
Position in onset/coda									
onset singleton	219	14.1	-11.1	425	36.1	-6.5	391	51.9	-1.9
onset-initial	9	30.7	4.3	25	50.4	7.7	11	71.3	9.6
onset-medial	3	38.3	13.9						
onset-final	82	20.3	-4.8	1	25.4	-8.1	26	37.9	-13.5
coda singleton	28	15.5	-10.2	77	28.8	-12.8	36	58.5	11.1
coda-initial	4	39.0	14.0	4	76.0	34.2			
coda-final	15	18.1	-6.2	11	29.1	-14.6	14	47.5	-5.4
intercept		*24.6*			*42.6*			*53.3*	
effect size		*25.0*			*48.8*			*24.6*	
p		*2.81E-07*	***		*4.47E-06*	***		*0.000085*	***
R^2		*0.19*			*0.13*			*0.22*	


relative VOT
100
75
50
25
0
initial syllable
medial syllable
final syllable


relative VOT
100
75
50
25
0
onset
coda


relative VOT
100
75
50
25
0
onset singleton
onset-initial
onset-medial
onset-final
coda singleton
coda-initial
coda-final