Vowel system or vowel systems?

Variation in the monophthongs of Philippine Hybrid Hokkien in Manila

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The Manila variety of Philippine Hybrid Hokkien (PHH-M) or *Lánnang-uè* is a contact language used by the metropolitan Manila Chinese Filipinos; it is primarily comprised of Hokkien, Tagalog/Filipino, and English elements. Approaching PHH-M as a mixed language, we investigate linguistically and socially conditioned variation in the monophthongs of PHH-M, focusing on the extent to which the vowel systems of the three source languages have converged. This analysis draws on data gathered from 34 native speakers; Pillai scores are calculated to assess the degree of merger. Contrary to certain predictions of prior work on mixed languages, PHH-M is found to have a unified, eight-vowel inventory distinct from any of its sources. Older women use more stable vowels across source languages, suggesting that they have led in the development of PHH-M as a mixed code; however, signs of change among younger women suggest either the endangerment of the code or its evolution in response to the community's shifting identity. We contextualize our conclusions in relation to the sociohistory and language ecology of metropolitan Manila's Chinese Filipino community.

Keywords: mixed languages, language contact, language variation, sociophonetics, vowel systems, Philippine Hybrid Hokkien, Chinese Filipinos, Lánnang-uè, Lannang

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1. Introduction

Philippine Hybrid Hokkien – commonly referred to as *Lánnang-uè* 'Our People speech' – is a Sino-Philippine contact language primarily characterized by elements drawn from Tagalog (Austronesian),[1] English (Indo-European), and Hokkien/Southern Min (Sino-Tibetan) (Gonzales 2018). Recent scholarship on this newly-identified code used by Chinese Filipinos also known locally as the Lannangs has begun to investigate its features and locate it within the typology of contact languages; Gonzales (2018) argues that social and structural evidence indicates Philippine Hybrid Hokkien is best classified as a "mixed language" (Matras and Bakker 2003: 1), referring to a variety of contact language generally resulting from the intertwining of languages in a situation of multilingualism, typically in contexts where a common code (or codes) is already present (Thomason 2003; Winford 2013; Meakins & Stewart in press).

In this study, we investigate the phonology, and particularly the monophthongal vowel system, of a mainstream metropolitan Manila variety of Philippine Hybrid Hokkien (henceforth, PHH-M). In this analysis, while acknowledging that not all contact languages may fit clearly into a particular typological class, we nonetheless adopt a mixed-language framework consistent with Gonzales (2018), seeking further evidence to illuminate the typological status of PHH-M. Departing from traditional language documentation approaches, we employ sociophonetic methods to describe socially and linguistically-conditioned variation in PHH-M, investigating whether the language has developed a unified vowel system or is comprised of distinct vowel systems based on its source languages, as is the case for certain other mixed languages. In doing so, we aim to shed light on the nature of the PHH-M phonological system and the historical trajectory of the language within the multilingual Chinese Filipino community of metropolitan Manila.

The following section summarizes prior accounts of mixed languages and their typologies. This is followed by a discussion of the sociohistorical situation and structure of PHH-M, as well as the vowel systems of its source languages. The study's methodology is described in §4. §5 gives acoustic and statistical analyses of the data, followed by a discussion and concluding remarks in §6 and §7.

1. While the terms 'Tagalog' and 'Filipino' are generally used interchangeably by locals, Tagalog technically refers to the 'unmixed' variety while Filipino refers to a standardized/nationalized variety of Tagalog that, according to the 1987 Constitution (Article XIV, Section 6), 'shall be further developed and enriched on the basis of existing Philippine and other languages' – in other words, a 'mixed' variety that may have borrowings from languages including Spanish, Hokkien, and English. Following local practice, and in recognition of the fact that this distinction is primarily ideological rather than a reflection of actual distinct codes, we refer to this language as 'Tagalog'.

2. Mixed languages

First identified as a distinctive class of contact language by Thomason & Kaufman (1988), mixed languages have subsequently been theorized to consist of several typological sub-types. This model, first proposed by Bakker (2003) and elaborated upon by Winford (2013), classifies mixed languages into three types based on differing structural and social features.

The first type, 'intertwined' mixed languages, refers to languages in which particular domains of linguistic structure draw from different source languages, resulting in 'splits': for instance, the split between grammar and the lexicon in the case of Ma'a (Tanzania) (Mous 2003) or the division between the verbal and nominal domains in Michif (Canada) (Bakker 1997). While intertwined languages are traditionally defined by such domain-level splits, variability and instability of features (e.g. in Gurindji Kriol, Australia) as well as borderline cases (e.g. in Ma'a) have also been observed (Matras & Bakker 2003; Meakins 2012). Varieties of this sub-type typically emerge when a bilingual group wants to assert its separate identity through the creation of a new code, when nomadic settlers create a new in-group code, or when male immigrants intermarry local women of another ethnicity that speak another language (Winford 2013). Communities that speak intertwined languages are also generally characterized by stable bilingualism, in which multiple languages are maintained.

The second class, converted (mixed) languages, comprises varieties that map lexical or morphological elements from one language onto the semantic and grammatical categories of another language (Winford 2009: 224). Languages of this type typically emerge from situations of unstable bilingualism, in which a minority group attempts to maintain its ancestral language in a society where another language is dominant (e.g. Sri Lanka Portuguese, with Sinhala and Tamil elements, Smith 1979a, 1979b). Over time, the group gradually adopts or replicates the grammatical patterns and categories of the socially dominant language in which its speakers are bilingual (e.g. Tamil, in the case of Sri Lanka Portuguese) (Winford 2009). Migration, military conquest, and other similar factors typically contribute to the emergence of converted (mixed) languages (Winford 2013).

Varieties that form the final class, lexically mixed languages, involve extensive lexical borrowing from another language but simultaneous preservation of a significant portion of the original lexicon, particularly for basic vocabulary (e.g. Chamorro and Maltese) (Bakker 2003; Winford 2013). While Bakker (2003) outlines the structure of lexically mixed languages, the social conditions under which this type of mixed language emerges remain unstudied.

The majority of mixed language literature has examined 'bilingual' contexts. This is not to say, however, that these mixed languages draw their lexicon from only two source languages. Work on Ma'a, for example, has characterized the variety as one that uses Mbugu as its morphosyntactic frame but adopts lexical items from Eastern Cushitic, Maasai (Nilotic), Pare, and Gorwaa (South Cushitic) (Mous 2003; Winford 2013). Similarly, Callahuaya has a Quechuan grammatical frame with lexicon drawn from Puquina and Tacana (Muysken 1994), and Light Warlpiri takes nominal morphology from Warlpiri (Ngumpin-Yapa) and verbal morphology from English varieties and Kriol (O'Shannessy 2005). PHH-M, the focus of the present study, is also proposed to draw its lexicon primarily from three sources: Hokkien, Tagalog, and English (Gonzales 2018). As such, this study adopts a definition of mixed language that extends beyond the traditional two-language model.

3. Philippine Hybrid Hokkien in Manila

3.1 Sociohistorical background of PHH-M

Generally perceived by the community as 'broken' or "adulterated" Hokkien (Ang See 1990: 14), PHH-M is referred to as *u ts^{h}ām e Hōkkiên-uè* 'Hokkien with mixing' and *halō-halô* 'mix-mix', although most Chinese Filipinos would generally refer to it as *Lánnang-uè* 'Our People speech'. It is generally used by Chinese Filipinos in the metropolitan Manila area (e.g. the Banawe and Santa Cruz/Binondo regions, Gonzales 2018).

Within the Manila Chinese Filipino community, PHH-M is generally used alongside Hokkien, Tagalog, and English, all of which serve distinct social functions (perhaps, a case of 'quadriglossia'). PHH-M, a predominantly oral variety, is the preferred code in in-group settings, such as at home,[2] or at Chinese Filipino business association gatherings; (Philippine) Hokkien, the 'unmixed' variety, is generally used in restricted domains (e.g. religious gatherings); (Philippine) English and Tagalog, co-official languages of the Philippines, are both used in academic contexts, in business, government, as well as in media (Bautista & Bolton, 2008). Given the community's longstanding knowledge of Hokkien, Tagalog, and English, it is likely that Chinese Filipinos communicated via a mixture of these codes in informal settings for many decades. However, as we will address in the present discussion, PHH-M may not have emerged as a distinct mixed variety until the occurrence of certain key historical events.

2. A minority of Chinese Filipino families use Philippine Hokkien rather than PHH-M as their dominant home language.

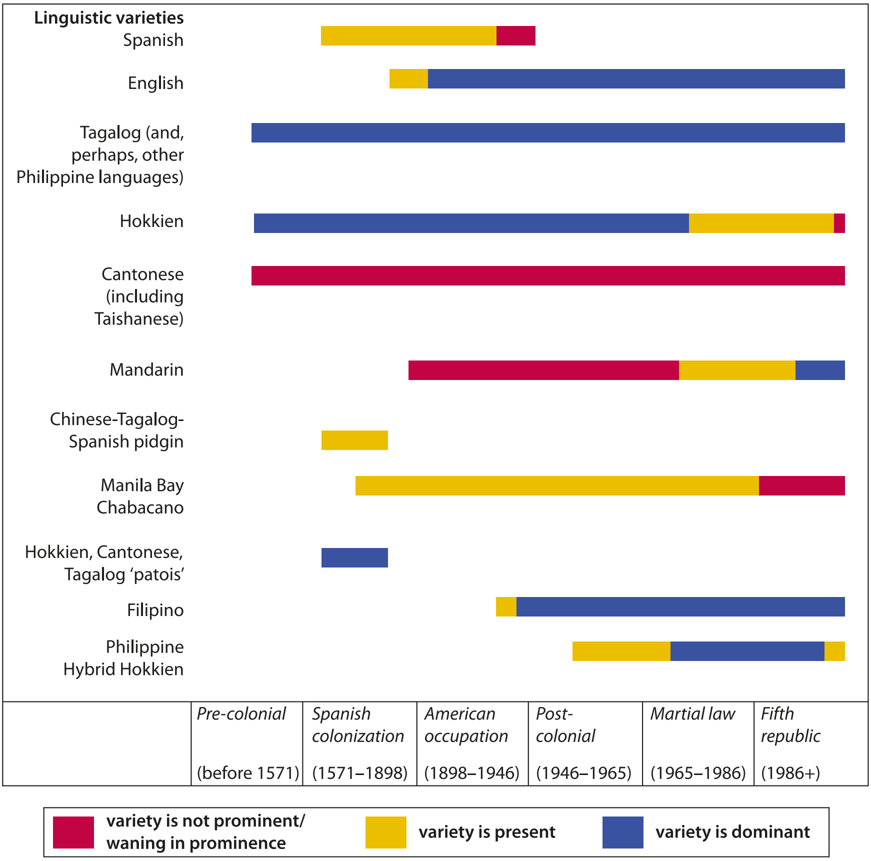


Figure 1. Relative significance of languages over various eras with respect to the Chinese Filipino community (adapted from Gonzales (2017))

Figure 1 summarizes the significant languages present in the Philippine Chinese community throughout its history. Sources indicate that the ancestors of contemporary Chinese Filipinos mainly originated from Southern Chinese migration in the late 19th century to the early 20th century, originating from *Tsînkāng*[3] (Jinjiang) and *Ēmúng* (Xiamen) (Doeppers 1986: 382, 385). These immigrants worked primarily as merchants, interacting with other local groups for the purpose of trade. 19th century historical records suggest that Chinese men in this period were multilingual speakers of Hokkien, Spanish, and Tagalog, while women, largely confined to the home, were Hokkien monolinguals (Chu 2010). English was the 'fashionable' language of the elite but was not used by the majority of Chinese

3. The orthography used here and in the following PHH-M examples is created by Gonzales and is documented in *The Lannang Archives*.

families, most of whom could not afford Western educations (Chu 2010: 354). Accounts of the region suggest that, as a result of the prominence of the Chinese community in trade, a mixed code involving Hokkien, Spanish, and Tagalog – perhaps a Chinese-Tagalog-Spanish Pidgin – was widely spoken as a lingua franca in the Manila region (Chu 2010: 108; Schuchardt 1884: 146). Chu (2010: 198) also proposes Chinese mestizo families (originating from Chinese men who married local wives) may have developed a mixed code involving Hokkien, Spanish, and Tagalog that was used in the home domain.

As noted in Figure 1, the American occupation of the Philippines, beginning in 1898, increased the prominence of English in the community, resulting in a linguistic ecology in which a mixed code containing elements of Hokkien, Tagalog, and English could potentially form. However, while some scholars have suggested that PHH-M emerged early in this period (the 1900s–1920s) (Chu 2010: 354), historical evidence and fieldwork data collected by Gonzales suggest that the language did not become conventionalized until the postcolonial era (the 1950s) (Gonzales 2018). Survey data from 80 to 89-year-olds (Gonzales 2017; see Figure 2), as well as additional spontaneous speech data elicited from three speakers ages 90 to 95 in the summer of 2019, representing community members born in the 1920s and 30s, collectively suggest that Hokkien was the dominant language before the 1940s. As indicated in Figure 2, almost none of these participants reported using English dominantly in their speech; instead, they report using Tagalog when communicating with locals, and Hokkien with all other interlocutors. Gonzales (2018) also finds that this older group lacks the intuitions shared by speakers in their 70s and younger regarding features of PHH-M grammar (e.g., the use of affixes from Tagalog), further supporting the conclusion that these older speakers did not grow up speaking PHH-M.

Given the historical evidence described above regarding the mixed code widely used in the Manila region in the Spanish colonial era, and the older community members' use of both Tagalog and Hokkien, it is likely that some degree of mixing was present in the early 20th century. However, no existing records are able to clarify whether this mixing was in the form of code-switching,[4] borrowing, or a conventionalized language. Given the limited observations we have of the 90-year-old community members, we suspect that the language mixing taking

4. In this paper, we adopt Grosjean's (2010) definition of 'code-switching' (switching between languages with no phonological adaptation) and contrast it with 'borrowing' (use of a word from another language with phonological adaptation and an implication of directionality from the source to the recipient language), and 'mixed language' (a conventionalized language with elements drawn from multiple sources, as described in the introduction). The code-switching practices we suggest were used in the Chinese Filipino community prior to the advent of PHH-M are therefore not equivalent to the development of a conventionalized mixed language.

place in this era was code-switching in the Grosjeanian (2010) sense, involving no phonological adaptation or conventionalization.

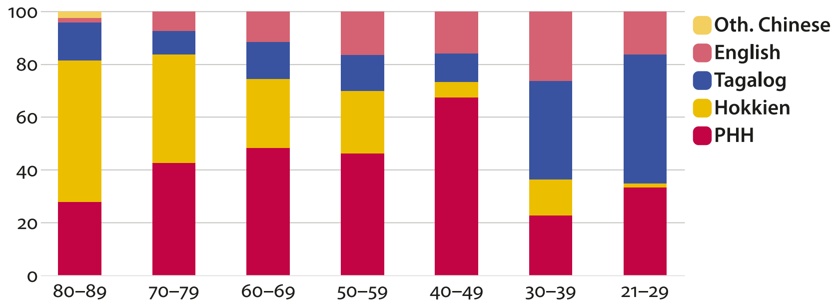


Figure 2. Self-reported dominant languages used with various interlocutors among 65 Chinese Filipinos (adapted from Gonzales (2017))

To understand why PHH-M conventionalized relatively late in the community's history, and why a distinct language emerged, rather than a full-scale community shift to Tagalog, we must bear in mind that, despite the long history of Chinese presence in the Philippines, Chinese settlement and cultural assimilation have been frequently disrupted by events such as immigration restrictions, wars, and massacres (Uytanlet 2014). Moreover, recurring waves of Chinese immigration likely facilitated the re-Sinicization of the community; the mixed Hokkien used by Chinese immigrants during the latter part of Spanish colonial period, for instance, may have been 're-Sinicized' by the Hokkien of the later wave of immigrants in the 1900s (Ang See 2004: 127).

The 1950s brought several notable changes to the situation of the Chinese Filipino community that likely triggered the development of PHH-M. In contrast to earlier periods, in which the community maintained considerable mobility between China and the Philippines, the end of the Chinese civil war and the Communist takeover meant that Chinese Filipinos were no longer able to return to mainland China (Uytanlet 2014: 108). The 'trapped' (108) Chinese of this era had no choice but to 'overstay' (108), make the Philippines their home, and adapt to their culture. During this period of adaptation, the use of English expanded in Chinese schools (Uytanlet 2014), and contact with the Tagalog-speaking local population increased. As observed in other cases of 'intertwined' mixed languages (Winford 2013), this increased contact, and the desire to index a distinctive identity that was neither Filipino nor Chinese, may have prompted the emergence of a new mixed code, PHH-M. This account of PHH-M originating in the 1950s is supported by aforementioned evidence from Gonzales (2018), which finds that speakers in their 70s are the oldest to share intuitions with younger community members regarding the grammatical structure of PHH-M, by Gonzales (2017) (see Figure 2), in which community members in their 70s are the first to report extensive use of PHH-M, and by follow-up fieldwork conducted in 2019, in which this same age group is the oldest observed to use PHH-M extensively in their spontaneous speech.

The proliferation and subsequent ongoing decline of PHH-M has also been crucially shaped by the evolving sociohistorical situation of the Chinese Filipino community over the 20th and early 21st centuries. The community remained largely in limbo and without legal residency status until the 1970s, when the Filippinization movement led to mass naturalization and increasing imposition of national language policy in Chinese schools. Following this shift, Chinese schools were taught in Tagalog, English, and Chinese (taught using Mandarin textbooks but via oral Hokkien in the classroom). The result is a Chinese Filipino population that is not only proficient in Hokkien, but also in English and Tagalog, with additional knowledge of Mandarin. Survey and interview data with Chinese Filipinos ages 40 to 69 indicates that these groups use PHH-M as their dominant language, suggesting that the Filippinization movement of the 70s was conducive to the conventionalization and maintenance of PHH-M.

In the 1990s, a reduction in Chinese-medium subjects in Chinese schools, and a shift from Hokkien to Mandarin as the dominant Chinese medium of instruction, reduced the younger generation's exposure to unmixed Hokkien. As a result, this generation, now in their 30s, has limited proficiency in 'pure' Hokkien. Moreover, although some community members in their 30s largely report learning PHH-M as their native language, as indicated in Figure 2, their use of PHH-M is much more limited than older generations and is restricted to the home domain. This is likely accounted for by the greater assimilation of younger Chinese Filipinos into mainstream Philippine society; they orient more strongly to a national Filipino identity (Chua 2004), and therefore use Tagalog and English as their primary codes of communication, in line with other Filipinos of their generation. Spontaneous speech data from Gonzales' 2019 fieldwork confirms a decline in the use of PHH-M among younger speakers. For those that do still use PHH-M, the preservation of a distinctive Chinese Filipino cultural heritage and the desire to maintain 'local Hokkien' are the primary motivations cited for their continued use of the language in these interviews.

Another key development in the post-1970s period has been the influx of new Chinese immigrants following China's cultural revolution; such migration has grown in recent years, as Chinese companies expand into the Philippine market (Siu 2019). Chinese Filipinos negotiating their identity in Philippine society must now consider their position in relation to new migrants, who are perceived as having a culture very different from their own hybrid culture. Many young Chinese Filipinos stress their dissimilarities with the new Chinese population and construct themselves as 'local' Chinese, but still express reservations about being entirely Filipino. A desire to remain distinct from recent immigrants and the majority Filipino population is one factor favoring the maintenance of PHH-M. At the same time, the increasing dominance of Tagalog and English may be changing the nature of PHH-M as it is spoken by the younger generation. For example, it is possible that PHH-M is in the early stages of 'unmerging' among younger speakers; features that were once part of the mixed language may now be produced more similarly to their source languages, essentially resulting in a return to code-switching (Gonzales 2016).

In the present study, we investigate whether there is any phonetic evidence for such a shift by comparing the vowels of speakers in their 20s and 30s to those in their 40s through 60s. We also test for the potential role of speaker gender, a factor often identified as a significant predictor of phonological variation (Eckert 1989). Specifically, as women are often found to lead in sound change (Labov 1972), we might expect a potential unmerging of PHH-M to be led by younger female speakers. Similarly, if the proposal that PHH-M only emerged in the 1950s is correct, we may also observe a gender difference among older speakers, with women perhaps having led in the development of a single PHH-M phonological system.

3.2 Structure of PHH-M

As in the case of other mixed languages, PHH-M may be generally broken down into elements with easily-identifiable source languages. Take, for example, utterances (1) through (4) below. In these examples, italicized words are from Tagalog, words in bold are from English, and non-italicized, non-bolded words are from Hokkien.

(1) *parang* lánnáng -e *mag* -piengiû **farmèr.**
like our people -GEN REC -friend farmer
'[He and I are] like Chinese farmer buddies'

(2) **Antibiotîc** si *para* khûn *ngâ* là.
Antibiotic COP for bacteria PRT PRT
'(I already told you that) antibiotics are for bacteria.'

(3) Dî sį ū *pang*- **protêct** khā -e *bá*?
2.SG COP have INST- protect feet PRT Q
'Do you have feet-protectors?

(4) Bō lê *galâw* là **wifì.**
NEG DYN.CON move PRT wifi
'The wifi is not working.'

Gonzales' (2018) fieldwork data provides some evidence of a 'composite' lexical-grammar split in PHH-M, meaning that elements of both the lexicon and grammar are drawn from multiple source languages. The grammar of PHH-M includes contributions from Hokkien (e.g., *-e* genitive affix in (1)) and Tagalog (e.g., (*para* 'for' in (2)), while the lexicon is sourced primarily from Hokkien (e.g., *khā* 'feet' in (3)) and English (e.g., *protêct* 'protect' in (3)) (see Table 1). Fieldwork in 2018 by Gonzales using a 219-word Swadesh list finds a Hokkien-dominant vocabulary, with Hokkien supplying 46.1% of items, English, 17.8%, and Tagalog, 3.7%. This composite structure is reminiscent of, although not identical to those observed in certain other mixed languages, including Gurindji Kriol (Meakins 2012), Michif (Bakker 1997), and Mednyj Aleut (Golovko 1994). Thus, PHH-M structurally resembles certain languages classified as intertwined languages (e.g., Gurindji Kriol), but not others classified under this sub-type (e.g., Media Lengua), which do not feature composite splits (Bakker 2003).

Given the relatively limited role played by English in PHH-M, and the historical circumstances outlined in the previous section, it is possible that when the language initially developed it primarily involved two source languages, Hokkien and Tagalog, with English's contribution coming later. It is also possible that at least some English items entered PHH-M via pre-existing borrowings in Tagalog. Thus, while we believe the representation of English in PHH-M is significant enough to warrant its inclusion as a source language, others might prefer to characterize PHH-M as a mixed language involving only Tagalog and Hokkien.

Table 1. Summary of dominant contributors to domains of PHH-M

Domain	Language source	Examples
Lexicon	Hokkien	*pieng-iû* 'friend'
		tsuî 'water'
		tshaì 'vegetable'
	English	*farmèr* 'farmer'
		treè 'tree'
		auntiè 'aunt'
		cōmpūtèr 'computer'
Grammar	Hokkien	pronominal system, pragmatic markers, genitive marker
	Tagalog	some adverbs, pragmatic particles, nominalizing affixes, most conjunctions, complementizers, interrogative marker

In line with the splits in its grammar and lexicon, prior work on mixed languages suggests that PHH-M ought to feature a split within its phonological system. Van Gijn (2009) surveys four different bilingual mixed languages: Media Lengua

(Ecuador), Callahuaya (Bolivia), Mednyj Aleut (Russia), and Michif (Canada). Comparing these languages, he argues that the phonological systems of mixed languages differ predictably according to structural (and sociohistorical) constraints. For mixed languages in which the domains are relatively un-mixed at the lexical level (e.g. Michif), he proposes that phonology should exhibit stratification or compartmentalization, as this allows for the application of distinct phonological rules for units larger than the phoneme or syllable; in other words, languages of this type would typically include phonemes from more than one source language. On the other hand, for mixed languages that exhibit frequent mixing at the word level (e.g. grammatical affixes from one language and roots from another, like Media Lengua), van Gijn (2009) proposes that the phonological system would typically be drawn from one source language, and specifically the 'native' language of the community. Stewart (2018), however, raises several objections to van Gijn's model, and outlines three cases in which the model does not fully predict the phonological structure of the mixed language: Gurindji Kriol, Michif, and Media Lengua. For example, in the mixed language Media Lengua, while van Gijn's model predicts an assimilation of the Spanish five-vowel system to the Quechuan three-vowel system, Stewart (2014) finds maintenance of the mid-vowels of the Spanish system.

In the case of PHH-M, a certain degree of word-internal mixing has been observed, specifically for nominal derivational affixation, in which Tagalog prefixes are added to Hokkien-, Tagalog- and English-sourced roots (Gonzales 2018). On the other hand, PHH-M is not a morphologically rich language, in terms of affixation, and thus would be characterized overall as a language in which domains are predominantly unmixed at the lexical level. According to van Gijn's (2009) structural model, we would therefore predict a stratified phonology for PHH-M, in which all three vowel systems are retained (i.e. English, Hokkien, and Tagalog). However, as Stewart (2018) has shown with other mixed language data, this prediction may not hold. A primary aim of this study, therefore, is to assess the validity of these models for mixed languages through an investigation of whether a three-way split is maintained in the phonology of PHH-M, or whether the language features a unified phonological system in spite of the split it exhibits in its grammatical structure.

3.3 Vowels in PHH-M

No previous work has investigated the phonology of PHH-M. While research on the phonological features of Hokkien, Tagalog, and English has been conducted, studies of the former two languages and the Philippine variety of English have been relatively limited (Schachter & Otanes 1972; Tayao 2004; Klöter 2011; Ladefoged & Johnson 2011; Lesho 2017). Nonetheless, there is a sufficient body of prior work to establish that the three phonological systems differ substantially; the alternatives of a split versus a merged phonological system in PHH-M, therefore, are potentially differentiable via acoustic analysis. The present analysis focuses on the monophthongal vowels of PHH-M. Before examining PHH-M vowels, we provide a brief description of the monophthongal vowel systems of the three primary source languages.

Philippine Hokkien has nine monophthongs, with [i] and [a] having phonemic nasalized counterparts[5] (Figure 3).

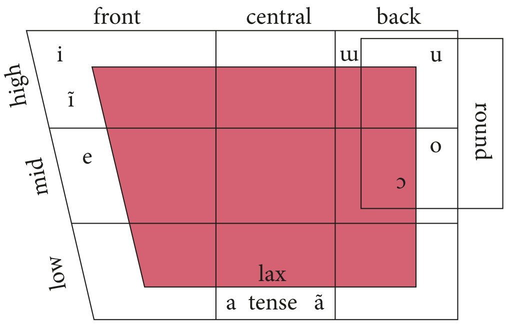


Figure 3. Philippine Hokkien monophthongs, based on Klöter (2011: 152) and Tsai (2017)

Tagalog, in contrast, has a five-vowel system (Schachter & Otanes 1972, Figure 4). These tense vowels have lax allophones that appear in certain environments; prior work has observed processes such as vowel laxing in closed syllables, unstressed vowel reduction, and high vowel lowering in phrase-final position (Gonzalez 1970; Schachter & Otanes 1972). Thus, the phoneme /i/, for example, may be realized as [ɪ], [e], or [ɛ] in various phonological environments (Figure 4).

As is typical in postcolonial contexts, a continuum of English varieties is used in the Philippines: the phonological system of the acrolectal variety is more closely aligned with General American English (GAE), while the mesolectal and basilectal varieties are more similar to Tagalog. Most notably for the present study, whereas the acrolectal Philippine English (PhE) spoken in Manila has approximately 12 monophthongs (Lesho 2017, see Figure 5), mesolectal PhE has six (Tayao 2004: 89, see Figure 6).

5. Tsai (2017) described Philippine Hokkien as having phonemic nasal-non-nasal pairs for [i], [e], [a], [o], [ɔ], and [u]. However, based on Gonzales' ethnographic fieldwork, Philippine Hokkien native speaker judgments, and existing accounts of Early Manila Hokkien (Klöter 2011), we disagree with this account, and argue instead that Philippine Hokkien only has nasal-non-nasal pairs for [i] and [a]. As the present study does not focus on unmixed Philippine Hokkien, we leave the resolution of this question to future work.

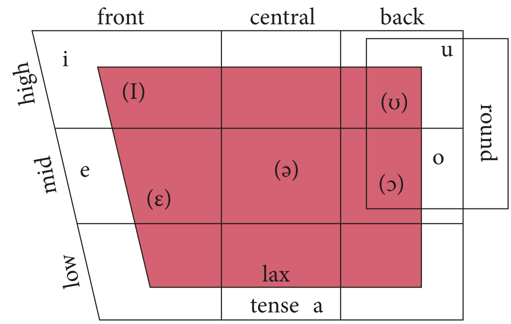


Figure 4. Tagalog monophthongs and their principal allophones, based on Schachter & Otanes (1972: 7)

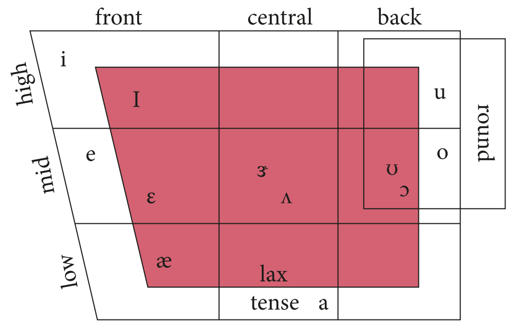


Figure 5. Acrolectal 'Metro Manila' Philippine English, based on Lesho (2017: 7)

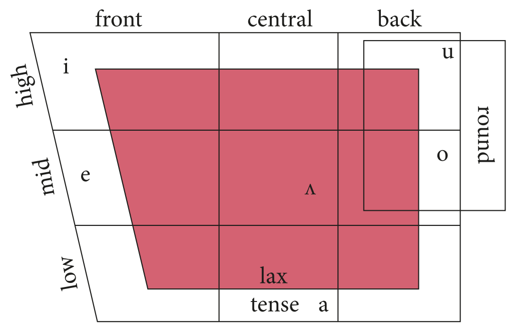


Figure 6. Mesolectal Philippine English monophthongs, based on Tayao (2004: 89)

As outlined above, among the language varieties that potentially contribute to PHH-M, some involve no contrast between tense and lax vowels, some involve allophonic variation between those vowels, and others feature a phonemic contrast. Therefore, the question arises: does PHH-M maintain a tense-lax distinction in its vowel system? In light of Gonzales' native speaker intuitions and observations during fieldwork in the Chinese Filipino community from 2014 to 2017, we hypothesize that PHH-M speakers do maintain certain tense-lax vowel contrasts, but not all of the contrasts found in acrolectal PhE. Specifically, we predict that the majority of PHH-M speakers phonetically contrast eight monophthongs: [i], [ɪ], [e], [ɛ], [u], [ʊ], [o], and [a]. This proposal will be tested in the present paper using statistical analysis of acoustic data drawn from a corpus of spoken PHH-M.

In characterizing the vowel system of PHH-M, our interest is not limited only to those areas in which its source languages exhibit phonological differences. Even in the case of vowels that are conventionally transcribed using the same symbol across these three languages, such as [o], gradient phonetic differences in their conventional realizations mean that these vowels are not, in fact, 'the same' in Hokkien, Tagalog, and English.[6] In a situation of conventional code-switching, we would expect to see significant differences in the pronunciation of similar segments across these three languages, despite some degree of convergence near code-switching points (Grosjean & Miller, 1994; Balukas & Koops, 2015). It is, therefore, also of interest to investigate the extent to which PHH-M speakers produce distinct or merged realizations of vowels in words of Hokkien, Tagalog, and English origin. We will refer to this phenomenon as 'intra-vowel' contrast, meaning phonetic distinctions in how a phoneme is realized in PHH-M words sourced from various languages. Following van Gijn (2009), who argues for a split in the phonology of mixed languages, we hypothesize that PHH-M does maintain phonetically distinct realizations of each vowel, corresponding to the source language of the lexical item in which it appears.

4. Methodology

In order to test the above hypotheses regarding the PHH-M vowel system, data were collected from 34 PHH-M speakers via a reading task. The demographic breakdown of participants is given in Table 2. All participants were of Chinese Filipino heritage, were born in the Philippines, and lived in the Manila metropolitan region; none had lived outside of the country for five or more consecutive years. All but one held at least an undergraduate university degree, and all were middle to upper class, as is typical of the members of this community (see Chua 2003). All participants attended a Chinese-medium (i.e. 'Hokkien'-medium) school in their primary and secondary years. Participants were all proficient in PHH-M, Hokkien, Tagalog, and English; in addition, the subjects all had parents who were also speakers of PHH-M.

6. In this discussion of PHH-M, 'English' will be used to refer to the local dialect of English, meaning the Manila variety of Philippine English.

Table 2. Demographic backgrounds of study participants

Sex	**Age range**		
	Younger (21–39)	**Older (40–69)**	**Total**
Male	7	10	17
Female	9	8	17
Total	**16**	**18**	**34**

Due to the hybrid nature of PHH-M, a reading passage task was selected as the most appropriate means of data collection. A word list design, while offering more control over context, would have been exceedingly difficult to implement, because the citation form of each word would most likely be interpreted and pronounced as belonging to its source language. The various components of the PHH-M sentences were written in their respective source language orthographies (Hokkien-source elements were written in an orthography adapted from that of Taiwanese Hokkien, which uses Roman script (Lin 2015)). Because PHH-M is an oral language that is rarely written, we adopted the strategy of placing an English translation of the passage before the PHH-M passage, to give the participants a sense of what the written PHH-M passage meant.

To efficiently elicit vowels from all three source languages, 'nonsense' sentences were created (e.g. 'This Monday, after counting umbrellas and opening the door, I saw thunder even though the summer was long'); the passages were all grammatically sound in PHH-M (see Appendix A for a full list of stimuli).[7] The nonsense passages were designed to include every vowel from the source languages in a variety of preceding consonantal environments, avoiding preceding nasals, liquids, and glides, as these segments have significant co-articulatory effects on the locations of the first three formants (see Table 2) (Deterding 1997: 49). The targeted vowels all occur within syllables that are 'stressed' in PHH-M, rather than in their respective source languages; for instance, the word *habit* receives final 'stress' in PHH-M, and not initial 'stress', as it does in standard US English. Similarly, words were assigned to vowel classes according to their PHH-M pronunciation (e.g. *stalk* is assigned to /o/, as it is pronounced [stok] in PHH-M). While [ɔ] was excluded from the study, as it was not observed to occur in PHH-M in preliminary fieldwork, words containing the [ʌ] vowel in acrolectal PhE were included, as some speakers appeared to distinguish between [a] and [ʌ]

7. Due to the unusual and formal nature of this task, it is possible that the speech elicited is not entirely typical of PHH-M. To overcome this limitation, future investigations may elicit data via stimuli repetition, translation, or other tasks.

in English-source words in preliminary data collection. For reliability, the final set of target words in Table 3 was vetted by two native speakers of PHH-M.

Table 3. PHH-M target words and monophthongs measured

Vowel	Words in stimuli		
	Hokkien source	**Tagalog source**	**English source**
i	bi so, si, di	bilo bilo, kasi, sisig, sitaw, tikoy	Barbie, baby, fancy, handy
ɪ	bin thau, tsi ge, pai dit	sabik, siksik, tiktik	habit, rabbit, basic, lactic, plastic
e	na bo e, phe/pe, lo be, pai se, te	bibe, Jose, Malate	Betty, sailor, taser
ɛ	beh, peh, peh, seh, the	pakbet, insekto, bistek	Quebec, sector, protect
a	papa, pak, sa, sak, ta, thak	ba, pakpak, sa, sakto, Tagalog, utak	passion, back-up, salad, sack, Malta
ʌ	–	–	Monday, summer, thunder, tuck in
o	bo, boksu, so, kietsok, to lo, tok	Bapor Tabo, palabok, bunso, pasok, kanto, katok, Tondo, bundok	Poland, Reebok, Esau, sawyer, soak, Waldo, stalk
u	laobu, su, du e	buko, Subic, tunay	bullet, zoo, undo
ʊ	phun, tsi tsun, thun	abot, suot, buntot	boot, suit, toot

Speakers were prompted to read each passage as naturally as possible after reviewing the English translation. Recordings were made in a quiet environment using a stereo digital audio recorder at 24 bit/96kHz. The recordings were subsequently analyzed using the acoustic analysis software Praat (Boersma & Weenink 2017) to measure the first and second formant values (F1 and F2) of each vowel, with 424 vowel tokens were analyzed in total. Formants were manually extracted at the vowel midpoint. To account for inter-speaker differences, formant values were subsequently normalized in the NORM Vowel Normalization and Plotting Suite (Thomas & Kendall 2007), using the modified Watt and Fabricius method, in which normalization is based on the values of /i/, /a/, and /u/, the three corners of the vowel triangle (Watt & Fabricius 2002, 2011; Fabricius, Watt, & Johnson 2009). We further analyzed the normalized F1 and F2 values using a Multivariate Analysis of Variance (MANOVA) test in the program R (R Core Team 2013) to obtain the Pillai-Bartlett statistic, also known as a 'Pillai score'; higher values of this score reflect a greater distinction between clusters of vowels. After the Pillai score was calculated for each speaker, the values were subject to analysis via ANOVA, to identify potential effects of gender or age (i.e., to assess whether speakers of different ages and genders exhibited significant differences in Pillai score magnitude). This statistical method has been adopted in recent sociophonetic work as a means of assessing whether two clusters of vowels are merged or distinct, and whether degree of merger correlates with social factors in a population (Hay, Warren, & Drager 2006; Hall-Lew 2010; Nycz & Hall-Lew 2013). A major advantage of this method, in contrast to conducting separate statistical analyses of normalized F1 and F2 values, or calculating Euclidean distances between the means of each vowel, is that the Pillai score more directly captures the degree of overlap between two clusters of vowels, rather than focusing on the distance between their average values; unlike these other measures, the Pillai score also assesses the statistical significance of the overlap, rather than the significance of F1 or F2 differences individually (see Nycz & Hall-Lew 2013).

5. Results

Figure 7 indicates the mean positions of the nine tested monophthongs for each of the 34 participants; vowels have been normalized using the modified Watt and Fabricius method, as described in the section above.

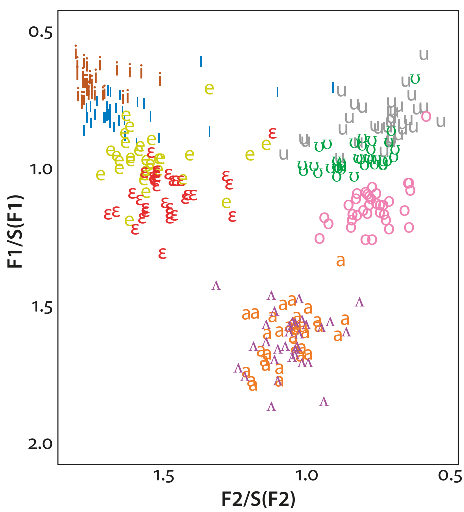


Figure 7. Mean vowel position for each participant, normalized using the modified Watt & Fabricius method in NORM (Thomas & Kendall 2007)

While certain pairs of tense and lax vowels appear quite distinct in the plot (e.g. [i] vs. [ɪ]), others exhibit considerable overlap (e.g. [a] vs. [ʌ]). In the first analysis, we test the extent of inter-vowel contrast by assessing the distinctiveness of tense-lax pairs; in the second analysis, we examine intra-vowel contrast, meaning distinctions between vowels from different source languages. In both analyses, after calculating Pillai scores for each speaker, we investigate possible effects of age and gender via two criteria: differences in the proportion of speakers who maintain a significant contrast (tested via generalized linear modeling), and differences in the average size of Pillai score, reflecting the magnitude of a contrast (tested via ANOVA).

5.1 Inter-vowel contrast

To better understand the vowel system of PHH-M, we first assess the distinctiveness of the following potential tense-lax pairs: (1) [i] vs. [ɪ], (2) [e] vs. [ɛ], (3) [u] vs. [ʊ], and (4) [a] vs. [ʌ]. Table 4 indicates, for each of the four tense-lax pairs, the mean Pillai score and number of speakers who maintain a significant contrast, according to the MANOVA; note that higher Pillai scores indicate a greater distinction between vowels.

Table 4. Summary of MANOVA results for four tense-lax pairs for all 34 participants, including mean Pillai scores and percent and number of speakers found to exhibit a significant contrast ($p < .05$)

Contrast	Mean Pillai score	% (N) speakers with significant contrast
[i] vs. [ɪ]	0.4488	85.3% (29)
[e] vs. [ɛ]	0.3185	70.6% (24)
[u] vs. [ʊ]	0.4482	79.4% (27)
[a] vs. [ʌ]	0.0757	17.6% (6)

As was suggested by the plot in Figure 7, a difference is evident in Table 4 between the first three pairs, for which over 70% of participants maintain a contrast, and [a] vs. [ʌ], which are only significantly contrasted by 6 of the 34 participants. Thus, while some inter-speaker variation is present, participants show overall agreement regarding which tense-lax pairs are distinctive in PHH-M.

Figure 8 illustrates the mean Pillai scores of speakers in four major demographic classes: younger women, younger men, older women, and older men. First, for [a] vs. [ʌ], it is apparent that the low level of distinction between these tested vowel categories is consistent across demographic groups. Other vowel pairs show somewhat more variability; among these, the most notable distinction is found in the [u] vs. [ʊ] pair, in which older men are using a greater distinction than the other groups.

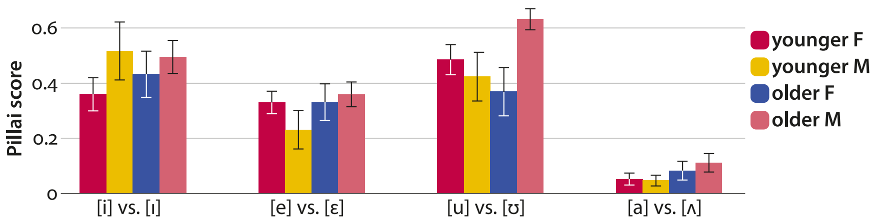


Figure 8. Average Pillai scores of younger women, younger men, older women, and older men for all four tense-lax vowel contrasts

Consistent with Figure 8, statistical analysis of the size of Pillai scores for each of the vowel pairs finds only one significant effect, an interaction between gender and age for [u] vs. [ʊ] such that there is a significant distinction by gender for older speakers and not for younger speakers, with older men producing a larger contrast than older women ($F = 5.9672$, $p = .02068$; see Appendix B.1 for full statistical models). Overall, we observe that, across the four demographic classes, speakers consistently maintain statistically significant phonetic distinctions for all tense-lax pairs except for [a] vs. [ʌ].

In sum, this analysis of PHH-M tense-lax vowel pairs has found evidence for significant spectral distinctions between [i] vs. [ɪ], [e] vs. [ɛ], and [u] vs. [ʊ] across all demographic groups, as well as evidence that [a] vs. [ʌ] is not consistently contrasted by any group. Note that [ʌ] was the only vowel of the nine tested that was associated with only one of the three source languages (English); thus, the eight remaining vowels identified as phonetically contrastive in PHH-M occur across words drawn from all three sources.

5.2 Intra-vowel contrast

Our second hypothesis relates to PHH-M's status as a mixed language. In this section, we examine each of the eight phonetically distinct vowels identified above, testing the homogeneity in production of these vowels with regard to words drawn from the three primary source languages: Hokkien, Tagalog, and English.

Table 5 gives the mean Pillai scores and proportion of speakers who are found to produce significantly different phonetic qualities for each vowel when it occurs in words drawn from each of the three source languages. For example, in the entry for [i], the Pillai score refers to the distinctiveness of [i] quality when occurring in words from different source languages such as *tikoy* (Tagalog), *biso* (Hokkien), and *Barbie* (English). As indicated in the table, the number of speakers distinguishing between source languages within each vowel is quite low, ranging from zero (for [u] and [o]) to five (for [ɛ]).

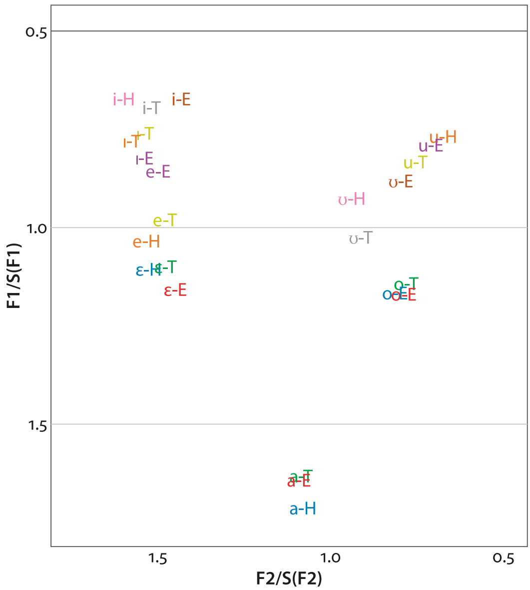
Table 5. Summary of MANOVA results for Hokkien, Tagalog, and English-sourced vowels for all 34 participants, including mean Pillai scores and percent and number of speakers found to exhibit a significant contrast between different source languages

Vowel	Mean Pillai score	% (N) speakers with significant contrast
[i]	0.3242	2.94% (1)
[ɪ]	0.3881	11.76% (4)
[e]	0.3653	11.76% (4)
[ɛ]	0.5834	14.7% (5)
[u]	0.4279	0% (0)
[ʊ]	0.5437	11.76% (4)
[o]	0.1331	0% (0)
[a]	0.1550	8.8% (3)

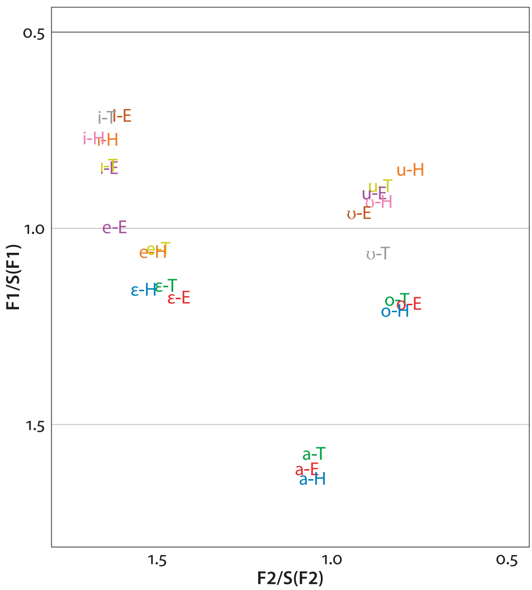
Figure 9(a–d) shows the vowel plots for the four major demographic classes. The source language of each vowel is indicated with an underscore; i_T, for example, refers to [i] from Tagalog-source words; the mean values for each vowel among all speakers in each demographic class are indicated. While certain vowels are produced extremely consistently among all four groups of speakers (e.g. [o]), others show more variance for some groups than others. This information is quantified more precisely in Figure 10, which gives the average Pillai scores for each of the four demographic groups for each vowel. As suggested in the vowel plots, [o] and [a] show very little distinction across source languages for all demographic groups; [i], [ɪ], and [u] have somewhat higher Pillai values, but these values are consistent across groups. For the remaining three vowels, [e], [ɛ], and [ʊ], we observe more variable Pillai scores. Indeed, statistical analysis reveals that these three vowels show the only significant stratification by demographic category; significant factors identified for each vowel are given in Table 6 (see Appendix B.2 for full models for each vowel).

Table 6. Significant effects identified via ANOVA for magnitude of Pillai score for intra-vowel analysis (see Appendix B.2 for full models). '*' = $p < .05$

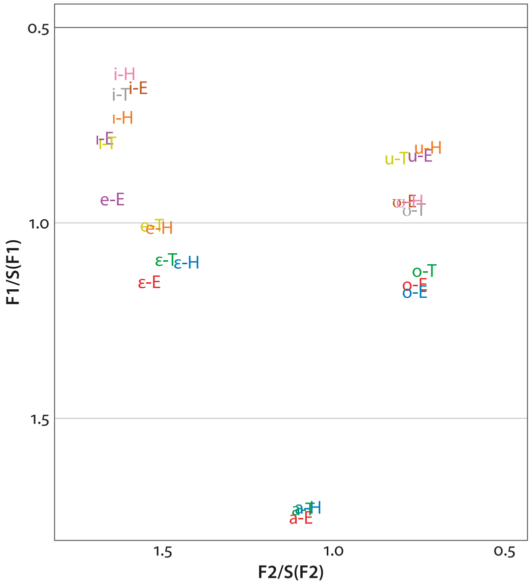
Vowel	Factor	F	p-value
[e]	age*gender	5.6090	0.02451 *
[ʊ]	age	4.6601	0.03900 *
	age*gender	5.9701	0.02065 *



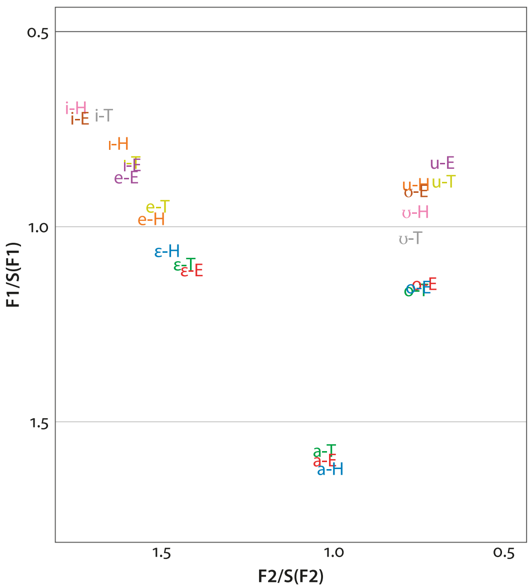
a. Younger female



b. Younger male



c. Older female



d. Older male

Figure 9. (a–d) Average position of Hokkien, Tagalog, and English source monophthongs among (a) younger female, (b) younger male, (c) older female, and (d) older male speakers. _E = English-source _H = Hokkien-source, _T = Tagalog-source

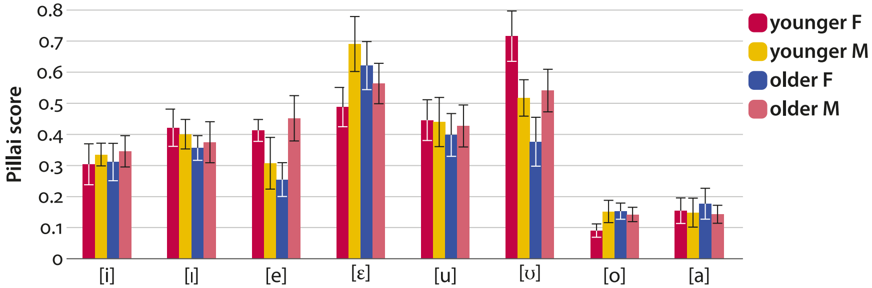


Figure 10. Average Pillai scores of younger women, younger men, older women, and older men for contrasts between Hokkien, Tagalog, and English-sourced vowels, for each of the eight proposed monophthongs

For the vowels [e] and [ʊ], a consistent pattern is observed such that older women produce the least distinct vowels between source languages, while younger women exhibit greater distinctions than young men. [ʊ] also shows a significant main effect of age, with younger speakers distinguishing between source languages more overall. Overall, the data indicate that older women show the least significant phonetic distinctions between source languages, and that younger women make significantly greater distinctions than younger men for certain vowels. While significant differences have been found in magnitude of Pillai scores, however, it is important to bear in mind that no significant differences are found in the proportion of speakers in each demographic group that show a significant distinction between source languages; a large majority of speakers within each group do not show significant differences in quality for vowels appearing in words drawn from different source languages. For example, among younger women, although this group leads in [ʊ] Pillai score magnitude, only three of the nine speakers have a Pillai score high enough to reach significance in the MANOVA model. We may therefore conclude that, overall, PHH-M speakers do not distinguish between vowels from different source languages.

6. Discussion

The previous section detailed the findings of two analyses of PHH-M vowels, focusing respectively on inter-vowel and intra-vowel contrast. The first analysis revealed that over 70% of participants produced statistically significant differences for three of the four tense-lax pairs examined: [i]/[ɪ], [e]/[ɛ], and [u]/[ʊ]. At the same time, [a] and [ʌ] were significantly contrasted by less than 20% of participants. This is particularly interesting when we consider that, as indicated in Figures 6 and 7, this is a contrast that is thought to be maintained in both acrolectal and mesolectal varieties of Philippine English, including the acrolectal variety spoken in the Manila area (Lesho 2017). This distinction disappears, however, both in basilectal Philippine English (Tayao 2004: 89) and in Colloquial Singapore English, an English-based contact language influenced by a Hokkien substrate (among other substrate languages) (Deterding 2007). It is therefore conceivable that the merger of [a] and [ʌ] is present in Manila Chinese English (Gonzales & Hiramoto 2020) itself, and that this feature distinguishes the variety from the acrolectal English spoken by Filipinos in Manila; this possibility may be assessed in future work.

Both of these findings were found to be largely consistent across older and younger speakers, as well as across male and female speakers; older female speakers, however, showed significantly less contrast between [u] and [ʊ], as measured by Pillai score. Overall, these inter-vowel contrast results constitute strong confirmatory evidence of our hypothesis that the PHH-M monophthongal system consists of eight vowels (see Figure 11).

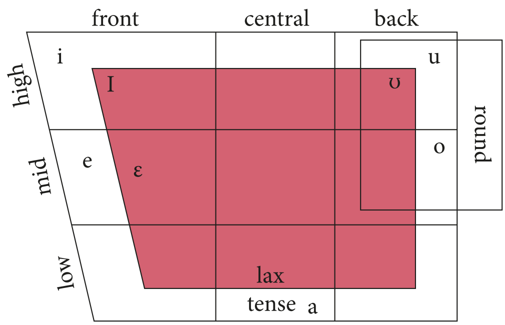


Figure 11. Proposed chart of PHH-M monophthongs

In the analysis of intra-vowel contrast, speakers were found to largely not distinguish between the phonetic qualities of vowels from words drawn from the three different source languages (Hokkien, Tagalog, and English); speakers with significant distinctions for each vowel ranged from zero participants to a maximum of five out of 34 participants. This finding is particularly notable in light of the relatively formal nature of the elicitation task, which might have encouraged speakers to produce words more consistently with their higher-prestige source languages, thus biasing the task towards the use of distinct vowels. Therefore, on the whole, the evidence indicates that PHH-M vowels operate as a single, unified system.

Regarding social factors, older women were found to show the least distinction between source languages for both of the vowels that exhibited statistically significant social conditioning ([e] and [ʊ]), while older men exhibited considerably larger distinctions for these vowels. This finding is consistent with an account in which women led in the conventionalization of PHH-M as a mixed language in the 1950s, assuming that these observed apparent-time differences reflect generational change. At the same time, for those same two vowels, young women showed a greater distinction between source languages than young men; this pattern suggests that, as young people increasingly shift to Tagalog and English in their everyday communication practices, young women are leading in the 'unmerging' of PHH-M. In other words, we may be witnessing the early stages of the death of this mixed language, as the community shifts, perhaps, to trilingual code-switching (or to bilingual code-switching, as Hokkien appears to be on the decline among young Chinese Filipinos). Nevertheless, given that the majority of speakers from all demographic groups exhibited unified vowels across source languages, at the present time, evidence indicates that PHH-M continues to operate in the community as a conventionalized mixed language with a unified vowel system.

Among the vowel systems of the three source languages, the one with the closest resemblance to the PHH-M system outlined in Figure 12 is that of Tagalog.[8] Unlike Tagalog, however, in which the lax vowels are allophones of the tense vowels appearing in closed syllables, we believe that the lax vowels of PHH-M ought to be classed as independent phonemes, in light of their distribution. On the other hand, given that many of the lax vowels do appear in closed syllables in PHH-M, an alternative model of the system, in which the lax vowels operate as allophonic variants, might be put forward; we leave this question to future work. Further analysis of durational contrasts in PHH-M, using data in which syllable structure is controlled more consistently than in the present work, would provide additional evidence for the phonemic status of these segments.

Notably, the finding of a unified monophthongal system for PHH-M might be argued to contrast with the claim of van Gijn (2009) that, from a structural point of view, unified phonological systems are not expected to occur in mixed languages that feature significant unmixed domains. One example of such a language given by van Gijn (2009) is Michif, in which both stems and affixes can come from the same source language, yielding large unmixed domains (e.g., verbs) in which the phonology of one particular source language may apply. Despite the composite split within the grammar and lexicon of PHH-M and its resultant set of stems

8. The system proposed for PHH-M is also not dissimilar to that of Hokkien, with the exception of the absence of nasal vowels. It is conceivable that the nasal vowels were merged with the lax vowels in the local variety of Hokkien prior to the development of PHH-M. Due to a lack of data regarding the sound system of Manila Hokkien as it is spoken today, or in the era of the development of PHH-M, we are unable to state definitively that the vowels of PHH-M do or do not closely resemble those of the local variety of Hokkien.

and affixes with mixed sources, because PHH-M is not a morphologically rich language, it often features clauses with no overt English or Tagalog elements (as in (5), which features only elements from Hokkien).

(5) Tīsí dûwè phâhsì láng?
when girl kill person
'When did the girl kill the person?'

In this sense, PHH-M might be said to feature unmixed domains, as it can be produced with little overt mixing at the phrasal or clausal level. At the same time, PHH-M does allow morphological mixing (e.g. nominal affixation mixing, Gonzales 2018), although such mixing does not occur as frequently as we would observe in a language with a richer affixation system. The unified phonological system of PHH-M, then, appears to result from the possibility of mixing in its system. This observation is line with van Gijn's (2009) argument that the smaller the units of language are at which mixing is evident, the more 'unified' the phonology of a mixed language ought to be.

Apart from structural factors, van Gijn (2009) identifies the sociohistorical situation of a mixed language as influential in shaping its phonology. Specifically, he proposes that a mixed language is likely to adopt the phonology of one of its source languages if it has experienced an extended period of contact with only that single parent language (112). Based on the account given in §3.1 of PHH-M's development and the sociolinguistic situation in the Philippines, this prediction does not appear to hold; the metropolitan Manila Chinese community in the 1950s, to the best of our knowledge, had significant exposure to Hokkien, Tagalog, and English, rather than only one of these languages. Thus, PHH-M developed from a sociohistorical context typical of a mixed language that should feature a split in its phonological system, according to van Gijn's analysis. Nevertheless, it does not appear to have such a split. Our understanding of the influence of various source languages on PHH-M is limited, however, due to the absence of acoustic data on local Hokkien, Tagalog, and English varieties. Given that the English spoken in this community likely exhibited a great deal of influence from Tagalog (Tayao 2004; Gonzales & Hiramoto 2020), and that the Hokkien spoken at the time of PHH-M's development may have also experienced considerable Tagalog influence, it may be that all three source languages featured quite similar phonological systems. This scenario would account for why PHH-M's phonology generally resembles that of Tagalog, the dominant local language, and would reconcile these findings with van Gijn's predictions regarding languages with unmixed domains developing in a sociohistorical situation of consistent multilingual exposure.

The early signs of unmixing we have observed among the younger population of PHH-M speakers may be the result of changes in language dominance, as young speakers increasingly acquire Tagalog as an L1 (see Figure 2), but may also arise due to factors related to the performance of identity. Younger Chinese Filipinos, negotiating between their Chinese and Filipino identities, may be shifting to a more 'Tagalog-like' production of Tagalog-source items in PHH-M as a means of indexing their Filipino-ness, and particularly to distance themselves from the rising population of recent immigrants from China, who are associated with a lack of proficiency in Tagalog, non-local sounding Hokkien (and/or PHH), and a failure to embrace Filipino identity, as illustrated in (6).

(6) Excerpt from fieldwork interview with Chinese Filipino PHH-M speaker[9]
Q: *Di tsiûwâ identifỳ taī̄diōkâ?*
How do you identify a Mainlander?
A: *The way talk.... Yá yá yá buē hiaû Tagalóg. Ūhmsī̄ kap dân sáng lê kóng-uè ânī̄ dapât si âni. Tsîgê tsâ sī̄ Fī̄l-Chì.... Lánnang-uè pero the tòne. Intsîk na intsîk pa. în e Tagalog si intsîk pà la. În ó si kahit na matagal în yákô bue hiaú thiâ huī̄dī̄pī̄n là.*
The way they talk. It's very, very... They do not know how to speak Tagalog. They don't speak like us. It should be like what we are talking in now. This is a hallmark of being Filipino-Chinese/Chinese Filipino. (Philippine Hybrid) Hokkien, but pay attention to the tone. It's very 'Intsik' [derogatory term for someone from mainland China]. Their Tagalog is very Intsik. Even if they have stayed in the Philippines for very long, they still do not love the Philippines.

A similar phenomenon of language change in an ethnolinguistic minority group being triggered by a wave of new immigration is given in Starr & Balasubramaniam (2019), who argue that a rapid shift away from trilled /r/ and adoption of mainstream approximant /ɹ/ in English among the longstanding Tamil Indian Singaporean minority community is the result of speakers' desire to index Singaporean identity and distance themselves from recent immigrants from South Asia. Given the attitudes towards mainland Chinese immigration observed in the Philippines and the increase in Tagalog dominance among younger Chinese Filipinos in the present analysis, we expect the unmixing of PHH-M and the shift away from PHH-M as an everyday language in the Chinese Filipino community to expand in the coming years.

9. This fieldwork interview was conducted by Gonzales in the summer of 2019 in Binondo, Manila.

In §3.2, we suggested that PHH-M does not clearly belong to any sub-type of mixed language proposed by Bakker (2003), although it does resemble intertwined mixed languages like Gurindji Kriol in having a composite 'split'; PHH-M was described as a mixed code that exhibits composite intertwining, but also features extensive lexical borrowing from English. The sociohistorical conditions under which the language emerged also do not exclusively follow a single subtype's characteristics. Thus, we can posit that PHH-M's seemingly anomalous system might have been affected by other factors beyond van Gijn's model, and perhaps other factors related to the other two mixed languages sub-types. Viewing PHH-M as a non-prototypical mixed language, consistent with Gonzales (2018), this analysis hopes to contribute to existing literature on mixed languages and admixtures, highlighting the wide spectrum of varieties that develop under complex sociohistorical conditions.

7. Conclusion

This study has investigated variation in the monophthongal vowel system of PHH-M, a potential mixed language used by the Manila Chinese Filipino community primarily composed of elements from Hokkien, Tagalog, and English. Drawing on acoustic data from 34 native speakers, and quantitatively analyzing the degree of overlap via Pillai scores, we proposed that PHH-M has eight monophthongs: [a], [e], [i], [o], [u], [ɛ], [ɪ], and [ʊ]. We further discovered that production of these vowels is largely uniform across source languages; as argued in the discussion above, while this finding arguably contradicts certain elements of van Gijn's (2009) observations on the typical phonological properties of mixed languages arising in particular sociohistorical conditions, potential Tagalog influence on the Hokkien and English varieties that contributed to PHH-M may account for this discrepancy.

The existence of a unified and distinctive monophthongal vowel system in PHH-M, along with our current knowledge of its linguistic structure and the sociohistorical context from which it emerged, provides additional support for the notion that PHH-M is properly regarded as a mixed language, rather than as an example of code-switching or extensive lexical borrowing. Because data on multilingual varieties, mixed languages, and admixtures remain limited, continued documentation of the structure of PHH-M, and the sociolinguistic context in which it is spoken, promises to yield further insights into this outcome of multilingual language contact. However, given that these findings do not entirely align with predictions made by van Gijn (2009) regarding the sociohistorical conditions under which a mixed language with a unified phonological system arises, a reevaluation of the factors leading to various outcomes in mixed languages is perhaps in order.

Additional data on diverse mixed varieties spoken in a variety of sociolinguistic contexts, as well as further analysis of the PHH-M phonological system and the phonology of its source language varieties, may shed further light on the question of whether PHH-M is indeed an anomaly among mixed languages.

Consistent with Labov's (1972) general observations on gender and language change, we identified sociophonetic evidence supporting the notion that women have both led in the conventionalization of PHH-M and are currently leading in its demise, as young speakers shift towards Tagalog and English; we argued that this shift has resulted from changes in language dominance, as well as an increasing desire to index Filipino identity. If PHH-M continues on a trajectory towards endangerment, future work tracking the production of PHH-M vowels among speakers of different backgrounds may provide a unique opportunity to understand the shifting roles of gender and other social factors over the lifespan of a language.

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Glossary

1	first person
2	second person
3	third person
CON	continuous
COP	copula
DYN	dynamic
GEN	genitive
INST	instrumental
NEG	negative
PL	plural
PRT	particle
Q	question marker
REC	reciprocal
SG	singular

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Appendix A. Nonsense reading passages

Instructions

1. You will be voice-recorded for this reading task.
2. Silently read the context or the translation of the nine nonsense sentences you are about to read.
3. Practice the sentence following the translation first.
4. Read the sentence following the translation loudly and clearly. Try to slow down a bit but try to make it as natural-sounding as possible.

1. ***Context (do not read aloud)***
   The Barbie doll is very fancy and handy because she loves bilo-bilo, sisig, sitaw, and four tikoys' taste.
   Read this aloud
   Barbie e baby ia fancy kap handy kasi i kap di ia ai bilo-bilo, sisig, sitaw, kap si e tikoy e bi so.
2. ***Context (do not read aloud)***
   This Sunday, that plastic and lactic rabbit and tik-tik (monster) will eat one bread out of basic habit because it is really crowded.
   Read this aloud
   Tsi ge pai dit, hi ge plastic kap lactic rabbit kap tik-tik beh tsiah tsi ge bin thau out of basic habit kahit sabik na siksik.
3. ***Context (do not read aloud)***
   Betty and Sailor followed Jose and his duck to Malate, if not they will be embarrassed. After eating lechon and kare-kare, they will lastly tazer themselves.
   Read this aloud
   Betty kap Sailor le te Jose kap i e bibe khi Malate, na bo in e pai se. Tapos tsiah diau lechon kap kare-kare, in beh lo be tazer in kai ki.
4. ***Context (do not read aloud)***
   You said you would climb the white Quebec sector so that you can protect the insects from eating pakbet and Bistek. If not, you will be crushed by rocks.
   Read this aloud
   Din seh din beh peh hi ge peh siak e Quebec sector para u thang protect hoai insekto tsiah pakbet kap Bistek, na bo in e ho hoai rocks teh lo ki.
5. ***Context (do not read aloud)***
   Did Dad use wings to bind those dry Tagalog clothes? What is your brain learning? Has it fallen? Just right, your passion is to eat salad in Malta and back-up those tucked-in sacks.
   Read this aloud
   Papa ieng pakpak pak hoai ta e Tagalog e sa lo ba? Di e utak thak siam mi a? Sak khi lo ba? Saktong-sakto, di e passion si be tsia salad sa Malta kap back-up hoai tuck in e sack.
6. ***Context (do not read aloud)***
   This Monday, after counting umbrellas and opening the door, I saw thunder even though the summer was long.
   Read this aloud
   Tsi ge Monday, sng umbrella kap khui mng diau, goa khoa tio mga thunder kahit na ia tng la summer.

7. ***Context (do not read aloud)***
   Pastor Waldo and Esau are at Poland mountain's one alley to buy a soaked palabok, Reebok shoes, and Tom Sawyer's book. After doing these, they didn't lock Tondo's door, that is why they knocked at Bapor Tabo, went in, and then stalked the youngest sibling at where? End.
   Read this aloud
   Waldo boksu kap Esau ti Poland bundok e tsi ge kanto boe tsi ge soak diau e palabok, Reebok oe, kap Tom Sawyer e tsheh. Tshong hoai diau, in bo so Tondo e tok, kaya in kai katok Bapor Tabo, pasok, tapos stalk hi ge bunso ti to lo? Kiet sok.
8. ***Context (do not read aloud)***
   My female mother lost. She's at Subic Zoo buying real coconut but she undid the bullet.
   Read this aloud
   Goa e du e e laobu su lo. I ti Subic Zoo boe tunay e buko, pero i kay undo hi-ge bullet.
9. ***Context (do not read aloud)***
   Presently, I am swallowing balut while reaching and watching him wear a tail, boot, and suit. After watching, I heard a loud "toot" sound, and then I was almost thrown away.
   Read this
   Goa tsi tsun le thunı balut habang le abot kap khoa i le suot e buntot, boot, kap suit. Goa khoa diau, thiah tioh tsi ge toot sia, tapos te beh phun tshu ki lo.

Appendix B. Statistical models

Models reported include two analyses: (1) analysis of difference in number of speakers with significant contrast according to MANOVA analysis, using generalized linear modelling implemented via glm in R, and (2) difference in size of Pillai score according to MANOVA analysis, using ANOVA implemented via aov in R. For all models, $p<.001=$ '***', $p<0.01=$ '**', $p<0.05=$ '*' 0.05, $p<.1=$ '.'

B.1. Inter-vowel contrast analysis

1. [i] vs. [ɪ]
   Analysis of number of speakers with significant contrast via generalized linear model:
   AIC: 35.806, Null dev.: 28.395 on 33 df. Residual dev.: 27.806 on 30 df.

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	1.9459	1.0690	1.820	0.0687 .
age (young)	−0.6931	1.3363	−0.519	0.6040
gender (m)	0.2513	1.5013	0.167	0.8671
age (young) * gender (m)	0.2877	2.0158	0.143	0.8865

Analysis of Pillai score size via ANOVA:

	df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.01283	0.012827	0.2682	0.6083
gender	1	0.09600	0.096000	2.0073	0.1668
age*gender	1	0.01847	0.018467	0.3861	0.5390
residuals	30	1.43475	0.047825	–	–

2. [e] vs. [ɛ]
Analysis of number of speakers with significant contrast via generalized linear model:
AIC: 44.182, Null dev.: 41.194 on 33 df. Residual dev.: 36.182 on 30 df.

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	0.5108	0.7303	0.699	0.4843
age (young)	0.7419	1.0845	0.684	0.4939
gender (m)	1.6864	1.2823	1.315	0.1885
age (young) * gender (m)	−3.2268	1.6942	−1.905	0.0568 .

Analysis of Pillai score size via ANOVA:

	df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.03048	0.030477	1.2140	0.2793
gender	1	0.00826	0.008258	0.3289	0.5706
age*gender	1	0.03365	0.033650	1.3404	0.2561
residuals	30	0.75315	0.025105	–	–

3. [u] vs. [ʊ]
Analysis of number of speakers with significant contrast via generalized linear model:
AIC: 33.745, Null dev.: 34.575 on 33 df. Residual dev.: 25.745 on 30 df.

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	7.053e−15	7.071e−01	0.000	1.000
age (young)	2.079e+00	1.275e+00	1.631	0.103
gender (m)	1.957e+01	3.401e+03	0.006	0.995
age (young) * gender (m)	2.073e+01	3.401e+03	−0.006	0.995

Analysis of Pillai score size via ANOVA:

	df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.02735	0.027355	0.7440	0.39524
gender	1	0.10207	0.102067	2.7759	0.10610
age*gender	1	0.21941	0.219407	5.9672	0.02068 *
residuals	30	1.10307	0.036769	–	–

4. [a] vs. [ʌ]
Analysis of number of speakers with significant contrast via generalized linear model: AIC: 30.458, Null dev.: 31.688 on 33 df. Residual dev.: 22.458 on 30 df.

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	−1.0986	0.8165	−1.346	0.178
age (young)	−18.4675	3584.6711	−0.005	0.996
gender (m)	0.6931	1.0408	0.666	0.505
age (young) * gender (m)	−0.6931	5419.5132	0.000	1.000

Analysis of Pillai score size via ANOVA:

	df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.020086	0.0200859	2.8095	0.1041
gender	1	0.001371	0.0013709	0.1918	0.6646
age*gender	1	0.002432	0.0024324	0.3402	0.5641
residuals	30	0.214475	0.0071492	–	–

B.2. Intra-vowel contrast analysis

1. [i]
Analysis of number of speakers with significant contrast via generalized linear model: AIC: 14.502, Null dev.: 9.0230 on 33 df. Residual dev.: 6.5017 on 30 df.

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	−2.157e+01	1.034e+04	−0.002	0.998
age (young)	2.026e−11	1.420e+04	0.000	1.000
gender (m)	1.937e+01	1.034e+04	0.002	0.999
age (young) * gender (m)	−1.937e+01	1.800e+04	−0.001	0.999

Analysis of Pillai score size via ANOVA:

	df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.00064	0.0006431	0.0242	0.8775
gender	1	0.00987	0.0098693	0.3707	0.5472
age*gender	1	0.00002	0.0000204	0.0008	0.9781
residuals	30	0.79868	0.0266227	–	–

2. [ɪ]
Analysis of number of speakers with significant contrast via generalized linear model:
AIC: 27.543, Null dev.: 24.630 on 33 df. Residual dev.: 19.543 on 30 df.

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	−19.57	3802.12	−0.005	0.996
age (young)	18.31	3802.12	0.005	0.996
gender (m)	18.18	3802.12	0.005	0.996
age (young) * gender (m)	−36.49	5565.73	−0.007	0.995

Analysis of Pillai score size via ANOVA:

	df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.01750	0.0175026	0.6295	0.4338
gender	1	0.00024	0.0002437	0.0088	0.9260
age*gender	1	0.00321	0.0032147	0.1156	0.7362
residuals	30	0.83408	0.0278026	–	–

3. [e]
Analysis of number of speakers with significant contrast via generalized linear model:
AIC: 25.959, Null dev.: 24.630 on 33 df. Residual dev.: 17.959 on 30 df.

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	−2.057e+01	6.269e+03	−0.003	0.997
age (young)	4.250e−11	8.615e+03	0.000	1.000
gender (m)	1.972e+01	6.269e+03	0.003	0.997
age (young) * gender (m)	−9.445e−01	8.615e+03	0.000	1.000

Analysis of Pillai score size via ANOVA:

	df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.00066	0.000659	0.0193	0.89043
gender	1	0.02471	0.024710	0.7238	0.40164
age*gender	1	0.19149	0.191488	5.6090	0.02451 *
residuals	30	1.02419	0.034140	–	–

4. [ɛ]
Analysis of number of speakers with significant contrast via generalized linear model:
AIC: 36.057, Null dev.: 28.395 on 33 df. Residual dev.: 28.057 on 30 df.

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	−1.9459	1.0690	−1.820	0.0687 .
age (young)	−0.1335	1.5059	−0.089	0.9293
gender (m)	0.5596	1.3296	0.421	0.6738
age (young) * gender (m)	−0.2719	2.0148	−0.135	0.8926

Analysis of Pillai score size via ANOVA:

	df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.00021	0.000209	0.0047	0.94578
gender	1	0.03631	0.036309	0.8179	0.37299
age*gender	1	0.14174	0.141743	3.1931	0.08406 .
residuals	30	1.33170	0.044390	–	–

5. [u]
Analysis of number of speakers with significant contrast via generalized linear model:
Null, no speakers with significant differences
Analysis of Pillai score size via ANOVA:

	df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.00772	0.007723	0.1856	0.6697
gender	1	0.00066	0.000658	0.0158	0.9008
age*gender	1	0.00256	0.002557	0.0614	0.8059
residuals	30	1.24854	0.041618	–	–

6. [ʊ]
Analysis of number of speakers with significant contrast via generalized linear model:
AIC: 25.959, Null dev.: 24.630 on 33 df. Residual dev.: 17.959 on 30 df.

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	−19.57	3802.12	−0.005	0.996
age (young)	18.87	3802.12	0.005	0.996
gender (m)	17.37	3802.12	0.005	0.996
age (young) * gender (m)	−36.24	5565.73	−0.007	0.995

Analysis of Pillai score size via ANOVA:

	df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.21519	0.215189	4.6601	0.03900 *
gender	1	0.00531	0.005310	0.1150	0.73690
age*gender	1	0.27568	0.275680	5.9701	0.02065 *
residuals	30	1.38531	0.046177	–	–

7. [o]
Analysis of number of speakers with significant contrast via generalized linear model:
Null, no speakers with significant differences
Analysis of Pillai score size via ANOVA:

	df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.006073	0.0060734	1.0513	0.3134
gender	1	0.005917	0.0059170	1.0242	0.3196
age*gender	1	0.010886	0.0108861	1.8844	0.1800
residuals	30	0.173309	0.0057770	–	–

8. [a]
Analysis of number of speakers with significant contrast via generalized linear model:
AIC: 26.049, Null dev.: 20.294 on 33 df. Residual dev.: 18.049 on 30 df.

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	−1.9459	1.0690	−1.820	0.0687 .
age (young)	−0.1335	1.5059	−0.089	0.9293
gender (m)	−17.6202	3400.7177	−0.005	0.9959
age (young) * gender (m)	17.9078	3400.7180	0.005	0.9958

Analysis of Pillai score size via ANOVA:

	df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.00063	0.0006268	0.0441	0.8351
gender	1	0.00332	0.0033152	0.2332	0.6327
age*gender	1	0.00159	0.0015921	0.1120	0.7402
residuals	30	0.42647	0.0142157	–	–

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