

AN EMPIRICAL STUDY OF LANGUAGE USE AND CODE-MIXING IN AMIS

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Abstract

This study investigates Amis language use and Amis-Chinese code-mixing using naturally occurring data and inferential statistics. The results indicate that there is a statistically significant difference between age and language use. The younger an Amis person is, the less Amis he or she speaks. This shift becomes apparent from the birth cohort of 1961 to 1970, and their language ability in Amis and their frequency of speaking Amis sharply deteriorates as age decreases. Among all types of code-mixing defined by Muysken (2000), insertion is the most common among Amis-Chinese bilinguals, irrespective of their age or generation. This is typical for two typologically different languages as Amis and Chinese. The insertion of Chinese into Amis structure is more prevalent than inserting Amis into Chinese structure, and a significant difference is found between age and preferred structure. The most typical elements used in noun phrases referring to things, followed by name, time, and kinship.

Keywords: code-mixing, language contact, sociolinguistics

ISO 639-3 codes: ami, cmn

1 Background

1.1 Code-mixing research

¹*Code-mixing* (CM hereafter) is the alternate use of two languages within a sentence (intra-sentential) or between sentences (inter-sentential), a practice observed among bilingual individuals. Since the inception of CM research, CM rapidly has become a focal point of scholarly interest, generating a flurry of research.

Explorations of the social aspects of CM have also been undertaken by means of a diverse number of methodologies, and from a variety of perspectives with a particular emphasis on bilingual communities worldwide. Sociolinguistic descriptions of CM illustrates language use patterns within the bilingual community for which that language pair is studied, enabling a close examination of functions (e.g., Gumperz 1982; McClure and McClure 1988; Nishimura 1997), purposes (e.g., Myers-Scotton 1983, 1993, 1998), language proficiency, diglossia (e.g., Myers-Scotton 1986), among others, of two languages either within a community (e.g., Singh, 1983) or between communities (e.g., Poplack 1988). This study focuses on language use, CM, and age in a community that is not a commonly studied immigrant or colonial community but a less studied group—an aboriginal group socially incorporated into the mainstream society.

¹ This study refers to code-mixing, instead of code-switching, for a few reasons. To some scholars (e.g., MacSwan, 1998), code-switching refers to intra-sentential code-switching without any phonological incorporation. In his definition, the Amis phrase '*ci chénātáng-an*' PPN *chénātáng*-DAT 'At Chénātáng place' is not a case of code-switching because the coda *-ng* of Chinese N *chénātáng* is phonologically incorporated with the Amis suffix *-an*. Thus, to avoid the controversy over code-switching, this study uses code-mixing to cover examples that mix two codes in their speech.

CM was initially viewed, particularly in the early days of research, as an indication of insufficient language proficiency in one language among bilinguals. However, CM is a speech behavior that can be observed among bilinguals of virtually all kinds, such as early bilinguals, late bilinguals, and even second-language learners. Thus, as suggested by Bullock and Toribio (2009), CM should be viewed “as a measure of bilingual ability, rather than deficit” (p. 9). In fact, Poplack (1980) has proposed that CM, especially intra-sentential CM, demands a bilingual’s sophisticated morphosyntactic knowledge of two languages. In her research, if an individual’s bilingual proficiency is imbalanced, he or she is more likely to make a tag-like switch, whereas those with seemingly equal bilingual proficiency are inclined to engage in intra-sentential CM. Similar effects have also been tested among third-generation immigrants who speak the dominant language more frequently (Bolonyai 2009). It is often the case that lexical insertion and tag-switching are the top two CM types among third-generation immigrants when they code-switch from their dominant language to their heritage language (Bolonyai 2009).

Muysken (2000) and Deuchar et al. (2007) also found that, among three types of CM patterns, insertion is often found among imbalanced bilinguals, especially those more fluent in their first language. Alternation is frequently observed among balanced bilinguals in stable bilingual communities, and congruent lexicalization is commonly seen among second-generation immigrants who are fluent in both languages.

Insertion, Alternation, and Congruent lexicalization are three intra-sentential CM patterns proposed by Muysken (1997, 2000). According to Muysken’s (1997, 2000) definition, insertion often involves embedding one unit in a language into a structure of another language, while alteration entails a switch in both grammar and lexicon from one language to another within one sentence. (1) and (2) are demonstrative examples.

Insertion

- (1) English-Spanish (Muysken 1997:361)
Yo anduve *in a state of shock* pa dos días
‘I walked in a state of shock for two days.’

Alternation

- (2) English-Spanish (Muysken 1997:361)
Andale pues *and do come again*.
‘That’s all right then, and do come again.’

In (1), a prepositional phrase in English is inserted into a Spanish sentence. On the other hand, in (2), the first clause is in Spanish, whereas the second clause, as well as the coordinating conjunction, is in English.

Congruent lexicalization refers to a switch inside a shared grammatical structure or unit. Congruent lexicalization is more likely to occur in language pairs sharing similar typological properties (Deuchar, Muysken, and Wang, 2007). (3) is one such example; both Spanish and English share the parallel PP structure in which ‘for the’ can be either in English or *pa’el* in Spanish.

Congruent lexicalization

- (3) English-Spanish (Muysken 1997:366)
Yeah, but I buy ‘em mostly *pa’el* hamburger meat.
‘Yeah, but I buy ‘em mostly for the hamburger meat.’

In (3), Muysken (1997) admits that sometimes the lines among alteration, insertion, and congruent lexicalization are blurry. Therefore, Muysken (1997) lists several diagnostic criteria to classify these three patterns. Readers who are interested can refer to Muysken (1997:373).

1.2 CM Studies in Formosan languages

In Taiwan, the multi-lingual situation in Taiwan has permitted a good deal of research on CM. Typically, language/dialect pairs are centered on interactions among or between varieties of Chinese, including Mandarin, Southern-Min, and Hakka. CM involving the Formosan languages and any of those three languages/dialects has often been a marginal part of other linguistic research. For instance, Chang’s (2010) extensive survey of phonological changes on Hakka dialects in the Four Stream Basin area, due to

dialect/language contact, found that when Saisiyat people code-switch to Hakka, aspirated stops are often pronounced as non-aspirated counterparts.

One of the earliest studies dedicated to the sociolinguistics of Formosan languages was conducted by Saillard (2006). Her research studied observations, tape recordings, and interviews of aboriginal people's language usage in two hospitals in Hualien City, Taiwan. Regarding language proficiency among aboriginal people, she noted that age matters. Saillard found that in general, the younger an aboriginal employee is, the less frequently he or she speaks Amis, the fewer words he or she knows, and the more he or she simplifies the morphological and phonemic structures of their native languages.

CM is found in Saillard's (2006) research sites and her interviews. One CM example is the phrase *truku-hua* "Truku language/speech", which Saillard (2006) believes to be evidence of aboriginal people classifying their language to a lower hierarchical position, since *hua* 話 'language/speech', in Chinese "is often associated with names of places or peoples and designates a language that has neither writing system nor social prestige, with a geographically or socially restricted realm" (2006:621). However, there are only a few CM examples in Saillard's (2006) paper, making it challenging for other researchers to make further inferences about Formosan languages and CMs based on the limited amount of data in her study.

1.3 Research of language use in Formosan languages

Since the 1990s, there has been an increase of attention, both politically and socially, of Taiwan's native cultures, drawing attention to Taiwan's native cultures. This trend has raised public awareness of the endangerment of Formosan languages, leading to a surge of research into the language vitality of these languages by linguists and ethnologists. Native language proficiency among Formosan people, especially Formosan youth, has become a major concern of educators and researchers. Results of most studies, unfortunately, are far from optimistic. Below, just a few findings are provided, though there are more.

Huang (1988) conducted a language survey among Formosan young adults who attended colleges/universities in Taipei and reported that 31% of young adults at that time did not speak their native languages. Even when these young adults get married within their own ethnic group, the rate of language loss for the next generation is still projected to be 47.6%. Huang (1993) predicted that Formosan languages in Taiwan were already on the path to becoming moribund. Similar pessimistic reports can also be found in studies of individual Formosan languages. Rau (1995) studied language attitude, language proficiency, and the use of Yami. She (1995) revealed that among Yami young adults (those aged 40 or below), when speaking to elders, only 10% spoke Yami exclusively, while more than 50% used a mix of Yami and Chinese in their daily life, and roughly 30% spoke Chinese only.

A study conducted by the Administrative Yuan in 2010 (cited in Chen (2017)) demonstrated a worrisome language use pattern among Formosan groups. It was found that over 70% of Formosan children aged 6 to 14 years old did not use their aboriginal languages, and approximately 50% of those aged 15 to 44 still used their mother tongue. In a recent comprehensive study funded by the Council of Indigenous Peoples and conducted by Shih-Hsin University (2016), it was revealed that overall, 64.62% of Formosan people self-reported speaking their native language in their daily life. They spoke their native languages most frequently at home, followed by at tribal gathering places, festivals, tribal recreation centers, and then in churches or religious temples. Additionally, the older the speakers were, the more they spoke their own native languages. Specifically, 92.71% of Indigenous people above 60 years old still spoke their mother tongue, whereas only 39.40% of those less than 10 years old still used their native language. On average, female Formosan speakers spoke their native languages more frequently than their male counterparts.

The Indigenous Languages Research Development Foundation conducted several in-depth surveys on Formosan people's language proficiency, use, and preservation. A survey of residents of the Tjubar tribe in Taitung, Taiwan (Tung 2019) revealed that levels of language skills (listening, speaking, reading, writing, and translation) varied with age. Speakers aged from 10 to 29 were less proficient in their first languages in all aspects of language skills. Those aged 30 to 49 and 50 to 69 were good at listening and speaking but less proficient in reading, writing and translation. Elders aged 70 years old and/or above were proficient in listening, speaking, and translation but not as proficient in reading and writing.

1.4 Proposed study

One implication of these studies on native language use of Indigenous people in Taiwan is the increasing use of Chinese or Taiwanese in daily life. There have been many self-reported surveys and some studies using

experimental heritage language proficiency tests, such as those of Rau (1995) and Chen (1997), to assess heritage language proficiency and its changes. However, to present levels of language proficiency based solely on self-reporting could be somewhat problematic. Gumperz emphasizes that “attempts to elicit such self-reported information on bilingual usage regularly show significant discrepancies between speakers’ descriptions of their own usage and empirical studies of tape-recorded texts” (1982:62). Thus, this study intends to investigate language use of Amis speakers using naturalistic data. The results can provide either supporting evidence or counterevidence for what has been agreed upon regarding language proficiency and CM types, from a group of minority people who are not immigrants, but rather aboriginal natives.

Therefore, the goals of this paper are twofold. First, this paper aims to re-examine self-reported results with empirical data. Second, the data can be used for future research. Chinese and Amis are two languages with extremely distinct structures. They differ from each other in a variety of morphosyntactic aspects, such as word order, DP, case-assignment, forms of adverbials, etc. Investigating a pair of languages, neither of which are Indo-European and which are typologically quite different from each other, may provide additional insights for CM research.

This is an empirical and statistical study of Amis language use and Amis-Chinese code-mixing undertaken in Taitung, Taiwan, from 2014 to 2016. This study intends to provide a descriptive and statistical account of language use and code-mixing phenomena in an Amis family. The precise research questions are as follows:

- (1) What language is or languages are spoken by Amis people of different ages? What is the percentage or what are the percentages of the language(s) they speak?
- (2) Where, in terms of morphosyntactic environment, do Amis speakers frequently engage in CM? If a switch occurs within a morphosyntactic unit, which language’s grammar is applied? Are there any differences among these three generations? What types of CM are often found in Amis-Chinese CM? Are there specific types of CM associated with a specific age range?

2 Methodology

2.1 Data collection

The data for analysis includes a digital recording and a survey of participants’ background. The digital recording took place in 2014 during a ²family gathering. The researcher first consulted with an Amis family whom the researcher has known for years to obtain consent and willingness. The family agreed with the recording and suggested that it take place during a funeral, specifically on the night before the cremation, when most family members, both close and distant, would gather together. On that day, virtually all family members and many friends of the deceased attended the event and were informed that their conversations would be recorded after dinner. Both the researcher and the participating family decided to place the recorder on a table outside the family’s house in the tribe. Some participants sat at the table, some stood beside the table, and others pulled a chair to sit next to the table. Some participants stayed for a long time, while others came but left shortly, and some just walked by. The recording captured unstructured conversations, and all people who came for the funeral were free to join or leave the conversation. In total, 48 speakers were identified in the recording.³ The recording lasted for one hour and four minutes and was transcribed and glossed with the help of a native speaker who also participated in the recording. The Amis instructor, being familiar with all participants, assisted the researcher in identifying the proficiency levels of the participants. In this recording, 1,730 identifiable utterances were transcribed. All utterances were first keyed onto an Excel file and then converted into the Statistical Package for Social Science (SPSS) for further analysis.

² The location of this family gathering is in Cinanuka (village), Taitung, Taiwan. The dialect is Hai-an (Costal) Amis, which belongs to central Amis.

³ There are 51 speakers in the recording. However, three of them were excluded because their age information was non-identifiable. In total, they contributed 10 utterances in the recording and these utterances are also excluded.

2.2 Participants

There were 51 speakers involved in this recording, spanning different age groups from youths born after 2010 to those born before 1950. The participants were categorized by the decade in which they were born. Refer to Table 1 for further details. It is important to note that in this study, there is a significant age difference between the first and the last members of the same generation. The youngest member of one generation is even younger than the oldest member of the other generation.

Table 1. Participants by age

Decade of birth	Number of Participants
1941-1950	7
1951-1960	12
1961-1970	14
1971-1980	6
1981-1990	1
1991-2000	6
2001-2010	1
2011-2020	1
Not identifiable	3
Total	51

3 Results and Discussion

3.1 Language use by age

A significant number of Formosan people, especially young individuals, no longer speak their mother tongue. This fact has been demonstrated in numerous language use surveys. The data presented here also supports this finding; more precisely, this sharp decrease is exhibited among those born from 1961 to 1970. In Table 3, it is shown that individuals born before 1960 are still able to maintain their Amis-speaking ability for approximately 70% of the time. However, the percentage of Amis utterances plunges to only 33% among those born between 1961 and 1970, and this percentage continues to fall as age decreases. A Chi-Square test was performed, revealing a statistically significant relationship between age range and language use, $X^2(12, N=1730)=530.47, p=.000$.

Table 2. Numbers of Utterances by Language

Participants	All Amis	All Chinese	CM	Chi-Square X^2
1941-1950 (N=556)	411 (74%)	95 (17%)	50 (9%)	530.47***
1951-1960 (N=532)	386 (72%)	84 (16%)	62 (12%)	
1961-1970 (N=390)	128 (33%)	224 (57%)	38 (10%)	
1971-1980 (N=120)	34 (28%)	71 (59%)	15 (13%)	
1991-2000 (N=3)	0 (0%)	3 (100%)	0 (0%)	
2001-2010 (N=123)	2 (2%)	120 (98%)	1 (<1%)	
2011-2020 (N=6)	0 (0%)	6 (100%)	0 (0%)	
Total ⁴ 1730	961	603	166	

Note: the significant level is .05. * if $p<.05$; ** if $p<.005$, *** if $p<.001$.

In this study, according to the Amis helper, participants born after 1991 lived with their grandparents in tribes before they went to elementary school in cities, and some even went to elementary school in or close to the tribe. In addition, they all passed beginner or intermediate levels of the proficiency test of aboriginal

⁴ This study counted the number of utterances by using natural syntactic boundaries, falling inflections, and pauses, with consideration of their interpretation in context. Thus, a NP response to a question is counted as one utterance. If the meaning of an incomplete utterance is recoverable in the context, it is also included. The size of an utterance in this study is not defined either in CP or TP.

languages. In other words, these young people can comprehend or speak Amis to some degree. However, there are only two Amis utterances, all single-constituent ones, made by these young people, shown in (4) and (5).

- (4) ⁵Akon-an
Grandfather-DAT
'At grandfather's place.'
- (5) Caho
NEG
'Not yet.'

Also shown in Table 2, most code-mixing utterances were made by those who were born before 1980. The percentage is quite consistent, roughly 10%, for participants born in four different decades. The youths who were born after 1990 barely code-mix at all. Considering their upbringing, it is possible to assume that they may not be fluent in both languages or that they feel uncomfortable speaking Amis. As a result, they prefer and choose to speak Chinese most of the time.

The preference of the young generation also influences the language choice of the elders. Tung (2019) indicates that elders often give up speaking their family language to their grandchildren or children because those of the younger generation can only speak Chinese, or their listening comprehension of their family languages is extremely low.

In this study, it can be seen that Amis-Chinese bilinguals, regardless of age, tend to switch to Chinese when the younger speakers join the conversations. Below is a script of a conversation among participants born between 1941 to 60, and a teenager, born between 2001 to 2010. The conversation was initiated by the teenager in Chinese. The following sentences, produced by his older relatives, were also in Chinese. The discussion only returned to Amis when one of the speakers became impatient with their conversations.

Speaker	Utterance
Male: 2001-2010	<i>Wóde lǎoshī shì hēn dào dìde...</i> 'My teacher is a genuine...'
Male: 1941-1951	<i>Nǐ jǐnián jí le?</i> 'What is your grade?'
Male: 1951-1960	<i>Yī nián jí?</i> 'The first grade?'
Male: 1941-1951	<i>Guó zhōng yī nián jí</i> 'The first year of junior high?'
Male: 1951-1960	<i>Wǔ nián? Nǐ nàme kuài shēng wǔ nián jí</i> 'The fifth year? So fast, you were in the fifth grade.'
Male: 1951-1960	<i>Nǐ yīniánjí yǒu méi yǒu dú</i> 'Have you studied in the first grade?'
Male: 1951-1960	<i>Yǒu?</i> 'Yes?'
Male: 1951-1960	<i>Wǒ huán yǐwéi nǐ yǒu bǐjiào gāode</i> 'I thought you are taller.'
Male: 1941-1950	<i>Yīnwèi chéngjī hēn hǎo, tiàogāo</i> 'Because (his) high jumping performance is good...'
Female: 1961-1970	<i>Tiàogāo.....xiàng māo yīyàng</i> 'Jumping high, like a cat.'
Male: 1951-1960	<i>Wǒ hái yǐwéi nǐ hái yīniánjí yé</i> 'I thought you are still a first grader (of junior high).'

⁵ The list of glossing abbreviations in this paper: ASP: aspectual marker; AV: actor voice; CN: common-noun marker; DAT: dative; FAC: Factual marker; LNK: linker; NEUT: neutral marker; NOM: nominative; NEG: negator; PL: plural; PPN: proper name/place marker; POSS: possessive; Q: interrogative marker; UV: undergoer marker.

Speaker	Utterance
Male: 1951-1960	<i>Wú nián jí le tā</i> 'He is already a fifth grader.'
Female: 1951-1960	Ca'esan! (Showing impatience)

To accommodate young people's language choice is, of course, not the only factor contributing to an elder's choice of spoken language. Elders also speak Chinese from time to time when speaking to people of their age without any young children engaging in the conversation. Moreover, they may switch to Chinese when someone changes the language of the topic under discussion.

Below is a set of conversations regarding what to eat for lunch the next day. Initially, the participants spoke in Amis. Then, a participant made a proposal in Chinese, so many subsequent utterances were in Chinese.

Speaker	Utterance
Male: 1941-1951	mitafukul tu kita tu sakalahok 'We can fish for lunch.'
Male: 1941-1951	tafukud han nudafak cira '(Let's) cast net tomorrow.'
Male: 1941-1950	Ira ho ku payci nu ngasaw 'The family still has money.'
Male: 1941-1950	<i>Yòng mǎide jiùhǎo le ā</i> '(We can) just buy it.'
Male: 1941-1950	<i>Yīyàng shì wúguōyú ā</i> 'The same thing, Tilapia.'
Male: 1951-1960	<i>Lùchá wǒ chū hāobùhǎo</i> 'I can pay for green tea, OK?'
Male: 1941-1950	<i>yě kěyǐ ā</i> 'Also, OK.'
Male: 1951-1960	<i>Míngtiān</i> 'Tomorrow.'
Male: 1941-1950	<i>Hǎo, wǔbǎikuài éryǐ</i> 'OK, only 500 dollars.'

One possibility is that the age hierarchy system in Amis may explain the percentage of conversations observed in this data set. One reviewer of this article indicated that in Amis culture, a strict age hierarchy system still exists where elders tend to dominate conversations, especially during major tribal events, and younger speakers may simply respond. This, according to the reviewer, could account for the unequal percentages of conversations across different age ranges observed in this data set.

Another possible explanation for the imbalance in engagement could be the different degrees of engagement of participants. The participant who assisted the researcher in placing the recorder recalled that young Amis speakers may stop by briefly but are less likely to stay and engage with the elders, as they may feel more at ease staying with people of their ages and prefer to speak Chinese. However, due to the limitations in the data collection method, the researcher was unable to fully identify the presence and engagement of all participants. It remains unclear whether the imbalance in engagement is solely related to the age hierarchy, as indicated by the reviewer, or if it is influenced by the limited presence of young people in the recording site. To further explore these possibilities, additional research with a different approach is needed. A more comprehensive study that takes into account the age hierarchy system as well as the presence and engagement of participants may shed light on the factors contributing to the observed patterns of language used in the dataset.

3.2 Code-mixing patterns in Amis

3.2.1 Types of CM

In the data sample, Amis-Chinese bilinguals engaged in code-mixing. As observed in Table 3, the majority of code-mixing utterances were produced by those who were born before 1980. The percentage remains quite consistent, at roughly 10%, for participants born in different decades, except for youths born after 1990. Furthermore, this study categorizes the CM instances based on Muysken's (2000) research into insertion, alternation, and congruent lexicalization. Table 4 presents the frequencies of these three types of CM by participants' age range. No significant difference was found between age and types of CM when analyzed by means of a Chi-Square test, $X^2(8, N=166)=2.76, p=.95$. Thus, it is concluded that insertion is the most common type of CM for all participants regardless of their age. At least over 70% of CM occurrences are insertion, followed by alternation, and congruent lexicalization comes in last.

Table 4. Frequency of CM by age

Age/Type of CS	Insertion	Alternation	Congruent Lexicalization	Chi-Square X^2
1941-1950 (N=50)	36 (72%)	13 (26%)	1 (2%)	2.76
1951-1960 (N=62)	48 (77%)	13 (21%)	1 (2%)	
1961-1970 (N=38)	28 (74%)	8 (21%)	2 (5%)	
1971-1980 (N=15)	12 (80%)	3 (20%)	0 (0%)	
2001-2010 (N=1)	1 (100%)	0 (0%)	0 (0%)	
Total	125	37	4	

Note: The significant level is .05. * if $p<.05$; ** if $p<.005$, *** if $p<.001$.

Among 125 CM insertions, 109 are insertions of Chinese constituents into Amis, while 16 are insertions of Amis into Chinese. A Chi-Square test signals a significant relationship between types of CM and age, $X^2(4, N=125)=10.35, p=.035$. The Amis morphosyntactic framework is used more often by the older Amis. Though we do observe a difference, there are not many code-mixing cases made by people born after 1971. This renders it difficult to formulate a robust conclusion that there is a strong tendency for the increasing preference of inserting Amis into Chinese as ages of speakers decrease. See Table 5 for details.

Table 5. The frequency of switched language by age

Age/CS language	Inserting Chinese into Amis	Inserting Amis into Chinese	Chi-Square X^2
1941-1950 (N=36)	31 (86%)	5 (14%)	10.35*
1951-1960 (N=48)	45 (94%)	3 (6%)	
1961-1970 (N=28)	24 (86%)	4 (14%)	
1971-1980 (N=12)	9 (75%)	3 (25%)	
2001-2010 (N=1)	0 (0%)	1 (100%)	
Total	109	16	

Note: The significant level is .05. * if $p<.05$; ** if $p<.005$, *** if $p<.001$.

3.2.2 Type of Insertion

In this study, the majority of the insertions involve mixing a noun from the other language; 103 out of 125 insertions are nouns. The evidence shows that common objects, such as 'cellphone', 'telephone', 'red envelope', and such, which are common loanwords, dominate the insertion types. Additionally, some modern inventions, such as 'face masks' and 'screen door', were not part of the Amis lexical inventory, leading to their borrowing from Chinese as well (examples 6 to 8). However, one must note that not all insertions for objects are due to borrowing. In (9), there is an Amis counterpart for 'shoes', but the speaker still uses that Chinese word in an Amis sentence.

- (6) Hay! Alatepongay saan k-u *shā chuāng*⁶
 Yes, broken say so NOM-CN screen door
 ‘Yes, there are a lot of holes on the screen door.’
- (7) Ma-’emin-ay k-u *kǒu zhào*
 UV-finish-FAC NOM-CN mask
 ‘There is no mask.’
- (8) Hai, awa-ay k-u *yíng mù*
 Yes, NEG-FAC NOM-CN screen.
 ‘Yes, there is no screen.’
- (9) *xiēzi* san kyami c-i *mā ma*
 Shoes say so this NOM-PPN mother
 ‘Mother said, shoes.’

CM of names is the second most frequent type. Many participants agreed that they would switch to a Chinese name if the person called upon does not speak much Amis or if there is only a loose relationship between them. On the other hand, when there is a strong sense of solidarity or if the person is fluent in Amis, they would feel more intimate and use an Amis name even in a Chinese utterance, as in (11). This preference contributes to a considerable number of instances of CM in names.

- (10) Mi-maan c-i *ā-róng*
 Where NOM-PPN A-Rung
 ‘What is A-Rung doing?’
- (11) *jiào* Afay *lái*
 Call Afay come
 ‘Ask Afay to come.’

Switches relevant to time, such as hours, days, weeks, months, and the like, are common and are ranked third in frequency of insertion. In the recording, there are only a few temporal expressions in Amis, most of which are not complex constituents but single constituent units, as in (14).

In over 1,700 utterances, there is not one insertion of an Amis temporal expression in a Chinese structured utterance. It is possible to see an Amis utterance in which there is a temporal expression in Amis, a Chinese utterance in which there is temporal expression in Chinese, and a Chinese temporal expression in an Amis structured utterance.

One reviewer of this article provided a structural explanation using the concept of the Matrix Language Frame Model (MLF, See Myers-Scotton (1993)). When the matrix language is Chinese, the typical temporal expression position is not where the Amis temporal expression tends to appear. However, this suggestion is insufficiently explanatory; in instances where the matrix language is Amis, the typical position for temporal expressions in Amis is still not where Chinese temporal expressions tend to be placed. However, even in these cases, participants still prefer to fill that position with Chinese temporal expressions. Overall, there is a preference for using Chinese temporal expressions in Amis sentences even when they differ in their typical syntactic structures.

- (12) Kara-’ulad k-u-na *shíyuè*
 Likely to-rain NOM-CN-this October
 ‘It will rain a lot this October.’

⁶ In this study, Chinese is presented in italic form.

(13) *Liù diǎn -ay san kami*
 Six o'clock-fac AV.SAY 1S.PL.NOM
 'We will take the six o'clock one (train).'

(14) *Tay:ra=tu rumi'ami'ad*
 AV.go=ASP everyday
 '(They) go (there) everyday.'

Indeed, the use of Chinese kinship terms in Amis utterances reflects the borrowing and extensive incorporation of these terms into the Amis language. The linguistic phenomenon is evident in (15) and (16), similar to (9), where kinship terms are spoken in Chinese even within Amis syntactic structures.

(15) *Caay! su'elin a gē ge*
 NEG NEUT.real LNK brother
 'No, to be honest, brother.'

(16) *Cuwa ca gūgū ka?*
 where PPN-PL aunt Q
 'Where are aunts?'

In some cases, there are insertions where a Chinese noun is affixed with an Amis voice marker to derive a verb/predicate, as seen in (17). In Amis, it is possible to derive a verb from a noun with an affix of a voice marker. This practice can also be observed in Amis-Chinese CM. This implies that word-internal code-mixing is possible in Amis-Chinese. Common types of combination include a Chinese noun or verb merged with an Amis voice marker (17 & 18), a nominalizer *-ay* (13 & 19), and a locative suffix *-an* (20). It is questionable whether these instances of word-internal CM can be categorized as code-switching in a strictly defined sense. When a Chinese noun or verb is merged with an Amis suffix, regardless of its function, the final coda of the Chinese noun or verb is phonologically incorporated with the onset of the Amis suffix. For example, in (20), the Amis dative marker *-an* is not independently pronounced but modified by the neighboring consonant *-ng* from Chinese. This type of code-mixing demonstrates the intricate interplay and blending of linguistic elements between Amis and Chinese in the context of word formation.

(17) *mi-yùn dòng huì cangra nucira*
 AV-sports meeting 3P.NOM next.time
 'They will go to the sports meeting soon.'

(18) *Kami satu mi-shōu*
 2P.NOM SATU AV-tide.up
 'We do the clean-up.'

(19) *K-u-ra mi-chǎonào*
 NOM-CN-that AV-quarrel
 'The one who is making a noise.'

(20) *Ira c-i chénātáng-an*
 exist NOM-PPN Chén,ātáng-DAT
 'At Chénātáng's place.'

Regarding the grammatical roles of insertions, the majority of them are located in nominative case-marked noun phrases. The next most common grammatical roles for insertions are predicates, including verbs, nominal predicates, and adjective predicates. On the other hand, insertions in Dative, Locative, or Temporal phrases (complement or adjunct) are relatively rare, with only a few instances observed.

One reviewer of this article hypothesized that utterances by speakers of younger generations may account for the bulk of insertions in grammatical positions other than subjects or adjuncts since they are

expected to respond to elders in their society. However, this tendency was not observed in this study. When looking at the cross table of grammatical roles of insertions and age, it becomes evident that insertions in NPs in nominative positions are the most common type, regardless of age groups.

Table 7. Frequency of grammatical roles of insertions by age

	1941-1950	1951-1960	1961-1970	1971-1980	2001-2010
Nominative	18	24	15	4	1
Genitive	2	2	1	1	0
Dative	1	3	3	1	0
Locative	2	3	1	1	0
Temporal	4	3	0	1	0
Predicate	7	12	4	3	0
C Domain	2	1	2	1	0
Function/ Conjunction	0	0	2	0	0

After examining the only case of CM in dative or complement position made by those born after 1971, it becomes evident that this insertion into complements is used to provide more precise information, rather than a response. This conversation took place while a group of people were trying to get access to free WIFI.

Speaker	Utterance
Female: 1961-1970	<i>Nǐ kān nàbiān yǒu wǐfī bù yòng qián de</i> 'You go there to see whether there is free WIFI.'
Female: 1961-1971	<i>Wā! Méiyǒu mìmdě</i> 'Wow! No password needed.'
Male: 1961-1970	<i>mǎshàng jiù yǒu le</i> 'Got it instantly.'
Male: 2001-2010	<i>Tā bù huì</i> 'He doesn't know (how to use it).'
Female: 1971-1980	<i>Qù zhǎo yìqíangde mama lā</i> 'Go to find Yiqiang's mother.'
Female: 1971-1980	<i>Tā jiao Afay</i> 'She's called Afay.'

3.2.3 Cases of Alternation and Lexical Congruency

In this study, there exist only a few cases of alternation and lexical congruency. Alternation is a type of code-mixing involving a switch in both grammar and lexicon from one language to the other within a sentence. These instances of alternation often occur at clausal boundaries as demonstrated in (21) to (23). In (21), two clauses, the first one in Amis and the second one in Mandarin, are conjoined without a coordinating conjunction, which, according to Liu (2003), is not used in Amis. In other words, in (21), the second clause in Chinese is connected to the first clause in Amis without a spoken coordinating conjunction. In (22), there are two clauses, one in Amis and the other in Chinese, connected by a Chinese coordinating conjunction. In (23), the independent clause is in Chinese, following Chinese structure, while the subordinate clause is in Amis. These examples portray a pattern where one clause contains words from one language, and its structure follows the grammar of that language. Then, after a conjunction, either visible or not, the second clause is switched into the other language, in both words and grammar.

- (21) Maru maru tini nǐ hē nǐde
 sit sit here 2S.NOM drink 2P.POSS
 '(You) sit here and drink yours.'

- (22) Kara'ulad ku rumiad *kě shì* *méi* *yǒu*
 KA-rain NOM-CN morning but no have
 'It is likely to rain in the morning, but it does not.'
- (23) Mahalek t-u mi-ninguy *hái* *yào* *dǎ qiú*
 UV-finish DAT-CN AV-shower still want play ball
 'Still want to play ball after showering?'

Congruent lexicalization refers to a switch inside a shared grammatical structure or unit whose lexical items can be filled with either language. Due to the typological differences between Amis and Chinese, which share very few typological properties, there are only a few cases of congruent lexicalization observed in this research. (24) is one of the very few of such cases found in this study. In the absence of a locative, both Amis and Chinese use an existential construction formed as “existential verb + Pivot”. In (24), the existential verb is in Amis, while the pivot is in Chinese.

- (24) Ira *wā tǔ jī*
 exist excavator
 'There is/are excavator(s).'

(24) stands out as one of the few exceptions where a noun is not case-marked. While not a universal rule, in most cases of Chinese noun insertion, an Amis case marker accompanies it. A closer examination reveals that noun phrases, whether in Amis or Chinese, often occur without a case marker when the morphosyntactic structure of the utterance follows Chinese, a language without case marking. Nevertheless, (24) is unique; it poses a challenge in defining what guides its morphosyntactic structure, since both Chinese and Amis share the same structure.

In summary, the limited number of instances of alternation and lexical congruency in Amis-Chinese CM correspond to the few typological similarities shared by Amis and Chinese.

3.3 Discussion

This study is aimed at exploring language use and Amis-Chinese code-mixing patterns using an Amis family gathering event. Specifically, one goal is to provide answers and discussions to the following research questions:

- (1) What language is or languages are spoken by Amis people of different ages? What is the percentage or what are the percentages of the language(s) they speak?
- (2) Where in terms of morphosyntactic environment do Amis speakers frequently engage in CM? If a switch occurs within a morphosyntactic unit, which language's grammar is used? Are there any differences among the three generations in this study? What types of CM are often found in Amis-Chinese CM? Are there specific types of CM associated with a specific age range?

The findings of this study align with the results of surveys, indicating that younger Amis speakers tend to use Amis less frequently. The decrease in Amis usage accelerates significantly with each subsequent generation born one decade after another. On the other hand, elders still prefer to speak their mother tongue, Amis. Those born before 1960 maintain at least 70% of their speech in Amis when engaging in conversations with people of various ages. However, their interactions with young children or teenagers account for the major proportion of their Chinese speech.

The slump in Amis language use began to take place among people born between 1961 and 1970, a generation heavily influenced by various sociocultural factors. During this era, the introduction of television became widespread in Taiwanese households, and television programs were consistently broadcast in Chinese, exposing the younger generation to the Chinese language on a daily basis.

Furthermore, this generation entered elementary and secondary school during the implementation of the National Language Policy, which was initiated in 1973 and promoted the use of Mandarin Chinese as the official language in education and public domains. The strict implementation of this policy during their school years further increased their exposure to Chinese. Moreover, as this generation entered the workforce,

they experienced Taiwan's economic growth, leading many participants born in this decade to emigrate to cities. In urban areas, Chinese became the dominant language of communication, and these individuals were immersed in a society where Chinese was prevalent.

According to Liu et al.'s (2015) study, the lack of compartmentalization is correlated with the language shift from their mother tongue to Chinese for Kananavu and Saaroa, and this is true for Amis, too. It seems that the greatest influence of all these factors does not lie in language proficiency since people born between 1961 and 1970 were found to be fluent in both Chinese and Amis. Rather, the critical impact was on people's *choice* of language, leading to a shift in language use towards Chinese. This shift does not reverse after the termination of the National Language Policy and the launch of Aboriginal Language Policy.

The findings in this study concerning the third generation of Amis participants provide several implications. First, these individuals were raised by their grandparents in tribes before attending high school in cities, and some even attending schools close to the tribe. In addition, they are all certified as having basic or intermediate levels of proficiency in their native language by relevant language-assessment tests. However, as presented in session 3, in addition to the extremely small number of Amis utterances, the youngest generation in this study only speak Amis like the one-word stage of children's first language acquisition. There is no utterance composed of an inflected predicate, subject, and/or object. There are several implications of this phenomenon. First, growing up in tribes does not necessarily mean they can and/or want to speak their heritage language. Immersion in an Amis-speaking family may foster their listening comprehension but may have little positive effect on their desire or ability to speak their mother tongue. Rau (1995) indicates the place of residency does affect Yami young people's choice of language. This finding appears to be for Amis as well. Young Amis in this study, despite spending their childhood in the tribe, predominantly migrated to cities, which then became their primary place of residency. Even when they return to the tribe, they still choose to speak Chinese to a large extent within the tribe.

Second, the possession of a (beginner or an intermediate) certificate of aboriginal language proficiency test does not necessarily motivate speakers in the younger generation to speak their family language more willingly, nor does it accurately reflect their true capacity to use their heritage language in everyday life. In other words, merely possessing an aboriginal language proficiency certificate is not a guarantee that they will actively and confidently command their mother tongue.

In addition to language use by Amis speakers, this study also investigates their code-mixing patterns. The descriptive account shows that insertion is the most common type in Amis-Chinese CM. According to Muysken (2000), insertion is preferred between two typologically distant languages, in colonial settings, in recent migrant communities, and among speakers with asymmetric proficiency in two languages. Among all these factors listed by Muysken (2000), typological distance explains why insertion is the dominant type with cases of lexical congruency remaining rare. Amis and Chinese are typologically distant in a variety of morphosyntactic characteristics, including, but not limited to, basic word order, case marking, noun marking, among other aspects. For lexical congruency to occur, there would need to be specific environments in which both Amis and Chinese exhibit similar morphosyntactic structures, allowing for seamless switching of lexical items between the two languages. Typically, it is only possible when a noun is optionally case-marked in Amis, resembling the presentation of a Chinese noun, or when Chinese subject/topic is omissible, leaving verbs to occur initially, similar to Amis word order.

In this study, findings reveal that insertion is the preferred CM pattern across all age ranges and generations. Most elders born before 1960 have lived in the tribe for their whole lives and consider themselves more fluent in Amis; on the other hand, those born after 1961 and who migrated between cities and tribal villages tend to claim they are fluent in both languages. Those who were born after 1990 hardly speak Amis and the only demonstrated CM was also a case of insertion. Overall, regardless of generation or language fluency, all participants exhibited a similar CM repertoire. Thus, typological dissimilarities between Amis and Chinese account for the bulk of insertions and very few cases of lexical congruency.

It was also found that inserting a noun is the most common type of insertion. A lot of insertions are, in fact, words that are not in Amis lexical inventories or do not have direct equivalents and thus are borrowed from Chinese. However, Amis speakers also insert Chinese nouns that do exist in their lexicon. Specifically, nouns for time, numbers, and kinships are commonly spoken in Chinese even when there are Amis counterparts. In other words, Amis speakers prefer Chinese to Amis when speaking of these items.

A significant relationship was found between age and the inserting language structure. The study highlights that there are numerous Chinese noun insertions into Amis morphosyntactic frames by Amis

speakers born before 1980. Conversely, the youth born after 2001 are observed to hardly engage in code-mixing at all.

4 Conclusion

To summarize, younger Amis speakers tend to use less Amis and more Chinese in their speech, while older speakers maintain higher levels of Amis language use. A considerable drop in Amis language use is observed among people born after 1961, with a more profound decline among those who are younger. However, there is no significant difference between types of CM and age. Insertion is the most common type among Amis-Chinese bilinguals, regardless of their age. This is likely to be attributed to the large typological differences between the two languages. Additionally, there is a significant difference between age and the preferred language frame in which insertions take place. Insertion of nouns, especially inserting a Chinese noun into an Amis utterance, is prevalent throughout the speech data produced by elders and adults.

This study provides a statistical account of Amis language use and Amis-Chinese code-mixing using naturalist occurring data. However, due to the limitations of the data collection method, this study is unable to provide a comprehensive picture in response to relevant sociolinguistic questions, such as turn-taking, solidarity, identity, and so on. Future research with alternative approaches, such as ethnographic studies, interviews, focus groups, or participant observations, could provide a more comprehensive understanding of the sociolinguistic dynamics among the Amis people and other Formosan language groups. These methods would allow researchers to delve deeper into the social interactions, language ideologies, language attitudes, and language maintenance factors that influence language use and code-mixing behaviors. By combining quantitative data like that obtained in the current study with qualitative data from other research methods, a more holistic and nuanced picture of the Amis people's language practices and their language shift patterns can be revealed. This integrated approach would be valuable for designing effective language revitalization strategies and policies that can help preserve and promote the use of endangered languages like Amis in Taiwan.

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