Heritage speakers on the edge:

Sentence final particle usage among heritage Cantonese speakers

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List of Abbreviations

The following is a list of the abbreviations used to gloss morphemes in this thesis.

1P	first person
2P	second person
3P	third person
CL	classifier
DEL	delimitative aspect
LOC	locative
MOD	modifier
NEG	negation
PFT	perfective aspect
PL	plural
PTC	particle

Cantonese Romanization & Tone

This thesis uses of the Jyutping Romanization system for Cantonese. Consonants that may deserve special note are *z* /t͡s/, *c* /t͡sʰ/, *j* /j/, and *ng* /ŋ/. Additionally, in most dialects of Cantonese /n/ has collapsed into /l/. The vowel inventory has a phonemic distinction between long and short vowels. Long vowels are indicated orthographically with two letters. The nasal consonants /m/ and /ŋ/ can also be syllabic when they appear on their own. The tone system is denoted with the numbers 1 through 6. Tones 1, 3, and 6 correspond to a high, mid, and low flat tone. Tone 2 and 5 correspond to a mid rising contour tone and a low rising contour tone. Tone 4 is a low falling contour tone.

Abstract

This thesis investigates the use of sentence final particles (SFPs) in heritage Cantonese. Heritage speakers are early or sequential bilinguals who, in adulthood, are more proficient in the dominant language of their society than in their first, "heritage" language. Heritage speakers exhibit systematic divergence from the baseline (the language they were exposed to), a number of which can be attributed to greater trouble with certain domains.

SFPs can serve as a lens into heritage grammar. These particles, attached to the end of sentences or utterances, perform a variety of functional and pragmatic functions. Given their abundance and ubiquity in colloquial Cantonese (Leung 1992; Kong 2013), SFPs are likely to be familiar to heritage speakers. However, interpretation of SFPs is sensitive to the context they appear in; as a result, it is often difficult to pinpoint their exact meanings. Additionally, absence of SFPs generally does not affect truth conditions or grammaticality of utterances, which leads to an appearance of optionality. Given that even native speakers and highly proficient bilingual speakers have trouble with optionality of phenomena at the interface of syntax and discourse (Sorace & Serratrice 2009), heritage speakers are predicted to have difficulty matching SFPs to the context and thus misuse or omit them inappropriately.

Research on SFP usage among native speakers of Cantonese with aphasia (Kong 2013) inspired this investigation heritage speaker use of SFPs. The results confirm the prediction that heritage speakers use fewer particles on average. Though heritage and aphasic speaker perform similarly, a closer look reveals that the former have access to the full CP domain, unlike aphasic speakers (Platzack 2001). This implicates processing constraints as the culprit behind heritage speaker performance. The results also motivated a reanalysis of the particles *aa3* and *ne1*, lowering their syntactic position from "Type 2" to "Type 1".

Chapter 1: Introduction

Section 1.1: Overview

This thesis aims to investigate the use of Cantonese sentence final particles (SFPs) in a specific population of bilingual speakers, namely heritage speakers who grew up in an English-speaking environment. These speakers perform differently from monolingual native speakers of the heritage language. Interestingly, the divergences are not haphazard, but evidence principles which may be related to the language acquisition process. The purpose of this investigation is twofold: first, to gain further insight into the grammars of heritage speakers, specifically heritage Cantonese speakers; and second, to bring a novel empirical approach to the problems surrounding the structural properties of SFPs.

To accomplish these goals, the thesis will first introduce the concept of heritage speakers and briefly explore the questions associated with their linguistic performance. Afterwards will be a discussion of the structural properties of SFPs, explaining why these particles are theoretically interesting especially in relation to heritage speaker grammars. More specifically, our predictions are that heritage speakers will evidence a different pattern of usage than native speakers, due to reasons that will be explored in chapters 2 and 3. The last part of the thesis will present original research comparing heritage speaker production of SFPs to native speakers'.

Section 1.2: Background

Section 1.2.1: Cantonese

Cantonese is a variety of Chinese spoken primarily in Guangdong Province in southeastern China, as well as the Special Administrative Regions Hong Kong and Macau.

Like other varieties of Chinese, it is an isolating language with minimal inflective morphology. It is also a tonal language, with three level or flat tones (tones 1, 3, and 6), two rising contour tones (tones 2 and 5), and one falling contour tone (tone 4). Cantonese is occasionally analyzed as having 9 tones, including the three that occur with syllables with a final consonant (although they correspond to tones 1, 3, and 6).

Outside of China, Cantonese speakers make up a large part of the Chinese diaspora, both within and outside of Asia. The historical influence of immigrants from Guangdong, or Canton, can be felt in the Chinatowns that have dotted the cities of the United States since the nineteenth century (He & Xiao 2008). As one of the top-spoken languages in the United States other than English (He & Xiao 2008, citing the 2000 US Census Bureau), Chinese languages are a major part of the diverse linguistic and cultural landscape of the country.

Though immigrant families, including Cantonese immigrants, may bring their home language, over the course of a few generations, the language generally ceases to be spoken. In the intermediate stages of this process are the heritage speakers, typically the second and third generations of an immigrant family, but sometimes also young first generation immigrants, who incompletely acquire of their heritage language. These speakers exhibit unique linguistic characteristics, which will be discussed in the following section.

Section 1.2.2: Heritage Speakers

Heritage language speakers are generally defined as bilinguals who have at least passive understanding of their heritage language, but are dominant in the majority language of their environment (see Montrul 2011 for an overview of definitions). A heritage language, therefore, is a minority language in the speaker's particular linguistic environment, often

spoken only in the speaker's home environment. Heritage language speakers can be either simultaneous bilinguals, acquiring both the heritage language and the environmental language at the same time, or sequential bilinguals, acquiring one language before the other.

Heritage speakers can differ wildly in terms of their proficiency in the heritage language. Polinsky and Kagan (2007) have compared the spectrum of heritage language proficiency to the continuum of creole languages. The term heritage speaker, therefore, may refer to both highly proficient "acrolect" heritage speakers, who are most similar to the native speakers of their baseline language/dialect, as well as "basilect" heritage speakers, who have very low proficiency.

Research on heritage speakers has increased in recent years, with motivations from several different sources. On the applied level are the implications for pedagogy, due to the pedagogical challenges related to the appearance of heritage language learners in classrooms geared toward second language (L2) learners. The recognition of the differences between heritage learners and L2 learners, compounded by the variation found within heritage speaker populations, has driven researchers to investigate factors that contribute to heritage speaker proficiency and the ways that heritage grammars diverge from the baseline. By figuring out what heritage learners already implicitly know, as well as what structures are more difficult, instructors can develop curricula and pedagogical tools that address heritage learners' needs.

On the theoretical level, work on heritage language can particularly inform theories on language acquisition. By comparing heritage speakers with children and adult native speakers, researchers can determine which structures in grammar are more fragile and require more input to solidify, and which structures are acquired more readily. Additionally, heritage languages, like creole and pidgin languages, show two linguistic systems in contact, and thus

can shed light on the various principled ways in which the language contact restructures grammars.

There is a well-established correlation between a speaker's proficiency in the heritage language and the age of first exposure to the L2. For example, Montrul (2008) proposes that simultaneous bilinguals have a harder time maintaining their L1 than sequential bilinguals because the former have reduced input to the L1 before it had sufficient time to crystalize. In particular, Montrul references Anderson's (1999, 2001) study of two siblings showing that the older sibling, a sequential bilingual who had acquired some literacy in her L1 Spanish, had fewer errors in Spanish verbal agreement than her younger sibling, a simultaneous bilingual, after five years of living in the United States. Though the older sibling was only three years old at the time of immigration, she had already acquired sufficient input to reduce the impact of L1 attrition.

This idea is partially related to the CRITICAL PERIOD HYPOTHESIS, which states that innate, biologically determined abilities such as language acquisition are developed within a certain age window known as the critical period (see Montrul 2008:10-11). If the child does not have receive sufficient exposure by the end of the critical period, hypothesized to be around age 13 for language, she will not acquire full mastery of the system. For language, this could mean the lack of a structured grammatical system entirely (Curtiss 1977; Montrul 2008). Thus, heritage speakers quickly lose proficiency in the L1 once exposure to the societally dominant L2 begins and the L1 becomes confined to specific contexts, usually related to home or family. Other than the age of L2 onset, factors such as quality and amount of input in the L1, and even personality or desire to use the language also affect the adult heritage speaker's proficiency in the heritage language.

As we will see in the chapter 2, heritage speakers exhibit certain patterns of divergence from the baseline. That is, they do not perform uniformly on all aspects of grammar, with native-like performance on some aspects alongside greater difficulty with others. Of particular interest is their difficulty with integrating phenomena on the syntactic and morphological levels with the discourse. Given this, Cantonese sentence final particles may be an interesting point of investigation.

Section 1.2.3: Sentence Final Particles

Sentence final particles (SFPs) are bound morphemes attached to the end of a sentence or utterance (Matthews & Yip 2011 and others). While present in other Chinese languages, as well as Singaporean English (Smakman & Wagenaar 2013) and other unrelated languages, their high quantity and common presence in the language make them characteristic of Cantonese. Multiple sources count at least 30 unique particles in the language (Kwok 1984; S. Law 1990; Fung 2000; Wakefield 2010; Matthews & Yip 2011; Kong 2013; and others). Additionally, multiple particles can stack at the end of a single utterance (see chapter 3), and some monosyllabic particles appear to consist of two or more particles stuck together. These facts account for the long-held disagreements regarding the true number of particles.

SFPs are ubiquitous in Cantonese informal colloquial speech (Leung 1992; Kong 2013). In fact, among students in Hong Kong, SFPs make their way even into emails otherwise written entirely in English (James 2001). On the other hand, they are much less prevalent in formal speech, lending to a sense of familiarity imparted by their usage. As such, they are often said to give emotional or affective coloring to utterances (Fung 2000;

Wakefield 2010). Certain SFPs also seem to "clause type" an utterance (i.e. they indicate whether an utterance is a question, assertion, etc.), mark evidentiality, or convey other nuanced meanings related to the context and the speaker's assumptions. Thus it can be seen that they perform a large variety of functions relating to the discourse and speech context.

The semantics of SFPs is not very well understood, though not due to a dearth of attempts to explain them. Instead, it is because of their apparent optionality and strong connection to the discourse. In many cases, the omission of an SFP does not affect the grammaticality or truth conditions of an utterance, although there is a general feeling of unnaturalness (Li 2006). Rather than a clear translatable meaning, they are often equated with intonation patterns in other languages such as English (Wakefield 2010 and references therein). As such, most early studies appear to have investigated these particles from a pragmatic or discourse-related standpoint (S. Law 1990:1).

The fact that they perform roles closely related to the context means that multiple definitions exist for the same particle, sometimes varying to such degrees that they seem contradictory (Fung 2000). Those definitions often fall short of explaining the unique contribution of the particle, but merely define the flavor of the particle in a particular context. Fung (2000) for example criticizes Leung's (1992) definitions, as their meanings are often merely the meanings from other elements in the context. The difficulty in defining SFPs has led some to claim that SFPs don't have any meaning independent of their context (referenced by Wakefield, 2010, who rejects the claim). All in all, it is clear that their semantic contents are hard to capture, even with native speaker intuitions.

Section 1.3: Questions and Predictions

Given their intrinsic connection to the discourse context, SFPs are an interesting phenomenon to study with regard to heritage speakers. As chapter 3 will explore in more detail, one of the primary areas heritage speakers have difficulty with is in connecting grammatical forms to the discourse (Sorace & Serratrice 2009, and subsequent work). In particular, one might assume that heritage speakers will have difficulties in deciding whether or not to use SFPs, or in choosing which SFPs to use. This raises a question about how SFP usage may differ between heritage speakers and native speakers.

Chapter 4 presents the study conducted to investigate this question. The inspiration came in part from Kong's (2013) study of SFP usage among native Cantonese speakers with various kinds of aphasia. His results show that aphasic speakers use fewer particles than non-aphasic controls. It is predicted that similarities exist between heritage speakers and speakers with aphasia, because both exhibit deviations from the standard. Broadly, the results of the study conducted for this thesis confirm that heritage speakers diverge from native speakers in a manner apparently similar to how aphasic speakers do. However, the key claim is that this similar performance stems from separate reasons, namely that heritage speakers suffer from processing constraints whereas speakers with aphasia are generally assumed to have more systematic reasons for divergence (Platzack 2001).

Section 1.4: Roadmap

The rest of the thesis will cover the theoretical literature about heritage speakers and sentence final particles in more detail, focusing on analyses that will be crucial to understanding the results of the study. Chapter 2 will cover findings about heritage speaker

grammars and the specific domains they have difficulties with. It will also focus in part on the research that has been done on heritage Cantonese speakers, showing that investigations into heritage use of SFPs are a novel approach. Chapter 3 will switch over to a discussion of theoretical frameworks for SFPs. In particular, it looks at several syntactic structures proposed to account for their distribution and position in the clause, and touches upon a few semantic analyses to highlight the challenging task of pinpointing their meanings. Both approaches will confirm that SFPs are integrally related to the discourse structure. With these theoretical framework established, chapter 4 will present the findings of the empirical study investigating SFP usage among heritage speakers. These analyses will show that heritage speakers differ from native speakers, but not due to a principled loss of the CP domain. Rather, their performance displays processing effects due to the size and complexity of the structures involving SFPs. I will also argue for a reanalysis of the structural position of specific particles, *aa3* and *ne1*, in order to solve an apparent conflict in the data. Chapter 5 will conclude by summarizing the findings and their implications to both our understanding of heritage Cantonese grammar and of the structure of Cantonese SFPs.

Chapter 2: Heritage Speakers

Section 2.1: Introduction

This chapter focuses on linguistic domains with which heritage speakers have difficulty, or in other words the domains in which they are most likely to deviate from the baseline. As mentioned in the previous chapter, heritage speakers are bilinguals with stronger proficiency in their second language, the societally dominant language, than their first language, the heritage language. The first part of this chapter presents an overview of findings about heritage speaker grammars. In particular, section 2.2.3 highlights difficulties heritage speakers have with morphology, while section 2.2.4 focuses on the challenges presented by domains at the interface of grammar and discourse. This will form the theoretical framework necessary for the discussion of heritage Cantonese speakers.

Heritage Cantonese represents one example of the underexplored topic of heritage languages with minimal inflectional morphology. After an overview of the historical and societal space heritage Cantonese speakers occupy, we will move on by first reviewing the areas they generally have difficulties with, followed by a section which connects the research on heritage Cantonese speakers to the larger body of work on heritage speakers in general. The chapter will conclude with a discussion of the insight that sentence final particles can shed on heritage Cantonese grammar.

Section 2.2: Heritage Speaker Performance

Section 2.2.1: Causes for Divergence

Although the fact that heritage speakers diverge from the baseline is indisputable, there are questions surrounding the reason for divergence. Some effects will be due to

transfer from the dominant L2, while others can either be due to attrition or incomplete acquisition of the heritage L1. Rothman (2007) also notes that certain aspects of a typical monolingual native speaker's grammar will develop only through exposure via formal education. In the absence of formal training, heritage speakers typically do not develop representations of these aspects of grammar.

While most researchers agree that both incomplete acquisition and attrition are responsible for divergences in heritage grammars, using certain methodologies may help distinguish between effects from the two causes. For example, longitudinal studies tracking the development of the heritage language in young children can shed light on whether structures are lost or never fully developed in the first place. Referring again to Anderson's (1999, 2001) work, Montrul (2008) observes that, at the start of the observation period, the older of two siblings correctly matched the gender of nouns and adjectives in Spanish 100% of the time. However, after two years, her rate of errors had risen to over 10%. Montrul cites this as a case of attrition, where the agreement rules for gender had been established early on, but then weakened due to the sudden loss of input. Meanwhile, the younger sibling, who had not yet reached target performance before the onset of L2 exposure, experienced a much sharper drop in proficiency with gender agreement. Montrul attributes this case to incomplete acquisition, where the grammar had not had time to completely develop before acquisition was interrupted.

When longitudinal data isn't available, more indirect methods can be used to disambiguate between attrition and incomplete acquisition. Polinsky (2011) shows that comparisons of child and adult heritage speakers with age-matched native speakers can guide inferences on the cause of divergence. Specifically, if both adult and child heritage speakers

and diverge from baseline native speakers in the same way, then the feature probably was not fully acquired. Otherwise, if heritage and native speaker children pattern together, but the adult heritage speakers diverge from the baseline, then it is likely that the feature was acquired before undergoing attrition.

Section 2.2.2: Near-native Domains

Although heritage speakers display great variability in their abilities, as discussed in the introduction, certain crosslinguistic trends have emerged to help identify particularly vulnerable areas in heritage language, as well as areas in which heritage speakers are nearly identical to native speakers. In terms of the latter category, heritage speakers are said to display near-native intuitions and behavior in the core aspects of grammar, such as phonology, core syntax, and lexical semantics. These are the parts of grammar that are most likely acquired first, and in which the heritage speaker receives sufficient input to maintain. Nevertheless, even within these domains, heritage speakers may diverge from the baseline.

For example, in the realm of phonology, heritage speakers generally sound (nearly) indistinguishable from native speakers, or have an advantage over L2 learners in (re)acquiring the phonology of the heritage language (Au & Romo 1997; Polinsky & Kagan 2007). However, some differences can still be found. For example, Kupisch and colleagues (2014) present empirical findings that German-Italian and German-French heritage speakers sound more like L2 speakers to native speakers. Similarly, Godson (2004) finds that heritage speakers of Western Armenian produce the vowels /a/, /i/, and /ɛ/ more closely to native English pronunciations, due to their phonetic closeness. Additionally, heritage speakers seem to show simplification of morphophonological rules by regularizing paradigms (Vago 1991;

Montrul 2008). Thus, despite descriptions of the native-like quality of heritage phonology, it appears that the real picture is a little more complex.

As with phonology, core syntax is expected to be relatively unaffected in heritage speakers. However, effects of simplification in morphology (see section 2.2.3) can cause divergence from the baseline. For example, Russian heritage speakers who have a simplified case system tend to rely on a fixed word order (Polinsky & Kagan 2007). Indeed, they report that heritage speakers disprefer scrambling or find it outright ungrammatical. Polinsky (2011) also shows that heritage Russian speakers have trouble interpreting object relative clauses, even though they are acquired relatively early by Russian children. Instead, heritage speakers seem to have restructured their grammar to only allow subject relative clauses, following a universal tendency to privilege subjects. This convergence with crosslinguistically common patterns is not an isolated example (see section 2.3.2), hinting that heritage speakers tend to prefer what may be cognitively simpler structures. In short, even basic aspects of syntax suffer from the reduction of linguistic input in heritage grammars, an effect that is compounded even further on interfaces between syntax and discourse (see section 2.2.4).

Lexical access is also generally compromised (Hulsen 2000; Montrul 2008), with heritage speakers demonstrating a narrower lexicon confined to words used in everyday conversation and greater difficulty accessing lexical items. This isn't surprising, given that heritage speakers typically only use the heritage language at home or other intimate contexts. Additionally, the phenomenon of having a more limited lexicon and more difficult lexical access appears to be a trait common among bilinguals in general (see Bialystok 2009 for an overview). Other than these largely superficial differences, though, heritage speakers do not seem to behave too differently from native speakers in this domain. In fact, Montrul (2006)

shows that heritage Spanish speakers easily distinguish between unergative and unaccusative verbs, demonstrating robust semantic and syntactic judgments on these lexical items.

Overall, the phenomena in these primary domains of grammar seem dominated by a general need to compensate for reduced processing in the weaker language, a trait shared by most bilinguals (and which we will explore in section 2.2.4). In the sections to follow, we discuss the areas that heritage speakers are reported to have the greatest trouble with, namely inflectional morphology (section 2.2.3) and external interfaces (section 2.2.4). Through doing so, we will try to show a general picture of heritage speaker competencies and introduce some theoretical explanations for these divergences from baseline grammars.

Section 2.2.3: Morphology

Heritage speakers appear to have issues with nominal morphology. Much attention has been focused on gender agreement in languages such as Spanish (Montrul 2008, 2013) and Russian (Polinsky 2008). In both languages, monolingual children acquire gender agreement systems very early on, around age three. By adulthood, they nearly never make any errors, although young children still struggle with lexical items that have more opaque gender markings until schooling begins. In contrast, heritage speakers and L2 speakers have very high rates of errors, displaying non-target production about 30% of the time. Case agreement systems in heritage Russian are also simplified. In Polinsky's (2008) corpus of heritage Russian speakers, the unmarked nominative case replaced most instances of the accusative case and the oblique cases. The prepositional phrases appear to be fossilized, used only to establish the setting of a narrative. As mentioned above, this simplification affects other domains of grammar, such as syntax (section 2.2.2).

This simplification appears in verbal morphology as well. Polinsky's (2008) heritage speakers also showed simplified use of tense and aspect, with the adult heritage speaker switching tenses indiscriminately, attributed to the speaker's weaker processing in Russian. Montrul (2008) also details the simplification of tense, aspect, and mood morphology in heritage Spanish speakers. Specifically, heritage speakers are prone to errors in choosing between the preterit and the imperfect. They also avoid the subjunctive mood in optional situations where the subjunctive is pragmatically licensed, and even in obligatory contexts. This reflects the larger issue of non-target behavior with discourse pragmatics, discussed in section 2.2.4.

The findings so far have primarily been on languages with richer inflectional morphology than English, which is often the dominant language. This explains why there is such great focus on the simplification of inflectional morphology in heritage grammars. One may argue that this simplification is simply due to transfer from English, the dominant language. Alternatively, the parallels between heritage languages and creole languages, which tend to be morphologically sparse, suggest that morphological simplification occurs whenever two language systems are put in contact. This is one of the areas where heritage Cantonese, a language with less complex morphology than English, may provide interesting insights (section 2.3.3).

Section 2.2.4: Discourse and External Interfaces

The interface between discourse and other aspects of grammar seems to be where most issues come up for heritage speakers. Indeed, these areas are ones where monolingual

children struggle with the most, and even monolingual adults do not perform consistently on these measures (Sorace & Serratrice 2009; Sorace 2011).

One area, related in part to simplified morphology, is the overuse of the strict SVO word order. Although Russian and Spanish are both SVO languages, both also allow reordering of the subject based on pragmatic discourse rules (Montrul 2008). However, the reduced morphological paradigms in heritage grammars cause more rigid word order, making these processes inaccessible for heritage speakers.

Another related issue is the overuse of overt subject pronouns in *pro*-drop languages such as Spanish and Italian. Once again, the choice between an overt or covert pronoun is pragmatically licensed, and overuse of overt subject pronouns is often infelicitous or awkward, though not ungrammatical (Polinsky 2008). One proposed cause is transfer from English, which does not allow *pro*-drop. However, Polinsky points out that overuse of pronouns sounds awkward in English as well, and Sorace (2011) finds that even Spanish-Italian heritage speakers, who speak two *pro*-drop languages, have issues with *pro*-drop in their heritage language. These findings rule out transfer from English and hint that reliance on overt pronouns indicates a common characteristic of heritage grammars.

Laleko's (2010) analysis of heritage Russian speaker's use of the imperfective and perfective aspects brings together the conclusions on the interface of morphosyntax with pragmatics. She finds that heritage speakers and bilinguals who have undergone attrition tend toward using the unmarked imperfective over the perfective. However, whereas the latter has comprehension intact, heritage speakers have lost all intuitions. As Laleko argues, the choice between imperfective and perfective involves telicity, a CP-level phenomenon. Its opacity to heritage speakers thus crucially implicates a deficiency in the CP-domain.

Similarly, Laleko and Polinsky (submitted) investigate the use of subject particles and topic particles in Japanese and Korean among three different populations: heritage speakers, L2 bilinguals, and native controls. Performance on an acceptability rating task was most native-like among the bilinguals (heritage and L2) for subject marking, indicating that topics were more difficult. As the authors note, topics are located high in the CP domain whereas subjects are below that. In addition, looking at the three different types of topics, Laleko and Polinsky found that bilingual speakers have the most trouble with anaphoric and contrastive topics, both of which link the utterance to prior discourse.

Bernardini and Schlyter's (2004) Ivy hypothesis can provide an account for this difficulty heritage speakers have with CP-level phenomena. The hypothesis assumes that levels of syntactic representation are built incrementally during childhood, such that higher levels of syntax take longer to develop. Thus, bilingual children with one stronger and one weaker language will rely on the dominant language to express syntactic representations that have not yet been developed in the weaker one. Therefore, we would predict that heritage speakers, whose acquisition in their heritage language is interrupted or incomplete, are less likely to have acquired these higher structures, and indeed that appears to accurately describe their divergence from the baseline.

Thus, at these levels where syntax and pragmatics are in close interaction, heritage speakers are at a great disadvantage, even if they are otherwise highly proficient in the heritage language. Observing the differences between highly proficient L2 speakers and monolingual native speakers, Sorace and colleagues propose the INTERFACE HYPOTHESIS, which claims that interface phenomena between a linguistic system and a non-linguistic cognitive system are harder to master than features between two submodules of grammar

(see Sorace & Serratrice 2009; Sorace 2011; and other works). In other words, aspects of language that arise from the interaction of two parts of purely linguistic systems (e.g. syntax-semantics, morphosyntax, syntax-phonology) are easier to acquire, and elicit more uniform judgments from native speakers. In contrast, interactions between grammar and the discourse context may lead to more variable judgments even among monolingual native speakers. These are the very same structures that children fail to fully acquire until later, and therefore are problematic even for highly proficient heritage and L2 speakers.

As for why these particular phenomena are uniquely difficult, Sorace (2011) distinguishes between two overarching explanations. The first, labeled the REPRESENTATIONAL ACCOUNT, proposes that the two (or more) grammatical systems that bilinguals have affect the knowledge representations of one another. The second, labeled the PROCESSING RESOURCES ACCOUNT, argues that real time processing strategies are the more important factor in realizing the divergences.

As evidence for the former, Sorace discusses research that shows that Italian-English bilinguals, including heritage speakers of Italian and L1 speakers who have undergone attrition, overuse overt subject pronouns (Tsimpli et al. 2004, as cited in Sorace 2011). This seems to indicate a reinterpretation of the [TOPIC SHIFT] feature in Italian; overt subject pronouns indicate [+TS] in monolingual Italian grammars, but are ambiguous between [+TS] or [-TS] in bilingual grammars, patterning with English. Since the English system is more economical (i.e. possible in more situations), it is argued that the bilingual speakers have shifted their representations of [TS] to be more English-like, regardless of the speaker's dominant language. Similarly, Turkish-Dutch bilinguals show influence from Turkish in their interpretation of a pronoun which can refer to a topically-salient interior antecedent or a non-

topical exterior antecedent (preferring the latter), whereas German-Dutch bilinguals perform like Dutch monolingual speakers (Roberts et al. 2008; Sorace 2011). This supports the idea that bilinguals' representations are affected by the systems of their other language(s).

However, Sorace brings up evidence that even Spanish-Italian bilingual speakers perform similarly to English-Italian bilinguals despite the fact that null subjects in Spanish and Italian have similar patterns. Additionally, even in the Turkish-Dutch and German-Dutch examples, although the two populations performed differently, both groups spent more time looking at the subject pronoun than did Dutch monolingual speakers.

This evidence suggests that something more fundamental about bilingual processing is at hand. To this point, Sorace proposes two different paths of analysis for why bilinguals have difficulty processing these structures. On one hand, it could be because these speakers really only notice select domains of grammar and base their representations on that limited picture. The other possibility is that bilinguals have difficulty accessing and integrating their syntactic representations due to greater processing demands compared to monolinguals, and therefore have limited processing resources.

In the vein of the first argument, Sorace cites the SHALLOW PROCESSING HYPOTHESIS proposed by Clahsen and Felser (2006a, 2006b) where bilinguals only tap into semantic, pragmatic, and lexical information rather than syntactic structures to process language. However, while Sorace confirms that this may be likely for developing L2 learners, she argues against this analysis for near-native speakers (Sorace 2006; Sorace 2011). Similar work, such as Hopp 2007, show that near-native bilingual speakers converge with native speakers even if weaker bilinguals may not. This points to the second argument that near-native speakers diverge from the baseline due to reduced processing efficiency.

This reduced processing ability is due in part to the additional cognitive strain that affects bilinguals. Bilingual speakers are theorized as constantly having to divert processing resources to suppress the non-target language grammar (Bialystok 2009). Under the assumption that processing resources are limited, this means that bilingual processing is majorly compromised compared to monolinguals. Especially in the context of suppressing the dominant language, then, bilingual speakers will have greater difficulty with phenomena that require a large cognitive load, such as external interface phenomena.

As for the particular reason discourse related interface phenomena (or external interface phenomena) are more difficult to process, Sorace (2011) claims that these phenomena are more prone to errors in resource allocation. That is, the need to search for referents outside of the actual syntactic structure may cause these processes to be inherently slower and thus make it easier for bilinguals to slip up. Additionally, bilinguals may have trouble reallocating attentional resources that were originally directed to the wrong referent when interpreting pronouns, for example. With their already compromised processing abilities, bilingual speakers struggle with these external interface phenomena, even at high levels of proficiency.

Laleko and Polinsky's (submitted) results suggest yet another option—that the larger structure inherent in a CP projection incurs a greater processing cost. Their analysis arises from a well-established assumption that syntactic structures is built from the bottom upward, and that the presence of a high projection implies all the structure below it. Therefore, material in the CP domain which deals with discourse will take more resources to process than material in the TP domain and below. At even greater detail, assumptions of a multi-layered CP domain (Rizzi 1997, see chapter 3) predicts that higher CP projections will be

more difficult than lower CP projections. This prediction holds out in light of the finding that anaphoric topics are more difficult than the structurally lower (but still discourse related) contrastive topics (Laleko and Polinsky, submitted).

The general empirical findings, then, are that heritage speakers have difficulty performing at a native-like level on discourse phenomena. The cause for this can be described in many ways. The IVY HYPOTHESIS proposed by Bernardini and Schlyter (2004) claim that since syntactic structures are acquired from the bottom-up, bilinguals are less able to access the higher domains in their weaker language. In the context of Laleko and Polinsky's (submitted) findings, these higher domains are where the utterance is connected to the discourse. Sorace and colleagues suggest that this problem with discourse-related domains is due to bilingual speakers' reduced processing abilities as well as the high processing demand of integrating syntactic material to external references. Laleko and Polinsky take this a step further by claiming that the size differences among discourse-related structures are important, namely that larger structures impose a heavier processing burden.

Section 2.3: Heritage Cantonese

Having presented a general overview of heritage speakers and the challenges they face, we shall now move on to a more focused discussion of the target population. Again, the first section will briefly describe who heritage Cantonese speakers are and the second section will look at some of the work that has been done to show what issues are particularly pertinent in heritage Cantonese.

Section 2.3.1: Description

Heritage Cantonese speakers are typically first or second generation children of immigrants who trace their roots to Guangdong Province, Hong Kong, and Macau. Historically speaking, this group of immigrants, especially those who spoke the less prestigious Taishan/Hoisan dialect, were the dominant group in the Chinese overseas diaspora, creating the character of many historical Chinatowns that remain today. As such, Cantonese language schools, geared primarily towards heritage speakers, have long been established within the United States (He & Xiao 2008).

In recent years, with the rising prominence of China and the increasing number of immigrants from the mainland, most Chinese language classes in the United States teach Mandarin, which is used as the standard variety of Chinese. These pressures, along with other sociolinguistic factors, have promoted the learning of Mandarin over Cantonese, even within Cantonese immigrant populations. In heritage Chinese classrooms, this creates some pedagogical complications due to lexical and structural differences between Cantonese and Mandarin. For heritage Cantonese learners of Mandarin, the linguistic differences may bring challenges because either they must maintain at least three separate linguistic systems (English, Cantonese, and Mandarin) or merge some aspects of their grammars. These may factor into some of the challenges that heritage Cantonese speakers face.

Section 2.3.2: General Challenges for Bilingual Cantonese Speakers

One way to find potential problem areas for heritage speakers is to look at what children have trouble with. Yip and Matthews (2007) track the development of their Cantonese-dominant bilingual children and highlight three problematic constructions. The

first is with the locative particle *hai2*, meaning 'at', which marks prepositional phrases. The second involves the dative particle *bei2* 'give'. The third is the most structurally complex, involving verb-particle constructions such as *lik1 hei2* 'pick up'. According to Yip and Matthews, these are vulnerable domains because they appear to show transfer from English despite the children's Cantonese dominance (Yip and Matthews 2007:Chapter 7).

Overall, the apparent transfer in the bilingual children's grammar seems to be due to both a preference for economical constructions and for statistical universalities. For example, with the use of *hai2*, the pattern V-*hai2*-location ([V PP]) appears most common. This is the same order that is found in English. However, in Cantonese, this linear order is only possible with certain verbs where the PP denotes a goal (e.g. *co5* 'sit' or *gwaa3* 'hang') and the preferred order is [PP V]. Given its ungrammaticality in English, it could be more economical to use the [V PP] order, as it is available in both languages, and also proves to be more common universally (Dryer 2003; Yip & Matthews 2007).

A similar story emerges for *bei2*, which can mean 'give' or mark a dative object. The pattern that bilingual children produce, *bei2*-recipient-theme ([V-R-T]), is common in English except for ungrammaticality when the theme is a pronoun (e.g. **He gave me it.*) As before, this order is possible in Cantonese as well, but only when the theme is longer than the recipient. The preferred structure, [V-T-R], is actually possible in both languages, so one would assume that it would be preferable due to its economy. However, it turns out again that the [V-R-T] version is more common cross-linguistically (Yip & Matthews 2007:201), ultimately causing heritage speakers to pattern this way.

The final case regarding verb-particle constructions differs from the other two, both because it lacks a clear universal preference and because of the directionality of transfer.

Crucially, both the children's English is affected (producing the ungrammatical *verb-particle-pronoun pattern) as well as their Cantonese (*verb-NP-particle). In both languages, the ungrammatical construction has exceptions. In English, as long as the object is an NP, the construction is fine (e.g. *pick up the truck* versus **pick up me*). In Cantonese, if negation or a potentiality particle is present, then the NP can come between the verb and the particle as well (e.g. *bai2-dak1* ***keoi5*** *dai1*'can put him/her down' or *bai2* ***keoi5*** *m4 dai1* 'cannot put him/her down', where the NP is bolded). Without a clear economic option or an obvious universal tendency, transfer is allowed in both directions, with the more dominant Cantonese having a more noticeable effect on the English constructions.

These examples show some interesting generalizations; primarily, when there is some degree of optionality involved in both languages, the pattern that is cross-linguistically more common tends to become prominent. Another factor that proved to be important was economy—that is, if a single construction could work in both languages, then it was more likely to be used by bilingual children. While there's not enough data to really tell, these factors could represent underlying processing-related strategies (recall the discussion of economy in section 2.2.4).

The following sections will look more closely at heritage Cantonese speakers, as opposed to Cantonese-English bilingual speakers in general. The domains covered are similar to those in section 2.2, with a focus on connections to material presented in sections 2.2.3 (morphology) and 2.2.4 (discourse).

Section 2.3.3: Problems with Morphology

In section 2.2, we touched upon the theme that heritage speakers have poor command of inflectional morphology. The languages that were discussed, however, were primarily Indo-European languages that tend to have a lot of morphological agreement. In contrast, Cantonese is an isolating language and appears to be nearly bare of morphology.

However, in one area, we may be able to find an analogue to inflectional morphology. Numeral phrases in Cantonese are constructed as [Num-CL-NP], with CL representing the classifier. These classifiers are similar to units of measurement and indeed are often taught as measure words in Chinese pedagogy. However, unlike in English where numerals can attach directly to the NP, in Chinese the CL almost always has to be in between the numeral and NP[1]. Additionally, different nouns take different classifiers, thus sorting them into broad semantic categories. For example, the classifier *tiu4* is used for ships, snakes, and skirts, while *zek3* is used primarily for many animals. Among these is a general classifier, *go3*, that is used as a catch-all for nouns that don't neatly fit anywhere, including humans. In this way, classifiers appear similar to noun classes in that they select for certain nouns.

Wei and Lee's (2001) corpus study of heritage Cantonese speaking children living in the U.K. revealed that the number of classifiers a child used correlated to the child's proficiency in Cantonese. For example, two of the children in the two youngest groups did not produce any classifiers at all. These same children did not produce any quantifier phrases in Cantonese. Even in the two older groups the mean number of classifiers was 3.8, whereas

[1] A notable exception is the construction X per Y, such as (i) and (ii):

(i)	jat1(-go3)	jan4	jat1-go3	(ping4gwo2)	(ii)	sam1	jat6	jat1	ci3
	one(-CL)	person	one-CL	(apple)		three	day	one	time
	'one (apple) per person'					'once every three days'			

a baseline speaker would need to use at least 6 different kinds of classifiers in the narrative. In short, these results show that heritage speakers simplify the morphological agreement between the classifier and the noun. This may partly be due to the fact that the classifiers have to be learned with each word, with schooling helping to reinforce less common classifiers. Nonetheless, this degree of simplification seems to echo findings that heritage speakers have difficulty with morphology.

Section 2.3.4: Problems with Discourse-related Phenomena

In section 2.2.4, we focused on studies that investigated morphemes licensed by certain contexts. The findings were that heritage speakers have categorical difficulties with such phenomena, often either by infelicitous omission (e.g. topic markers) or overuse (e.g. overt pronouns). The findings in this section reflect similarities.

For example, Kwan and colleagues (2013) conducted a corpus study investigating heritage Cantonese speaker use of the *zoeng1* construction, which marks objects in expressions of movement or displacement. This research was based off of work done on the analogous *ba*-construction in heritage Mandarin (Polinsky et al. 2010). Both use the fruit carts methodology developed by Gómez Gallo and colleagues (2007), in which subjects instruct an experimenter to move objects on a computer screen so that the diagram on the screen matches the diagram the subject is given. This design limits the scope of discussion and thus allows for precise comparisons between different groups of speakers.

Kwan and colleagues found that native Cantonese speakers were much more likely to use the *zoeng1* constructions, while heritage speakers used a variety of other strategies to achieve the same effect. One such strategy was to use multiple clauses in canonical SVO

structure. The multi-clausal structure allows for shorter and simpler utterances, generally providing only one piece of information at a time (i.e. object to move, details of object, or location). These shorter utterances are easier to process and produce compared to the *zoeng1* construction, which requires making explicit at least both the object and destination.

Another strategy that was seen particularly in Kwan and colleagues 2013 was the use of topic-like constructions[2] in place of the *zoeng1* construction. This is an interesting finding because it rules out mere transfer from English. As they mention, sentence topics are more common in Cantonese than in English, making it unlikely that the reliance on SVO utterances is simply due to convergence with English. The frequent use of topicalization lessens the cognitive load during real time processing and production. By establishing the topic first, the speaker can pause and focus on forming the rest of the utterance (e.g. where to put the object just described) without having to keep it embedded within the VP. This strategy thus reflects the processing difficulties mentioned in section 2.2.4.

Section 2.4: Conclusion

In this chapter we have sketched a description of heritage speakers and identified specific linguistic domains that prove particularly difficult for heritage speakers. Specifically, we identified two main areas of difficulty: (1) heritage speakers are less consistent in their use of inflectional morphology, typically demonstrating a simplified and restructured system; and (2) even highly proficient heritage and L2 speakers have great trouble with domains where "purely linguistic domains", such as syntax and morphology, interact with the context

[2] Kwan (2014) reports that heritage speakers and L1 attriters had high rates of topicalization, in which they also include fronting structures without formal topic marking other than a pause. While these could indicate topicalization, it is also possible that the fronted material constitutes a short utterance on its own.

of the utterance. Judgments on discourse-related phenomena vary considerably even among adult monolingual native speakers, so it is unsurprising that heritage speakers and L2 learners find them difficult.

These empirical findings led us to two theoretical explanations. One is the ivy hypothesis proposed by Bernardini and Schlyter (2004), which demonstrated that uneven bilingual speakers might not have higher syntactic representations in the weaker language. Given that heritage speakers have incomplete acquisition of their first language, we assume that these higher levels of structure may be absent in the heritage language. As we will see in the next chapter, these higher domains link the utterance to the discourse and context. Another theory, the interface hypothesis propelled by Sorace and colleagues, suggests that phenomena at the interface of morphosyntax and discourse take greater processing power to access because they require reference to external non-linguistic knowledge (Sorace 2011). This is true even for monolingual native speakers, therefore implying that heritage speaker behavior at these interfaces will be less common and more prone to error.

In our discussions of heritage Cantonese speakers, we found similar challenges. On the level of structure, Yip and Matthews (2007) identified three syntactic areas that are problematic for Cantonese-English bilingual children. This gave us a window into the motivations behind the temporary solutions bilingual children utilize when they have not completely acquired their languages. In particular we found hints that processing effects may be the cause for specific errors that might otherwise be attributed to transfer. Heritage speakers of Cantonese were also found to display problems with classifiers, a potential analogue to issues with inflectional morphology (Wei & Lee 2001). Finally, in line with discussions on heritage weaknesses on external interface phenomena, we saw that they

avoided the discourse-licensed *zoeng1* construction in expressions of displacement (Kwan et al. 2013; Kwan 2014). This may indicate decreased sensitivity to the contextual licensing conditions in Cantonese, which could corroborate the ivy hypothesis. Additionally, Kwan and colleagues (2013) report that heritage speakers used topic-marking structures to break up an utterance more frequently than Hong Kong Cantonese-dominant bilingual speakers, suggesting that they were more susceptible to processing constraints.

With these frameworks in place, we can start to look at heritage speaker production of sentence final particles and compare it to that of native speakers. In the next chapter we will discuss the structural properties of SFPs that make it a good place to look for divergences from Cantonese-dominant grammars—namely because of their close connection to the discourse context. Finally, we will close by discussing the actual study conducted for this thesis.

Chapter 3: Sentence Final Particles

Section 3.1: Introduction

This chapter focuses on the syntactic and semantic analyses of sentence final particles (SFPs). In the first part, we will review discussions on the syntactic properties of SFPs as well as some theoretical frameworks that account for their distribution (section 3.2). Then we will look at attempts to dissect their semantics and pragmatic meanings (section 3.3). Finally we will discuss in greater detail why SFPs are an interesting domain to study heritage speaker grammars (section 3.4). Ultimately, this will set up the assumptions that will serve as the basis for analysis in the following chapter.

Section 3.2: Syntactic Properties of SFPs

As their name suggests, SFPs are most commonly found at the end of sentences. However, the concept of the sentence is hard to formally define, and some have pointed out that these particles can occur at the end of utterances that might not constitute a sentence, thus leading to some controversy over the term "sentence-final particle" (see Matthews & Yip 2011:390). Wakefield (2010) thus defines SFPs as having a position "somewhere within the uppermost projections of a sentence" in order to capture the fact that all SFPs appear at the right edge of a clause or utterance.

One syntactic mystery that has surrounded all the Chinese particles has involved the FINAL-OVER-FINAL CONSTRAINT (FOFC), which states that head-final phrases can only dominate other head-final phrases (Biberauer, Holmberg, & Roberts 2007). That is, head-final phrases cannot be dominated by head-initial phrases. However, SFPs, analyzed as being at the top projections of a sentence, appear to right-branching heads, despite the fact that

Chinese languages appear to be head-initial as evidenced by the VO order. Li (2006) notes that there are two ways to look at SFPs in light of this. Either they are an exception to the FOFC (as Paul, 2014, argues) due to the principle's nature as a statistical generalization, or they originate in the left periphery and undergo movement later on. If this is the case, then upon linearization the whole domain must be flipped so that lower projections are linearized to the left of higher ones. The debate does not seem to be settled, but either solution should be able to attest for the distribution of the particles.

A unique characteristic of Cantonese SFPs is their well-known combinatory properties. Several particles can appear together at the end of an utterance, and the meaning of the particle cluster appears to be composed from the contributions of the individual particles. Many theories about the syntax of SFPs try to formalize the rules that underlie this combinatory process. As depicted by Matthews and Yip (2011), there are clear descriptive constraints on the order in which particles can combine. In their Table 18.2, they show that at least up to four particles can be combined in an utterance.

(1) Adapted from Table 18.2 in Matthews & Yip 2011:395

1 **Adverbial particle**	**2** **Assertion**	**3** **Evaluation/ modification**	**4** **Question/ exclamation**
sin^{1}_{4}	ge3	ze3/zaa3, ze1	aa3, aa1, aa4 bo3
tim^{1}_{4}	lei4 (ge3/gaa3)	laa3, laa1	gwaa3 haa2, ho2 le1
		aak3	maa3, aa1maa3
		zek1	me1
		lak3/laak3	wo3, wo4, wo5
		lo3, lo1	
		lok3	
		le5	

(2) Keoi5 jau5 me1je5 gam3 dak6bit6 zek1?
3P have what so special PTC
Keoi5 sik1-dak1 jau4seoi2 tim1 ge3 z-aa1maa3.
3P know-able swim PTC PTC PTC-PTC
'What's so special about him? It's just that he also knows how to swim.'

Fung (2000) also cites an example where clusters of up to seven particles are possible, but those cases show the particle *aa3* combining with other particles to change the vowel quality and/or tone. However it is not clear whether the change in vowel quality is simply due to vowel reduction (i.e. Li, 2006, notes that non-final particles in clusters have vowels that sound closer to schwa) or to the presence of the particle. This difference is especially difficult to tease out when there are also no tonal changes (e.g. *ge3* and *gaa3*). Regardless, the examples above show that particle clustering is quite robust.

Particles to the right of the another particle are generally analyzed as being in a higher syntactic position, whereas an inability to combine would either indicate that the particle on the right is syntactically equal to or lower than the particle to its left. Alternatively, some posit that semantic or perhaps phonological incompatibility can also prevent combination (S. Law 1990; Fung 2000; Wakefield 2010).

S. Law (1990) presents a fairly thorough description and analysis of the combinatory properties of SFPs. First, she intuits that the particles must combine in certain orders, and formalizes that intuition into syntactic structures. She organizes the particles into three categories: particles in VP, particles in the COMP(lementizer) position, and particles in SPEC(ifier) of CP. The most deeply embedded particle under her analysis, *tim1*, is a VP particle. Above that, and linearly further to the right, are the COMP particles, such as *ge3*, *laa1*/*laa3*, *lak3*/*laak3*, *lo3*/*lo1*, *le5*, *le1*, and *za3*, which she formalizes as C heads. Finally, at SPEC CP are the structurally highest particles, which include the question particles (*me1*,

ma3, *aa5*) as well as *laa3bo3*, *-e*, and *wo4*. In short, under S. Law's (1990) analysis, if a particle is found to the right of another particle, the former is at a higher projection. These structural formalizations seem to come close to capturing the generalization found in (1), although there are some differences in the details.

Additionally, S. Law notes that one of the reasons for the disagreement over the total number of particles is due to the existence of monosyllabic particles that differ only slightly from each other, in vowel and/or tone. These she takes to be derived from the same base particle with tonal and segmental morphemes attached. For example, the contrasts between *–e* and *–aa* particles (e.g. *zaa3* and *ze1*) can be explained either by the addition of the *–aa3* particle, or by the addition of an *–e1* particle. Similarly, the difference between *laa1*, *laa3*, and *laa4* are analyzed as stemming from tonal morphemes that convey different "strengths" of meaning, with high tone (e.g. *laa1*, *me1*) typically characterized as being weaker, and falling tone (e.g. *gaa4*, *laa4*) as having a stronger assertion. Least controversial is the analysis of SFPs ending in *–k* as being composed from the addition of a bound morpheme *–k* (although what it adds to the semantics and syntactic structure of the particle is unclear).

S. Law's (1990) discussion of particle clustering takes into consideration not only syntactic constraints, but also phonological and semantic constraints. Indeed, her explanation for the descriptive generalization that *–k* final particles cannot be followed other particles is phonological. Some combinations between particles like *laa1* and *laa1maa3* are also analyzed as being prohibited due to their phonological similarity. In terms of semantics, she argues that the particle *le1* cannot combine with question particles (e.g. *me1*, *aa4*) or *wo4* (for "reported speech") because of semantic incompatibility.

While her articulation of several theoretically important intuitions, such as the existence of tonal morphemes and the morphemic compositionality of some monosyllabic SFPs, is a significant contribution, there are several flaws with S. Law's (1990) argument. For example, some particle combinations would be unaccounted for, such as *gaa1maa3*, which clearly comes from *ge3* + *aa1maa3*, because she only has *laa1maa3*. On the other hand, some particle formations might be a little farfetched, such as those involving the *–e* morpheme, given that it doesn't appear to have a consistent meaning.

Additionally, both Fung (2000) and Wakefield (2010) argue against S. Law's idea that high tone necessarily bears the "weaker" meaning of the particle. Fung for example argues that high particles can have both strong and weak meanings (e.g. *laa1* can either be a softener or mark a sharp command, depending on the context), and instead argues for an analysis of tone as a reflection of the epistemic level of the particle–that is, Fung (2000) claims that high tone indicates the speaker's assumption that the hearer has prior knowledge of the topic in discussion. Wakefield on the other hand argues against any generalizable meaning deduced from tonality, though his argument is primarily addresses frameworks that analyze SFPs as being inherently toneless, surfacing with tone solely from these morphemes.

Frameworks that come after S. Law 1990 are based on Rizzi's (1997) influential SPLIT-CP HYPOTHESIS[3]. This framework takes the CP and expands it into a multiple layer projection, with each functional head in charge of separate functions associated with the CP. Among these are Fin (finiteness), Foc (focus), Top (topic), and Force (which governs utterance type). Force makes up the top layer in his framework, while Fin represents the

[3] While the split-CP hypothesis provides a very good framework that can account for the distribution and clustering of SFPs, this thesis will remain agnostic on the details of the theory, focusing on the insight that right-edge material are syntactically higher.

lower bound. A later work (Rizzi 2002), expands the domains within the framework, as reproduced in Li (2006):

(3) Force > Top* > Int > Top* > Foc > Mod* > Top* > Fin
(the layers marked with an * represent optional recursion)

A. Law (2002) presents an analysis of Cantonese SFPs using the split-CP hypothesis. She divides particles into two groups, SFP_1 and SFP_2, with the latter consisting of *zaa3*, *tim1*, and *laa3*, and the former including most other particles (the particles *ge3* 'nominalizer'[4], *lei4* 'verbalizer', *sin1* 'first', and *zyu6* 'temporary' are not analyzed as being part of the CP domain, and are therefore not included). In her framework, SFP_1 is equivalent to ForceP, because many particles located in that domain indicate whether an utterance is an interrogative ([+Q]) or not ([-Q]). Since ForceP is unique, there can only be one particle in this projection at a time, which A. Law claims accounts for the combinatory patterns of the particles. SFP2 particles, however, can iterate. Thus, the structure A. Law (2002) asserts for the CP domain is the following:

(4) Force [SFP_1] > Topic > SFP_2* > Focus > Topic > [...]

Unfortunately, her characterization of particles does not fully account for particle combinations. Consider the utterance below:

(5) Ngo5 jau6 hou2 zung1 ji3 nei5 tim1 ge3 zek1.
1P again very like 2P PTC PTC PTC
'(I like other people, but) I really like you too.' (implies coyness)

In this example, the particles *tim1*, *ge3*, and *zek1* are present. If we take *ge3* to be the one in SFP_1 (i.e. 'assertion'), then it is strange for it to co-occur with *zek1*, given that the latter is also in SFP_1. If we interpret *ge3* as being the 'nominalizer' *ge3* that is not part of the CP domain, then it seems strange for it to be linearly to the right of, and thus implicitly

[4] A. Law (2002) also analyzes a homophonous particle *ge3* meaning 'assertion'.

structurally dominating, *tim1*, which is analyzed as being in SFP_2. Nonetheless, this work presents interesting observations that will come into play later.

A more detailed approach that does seem to account for much more of the combinatory power of the particles is Li 2006. In chapter 3 of her dissertation, which analyzes Cantonese particles, Li builds on the work of S. Law (1990) and Fung (2000), using the latter's methodology to analyze the semantics in the segmental and tonal components of SFPs (discussed in the following section) and taking that to build a syntactic analysis based on the ordering of the phonological elements. Some unique aspects of her analysis involve the characterization of *–e* particles as the "basic" form, with *–aa* and *–o* contributing extra information. Additionally, the particle romanized as *le1* in many works (including Matthews and Yip 2011) is *ne1* in Li 2006, as well as in the present work, and therefore is not the same *le1* that Li analyzes as deriving *laa3*. Finally, the tones 1, 4, and 5, and the bound morpheme –k, are analyzed as heading functional projections themselves. Thus:

(6)

$Epist_1$ >	Evid >	$Epist_2$ >	Disc	> Eval >	Mood >	Deik >	Foc >	Fin
1, 4	*5*	*k*	*aa, (w)o*	*ne*	*me*	*le*	*ze*	*ge3*

from Li 2006:118

This analysis is interesting because of its close integration of the semantic and functional contribution of these particles with their syntactic structure. However, this focus on the segmental material still does not account for all the particles, in particular the question particle *gwaa3*, the confirmation particles *haa2* and *ho2*, and the assertive particle *aa1maa3*. It also isn't clear why some elements can combine while others cannot (e.g, **naa*/**no*). Interestingly, Force is not part of this structure, though Li mentions that *me* is a typing particle for yes/no questions. This structure is revised significantly in Li and Sybesma 2007, where *m-* and *aa4* are both placed in ForceP directly dominated by $Epist_2P$. Nevertheless, as

Wakefield (2010) points out, systematic problems still remain in their ability to account for the meaning and distribution of all SFPs. Ultimately, while it apparent that there is a level of semantic compositionality involved in the individual particles that appear on the surface, binding the syntactic structure to the individual semantic functions seems overly limiting.

In contrast to Li's (2006) broad survey of Chinese particles, Wakefield (2010) presents a more detailed analysis of just four particles: *me1*, *aa4*, *lo1*, and *aa1maa3*. Wakefield's primary argument on the syntax of SFPs is that these particles must be higher than ForceP. One of the reasons is that many particles, apparently including *lo1* and *aa1maa3* can apparently select both interrogative and declarative utterances (Wakefield 2010:235). This indicates that they are not clause typing particles in ForceP, but apparently suggests that they dominate ForceP (Wakefield references Haegeman's 2009 work on West Flemish discourse markers). The other reason is that question particles like *me1* and *aa4* encode certain assumptions of the speaker and are therefore not neutral questions. Rather, they connect the utterance to the discourse in some way, namely by indicating the speaker'. Finally, the fact that SFPs are not found in embeddings indicates that they must perform some function unique to the matrix clause, and that they are syntactically high. To this effect, he proposes that SFPs belong to the higher projection of DiscourseP, primarily because of their intimate relation to the discourse and context. While compelling, it's unclear how this analysis would account for particle clustering if all SFPs belong in the same projection. Nonetheless, it remains significant that SFPs occupy a very high syntactic projection, which we will discuss in section 3.4.

Section 3.3: Semantics and Pragmatics of SFPs

As noted before, the independent meanings of the many SFPs are hard to pin down. However, several approaches attempt to do so.

The most basic approach is to simply describe the contribution each particle makes in particular contexts. The limitation, of course, is the difficulty in disentangling the meaning of the particle from that of the other elements in the utterance. For example, Fung (2000) criticizes Leung's (1992) explanations, one of which is copied in (7).

(7) Keoi5 gam3 kan4lik4 m4-wui5 m4-faan1hok6 ge3,
3P so hardworking NEG-will NEG-go.to.school PTC
waak6ze2 beng6-zo2 laa1.
perhaps sick-PFT PTC
'He won't skip school since he's so industrious, maybe he's sick.'

From this example, Leung (1992) apparently infers a meaning of "possibilities" for *laa1*. However, Fung (2000) points out that the meaning of "possibility" is derived entirely from *waak6ze2* 'perhaps', and that without it, *laa1* loses that sense of expressing possibility.

(8) A: M4-zi1 keoi5 heoi3-zo2 bin1dou6 ne1?
NEG-know 3P go-PFT where PTC
'I wonder where he went?'
B: # Keoi5 faan1-zo2-hok6 laa1.
3P go.to-PTF-school PTC
'He's (already) gone to school…' NOT 'Maybe he went to school.'

The fact that even native speakers tend to confuse the meanings contributed by SFPs with the meanings contributed by other elements in the context emphasizes the difficulty in grasping the unique semantic contributions of these particles.

The alternative approach pursued by Fung (2000) and Li (2006) analyze the segmental material as contributing semantic meaning. Fung (2000) groups particles into particle families based on the initial phoneme. She categorizes 25 particles as Z-type ([+restrictive]), L-type ([+realization]), and G-type ([+situationally given], [+focus], and

[+deictic]), with all the particles in a particular family sharing the given semantic primitive(s) and then derived from the addition of other primitives.

Fung's approach, with it's strong corpus-based empirical leanings, clearly delineates different functions of the various particles, including the distribution and overlap between the particles. She also teases out nuanced differences between particles of the same "family" where overlap does occur. Beyond the relations within the particle families, for the G-type particles, Fung also makes an interesting connection between G-type particles and other non-SFP grammatical particles, such as the linking particle *ge3* and the nominalizer *ge3*, the general classifier *go3*, the distal demonstrative *go2*, and the predicative demonstrative *gam2*, noting that they all share the primitive [+deictic]. While the validity of some claims may be up to debate (for example, not all particles with [+deictic] have *g-*, such as *ni1/ji1* 'this'), the thoroughness that characterizes her approach is certainly laudable.

There are other issues in Fung's approach as well. One criticism that comes naturally from the particle family approach concerns the lack of consistent compositionally based explanations for different particles within the same family. For example, while it seems like the basis for the theory is that these particles all derive from the same particle, the correspondence between the phonological and morphological differences aren't explained (at least not explicitly). Additionally, the terms used to describe the three groups (Z-type "restriction", L-type "realization", and G-type "givenness") are all broad categories, whose correspondence to functional categories aren't always (only the Z-type "restriction" or [+restriction] is explicitly stated as representing focus). Nor is it the case that all particles demonstrating a particular characteristic are included in the family (e.g. *ne1*, a topic-marking particle, is not shown to be related to the G-type "givenness" particles). As a final critique,

Fung's source material is from the 1980s, although she occasionally supplements it with her intuitions about how the particle use is changing.

Li's (2006) analysis is a little more thorough, generalizing the semantic values of not only initial segments, but also vowels, the coda –k, and tones after a wide survey of Cantonese SFPs. It however succumbs to similar issues regarding the consistency of these meanings across particles that share the phonological primitive. Additionally, the contribution of each component to the overall semantic meaning of a particle may not be consistent across usages, or may contain nuances unaccounted for by the semantic primitives (e.g. Wakefield, 2010, notes that *aa4* is speaker-oriented and forward-looking, traits associated with tone 1 but not tone 4).

A third approach is Wakefield's (2010), which matches particles with their natural semantic metalanguage (NSM) counterparts, based on the Wierzbicka hypothesis, and tries to associate them with their prosodic counterparts in English. The latter goal follows from Yau's (1980) statement that English and Cantonese are extreme opposites in terms of tonal phonemes and prosodic intonation. That is, the greater the variety in lexical tone, the less the language can rely on prosodic cues, meaning that it must compensate in other ways. Indeed, the connection between SFPs and prosody is noted at least in passing by many sources on Cantonese SFPs (see Wakefield 2010).

Wakefield presents an in-depth analysis of SFPs both in terms of NSM and in terms of their prosodic counterparts. In contrast to Fung (2000), Wakefield (2010) draws from an independently justified source for the various semantic primitives he uses to describe the particles. However, his study was fairly limited in scope. First, he notes that in order to provide a more in-depth analysis, he limited his study to four particles, *me1*, *aa4*, *lo1*, and

aa1maa3. While it is a strong first step, it nonetheless remains possible that this constrains the relevance of his analysis. Additionally, he notes that not all SFPs have prosodic counterparts, which means that there are integral limitations to this particular approach.

Overall, it is clear that SFPs are highly dependent on their surrounding context, both for proper licensing and for interpretation. This fact explains the difficulty linguists have had with defining them. Because this context-dependency makes it difficult for even native speakers to define the meaning of SFPs—although they have no problem saying if a particular usage is appropriate or not—it may have even greater implications for heritage speaker grammar, as we will discuss in the following section (section 3.4).

Section 3.4: SFPs and Heritage Speakers

As mentioned previously in chapter 2, SFPs have not been a major area of investigation for heritage Cantonese grammars. However, in line with the generalization that heritage speakers have trouble with morphology (section 2.2.3) and with phenomena on external interfaces (section 2.2.4), it follows that SFPs may yield interesting insights on the nature of heritage Cantonese grammar.

In addition, studies on other populations with divergent grammars have yielded interesting findings. Particularly, Kong's (2013) study shows that aphasic Cantonese speakers have a lower proportion of utterances with SFPs than do non-aphasic controls. His analysis is based on an apparent distinction between two types of particles from S. Law (1990). These groups he labels simply as Type 1 and Type 2, with the former apparently indicating "time and focus" and the latter "stress or emotional feelings" (Kong 2013). While their examples do not perfectly align, Type 1 appears to correspond to the COMP CP and VP

particles in S. Law 1990 (the first three columns in Matthews & Yip 2011) while Type 2 particles correspond to the SPEC CP particles (the fourth column in Matthews & Yip 2011).

Based on our assumptions that reduced grammars cut off higher levels of syntax, it would follow that aphasic speakers might have reduced access to the structurally higher Type 2 particles as compared to native control. In particular, Kong summarizes that aphasic speakers typically demonstrate agrammaticism, where grammatical morphemes are missing or misused (see for example Packard 1990 and Yiu 1995). The shearing off of difficult structure may be associated with this phenomenon of agrammaticism. However, Kong's results appear to contradict the assumption: despite displaying an overall lower proportion of utterances with SFPs (47.34% versus native speaker's 61.43%), aphasic speakers use a higher percentage of Type 2 particles than native controls do (15.67% to 12.87%). Given the framework provided by S. Law (1990), Kong's Type 2 particles are at a higher level of syntax, namely SPEC-CP, than Type 1 particles. Therefore, the finding that they exhibit higher proportions of Type 2 particle usage than native speakers do is extremely surprising given that aphasic speakers supposedly have a compromised syntax (Platzack 2001).

One of the reasons for this discrepancy may be due to the nature of the task, which was a picture description task. As Kong noted, the picture description task lent itself to the overuse of the particle *le1*, which may be analyzed as a topicalization marker. Indeed, for both populations it was the most commonly used particle (19.33% in aphasic speakers and 25.94% in controls). However, this is a Type 1 particle, and does not explain the high proportion of Type 2 particles that aphasic speakers produced. Alternatively, it could be that the sample, mostly consisting of speakers with anomic aphasia, primarily had difficulty with lexical access, not CP domain access. Still, these reasons cannot completely explain the

apparent reversal of the assumption that aphasic speakers have reduced access to Type 2 particles compared to non-aphasic speakers.

Nonetheless, this study provides one framework to compare native speakers' usage of SFPs to other populations in a controlled context. The following chapter will present a study adapted from Kong 2013 comparing heritage speaker use of SFPs to native speaker performance. Analyzing the results may yield interesting implications both for heritage grammars and native speaker grammars of SFPs.

We can imagine three different scenarios that could occur. In the first scenario, heritage speakers pattern just like aphasic speakers. This could indicate one of two things. Either (1) heritage speakers and aphasic speakers share something in common, namely a missing CP domain (and therefore their use of particles may represent a syntactic reinterpretation of SFPs), or (2) heritage speakers and aphasic speakers perform similarly but for different reasons. Specifically, whereas aphasic speakers are known to have reduced trees and therefore (nearly) no access to higher CP domains, heritage speakers may have full access but simply choose to access the CP domain less often, probably for the processing constraints described in section 2.2.4. The other two scenarios may be less complicated. In the second scenario, if heritage speakers diverge from both native speakers and aphasic speakers, it implies that the factors affecting heritage speaker populations are different from those affecting aphasic speakers. Finally, if heritage speakers show no difference from native speakers in terms of SFP usage, that may mean that (1) SFPs occupy a syntactically lower position than most theories detailed in chapter 3 assume, or (2) heritage Cantonese speakers have full access to high levels of syntactic projection.

Chapter 4: Speech Elicitation Study

Section 4.1: Introduction

In order to compare the usage of SFPs between heritage speakers and native speakers, participants were recruited to perform a speech elicitation task, based on an adaptation of the task described by Kong (2013). The purpose of the task was to create a small corpus of heritage speaker elicitation as well as to establish a native speaker standard for comparison.

At the end of the previous chapter, we came up with three different scenarios of results, and made predictions about what those results might indicate. Our predictions are summarized below:

Scenario 1: Heritage speakers pattern with speakers with aphasia. We would interpret these results to mean that either (a) heritage speakers lack a CP domain, just like aphasic speakers, or (b) heritage speakers diverge from the standard for a different reason than aphasic speakers do.

Scenario 2: Heritage speakers diverge from both native controls and aphasic speakers. This would implicate different factors than those at work in aphasic speakers.

Scenario 3: Heritage speakers pattern with native controls. This would imply that either (a) SFPs are not as structurally high as hypothesized, or (b) heritage speakers have full access to the structurally high CP domain.

Section 4.2: Methods

Section 4.2.1: Participants

10 heritage speakers (HS01 ~ HS10) and 6 native speakers (NS01 ~ NS06) of Cantonese were recruited as volunteers to participate in the study. At the time of the

interview, all volunteers were college students, recent graduates, or graduate students, with an age range of roughly 19~25. All heritage speakers were born in the United States and had been raised in a predominantly English-speaking environment. Several of the heritage speakers grew up in a strong Cantonese speaking community, particularly in the New York City or Boston Chinatowns. Almost all had studied Mandarin or had a parent who spoke Mandarin natively in addition to Cantonese. Two speakers (HS07 and HS10) briefly code switched into Mandarin several times during the interview. Most heritage speakers had parents who grew up in Hong Kong, although three also had a parent from mainland China, and three had parents who grew up overseas.

The heritage speakers represent a wide range of abilities. Speech rates ranged from roughly 110 syllables per minute to 190 syllables per minute during the main task, with natural speech rates during casual conversation being faster on average. Almost all heritage speakers (including the interviewer) had a noticeable accent, though this could partly be due to dialectal variation. HS01 was the most native-sounding Cantonese speaker, despite not having spent any time in Hong Kong or Guangzhou. However, she reported that people from Hong Kong could discern that she grew up abroad simply from her accent. On the other hand, HS06 had about four years of elementary school education in Hong Kong, but was one of the less confident speakers, showing hesitation and often code switching into English.

The native speakers were all raised in either Hong Kong or Guangdong province for the majority of their lives. At the time of interview, all had been living in the United States for several years, primarily for study though at least one was living permanently in the United States. One native speaker from Guangdong province also mentioned that her home dialect was different from Standard Cantonese, but that she had come to speak standard

Cantonese after she began going to school in Guangzhou. The average speech rate ranged from 160 syllables per minute to about 200 syllables per minute on the higher end. Thus, the slower speakers are roughly similar in speech rate to the heritage speakers who are fairly proficient, while the two or three most proficient heritage speakers are on par with native speakers in terms of speech rate. More details about the speakers can be found in appendix A.

The author, a heritage speaker of Cantonese whose parents emigrated from Guangzhou, conducted the interviews in Cantonese, with occasional code switching into English. Most interviews were conducted in person, although two were conducted over Skype. While the environment for the interviews was controlled as much as possible for noise levels, the actual location varied to maximize flexibility with participants' schedules.

Section 4.2.2: Procedures

The speech elicitation task was designed with Kong's (2013) task in mind. As such, in the main task, participants were simply asked to describe versions of the Cookie Theft Scene and the Picnic Scene from the Western Aphasia Battery (Kertesz 1982; see appendix B). The interviewer spoke primarily to direct the participant's attention to areas of the picture that had not yet been described, to ask if there was more that the participant wanted to say, or to announce a transition between images or the end of the task. Occasionally participants would ask about the Cantonese word for something, in which case the interviewer might also join in and try to think of the appropriate word. Participants were not told the assumptions of the task beforehand, but were given an informal briefing afterwards.

Preceding the main task was a short interview section, which lasted on average roughly 5 minutes. The interview was used as a warm-up and also to get a sense of the

speaker's natural conversational speech. For some participants, namely HS02, HS05, NS01, and NS03, time limitations or technical limitations led to the warm-up session being skipped or left unrecorded. It did not factor into the primary data analysis.

Each interview was recorded and then transcribed, glossed, and translated. The particles that were glossed were then coded as final particles (FPs), topic particles (*ne1*), or verbal particles (of which two, *maai4* and *saai3*, were tracked)[5]. The total number of utterances for each speaker was also recorded, which a single utterance being any string of speech during which the speaker does not evidence a change in intention to speak. Therefore, some utterances can span several sentences if the end of one sentence runs phonetically into the start of the next, while some utterances consist of short confirmations or markers of continuation followed by a pause. Any utterances that were composed of merely a disfluency (e.g. "um") followed by a pause were discarded before counting the utterances.

There are certain limitations to this task. For example, several native speakers remarked upon conclusion of the task that they felt it to be highly unnatural. One native speaker misunderstood the purpose of the task, starting by simply naming items she saw rather than describing the image using full sentences. These limitations may have led to elicitation of less natural speech. Indeed, Kong (2013) notes that several common conversational particles, such as *zaa3*, were not produced, a finding consistent with this study. Nonetheless, in order to draw comparisons to Kong's (2013) data, we decided to use maximally identical materials. Additionally, as mentioned in Kong 2013, the ability to control the content of the elicitations makes the task valuable, even though it may be

[5] These are probably aspect markers, unlike S. Law's (1990) VP particle *tim1*.

somewhat unnatural. The conversational interviews, which preceded the main task, may also counterbalance the unnaturalness by providing examples of more natural speech.

Section 4.3: Results

Following Kong (2013), we first roughly divided the particles up into the "Type 1" and "Type 2" particles he takes from S. Law (1990). As mentioned before, Kong's (2013) Type 1 corresponds quite neatly to the particles in column 2 ("Assertion") and column 3 ("Evaluation/modification") in Matthews and Yip 2011, reproduced below, and Type 2 particles include those in column 4 ("Question/exclamation").

(1) Adapted from Table 18.2 in Matthews & Yip 2011:395

1 **Adverbial particle**	**2** **Assertion**	**3** **Evaluation/ modification**	**4** **Question/ exclamation**
sin^{1}_{4}	ge3	ze3/zaa3, ze1	aa3, aa1, aa4 bo3
tim^{1}_{4}	lei4 (ge3/gaa3)	laa3, laa1	gwaa3 haa2, ho2 le1
		aak3	maa3, aa1maa3
		zek1	me1
		lak3/laak3	wo3, wo4, wo5
		lo3, lo1	
		lok3	
		le5	

The most obvious discrepancy between Kong's (2013) list and Matthews and Yip's (2011) list is the placement of *le1* (which I romanize as *ne1*). The former lists it as a Type 1 particle whereas the latter places it in column 4, corresponding to my designation of the Type 2 particles. Kong (2013) describes *le1* as a particle used "to address the important feature of an object or a place", which I previously noted sounds like a topicalization marker. In

contrast, the *le1* listed in Matthews and Yip 2011 appears to be a question or uncertainty marker. Observe the contrast in (2) and (3):

(2) Di1 seoi2 ne1 zau3 se2-saai3 lok6 go3 dei6haa2 go2dou6.
PL.CL water PTC then spill-PTC drop CL floor there
'The water has spilled all over the floor.' (from HS01:05)

(3) M4-zi1 jing1-m4-jing1goi1 tung4-keoi5 jat1cai4 heoi3 ne1?
NEG-know should-NEG-should with-3P together go PTC
'I wonder if I should go with him.'

Therefore, I will initially treat *ne1* as a Type 2 particle, as it patterns more closely with the other question particles such as *aa3* (although see section 4.4 for further discussion).

Another issue that came up while sorting the particles into Type 1 and Type 2 involved the particle clusters. Some were limited to particles in Matthews and Yip's (2011) columns 2 and 3, which placed them in Type 1, but others crossed boundaries between columns 3 and 4. Kong's (2013) procedure does not seem to be particularly consistent, as *gaa3 laak3* is labeled as Type 2 even though both components are in Type 1. Therefore, I have sorted these separately.

(4) Distribution of sentence final particles for heritage speakers

Participant	HS01	HS02	HS03	HS04	HS07	HS08	HS09	HS10	
Type 1									
ge2	NA	NA	1	NA	NA	NA	NA	NA	**1**
ge3	NA	NA	3	4	9	1	NA	1	**18**
ge3 laa1	NA	1	1	NA	NA	NA	NA	NA	**2**
ge3 laa3	NA	1	3	1	NA	NA	NA	NA	**5**
ge3 lo1	NA	NA	NA	NA	1	NA	NA	NA	**1**
laa1	7	6	1	4	NA	5	3	2	**28**
laa3	NA	2	2	NA	2	1	NA	1	**8**
laa3 wo3	NA	1	NA	NA	NA	NA	NA	1	**2**
laak3	NA	NA	NA	NA	NA	NA	NA	NA	**0**
lei4ge2	NA	NA	NA	NA	NA	NA	NA	NA	**0**
lei4ge3	1	NA	NA	6	NA	1	NA	NA	**8**
lo1	1	12	NA	3	4	3	6	1	**30**
lo4	NA	NA	1	NA	NA	NA	NA	NA	**1**
									104/153 (68%)
Combination									
ge3 laa3 bo3	NA	1	NA	NA	NA	NA	NA	NA	**1**
gaa2	NA	NA	1	NA	NA	NA	NA	NA	**1**
gaa3	NA	NA	3	NA	1	NA	NA	NA	**4**
gaa4	NA	NA	NA	NA	NA	NA	NA	1	**1**
gaa3 haa2	NA	1	NA	NA	NA	NA	NA	NA	**1**
laa1maa3	NA	NA	1	NA	NA	NA	NA	NA	**1**
									9/153 (6%)
Type 2									
aa1	1	NA	NA	NA	NA	4	NA	NA	**5**
aa3	NA	7	6	NA	NA	2	1	6	**22**
aa4	NA	NA	NA	NA	NA	NA	NA	NA	**0**
aa6	NA	1	1	NA	NA	NA	NA	NA	**2**
gwaa3	1	NA	NA	NA	NA	NA	NA	NA	**1**
ne1	2	1	NA	1	NA	2	NA	1	**7**
wo3	NA	1	NA	NA	NA	NA	NA	2	**3**
									40/153 (26%)
Total	**13**	**35**	**24**	**19**	**17**	**19**	**10**	**16**	**153**

(5) Distribution of sentence final particles for native speakers

Participant	**NS01**	**NS02**	**NS03**	**NS04**	**NS05**	**NS06**	
Type 1							
ge2	NA	NA	NA	NA	NA	NA	**0**
ge3	5	NA	NA	NA	1	NA	**6**
ge3 laa1	1	NA	NA	NA	NA	NA	**1**
ge3 laa3	1	NA	NA	NA	NA	NA	**1**
ge3 lo1	NA	NA	NA	NA	NA	NA	**0**
laa1	13	6	5	15	5	10	**54**
laa3	5	1	1	NA	1	1	**9**
laa3 wo3	NA	NA	NA	NA	NA	NA	**0**
laak3	NA	NA	NA	NA	NA	2	**2**
lei4ge2	NA	NA	NA	NA	1	NA	**1**
lei4ge3	NA	NA	NA	NA	1	2	**3**
lo1	1	1	4	3	9	1	**19**
lo4	NA	NA	NA	NA	NA	NA	**0**
							96/116 (83%)
Combination							
							96/116 (0%)
Type 2							
aa1	NA	NA	NA	NA	NA	NA	**0**
aa3	1	2	4	NA	2	2	**11**
aa4	1	1	NA	NA	2	NA	**4**
aa6	NA	NA	NA	NA	NA	NA	**0**
gwaa3	NA	2	NA	NA	NA	NA	**2**
ne1	NA	NA	NA	NA	NA	NA	**0**
wo3	2	NA	NA	NA	1	NA	**3**
							20/116 (17%)
Total	**30**	**13**	**14**	**18**	**23**	**18**	**116**

This shows that Type 1 particles made up 68% of the SFPs used by heritage speakers and 83% of the ones used by native speakers, Type 2 particles made up 26% of the ones used by heritage speakers and 17% of the ones used by native speakers, and particle clusters with both Type 1 and Type 2 particles made up 6% of the particles used by heritage speakers.

These results seem to be similar to those found by Kong (2013). Type 2 particles make up a larger proportion of the particles heritage speakers use, just as they do for aphasic

native speakers. Additionally, heritage speakers' use of Type 2 particles proportionally exceeds that of native speakers. Finally, native speakers have a higher proportion of Type 1 particles than heritage speakers do, and a higher proportion of Type 1 particles than Type 2 particles, just like in Kong 2013.

However, unlike Kong 2013, the analysis above only looks at the proportions of Type 1 versus Type 2 particles without including a count of utterances where speakers did not use any SFPs. Due to the fact that some utterances contained multiple particles, it seemed potentially misleading to calculate a proportion of particles to total utterances, as the sum of the percentage of Type 1, Type 2, and no particles would be over 100%. Instead, I compare utterances with particles (single or multiple) to those without particles below.

(6) Distribution of particles within utterances

	Total # of Utterances	**Total Utterances with Particles**	**% Utterances with Particles**	**Total Utterances with SFPs**	**% Utterances with SFPs**
HS01	42	16	38%	12	29%
HS02	65	34	52%	31	48%
HS03	54	25	46%	20	37%
HS04	53	20	38%	17	32%
HS05	47	1	2%	0	0%
HS06	45	2	4%	0	0%
HS07	59	20	34%	16	27%
HS08	54	20	37%	19	35%
HS09	44	9	20%	8	18%
HS10	50	13	26%	13	26%
Average			**30%**		**25%**
NS01	45	38	84%	27	60%
NS02	33	13	39%	11	33%
NS03	25	15	60%	12	48%
NS04	37	22	59%	15	41%
NS05	33	22	67%	18	55%
NS06	42	14	33%	14	33%
Average			**57%**		**45%**

This table reveals that on average, native speakers have a higher proportion of utterances with some sort of particle (including topic particle *ne1* or the verbal particles *saai3* and *maai4*), as well as a higher proportion of utterances that specifically have SFPs, than heritage speakers do.

To confirm that the data represents two different populations, a Wilcoxon Rank Sum Test (also known as a Mann-Whitney *U* Test) was run on the proportions, excluding the averages. The results indicate that these two populations are indeed different to a high degree of significance, with heritage speakers producing a lower proportion of utterances with any particle (one-tailed Mann-Whitney, $p < .01$). Additionally, they produce a lower proportion of utterances with SFPs as well ($p < .01$). These effects may partially be driven by the two heritage speakers who did not produce any SFPs. However, repeating the analysis with their data removed from the analysis still yielded significant effects ($p < .05$ for particle use and SFP use).

Other than SFPs, topic particles (*ne1*)[6] and verbal particles (*maai4* and *saai3*), which indicate aspect, were also counted. The latter were used very sparsely through both groups, although interestingly they were the only particles used by HS05 and HS06. Topic particles showed some difference in use between the two populations, as indicated below, but did not seem to be a major driver in the difference between the two populations ($p < .1$); although NS01 and NS04 used the topic particle very often, the others did so at rates equivalent to heritage speakers.

[6] Recall that Kong (2013) included *le1* in his count of Type 1, whereas they have been left out of the analysis here. This could contribute to the finding here that heritage speakers use a lower percentage of Type 1 particles than native speakers. However, given the much higher rates that native speakers use *ne1*, counting them as Type 1 particles is unlikely to yield any differences.

(7) Distribution of utterances with topic particles

	Total Utterances with Topic Particles	% Utterances with Topic Particles
HS01	4	10%
HS02	3	5%
HS03	5	9%
HS04	6	11%
HS05	0	0%
HS06	0	0%
HS07	4	7%
HS08	1	2%
HS09	2	5%
HS10	0	0%
Average		**5%**
NS01	18	40%
NS02	0	0%
NS03	4	16%
NS04	12	32%
NS05	5	15%
NS06	1	2%
Average		**18%**

Finally, it appears that the two populations differ significantly only in terms of the proportion of utterances with particles compared to utterances without particles. On the breakdown of individual particle types, the differences are not significant ($p > .1$).

(8) Categorization of particles used

	Total Particles	% SFPs	% Topic Particles	% Verbal Particles
HS01	18	72%	22%	6%
HS02	42	83%	12%	5%
HS03	29	83%	17%	0%
HS04	28	68%	32%	0%
HS05	1	0%	0%	100%
HS06	2	0%	0%	100%
HS07	21	81%	19%	0%
HS08	20	95%	5%	0%
HS09	12	83%	17%	0%
HS10	16	100%	0%	0%
Average		**67%**	**12%**	**21%**
NS01	59	51%	46%	3%
NS02	16	81%	0%	19%
NS03	19	74%	21%	5%
NS04	33	55%	39%	6%
NS05	29	79%	17%	3%
NS06	19	95%	5%	0%
Average		**72%**	**21%**	**6%**

This suggests that while the frequency of utterances with particles is higher in native speakers than in heritage speakers, within the utterances where they do use particles, they use the different kinds (SFPs, topic, and verbal) in similar proportions. Nonetheless, certain differences are apparent, such as the higher proportion of topic particles in native speakers and the higher proportion of verbal particles, although these may be due to skewing by HS05 and HS06, whose only particles are verbal.

Therefore, with regards to the three scenarios presented in section 4.1, the data appears to confirm Scenario 1, where heritage speakers pattern with aphasic speakers in how they differ from native speakers. As mentioned before, this could indicate one of two things: either heritage speakers are like aphasic speakers and lack a CP representation, or heritage

speakers have a different reason for diverging from native speakers. We will explore these possibilities in the following section and expound on the implications on our understanding of heritage Cantonese grammars and SFPs.

Section 4.4: Discussion

In general, comparisons between this study and Kong's (2013) show that parallelisms between the aphasic speakers and heritage speakers do in fact exist. Indeed, the near replication of Kong's trends regarding the proportions of utterances with Type 1, Type 2, and no particle is quite astounding. The two studies also show similarities in the most common particles, likely due to the similar tasks. Although the most common particle in Kong 2013 was *le1*, which was not included in the analysis here due to its likely status as a topic rather than final particle, the other most common particles are the same.[7] Namely, the most common particle overall was *laa1* (28 tokens among heritage speakers and 54 tokens among native speakers) and *lo1* (30 and 19) in Type 1 and *aa3* (22 and 11) in Type 2.

One interesting difference is that *ge3* is more commonly used among heritage speakers than native speakers in this study, whereas the aphasic speakers in Kong 2013 did not use *ge3* at all. This particle (and related particles such as *gaa3*) has been described as an assertion particle (Fung 2000; Li 2006; Sio; 2011) or an actuality marker (Sybesma 2004). In essence, *ge3* marks certain information as being relevant to the current context. Li (2006) puts it somewhat differently, noting that the *g-* particles (other than *gwaa3*) apparently derived from *ge3* indicate a property of 'asserting factuality'. In the current study, speakers appeared to use it to express properties of the situation, such as to indicate events that were

[7] Actually, in this study, it appears that *ne1* does not surpass *laa1* and *lo1* among heritage speakers, or *laa1* among native speakers.

happening or about to happen, or to explain something mentioned before. S. Law (1990) shows that *ge3* usually appears in the pattern *(hai6)…ge3*, and calls it a complementizer due to its use in relative clauses. Therefore, the structure may be something like in (9c):

(9) a. [$_{NP}$ [$_{CP}$ [$_{C'}$ [$_{TP}$ [$_{VP}$ … e_i …]] **ge3**]] N_i] **relative clause**
Seng4-jat6 wan6dung6 ge3 sai3lou6zai2 bei2gaau3 gin6hong1.
all-day exercise PTC child compare healthy
'Children who exercise always exercise are healthier.'

b. [$_{NP}$ [$_{CP}$ [$_{C'}$ [$_{TP}$ [$_{VP}$ … e_i …] **ge3**]] *e'*$_i$] **free relative**
Nei5 mou5 **ngo5 zung1ji3 ge3**.
2P NEG.have 1P like PTC
'You don't have what I like.'

c. SUBJ$_i$ (be) [$_{NP}$ [$_{CP}$ [$_{C'}$ [$_{TP}$ [$_{VP}$ … e_i …]] **ge3**]] *e'*$_i$] **sentence final ge3**
Ngo5-dei6 (hai6) **hou2-siu2 ceot1gaai1 ge3**.
1P-PL be very-little go.out PTC
'(The fact is that) we very rarely go out.'

(all adapted from S. Law 1990: 38-44)

She also notes that double *(hai6)…ge3* constructions are also possible, with one in an embedded clause and another in the matrix clause.[8]

There are two possibilities for why this is so common among heritage speakers, in comparison to among native speakers. One may simply be that the *(hai6)…ge3* pattern has been fossilized for heritage speakers, such that they use *ge3* whenever they have *hai6*. This does not appear to be true, as *hai6* does not always trigger *ge3*, and not all instances with *ge3* have *hai6*. The other reason may be due to its lower structure; all frameworks other than A. Law's (2002) places *ge3* lower than the majority of other SFPs. This makes it a more easily assessed particle for heritage speakers, perhaps causing them to use it in case where native speakers could use particles higher up in the CP domain. Overall, it does not appear that heritage speakers misuse *ge3*, though a few slightly infelicitous examples exist.

[8] However, *ge3* must be lower than the other COMP particles S. Law (1990) lists, because it cannot combine to the right of the table in Matthews & Yip 2011 shows.

Additionally, almost all heritage speakers who used particles also produced particle clusters[9], and some used more than one cluster (HS02 and HS03 in particular). A few of these examples may sound a little awkward, though in general it's difficult to tell what the speaker's intention is. Nonetheless, some were highly unique (e.g. *ge3 laa3 bo3* from HS02:54 and *gaa3 haa2* from HS02:58) but still clearly felicitous. Given that particle clustering is considered to require access to the different levels of syntax where the particles are represented, and may also require knowledge of the constraints on particle combination, it was unexpected that heritage speakers would demonstrate high command of these clusters.

Overall, this evidence suggests that, although heritage speakers appear to pattern with aphasic speakers on the surface, the underlying causes may be different. It may in fact be the case that heritage speakers have access to the CP domain, but simply due to online processing constraints, they tend to access the higher domains less often than native speakers. This explanation falls in line with the expectation that discourse-related structures are more difficult and processing-heavy (section 2.2.4). In that sense, they would be different from aphasic speakers, who have been shown to use pruned trees and therefore lack a CP domain for more principled reasons (Platzack 2011).

The apparent exceptions are HS05 and HS06, neither of whom produced sentence final particles. This initially seems to indicate that weaker heritage speakers do indeed lack access to higher domains. However, in at least one example from HS05 (HS05:40), the participant indicates a question with rising prosody, a strategy found in more commonly in English, though also possible in Cantonese. This use seems to align with Bernardini and Schlyter's (2004) ivy hypothesis, where uneven bilinguals express phenomena located higher

[9] The particles *lei4ge3* and *aa1maa3* are perhaps not particle clusters, as they are often considered one unit (see for example Wakefield 2010).

up in syntax with the lexicon of the dominant language. This is a key difference between heritage speakers and speakers with aphasia: the former possess the higher structures but may need to rely on their stronger language to encode and process those structures; the latter are said to have entirely lost access, depending on the type of aphasia.

Other than these two heritage speakers, the rest appear to perform similarly to native speakers except with a generally reduced production of particles. The difference in distribution of topic particles, as indicated by (7) above, also illustrates clearly that heritage speakers are in some sense limited in their access to the CP domain, at least within the confines of Cantonese.

The question that remains, however, is why heritage speakers and aphasic speakers appear to produce a higher proportion of Type 2 particles, which based on their placement in Matthews and Yip's (2011) chart, are found higher in the CP domain than Type 1 particles. If we assume that heritage speakers do in fact have more trouble accessing the CP domain, it seems logical to deduce that they should have more reduced access to higher areas of the CP domain (Laleko & Polinsky, submitted). Thus, if it turns out that heritage speakers use Type 2 particles more often than native speakers, then at the very least it would suggest that size of structure doesn't matter.

However, we can take a closer look at the Type 2 particle driving the difference, namely *aa3* (and to a lesser extent, *ne1*). These two particles make up most of the Type 2 particles produced by heritage speakers. Removing them from the Type 2 category would thus more or less level out this dichotomy of heritage speakers producing higher syntactic structure more often than native speakers.

An observation in A. Law 2002[10] may provide some evidence that particles like *aa3* and *ne1* are different from the other Type 2 particles, such as the question particles *aa4* and *me1*, the evidential *wo3*, and assertive *aa1maa3*. Under A. Law's framework, all SFP_1 particles, located in the highest CP projection ForceP, have a feature [+Q] or [-Q]. Particles with the [+Q] feature license questions, while those with the [-Q] feature typically cannot combine with questions. However, *aa3* and *ne1* can combine with interrogative (both *A-not-A* polar questions and *wh*-questions), declarative, and imperative utterances.

(10) a. Aa3saan1 hai2-m4-hai2 (ji1)dou6 aa3?
Ah-Saan LOC-NEG-LOC here PTC
'Is Ah-Saan here?'
b. Nei5 zung1ji3 bin1-(jat1)-go3 aa3?
2P like which-(one)-CL PTC
'Which one do you like?'
c. Ngo5 hai6 aa3 saan1 aa3.
1P be Ah-Saan PTC
'I am Ah-Saan.'
d. Faai3-di1 faan1lei4 aa3.
fast-MOD come.back PTC
'Come back soon.'

(11) a. Nei5 zung1-m4-zung1ji3 keoi5 ne1?
2P like-NEG-like 3P PTC
'Do you like him/her (I wonder)?'
b. Nei5 hai2 bin1dou6 ne1?
2P LOC where PTC
'Where are you (I wonder)?'
c. Ji1-go3 jau6 hou2sik6 jau6 peng4 ne1.
this-CL again delicious again cheap PTC
'This one is both delicious and cheap (so we should eat here).'
d. Si3-haa5 sin1 ne1.
try-DEL PTC PTC
'Try it first (and maybe you'll like it).'

[10] Recall that A. Law (2002) only analyzes two levels of particles to account for clustering. Unfortunately it doesn't appear to be sufficient to account for all clusters.

Additionally, unlike the other question particles, which form questions by attaching directly to statements, *ne1* and *aa3* only combine with already well-formed questions, acting mainly as a softener to make the utterance sound less abrupt.

(12) a. Nei5 sik6-zo2-je5 mei6 aa3/ne1/*aa4/*me1/*maa3?
2P eat-PFT-thing NEG.have PTC
'Have you eaten yet?'
b. Nei5 heoi3-m4-heoi3gaai1 aa3/ne1/*aa4/*me1/*maa3?
2P go-NEG-go.shopping PTC
'Do you want to go shopping?' or 'Are you going shopping?'
c. Keoi5 maai5-zo2 mat1-je5 aa3/ne1/*aa4/*me1/*maa3?
3P buy-PFT what-thing PTC
'What did s/he buy?'

(13) a. Nei5 sik6-zo2-je5 l-aa4/laa3 me1/laa3 maa3?
2P eat-PFT-thing PTC-PTC
'You already ate?'
b. Keoi5 m4-heoi3gaai1 aa4/me1/maa3?
3P NEG go shopping PTC
'S/he isn't going shopping?'

Because of this, A. Law claims that *ne1* and *aa3* are [-Q], as their presence doesn't type clause an utterance as interrogative. At the same time, though, other [-Q] particles do not combine with questions. A. Law thus claims that *ne1* and *aa3* are able to combine with questions because they lack semantic content, whereas the others possess semantics that are incompatible with questions.

However, it turns out that this contrast may arise due to a structural difference. Specifically, A. Law observes that *ne1* and *aa3* pattern together with *zek1* (an "intimacy" marker).

(14) a. Aa3-saan1 hai2-m4-hai2 (ji1)dou6 zek1?
Ah-Saan LOC-NEG-LOC here PTC
'Is Ah-Saan (actually) here?'

b. Nei5 zung1ji3 bin1-(jat1)-go3 zek1?
2P like which-(one)-CL PTC
'Which one do you like?'

c. Ngo5 hai6 aa3-saan1 zek1.
1P be Ah-Saan PTC
'I am Ah-Saan.'

d. Faai3-di1 faan1lei4 zek1.
fast-MOD come.back PTC
'Come back soon.'

Unlike the other two particles, *zek1* is listed in the column 3 rather than column 4 in Matthews and Yip 2011. If we are to interpret this placement meaningfully, it would indicate that *zek1* is actually at a lower level of representation than the others. However, because all three pattern with each other and differently from the other so-called question and exclamation particles in column 4, perhaps *ne1*, *aa3*, and *zek1* are syntactically distinct from *aa4*, *me1*, and *maa3*. Assuming, then, that *ne1* and *aa3* are indeed separate from the other column 4 particles, the next task would be to figure out where they go.

To address this question, we will start with a few additional observations. One is that all three of these particles appear to be at the right edge—it doesn't seem that anything can follow them linearly.[11] For *zek1*, the final –k seems to be a morpheme that phonologically prevents further clustering (S. Law 1990). Other particles in column 3, *lo1*, *lo3*, and *le5,* also exhibit similar utterance finality, despite a lack of *–k*. Thus, *ne1* and *aa3* would not be obvious exceptions. However, this means that they are indistinguishable from column 4 particles, at least in the sense that they apparently cannot be dominated by another particle.

[11] *aa3* has been hypothesized to combine with other particles to give rise to new forms, such as *ge3* + *aa3* = *gaa3*, and *ze1* + *aa3* = *zaa3*. While this is plausible, for our purposes we will view particles like *gaa3*, *laa3* and *zaa3* as being single units.

One diagnostic would be to see whether or not the particle in question combines with a well-established column 3 particle. For example, *laa3* and *zaa3* are known to take the question particles *me1* and *aa4*, and perhaps also *maa3*. Thus, any particles that can combine to the right of *laa3* and *zaa3* are likely structurally higher. If, on the other hand, a particle cannot combine to the right of *laa3* or *zaa3*, then it must be structurally equal (column 3) or lower (column 2 or 1).

This seems to align with the table in Matthews and Yip 2011 for the most part. For example, *laa3* and *zaa3* cannot combine with each other or any other similar particles. In addition to the question particles noted above, they can also combine with *gwaa3*, *aa1maa3* (*zaa1maa3*, *laa1maa3*), *bo3*, *haa2*, *ho2*, *wo3*, and *wo5*. They might also be able to combine with *wo4*, although its rarity (Matthews & Yip 2011) makes it hard to tell. Crucially, *laa3* and *zaa3* do not seem to combine with *ne1*, *zek3*, and *aa3*[12], indicating that these three particles are lower than particles like *me1*. We could then collapse them into the Type 1 particles (columns 2 and 3 in Matthews & Yip 2011). This would severely reduce the count of Type 2 particles produced by heritage speakers, and thus eliminate the discord wherein heritage speakers and aphasic speakers produce a higher proportion of the syntactically higher Type 2 particles than native speakers do.

Another unexpected finding is that *zaa3* appears to combine with *lo1* (and maybe *lo3*), which might indicate that *lo1* belongs higher up in the CP domain.

(15) Mai6 zau6hai6 gam3-do1 zaa3 lo1.
NEG.be that.is so-much PTC PTC
'This is exactly all there is.'

[12] While our diagnostic doesn't tell us whether or not *laa3* and *zaa3* combine with *aa3*, because *aa3* patterns with *zek1* and *ne1*, we assume that they do not.

Indeed, Wakefield, 2010, seems to agree that *lo1* belongs with *aa1 maa3* and *me1* up in a higher level of the CP domain (namely DiscourseP) because of its strong connection to the discourse context. If this is indeed the case, it might raise the count of Type 2 particles back up, which would undo the effects of adding *ne1* and *aa3* to Type 1. However, the frequency of *lo1* in the corpus is in part due to the expression *hai3 lo1* ('that's it'), which accounts for one fourth of heritage speaker use of *lo1*, and over half native speakers use. Thus it could just be a fossilized expression to indicate that one has finished talking about something, rather than a meaningful use of *lo1*.

In summary, these results indicate that heritage speakers, compared to native speakers, avoid CP encodings in Cantonese. This is especially true in consideration of the (admittedly anecdotal) observations that heritage speakers uses prosody to compensate for particle omission. However, unlike aphasic speakers they clearly have access to CP—this is corroborated by at least three empirical facts. First, their absence of CP material is not categorical. In fact, their use of particle clusters demonstrates occasional high level access. Second, they use other means, including prosody, to express CP-related meanings such as discourse orientation, polarity, and attitude. This indicates that, at least in English, they have acquired a CP-domain. And third, they do not make errors when encoding CP material.

Section 4.5: Conclusion

This chapter described a speech elicitation task which compared heritage speaker and native speaker production of SFPs. Through comparisons with Kong's (2013) study on aphasic speakers, apparent similarities emerge between heritage speakers and aphasic speakers who are said to lack access to the CP domain. However, this similarity is only

superficial. On closer scrutiny, the evidence from high-performing heritage speakers of their knowledge of particle clusters, and the use of compensatory methods such as prosody among weaker speakers, suggest that heritage speakers in fact do have access to the CP domain. They merely perform at reduced rates, likely due to online computational difficulties. In other words, their lower rates of production are simply due to the fact that heritage speakers tend to perform better with smaller rather than larger structures (Laleko & Polinsky, submitted).

In addition to the conclusions about heritage speaker grammar, the results from this chapter also prompted a reanalysis of the syntactic position of certain particles, most importantly *ne1* and *aa3*. While many sources, including Matthews and Yip 2011, list these as question particles, observations from A. Law (2002) reveal that they are in fact different from particles that attach directly to otherwise declarative utterances to turn them into interrogatives. These observations led to the claim that *ne1* and *aa3* are actually syntactically lower than the other question particles. By moving *ne1* and *aa3* into the Type 1 category, we solve the problem of heritage and aphasic speakers producing Type 2 particles at higher rates than native speakers.

Chapter 5: Conclusion

This thesis investigated the usage patterns of sentence final particles among heritage speakers of Cantonese. In doing so, it aimed to improve our understanding of the grammars of heritage speakers, specifically heritage Cantonese speakers, and to take a fresh empirical look at the structural properties of SFPs.

The first part of this thesis introduced the concept of heritage speakers and described the linguistic domains that they have difficulty with. It focused in particular on the simplification of morphological paradigms and the grammatical interface with the discourse context. The underlying cause for these difficulties appears to lie in the compromised processing abilities of heritage speakers, a problem shared by all bilingual speakers but exacerbated by heritage speakers' uneven command of their two languages. We then shifted the discussion to heritage Cantonese, a morphologically isolating language that could counterbalance the dominating influence that morphologically rich languages hold on heritage language research. In general, we found that the same processing concerns seemed to underlie the heritage speaker divergences from the baseline.

The following section explored the syntactic and semantic properties of SFPs. Syntactically, SFPs occupy structurally high positions in the CP-domain. This is evidenced by their position on the right edge of utterances. While different accounts vary in their precise placement of SFPs, all share the intuition that structurally higher particles are linearized closer to the right edge of an utterance. Research into the semantics of these particles confirms that their role is to connect the utterance with the discourse context. This context dependency is apparent in the difficulty of pinning down a precise meaning for any given particle or its phonological components. Additionally, the link between SFPs and

prosody in other languages makes clear the connection between SFPs and the discourse context, corroborating the claims of their syntactic complexity.

The final part of the thesis presented new research that compares heritage speaker production of SFPs to native speaker controls, based on a similar study looking at native speakers with aphasia. The results of the speech elicitation study indicate that both heritage speakers and aphasic speakers produce SFPs at reduced rates compared to native speakers. However, the data also show that heritage speakers, unlike aphasic speakers, have command over particle combination and prosodic structures, implying full access of the CP domain. The results also motivated a reanalysis of the syntactic position of several particles. Namely, to solve the apparent dilemma of heritage and aphasic speakers producing structurally higher particles at greater rates than native speakers, the particles *aa3* and *ne1* were reanalyzed as being structurally lower than previously assumed.

The theoretical importance of this thesis lies in the finding that even speakers of languages without complex morphology suffer from processing demands, causing non-native-like behavior in various domains, most obviously at the interface with discourse. Thus, it supplements existing research on heritage languages and reaffirms the claim that heritage speakers have trouble with structurally heavy domains. It also takes a novel approach by exploring SFPs in heritage Cantonese speakers, a topic that not received much attention. The implication for heritage language instruction is that even parts of the language that heritage speakers likely encounter regularly can evidence non-target-like behavior, and thus warrant further attention.

While the data in this thesis indicates clear trends in heritage speaker use of SFPs, it unfortunately is based on a small sample. Further work should be done to expand the corpus

of heritage Cantonese speaker speech to confirm the strength of the findings. This thesis should also serve as a springboard for new investigations into the processing tradeoffs for heritage language speakers. In particular, one possibility would be to systematically analyze the strategies heritage speaker use in place of SFPs, such as prosody or code-switching. Doing so will help piece together the complex picture of incomplete acquisition.

In short, this thesis validates claims about heritage speaker grammars, showing that they significantly diverge from native speaker grammars in the discourse-related phenomenon of SFPs, and raises questions about the structural properties of several SFPs. Though they appear to constitute only a meager and mundane part of the grammar, SFPs actually perform one of the more difficult roles of language, namely to connect the words uttered with the situation they are uttered in. By looking more closely at phenomena like this, we can gain deeper insight into the rich expressive power of language.

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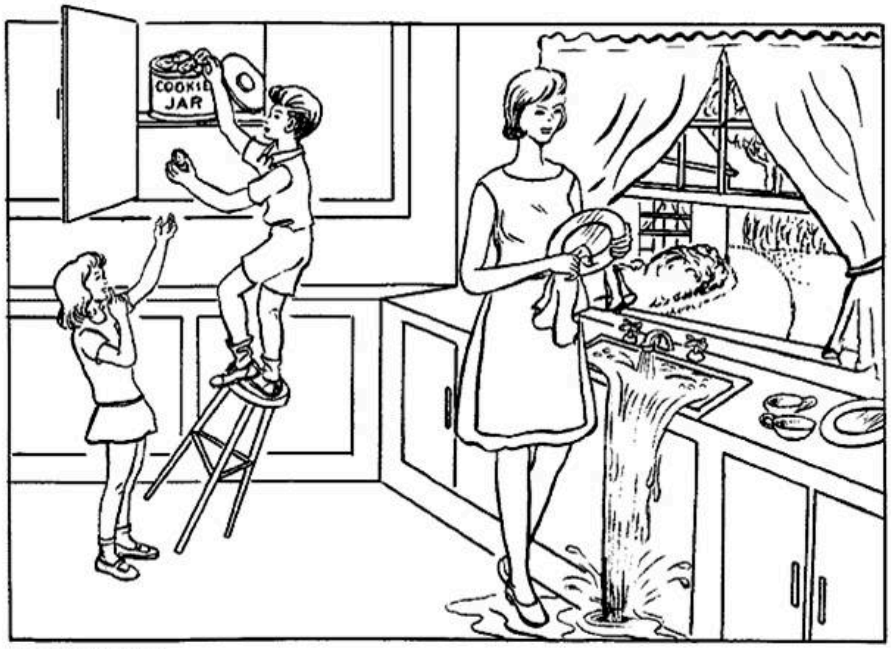
Appendix A: Table of study participants

	Home Language(s)	**Places Lived**	**Parent's Hometown**
HS01	Cantonese	USA	Hong Kong/USA (M)
HS02	Cantonese, (Mandarin)	USA Territory	Macau (F), China (M)
HS03	Cantonese, (Mandarin)	USA	Hong Kong/USA (M), Argentina/Taiwan (F)
HS04	Cantonese, (Mandarin)	USA	Guangzhou (F), Hong Kong (M)
HS05	Cantonese	USA	Hong Kong
HS06	Cantonese	USA, Hong Kong	Hong Kong
HS07	Cantonese, (Mandarin)	USA, Canada	Hong Kong (F), Nanjing (M)
HS08	Cantonese	USA	Guangdong (M), Malaysia (F)
HS09	Cantonese, (Hoiping)	USA	Guangdong
HS10	Cantonese	USA	Hong Kong
	Home Language(s)	**Places Lived**	**Hong Kong / Guangzhou**
NS01	Cantonese	Hong Kong	Hong Kong
NS02	Cantonese, (Maoming), Mandarin	Guangzhou	Guangzhou
NS03	Cantonese	Hong Kong	Hong Kong
NS04	Cantonese	Guangzhou, Hong Kong, USA	Guangzhou, Hong Kong
NS05	Cantonese	Hong Kong	Hong Kong
NS06	Cantonese	Hong Kong	Hong Kong

Appendix B: Task images

(1) Cookie Theft Scene



(2) Picnic Scene