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**L2 Influence on L1: Chinese Subject Realisation in
Chinese-English Bilinguals**

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To my Grandmother

杨素清

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This thesis is the product of a journey of challenges, but the trip has also been full of love and gratitude. On this journey, I experienced passion, fragility, and resilience. On this journey, I met beautiful minds and encountered great companionship. It is these people who made this journey rewarding and exhilarating.

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Statement of Authentication

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

Ying Liu
November 2020

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Abbreviations

3sg	Third Person Singular
ADJ	Adjunct
BA	Marker of the <i>ba</i> Construction
BEI	Passive (<i>bèi</i>)
BM	Bilingual Mode
CHAT	Codes for the Human Analysis of Transcripts
CHILDES	Child Language Data Exchange System
CLAN	Computerised Language Analysis
CL	Classifier
CLI	Cross-linguistic Influence
COMP	Closed Clausal Complement
CRS	Currently Relevant State (<i>le</i>)
DF	Discourse Function
DUR	Durative Aspect (<i>-zhe, zài</i>)
FM	First-mentioned Subject
GF	Grammatical Function
L1	First Language
L2	Second Language
L ϵ	Language of Environment
LFG	Lexical Functional Grammar
MM	Monolingual Mode
NP	Noun Phrase
NSL	Null Subject Language
OBJ	Object
OBJ $_{\theta}$	Second Object
OBL $_{\theta}$	Oblique Argument
PFV	Perfective Aspect (<i>-le</i>)
SLA	Second Language Acquisition

SM	Subsequently-mentioned Subject
SOV	Subject -Object-Verb
SUBJ	Subject
SVO	Subject-Verb-Object
WALS	World Atlas of Language Structures
XADJ	Open Adjunct, an adjunct without an overt subject
XCOMP	Open Clausal Complement, a complement without an overt subject

Abstract

This study aims to investigate the influence of the second language (L2) on the use of the first language (L1) in late bilinguals within an L1 dominant environment. Cross-linguistic influence (Kellerman & Smith, 1986) has been usually studied in the forward direction: how bilinguals' L1 influences the acquisition and use of their L2. The other direction (i.e., the influence of L2 on L1), on the other hand, has not been sufficiently investigated. Cook's (1992, 2003, 2016) Multi-competence proposal, which highlights the dynamic interaction between the bilingual's languages, stresses instead the importance of studying the possible effects of L2 on L1. However, most research under this paradigm, focuses on bilinguals residing in the L2 environment (Schmid & Köpke, 2017), with results showing that extensive exposure may contribute to L1 alteration, leading to instances of borrowing, restructuring, convergence, shift and even attrition (Pavlenko, 2003). Nonetheless, such studies do not account for L2 learners living in the L1 environment, a far larger population in scale.

The current study, consequently, attempts to address such an imbalance by looking at Chinese-speaking learners who acquire their L2 English through instruction in an L1 dominant environment. It does so by examining 'subject realisation', an area where Chinese and English exhibit substantial typological contrasts since Chinese allows both overt and null arguments under certain discourse-pragmatic conditions, whereas subjects in English are, under most circumstances, obligatorily expressed (Huang, 1984).

It is then hypothesized that long-time learning and regularly using English as L2 would increase the use of overt subjects realised in the bilingual's first language, i.e., Chinese, with the consequent use of fewer null subjects in their L1. In addition, following Grosjean (1998), the interaction between the bilingual's two languages is expected to be stronger when bilinguals produce language in the so called 'bilingual mode', i.e., when both languages are highly activated, than in a 'monolingual mode', i.e., when only one language is predominately activated. Such 'language mode' factor leads naturally to a further hypothesis: fewer null subjects are realised in speech produced by Chinese-English bilinguals within a

bilingual mode compared to monolingual mode.

To test these hypotheses, 15 Chinese-English bilinguals were recruited among highly competent users of English L2 to undertake, as the experimental group, tasks of Chinese narrative elicited in each monolingual mode (MM) and bilingual mode (BM) conditions. Informants for two control groups were also recruited. The first control group comprised 15 functionally monolingual Chinese speakers who performed the same MM condition tasks as the bilinguals. The second control group comprised two English native speakers who performed the same MM condition tasks in English. Utterances produced by all informants were digitally recorded and then transcribed for further analysis.

Results show that in the MM condition, the experimental group yielded significantly fewer null subjects than the Chinese control group. Also, the use of null subjects by the bilingual participants' in the BM condition is significantly lower than that in their MM condition. Participants' performance may be distributed over a subject realisation continuum: English Monolinguals < Chinese-English bilinguals in the BM condition < Chinese-English bilinguals in MM condition < Chinese monolinguals. Quantitative results offer a remarkable degree of support for both hypotheses.

Syntactic and discourse analyses were also conducted to locate the differences in the participants' choice of subject realisation. For advanced Chinese-speaking learners of L2 English in the present study, their subject realisation in Chinese exhibits preference for structures which Chinese shares with English but without violating L1 rules. These findings contribute supporting evidence for the multi-competence perspective (Cook, 1992; 2003; 2016) of bilinguals' language performance: the bilingual's L1 is not the same as that of a monolingual; the later acquired L2 can also influence the use of the mother tongue and such influence is observable, and measurable, in an L1-dominant environment. It seems that bilinguals develop syntactic processing strategies that are less costly in terms of the cognitive effort expended in utilizing resources from both languages.

Chapter 1 Introduction

The aim of this study is to investigate the influence of the second language on subject realisation in the first language of adult Chinese-English bilinguals, who are highly proficient in, and frequent users of, both their languages. A second language is, simply, a language “acquired later than a first language” (Larsen-Freeman & Long, 1991, p. 6). In Grosjean’s (1989) words, “a bilingual is not two monolinguals in one person.” No matter what accounts for the relationship between the two languages, whether they are independently stored, connected, or integrated, one thing can be safely assumed is that the two languages interact in varying degrees (Bialystok, 2009; Green & Abutalebi, 2013). Cross-linguistic influence (Kellerman & Smith, 1986) that is “the influence of a person’s knowledge of one language on that person’s knowledge or use of another language” (Jarvis & Pavlenko, 2008, p. 1) is often the focus in investigations of bilingualism since this kind of interaction may result in implicit and explicit impact on language perception and production (Bialystok & Barac, 2012).

Historically, cross-linguistic influence (or CLI) was studied principally in one direction. CLI used to be conceptualised as ‘interference’ (Lado, 1957; Weinreich, 1953) of the learner’s first language (L1) on the use of a second language (L2), with some negative undertones, regarding it as something of an impediment to learning a second language. This unidirectionality continued with Selinker (1972) who saw CLI, more positively, as ‘transfer’ (Gass & Selinker, 1994) from the L1, which could cause both positive and negative effects on the acquisition of the L2. Research in second language acquisition (SLA) has yielded abundant literature on L1 transfer, recording effects on the acceleration (Cummins, 2008) or interference (Selinker & Rutherford, 2013), the rate of learning and ultimate attainment, as well as the role of development in L1 transfer (Pienemann, Di Biase, Kawaguchi, & Håkansson, 2005). In the current study, the author uses cross-linguistic influence as a cover term to refer to the interaction between two linguistic systems in the bilingual’s use of either language rather than assuming the L1 as the only potential source of transfer.

As the recognition of cross-linguistic influence has become established in SLA and Bilingualism research (Wei Li, 2010; Meisel, 2001; 2007; Yu & Odlin, 2016; Yuan, 2014; Yuan & Lin, 2019), focused investigations of the phenomenon progressed towards identifying its causes and constraints. One of the issues is the directionality of CLI i.e., whether the influence is bi-directional rather than uni-directional (Pavlenko & Jarvis, 2002) or whether the environmentally prevalent language in the bilingual context may have an inhibiting effect on CLI (e.g. Qi & Di Biase, 2020). Some researchers, including Weinreich, also considered whether CLI might take place in the other direction as well, i.e., L2 might have an influence on L1, i.e., whether there was a ‘reverse’ or ‘backward’ effect (Weinreich, 1953). But, studies of this phenomenon ended up concerning mainly established migrant communities and converged with studies of ‘attrition’ (De Bot & Clyne, 1994; Schmid, 2016). Most other investigations looked at whether bilinguals behave differently from monolingual peers in their L1 (Grosjean, 1982; Major, 1992; Pavlenko & Jarvis, 2002). This comparatively under-researched area continued to grow, however, particularly after Cook (1991) proposed the notion of ‘multi-competence’.

The multi-competence framework (Cook, 1992, 2003, 2016) suggests that people who know two languages might behave differently from monolinguals in either of their languages. The bilingual’s L1 is not the same as that of the monolingual’s due to the dynamic relationship between two languages in the same mind. Such a bilingual perspective is shared by Grosjean (1998), who argues that a bilingual is not simply the sum of two monolinguals but a language user whose overall linguistic system has unique features. Bilingual speakers thus develop their competence to the extent required by their needs in various contexts of language use. Under the multi-competence perspective, investigations would look at how bilinguals’ behaviour may exhibit features of a modified linguistic system that facilitate the use of the two languages, rather than induce errors against monolingual norms (Baus, Costa, & Carreiras, 2013; Bergmann, Nota, Sprenger, & Schmid, 2019; Su, 2001). Evidence has since been accumulating to show that learning a second language might change the perception and production of the bilingual’s first language (Cook, 2003; Jarvis & Pavlenko, 2008; Kroll, Dussias, Bice, & Perrotti, 2015; van Hell & Dijkstra, 2002).

The phenomenon of cross-linguistic influence was frequently discussed in childhood and simultaneous bilingualism. Pioneers such as Volterra and Taeschner (1978) proposed that in bilingual acquisition, the two languages develop together and only later are they differentiated. Meisel (2001) and De Houwer (1990) argued, on the contrary, that the two languages of a simultaneous bilingual develop separately. The debate continued unabated with Müller (1998), Yip & Matthews (2007), and Qi (2010) among others. Late bilinguals who learned their second language in their youth or adulthood also came under the spotlight where the influence of the language learned later had effects leading to first language to the extent of causing attrition (De Bot & Clyne, 1994; Schmid & Köpke, 2007). In both cases where children acquire two languages at an early age and adults who experience L1 attrition after moving to another country, the L2 is also the language of environment (L_e in Qi & Di Biase, 2020's terms), i.e., where the L2 is the language predominantly used in the societal context. Research on L2 immersion has found instances of L1 deviation in phonology (Cabrelli, Luque, & Finestrat-Martínez, 2019; Major, 1992), lexical and semantic access (Ivanova & Costa, 2008; Laufer, 2003), morphosyntax (Gürel, 2008; Su, 2001), as well as discourse and pragmatics (Pavlenko & Malt, 2011; Serratrice, 2005). Some studies reported that even short-term L2 immersion could impact on L1 use in post-puberty L2 learners (Chang, 2013; Pavlenko & Jarvis, 2002).

It seems that an L2 dominant environment is an ideal place for testing the L2 influence on L1. However, some complex and problematic issues exist. Most bilinguals who have been studied in an L2 environment are the first and second generations of immigrants, who use their L2 (the predominant language most of the time) especially in situations of language shift (Clyne, 2003) where their L1 may be sparingly used in a very limited number of contexts. This is also true, e.g. of the situation of Italian second generation immigrants in Australia as confirmed in a very recent study by Galatà, Avesani, Best, Di Biase & Vayra (2020). Consequently, the distinct L1 performances found on bilingual children might be attributed to the incomplete acquisition of their L1 (Silvina, 2016; Polinsky, 2018) whereas those of adult bilinguals might result from decreased exposure and use of their L1 (Schmid & Köpke,

2007), rather than (or in addition to) an impact induced by the L2. In this regard, it is crucial to look at the opposite situation where bilingual users, whose L1 is complete and functional, use both languages actively and frequently in the L1 environment. A large population of such bilinguals are the L2 learners who acquire the second language through classroom instructions on their homeland. Their bilingual specificity is not covered by the kind of studies referred to just above, hence it would be intriguing to know whether these bilinguals in their own L1-dominant environment might also experience any influence from their L2 when using their L1. Kecskes and Papp's (2000) book is a significant contribution to this emerging area of research, which considers possible influences of foreign language instruction on the mother tongue. However, due to the scarcity of such research, it is still not well understood whether the L1 of bilinguals in an L1 environment behaves similarly or differently from that of their monolingual peers; and if there were some differences, what would they look like and whether they could be measured and accounted for.

This study, then, examines whether L2 influences L1 performance in an L1-dominant environment where both languages are actively used. It targets adult Chinese-English bilinguals who are native speakers of Chinese and who learned English L2 in instructed environments and performed at an advanced level. They represent a group of bilingual speakers who use a second language for a wide range of functions such as in their training as professional interpreters or international communication. These bilingual users may be defined as 'the international professional community of L2 users' in Cook's (2007, 2011) categorization of L2 user identities. Unlike the bilinguals in an English environment, who had exposure to both formal and informal English and used the language in various contexts, L2 English learners in China learn L2 English mainly in foreign-language courses and keep the use of L2 English to certain contexts such as for academic and professional purposes. Their L1 is intact and predominantly used on all other daily communications.

There is another intriguing aspect of a bilingual's use of their second language identified by Grosjean (1998, 2001) who claims that the bilingual's language use corresponds to various points on a language mode continuum, ranging from a monolingual endpoint where one

language is predominantly called up with the other extremely inhibited, to a bilingual endpoint where both languages are highly activated. Language mode, according to Grosjean (2001), is subject to external factors such as the interlocutor, the topic, and the context of the interaction among others. Bilinguals are said to operate in a more monolingual mode if only one language is required, such as when talking to a monolingual speaker, either from the L1 or the L2 community. By contrast, the same bilingual is in a more bilingual mode, if both languages need to be activated, such as when communicating with a group of people among whom different languages are used or in a situation where code-switching takes place (Auer et al., 2014; Wei Li, 1995). In other words, the L1 dominant environment notwithstanding, bilinguals would have different L1 performances subject to language mode. When the L2 is prevalent, their L1 might have a higher possibility of deviating from monolingual rules; whereas when the L2 is inactive, their L1 might present more monolingual-like patterns.

Chomsky (1981) claims all languages express subject. That is, this grammatical category appears to be a linguistic universal. This is part of the motivation for this study to look at the domain of subject realisation as a possible locus for change. Further, Chinese and English display not only typological contrasts but also similarities. On the one hand, Chinese and English share canonical word order SVO, whereby the subject takes the most prominent position in word order, preceding the verb. On the other, Chinese and English stand in typological contrast in terms of subject realization, with Chinese allowing both overt and covert (or null) argument in subject position, whereas English demands obligatory forms under most circumstances (Huang, 1984). Since the specific form of the subject in Chinese fulfils discourse-pragmatic choices, mature speakers of Chinese can be expected to choose the form of subject realization after its first mention in a discourse (i.e., whether to use null or pronominal forms and at what point in the discourse chain) according to their own perceived needs. Given this context it is hypothesized that if L2 English does exert some influence on L1 Chinese, Chinese-English bilinguals might favour overt subjects over null subjects in their L1 Chinese. Likewise, the preference for overt forms in subject realisation might also be observed to be greater in a bilingual mode than in a monolingual mode.

To test these hypotheses, fifteen proficient Chinese-English bilingual users in China will be recruited. They will undertake on-line communicative tasks to generate narratives in their L1 Chinese. A further fifteen native Chinese monolingual controls will also be recruited to perform the same tasks. The performance of bilingual participants will then be compared to that of the monolingual participants on how they address subjects with the expectation that a higher rate of overt forms (equivalent to a lower rate of null forms), would be found in the utterances of bilingual participants. Moreover, the context of language use will also be manipulated in the elicitation of the bilingual participants' utterances in response to Grosjean's (1998) argument that language mode should be controlled in the examination of CLI. Within-subject comparison will then be carried out to test whether the rate of null forms would be even lower when bilinguals produce Chinese in a bilingual mode than in a monolingual mode. Results will also be compared to the subject realisation of two English monolingual controls performing the same task in English.

If bilingual participants are found to behave differently in realising subjects compared to their monolingual counterparts, it would also be critical to know in what sort of syntactic environments these differences occur, as a check on the 'grammaticality' of such choices. Also, given the involvement of discourse-pragmatic factors involved in the selection of null versus pronominal forms, a qualitative analysis will also be carried out to pinpoint the locus of these differences. With respect to syntactic environments, bilinguals' choices of subject forms will be analysed at the level of sentence structures, following Kroeger's (2005) categorization by reference to Li & Thompson (1989) and Huang (1984) for Chinese-specific features. The discourse-pragmatic conditions (Givón, 1983) on the other hand, will be analysed with Pu's (1997, 2019) categorization of discourse continuity in Chinese narratives. Likewise, the mode difference will take the same analytical approach.

Results and findings from this study will contribute to the explorations on how proficiently bilinguals behave in an L1 environment. It complements the investigations of the bi-directional nature of CLI, and thus may shed some light on the dynamic interaction between the bilingual's two languages (Cook, 1992, 2003; De Bot, 2000). The author argues for a

multi-competence perspective in looking at the bilinguals' L1, that is, the bilinguals' L1 is not the same as that of a monolingual due to the possible changes induced by the experience of learning and using their L2. Furthermore, it may offer some insights into how languages work in the mind, particularly for bilingual language processing (Kroll et al., 2015) and production (Grosjean, 1998).

The remainder of the thesis consists of six chapters. Following the present introduction, Chapter 2 reviews the literature on CLI and subject realisation. It outlines the motivation and rationale of this study by sketching an overview of the field, addressing its development and trends, discussing major findings, and identifying the gap whereby research questions are raised. It also explains the typological differences between Chinese and English in realizing the subject, which is the construct delimiting the present study. Chapter 3 describes the methodological approach, justifies the design of the experiment, and explains the approach taken in analysing the data. Upon highlighting grammatical and discourse functions of assigning the referent in Chinese, the author proposes an analytical framework for analysing subjects in the current work. Chapter 4 shows results and key findings from the collected data. Chapter 5 offers an analysis of the syntactic and discourse environments for subject realisation with an ensuing discussion to interpret between-subjects and within-subject differences. Chapter 6 summarizes the answers to the research questions posed in the present study and concludes with implications and directions for further investigation.

Chapter 2 Literature Review

This chapter introduces the multi-competence perspective of bilingualism, theoretical frameworks of subject realisation, and empirical studies on bilingual subject realisation. The multi-competence perspective views bilinguals as a distinct group of speakers that have developed their own strategies in communication with two languages. It argues for studying the bilingual performance in their own right rather than making a simple comparison with monolingual behaviours. In the following sections, bilinguals' multi-competence will be elaborated with a focus on how the bilingual's L1 is different from that of a monolingual. To make such a difference explicit, the domain of subject realisation will be examined. It then offers theoretical considerations on major constraints governing subject realisation. Previous research on bilingual performance in realising subjects will be reviewed before sketching the research questions and hypotheses for the current study.

2.1 Multi-competence and the Bilingual's L1 Performance

The existence of two languages in a single mind makes the bilingual's overall language system different from that of the monolingual. The multi-competence perspective regards bilingual behaviours as having features that reflect on how the knowledge and use of two languages are coordinated by an individual bilingual speaker. The bilingual behaviour thus exhibits variations in monolingual performance regardless of which language they use. The bilingual's L1 is not the same as that of the monolingual.

2.1.1 Multi-competence Perspective of Bilingualism

Bilinguals differ from monolinguals in that they use two or more languages rather than one. One of the major debates in the field of bilingualism is how the bilingual's languages are related, i.e., whether they are separate or shared (Kollers, 1963; Weinreich, 1954). Previous literature offers three theoretical accounts. The first one regards the two language systems as separate watertight compartments, with no connection between the L1 and the L2, reflecting

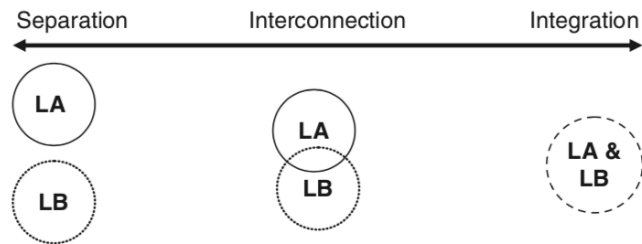
Weinreich's (1954) concept of coordinated bilingualism. In this sense, the L2 develops and is processed independently from the L1 (Burt & Dulay, 1980) and the two systems are stored in parallel in different regions of the brain (Bialystok & Hakuta, 1994; Kovelman, Baker, & Petitto, 2008). This account however, fails to interpret why an L2 user's interlanguage (Selinker, 1972) as well as their ultimate L2 achievement are shaped to some extent by features of their first language (Tsimpli, 2003). Influence from the non-target language seems to play a role in such phenomena as code-switching (Backus, 2005) when speakers mix the use of two linguistic systems in a single utterance, or foreign accents on highly competent bilinguals whose L2 proficiency is native-like.

The second account takes the opposite view by seeing the two languages integrated into a single system in which L2 is developed and stored together with L1 (Caramazza & Brones, 1980; Hasegawa, Carpenter, & Just, 2002). Total integration echoes the idea of compound bilingualism (Weinreich, 1953) and helps to justify instances of cross-linguistic influence in various linguistic domains (Jarvis & Pavlenko, 2008) as well as language co-activation in the bilingual lexicon (Bates & MacWhinney, 1989; De Bot, 2000). This position resonates in Schwartz and Sprouse's full transfer-full access (1994, 1996) according to which the initial state of the L2 is the final state of the L1. But if the two languages are totally merged then it is difficult to explain why there are constraints for L2 learners in transferring their existing L1 knowledge in processing L2 (Pienemann, Di Biase, Kawaguchi, & Håkansson, 2005) and how simultaneous bilinguals can distinguish the use of the two languages at a very early stage (De Houwer, 1990; Meisel, 1989).

The third account was developed from the previous two but rejects total separation or integration as being too extreme. Rather, it postulates a middle course whereby the relationship of the two languages is separate but linked or partially integrated and hence interactions of various degrees are likely to occur (Kroll & Tokowicz, 2001; van Hell & Dijkstra, 2002). Within that same position, Cook (2003) proposed a model to describe the dynamic interaction between the bilingual's two languages as points on a continuum. This offers a visual metaphor that reflects the diversity and complexity of the relationship between

the two languages in a single mind (see Figure 2.1).

Figure 2.1 The integration continuum of possible relationships in Multi-competence (Cook 2003, p. 9)



According to Cook (2003), total separation and total integration are situated at the two ends of the continuum and different degrees of interconnection come in between. The two ends are unlikely to show in their extreme form, rather, bilingual users may be found somewhere along the continuum in regard to how their two languages develop, changed and interact. Likewise, different domains of language could be located at different points of attainment whereby some domains, e.g. the lexicon are better integrated than others e.g. phonology. Most importantly, the continuum represents fluid, rather than static relationships, in that the degree of separation on the continuum is not constant and can change in either direction. The influence of one on the other language waxes and wanes; the co-activation levels vary in different communication contexts (Grosjean, 1998).

As shown by this continuum model, bilinguals develop various skills and knowledge in dealing with two languages, and functioning as competent language users. These skills and knowledge in the bilingual mind are termed by Cook (1991) as 'multi-competence', which refers to the distinctive and holistic competence 'with two grammars' as opposed to a simple L1 plus L2 equation. The definition of multi-competence was later modified to 'the knowledge of more than one language in the same mind' (Cook, 2003) and extended to cover 'the overall system of a mind' in both language and cognitive systems (Cook, 2012). The multi-competence perspective advocates a consideration of the bilingual as a unique and competent language user in their own right, rather than viewing them as someone having two distinct monolingual language systems.

The present study is inspired by the multi-competence perspective of bilingualism for two major reasons. First, bilinguals are different from their monolingual peers of either language. Both languages of the bilingual are subject to changes due to the dynamic interactions with one another. Second, a bilingual speaker may exhibit some competence distinct from monolingual speakers of either language, due to the bilingual's experience of handling two languages. The levels of integration and interaction feeding performance in the two languages may vary from one bilingual to the next and even within the same bilingual in different situational contexts. This can be appreciated in measurable changes in variables, such as the language dominance within different situations and contexts (Xu, Wang, & Wei Li, 1998).

The bilingual's multi-competence has been evidenced in SLA studies where L2 learners are found to transfer L1 linguistic knowledge in facilitating the acquisition of the L2 (Cummins, 2008). Also, in psycholinguistic studies, enhanced cognitive functions are observed in bilinguals as a result of frequent control for language use (Bialystok, 2009; Green, 1998; Paap & Greenberg, 2013) in communicating with people from diverse backgrounds where borrowing and code-switching often take place (Kharkhurin & Wei Li, 2014). Further, the pattern of activation and suppression of either language is also exercised in metalinguistic awareness (Pearl & Lambert, 1962). Researchers found bilinguals are sensitive to properties of both language systems, even when the context requires the application of only one of them (Kroll, Dussias, Bogulski, & Valdes-Kroff, 2012). In Grosjean's words, the bilingual is 'a specific and fully competent speaker/hearer who has developed a communicative competence that is equal, but different in nature to that of the monolingual' (1994, p. 1657). The bilingual's multi-competence is manifested then, by their ability to use language to satisfy different needs, in different contexts, with different people (Grosjean, 2016; Ivanova & Costa, 2008).

2.1.2 Cross-linguistic Influence

Cross-linguistic influence (Kellerman & Smith, 1986) is a widely-studied topic in examining

the bilingual population. The other two terms, i.e., ‘transfer’ (Gass & Selinker, 1994) and ‘interference’ (Lado, 1957; Weinreich, 1954) are used to denote similar meanings but are said to be not as felicitous as cross-linguistic influence (henceforth as CLI). ‘Interference’ has a negative connotation associated with difficulties and ‘transfer’ seems to imply that some concrete entity needs to be moved from one language to the other. In many cases however, the influence can be positive or implicit. One such example is that Chinese speakers who are learning English L2 may produce sentences like *apple is good for your health* rather than *the apple is good for your health* because Chinese lack articles. It is easier to comprehend this phenomenon under the term of ‘CLI’ rather than ‘transfer’. In this thesis, cross-linguistic influence will be used as a cover term to refer to the interaction between two linguistic systems in the bilingual’s use of either language.

L1 Influence on L2

No one could ever deny that the first language plays a salient role in the acquisition of the second language. The accumulated evidence from the previous research has proved Odlin's (1989) assumption that "transfer can occur in all linguistic subsystems" (p.23). In the domain of L2 phonology and phonetics, L1 transfer is examined at the segmental level for the difficulty of distinguishing and producing certain L2 sounds that do not have a phonemic counterpart in L1 in regard to properties such as duration, voicing, and aspiration (Cook, 2003; Eckman, 2004; Escudero & Boersma, 2004; Schmid & Köpcke, 2007); at the suprasegmental level for relying heavily on L1 norms in organizing syllable structure (Hansen, 2001) and applying intonation, stress, and rhythm (Levis, 1999). In the domain of L2 morphology and semantics, L1 transfer is reported by studies on word knowledge and its use associated with frequency, formality, register and concept (Foroodi-Nejad & Paradis, 2009), semantic errors (Poulisse, 1999); lexical representation and activation (Jiang, 2004); word choice (Hohenstein, Eisenberg, & Naigles, 2006), and morphological reference (Jarvis & Odlin, 2000). Syntactic transfer was found to be related to L1 cue preference, in both comprehension and production (Gass, 1983; Jarvis, 2002; Su, 2001; White, 1987). Discursive transfer has been revealed in rhetorical conventions (Connor, 1996), and framing effects for

events, concepts, and emotions (Jarvis, 2016). Pragmatic transfer draws attention to how L1 knowledge influences L2 learners' speech acts in perception (Byon, 2004), and production (Chang, 2009). Sociolinguistic transfer was investigated by looking at how L2 learners become socialized into a new speech community (Yu, 2004), and how social variables guiding their L1 knowledge can be carried over into their use of L2 (Pavlenko, 2007).

CLI used to be studied as a unidirectional phenomenon, despite that Weinreich (1953) first mentioned the concept as 'instances of deviation from norms of either language' (p.1). As captured by Cook's multi-competence perspective, dynamic interaction between the bilingual's two languages makes the bilingual's first language susceptible to processes of change and adaption under L2 effects. The bi-directionality has gradually become a noteworthy development in CLI studies (Ringbom, 2007), generating a growing body of literature in the backward or reverse direction (Cook, 2003; Schmid & Köpke, 2007).

L2 Influence on L1

Bilinguals differ from monolinguals in various ways, not only with respect to the second language but also to the first language. The knowledge of the first language is not always stable even after full acquisition. Linguistic units and structures in the L1 are amenable to modification by the input of similar or competing patterns in the L2 both in the immediate and longer terms (Schmid & Köpke, 2017).

Research in phonology showed that L2 learning might result in L1 parameter restructuring towards L2 norms (Chang, 2012; De Leeuw, Tusha, & Schmid, 2018; Flege, 1987; Major, 1992; Ulbrich & Ordin, 2014). Williams' (1979) study found Spanish learners of L2 English shifting from a Spanish-like to an English-like manner in producing Spanish word-initial tokens. Tamminen, Peltola, Tovivonen, Kujala, and Naatanen (2013) found the perception of phonological categories in the L1 becomes weakened by the competing L2 categories. Chang (2012) and Fledge (1987) reported that the adaptation of voice-onset-time value towards the L2 setting becomes stronger as L2 exposure and proficiency increase.

A series of empirical studies has uncovered an L2 influence in lexicon and semantics (Ameel, Malt, Storms, & Van Assche, 2009; Malt, Li, Pavlenko, Zhu, & Ameel, 2015; Marian & Spivey, 2003; Pavlenko, 2010; Pavlenko & Malt, 2011). Ringbom (1992) argues that lexical transfer from L2 tends to be detected when L1 and L2 are closely related, while semantic transfer is more likely to happen in learners with a high L2 proficiency. Laufer (2003) found that the speed of retrieval, lexical diversity and collocation might deviate from that of the monolingual speaker due to language competition (Abutalebi & Green, 2007; De Bot, 2000). Pavlenko and Jarvis (2003) have observed that even late bilinguals who are fully proficient in their L1 and maintained a regular L1 usage, produce L1 lexico-semantic errors due to an L2 influence after immigrating to an L2 environment.

With respect to syntax and morphosyntax, Pavlenko and Jarvis (2002) found errors in pronominal case marking in Russian speaker's L1 subject to the L2 English pronominal case system. Altenberg (1991) and Köpke (2002) argued that a person might become more tolerant of ungrammatical constructions in their L1 after learning a second language. Others (Jarvis, 2003; Su, 2001) found that advanced L2 users might reject some constructions that are grammatically correct in L1 but violates L2 constraints. Su (2001), Morett and Macwhinney (2013) both found that L2 learners showed an increasing reliance on L2 cues like word order in interpreting L1 sentences, as their L2 proficiency was enhanced. Dussias (2003, 2004) noticed a preference for English parsing strategies in Spanish-English bilinguals. Other areas like tense and aspect, gender- and number-marking, and subcategorisation also reported L2 effects (Håkansson, 1995; Schmid, 2011; Seliger & Vago, 1991).

In discursive and pragmatic domains, Tao and Thompson (1991) documented L2 effects in the frequency with which Chinese-English bilinguals produce backchannel responses in their L1. Pavlenko and Driagina (2007) compared the use of emotion vocabulary use in their corpora of Russian immigrants in the US, with monolingual Russian providing evidence of L2 transfer in framing specific ideas. Pragmatic transfer from L2 to L1 is also evident in the studies from L2 English to L1 Spanish (Cenoz, 2003) and L2 English to L1 Russian

(Pavlenko, 2002). Kecskes and Papp (2000) found that training in L2 English writing conventions helps improve the quality of L1 writing in Hungarian-speaking pupils.

Most studies reviewed above target bilinguals living in an L2 dominant environment, as in the case of migrants. However, the possible influence that learning and using L2 in an L1 environment may impose on the bilingual's L1 is under-approached (Cenoz, 2003).

2.1.3 Bilinguals in the L1 Environment

The majority of bilinguals in the L1 environment consists of classroom L2 learners who acquire a second language for academic purposes and L2 users in a bilingual working environment (Cook, 2011). The largest number of these bilinguals have an L2 of English due to its dominant status in international trade, politics, and communication, as indicated by the term of English as the Lingua Franca (Seidlhofer, 2004). There is a phenomenal growth in the global population of L2 learners in an L1 environment as the internet has made cross-border exchanges and collaboration easier, wider and more frequent. In fact, L2 learning is a compulsory subject in elementary and secondary education in many countries (Graddol, 2006). However, studies on this group of bilinguals focus mainly on their linguistic performance of L2; how learning and using a second language might affect their L1 use is rarely examined. This is partially due to the misconception that a well-established L1 is immune to change especially when exposure and use is not dramatically decreasing as in the case of L1 attrition (Schmid & Köpke, 2007) observed in emigrants. But, according to the multi-competence perspective, the bilingual's language system is highly adaptive, the native or dominant L1 also experiences changes in response to the L2 (Cook, 2016; Kroll et al., 2015; Schmid & Köpke, 2017). It is intriguing to see what changes and adaptations L1 exhibits in an L1 environment and how these phenomena can be identified and interpreted.

Findings from literature on L2 effects in an L2 environment may offer some clues. Some studies reported that learners with higher L2 proficiency and frequency of use are more likely to experience L2 effects (Lagrou, Hartsuiker, & Duyck, 2013; Schwartz, Kroll, & Diaz, 2007).

The number of L2 learners with high proficiency and frequent use keeps growing. Take English learners in China's big cities for example, the age of onset seems to be when children are sent to pre-school language courses at an early age. Private language schools enrol children from the age of three. Compulsory English learning starts from the first year of elementary education in public schools. In private schools, many subjects are taught in English. In universities, students who study English courses for future professional pursuits such as translators, interpreters, and any others who are oriented to international communication, make up a huge number. These L2 learners have a strong motivation and function as speakers of a larger global speech community (Cook, 2011).

Some common features of these bilingual groups are as follows. First, they use their L1 and L2 in different work and life contexts. The L2 is most used for the study and the work environment and thus more academic and profession oriented whereas L1 is predominantly used in a more casual way such as dealing with daily affairs. For people who shift between two languages e.g. translators/interpreters and employees of transnational enterprises where both L1 and L2 are the working languages, more instances of cross-linguistic influence may be noticed. Second, many of them are advanced learners who are competent in using the second language and the proficiency may keep increasing with longer exposure to bilingual studying or a working environment. Third, many instances that are caused by learning and using the L2 may not lead to grammatical mistakes or unaccepted usage of the L1 since there is no incomplete acquisition or disuse issues behind the deviated performance of heritage speakers (Montrul, 2006; Polinsky, 2011).

In Kecskes and Papp's (2000) study, L2 learning has a positive influence on Hungarian High schoolers' performance in L1 writing in regard to conceptual fluency. They claim that intensive and successful L2 learning facilitates L1 development because trying to comprehend L2 might trigger some passive use of the L1. Van Hell and Dijkstra (2002) studied the influence of English L2 on Dutch L1 performance in an exclusively L1-dominant environment. The Dutch-English bilingual participants, who are highly proficient in their L2, performed word association and lexical decision tasks in their L1. The results show that the

reaction times to L1 words that have cognates in L2 are shorter than those without cognates, suggesting a L2 impact on L1 processing. Brown (2015) investigated motion event expressions in adult bilinguals who live in an L1 environment. Bilingual participants in her study are 12 Mandarin-speaking learners of English L2 in China, and 15 Japanese-speaking learners of English L2 in Japan. Differences in L1 performance were found in comparison to those of monolingual peers. Brown attributed the difference in patterns as L2 effects on L1 rather than L2 immersion or L1 attrition since the participants had active use of L1 in an L1 environment. She further suggested the existence of convergence in this domain between the two languages of bilinguals even when their L2s are at the intermediate level. L2 effects in an L1 environment at an early stage are also reported in Bice and Kroll's (2015) study in which they tested native English speakers learning Spanish in L1 environment and found L2 learning impacts the L1 performance when learners' L2 skill is at the early stage of development. Su (2010, 2012) examined the requesting and apologizing behaviors in Chinese-speaking learners of English L2 in the L1 environment and reported backward transfer from L2 on L1 pragmatic strategies, supporting Cenoz's (2003) argument that intensive L2 exposure makes convergence of pragmatic competence from L1 towards L2 possible.

These studies indicate the multi-competence of a bilingual in the L1 environment might exhibit distinctive features in regard to their L1 use, for the sake of constant interaction between the two languages in the same mind as well as the need for coordinating the two languages from linguistic and cognitive perspectives. In an L1 environment, where active L1 use seems to be sufficient, changes or adaptations to the well-established L1 knowledge are more likely to be identified in spontaneous speeches rather than in prepared speeches or written productions. The former setting is largely constrained by time and cognitive efforts. This is in line with psycholinguistic findings that bilinguals are less efficient than monolinguals because they have fewer general cognitive resources to deploy in the integration of different types of information in online tasks (Abutalebi & Green, 2007; Hartsuiker & Pickering, 2008; Kroll et al., 2015).

2.1.4 Bilingual Speech Production and Language Mode

Bilinguals' speech production is to some extent the same as that of monolingual speakers (Levelt, 1989; Levelt, Roelofs, & Meyer, 1999). However, since bilinguals have two languages rather than one, when producing an utterance in one language, the existence of the other language poses a cognitive and processing influence. In this sense, bilingual speech production also exhibits distinctive features (De Bot, 2000). In the following subsection, we present the features that are identical in general language production and distinct to bilingual performance.

Levelt's (1989) model depicts speech production as a psycholinguistic process which consists of three independent procedures, i.e., conceptualization, formulation, and articulation. These procedures are hierarchically ordered with the output of the preceding one feeding into the succeeding one. Production is incremental, parallel, and automatized. It means spontaneous speech production is instant, linear, and irreversible. A speaker's intention is first generated into preverbal messages in the conceptualizer, where discourse and situational knowledge are encapsulated. The decided message then inputs into the formulator, where lemmas are selected from the mental lexicon and encoded with proper linguistic forms and phonological items. The final step is for phonetic plans to be sent to the articulator to form the overt speech. For a bilingual speaker, these processes include the competition of elements from both languages. In the planning of the preverbal message, the speaker's intention, his assessment of communicating context and the hearer's knowledge for comprehension, guide his choice. In the formulation, the message, lexical retrieval, grammatical and phonological encodings all concern the target item's selection. With respect to bilingual speech production, there seems to be a consensus that when bilinguals speak one language, lexical and syntactic representations from both languages are activated (Abutalebi & Green, 2007; De Bot, 2000; Green, 1998; Kroll et al., 2015). The claim that bilingual production is principally non-selective language has yielded available evidence indicating that the activation of the non-target language is automatic and almost unavoidable even for highly proficient bilinguals, and even when the context signals "turning off" the non-target language (Wu & Thierry,

2012).

The language non-selectivity of bilingual speech production makes bilingual performance unique in two major ways. First, more processing efforts and cognitive resources are needed when there is competition from the non-target language (Bialystok, Craik, Green, & Gollan, 2009; Costa, Hernández, Costa-Faidella, & Sebastián-Gallés, 2009; Ivanova & Costa, 2008). When speaking, bilinguals constantly need to inhibit non-target structures or words from the other language. Compared to monolingual speakers, bilinguals show longer reaction times to name objects, make more errors, and suffer more tip-of-the-tongue problems, not only in their weaker language (L2) but also in the dominant and well-established L1 (Ivanova & Costa, 2008; Sadat, Martin, Alario, & Costa, 2012). Bilinguals therefore tend to use structures that comply with both linguistic rules more often than those that only satisfy either rule (Hartsuiker, Pickering, & Veltkamp, 2004). It is possible that bilinguals develop multiple linguistic competences through coordinating efforts in achieving cognitive efficiency and pragmatic effectiveness according to various communicative contexts.

Second, the influence of the non-target language varies in accordance with the degree of co-activation (Grosjean, 1998). The more activated the non-target language, the higher the influence it might exert, either positive or negative. To visualize the activation status of languages in a bilingual mind, Grosjean (1989, 1998) proposed the language mode continuum to describe different degrees of co-activation. The concept of a language mode is derived from the fact that there are two different contexts for bilingual language behavior, when speaking to a monolingual and when speaking to a bilingual, and has been alluded to over the years by some researchers (Baetens Beardsmore, 1986; Weinreich, 1953). The co-activation level spans from a monolingual mode in which one language is predominantly activated and the other extremely deactivated, to a bilingual mode in which both languages are highly activated. The bilinguals' everyday speech behavior echoes at any given point on the continuum depending on the situation. When speaking in one language, the activation level of the other language is the lowest at the monolingual end and highest at the bilingual end. Neither a pure monolingual mode with one language totally 'switched-off' nor an ideal

bilingual mode with both languages being extremely balanced is easy to find. The speech mode is more of a context for understanding bilingual performance.

Evidence has been reported in empirical studies (Grosjean, 1998; Hermans, Ormel, van Besselaar, & van Hell, 2011) which confirms the dynamic co-activation status with different bilingual's performance. Poplack (1988) recorded different code-switching patterns of a Spanish-English bilingual and reported four times more code-switching per minute in a bilingual mode than in an intermediate mode. Treffers-Daller (1998) obtained quite different results from the experiments on a Turkish-German bilingual in three different language modes by manipulating the conversation context and the interlocutors. She concluded that language modes might affect the type and frequency of mixing language use in bilingual utterances. Grosjean (1997) tested his language mode concept on French-English bilinguals. The production is elicited by retelling stories in the different contexts corresponding to a monolingual, an intermediate, and a bilingual mode. The number of instances where borrowing, code-switching, and hesitation take place differs significantly among different modes.

Grosjean (1998) stated that the language mode model is valuable in interpreting experiment results on the frequency of code-switching behaviors, which reveals a significant contrast between the proportion of mixed utterances in different language modes. Toribio (2004) applied two conditions in conducting her experiments investigating the convergence in the speeches of Spanish-English bilinguals. The elicitation conditions include a monolingual mode, where only Spanish is activated and a bilingual mode, where English and Spanish are simultaneously activated. It has proved that convergence in bilingual speech is attenuated in the monolingual mode and amplified in the bilingual mode. Bordag and Pechmann (2007) designed their experiments into monolingual and bilingual contexts, and obtained different error rates regarding non-target language interference. Dunn and Tree (2012) documented that a change in language mode can influence a bilingual's language processing, with the bilingual taking a longer time to reject non-words in the bilingual mode than in the monolingual mode. Onar Valk (2014) found that the Dutch influence on the word order of

immigrant Turkish in Netherlands is more pronounced when the subjects are tested in a bilingual mode than in a monolingual mode.

Grosjean (1998) argues that any studies of bilingual performance should take into account the language mode that bilingual speakers or L2 learners are in when they are being studied. This is in line with a psycho-linguistic and neuron-linguistic perspective of differentiating language use into different contexts in which the activation of the two languages differs (Abutalebi & Green, 2007; Green & Wei Li, 2014; Thierry & Wu, 2007). A single-language context is when one language of a bilingual is activated with the other suppressed, and in a dual-language context, both languages are highly activated.

2.1.5 Factors Affecting the Bilingual's L1 Performance

The above subsections reviewed the bilingual's uniqueness of handling two languages in a single mind. For the bilingual's native language, once acquired, is also susceptible to processes of change and adaptation, hence exhibiting different patterns in performance in some areas. This subsection looks at factors that might affect the bilingual's L1 performance.

As the two languages in the bilingual's mind are in constant interaction, one of the key factors that affect the L1 performance is cross-linguistic influence from the L2. Some inspirations can be drawn from studies investigating what makes CLI to take place. Kellerman (1977, 1979), Ringbom (1987) are among the first in the study of the issue of transferability: some constraints that govern the occurrence of transfer are proposed. For instance, Andersen (1983) states that a linguistic structure is susceptible to a transfer effect if it has a similar counterpart in the other language. Kellerman & Smith (1986) made a similar claim that unmarked structures are more likely to be transferred.

In the investigation of bilingual children who acquire two first languages, Hulk & Müller (2000) and Müller and Hulk (2001) proposed two conditions that might trigger cross-linguistic interaction. The first condition identifies the location of influence which argues that

CLI is more likely to occur at the interface between pragmatics and syntax where difficulties also arise in monolingual acquisition. The second condition concerns structural ambiguity, suggesting that CLI appears to occur in the domain where the two languages share overlapping structures. Their proposal tried to predict where cross-linguistic influence is expected to be found, and thus has been widely adopted to test bilingual performance in both children and adult populations (Guerriero, Oshima-Takane, & Kuriyama, 2006; Hacothen & Schaeffer, 2007; Mykhaylyk & Ytterstad, 2017; Zwanziger, Allen, & Genesee, 2005).

Research that tests the two conditions focuses on null argument expressions produced by bilingual children (Haznedar, 2010; Mishina-Mori, Nagai, & Yujobo, 2015; Paradis & Navarro, 2003; Serratrice et al., 2004). Subject and object realisation across null argument languages and non-null argument languages qualifies both conditions. On the one hand, the selection of different null forms is governed by syntactic and pragmatic properties, in that new information is coded by lexical forms, whereas given information is realised by pronominal anaphors (Givón, 1983). On the other, the overt form is the shared structure between null argument languages and non-null argument languages, which means that the bilingual receives ambiguous input in the null subject language, since both null and overt forms are allowed. The structure in the null subject language then is vulnerable to be affected by that of the non-null subject language, which has only one option and hence a straightforward input. Therefore, structures that are dependent on pragmatic and contextual variables turn out to be at the center of attention for detecting CLI in bilingual linguistic performance.

In adult bilinguals, deviations from the monolingual performance reflecting the difficulty at the interface are also captured by Sorace and her colleagues in studies on L2 acquisition and L1 attrition (Belletti, Bennati, & Sorace, 2007; Sorace & Filiaci, 2006; Tsimpili, Sorace, Heycock, & Filiaci, 2004). Sorace (2005, 2011) then put forward an interface hypothesis to account for patterns of optionality found in bilingual language development and use. The hypothesis originally proposed that linguistic structures situated at the interface between syntax and other cognitive domains require more processing efforts than those that do not

involve this interface. Null argument expressions continue to be a prime locus of testing the hypothesis. The over-extension of interpreting subject pronouns and over-production in realising subjects are found in bilingual speakers' null subject language with the possible influence from their non-null argument language. The hypothesis was later refined to distinguish the internal interface where syntax and semantics are involved, from the external interface where syntax and discourse are concerned. It is argued that processing structures that demand the integration of multiple sources of information are less automatic, hence CLI is more likely to be found at the external interface where the integration of syntactic and pragmatic conditions give rise to more optionality.

There are, nevertheless, many variables that interact with each other to affect bilingual L1 performance under the influence of L2. Linguists studying the cross-linguistic influence (Gass, 2008; Gass & Selinker, 1994; Jarvis & Pavlenko, 2008; Kellerman & Smith, 1986; Odlin, 1989) summarized some nonstructural factors, among which L2 proficiency, frequency of exposure and use, language use in context (i.e., language mode) and L1 input, will be elaborated here.

First, studies of how learning and using a second language might cause L1 to differ from the monolingual norms have reported that an increase in the amount and proficiency of L2 affect both learning and performance related effects on the use of the L1 (Major, 1992; Tao & Thompson, 1991). Likewise, results from some other research on L2 transfer also show that more instances or a higher ratio of L2 effects are in association with intensified L2 exposure and use (Hopp & Schmid, 2011; Montrul, 2019; Polinsky & Scontras, 2020). Flege (1987), for instance, documented the L1 adaptation of voice-on-time values towards the L2 setting increases with length of L2 experience and proficiency levels. Also, Su (2001) explored the transfer of sentence processing strategies from L2 English to L1 Chinese. The participants in her research exhibit a strong correlation between L2 effects and L2 proficiency. Her study indicates that the interaction patterns of the L2 user's two language systems might change as a function of proficiency.

Second, the language mode affects the performance as illustrated in §2.1.4. It is believed that confounding variables that affect the language mode include interlocutor, environment, and topic. Language mode concerns some key factors such as who is the interlocutor. If the speaker knows that the person he talks to is able to understand both languages, then he might intentionally activate the other language for achieving better communication effects: with no code-switches into English in the monolingual condition, some code-switches in the intermediate condition, and practically a doubling of the amount of code-switching in the bilingual condition. The second concerns which language is called for in the communication, whether only one language is needed or both languages can be applied. For people who work in a bilingual or multilingual environment, where communication can take many ways or information is from multiple linguistic backgrounds, the possibility of using two languages is innate. If the target language is not proficient enough, then as processing is automated, the non-target language will be called upon for compensation purposes. In the similarities between the two languages, the more similar they are, the more likely the use of one language might activate some elements or knowledge of the other. Concerning the topic and stimuli, the presence of a foreigner may also increase the level the bilingual mode.

Third, the bilingual's deviated performance from monolingual patterns can also be attributed to the changes of input received. In the case of heritage languages, some distinct features found in the production of second or third generations are not merely L2 linguistic influences or cognitive effects of handling two languages, but an input effect from the older generation who experienced attrition (Polinsky, 2018). A wealth of research documented the increased use of overt subjects in pro-drop languages, such as Italian and Spanish in utterances of heritage speakers residing in a non-pro-drop language environment such as in the UK and Germany (Montrul, 2016; Serratrice, Sorace, & Paoli, 2004; Silva-Corvalán, 1994; Silva-Corvalán & Treffers-Daller, 2016). It is not surprising to view the preference of overt subjects as an influence from the environmental dominant language that in most cases does not allow the use of null subject. But as some researchers have observed, the use of null pronominal subjects is decreasing or diminished in the speech of first-generation migrants who are the source of input for heritage speakers (Montrul, 2016, 2019; Otheguy, Zentella, & Livert,

2008; Silva-Corvalán & Treffers-Daller, 2016). Likewise, Domínguez & Hicks (2016) ascribe the reason for the change in L1 feature observed in their study not so much to L2 influence but intensive exposure to L1 input with different grammatical properties. Therefore, the bilingual's L1 performance is to some degree influenced by the input they receive. In a smaller context, if people around them are speaking in the same style or pattern (Xu, Chew, & Chen, 1998), it is more likely that they favour certain way of speaking or their acceptability for certain structure is higher. For instance, bilinguals tend to code-switch more in some communities where code-switching becomes a more accepted norm of speaking. The more code-switching one perceives, the more instances of code-switching might occur in the bilingual's utterances.

From the multi-competence perspective, this dissertation aims to look at whether and to what extent L1 has been modified or changed due to the frequent use of L2 English on advanced learners of Chinese-speaking bilinguals in an L1 environment. Subject realisation in Chinese utterances will be examined for possible divergence from monolingual performances.

2.2 Typology of Subject Realisation

The present study investigates cross-linguistic influence from L2-English to L1-Chinese on proficient bilingual speakers. Subject realisation is the linguistic construct utilised in the current thesis for looking at the possible effects of L2 on L1. This section first presents the typological contrast in subject realisation across languages. It then offers some theoretical descriptions of language generation which uncover grammatical and discourse constraints of subject realisation. Lexical functional grammar (Bresnan, 2001) as well as Givon's (1983) discourse continuity scale will be used as a framework for the sentence level (Kroeger, 2005) and beyond the sentence level illustration since subject realisation needs to be explicated with reference to both sentence and discourse-pragmatic conditions. Finally, factors that constrain subject realisation in Chinese are illustrated with comparisons that help to reflect the similarities and contrasts between Chinese and English from both syntactic and discourse-pragmatic perspectives.

2.2.1 Typological Contrast

Word order denotes the ordering of basic syntactic elements, i.e., Subject, Verb, and Object in a transitive clause of a declarative sentence. According to WALS (Dryer, 2013), 1188 out of 1377 world languages described have a dominant word order. The most frequent type is SOV (Subject-Object-Verb) followed by SVO (Subject-Verb-Object), represented by 565 languages and 488 languages respectively. The order with which Subject occupies the initial position accounts for 88.6% of the languages that have a dominant word order. It is then fair to argue that Subject takes the most prominent syntactic position in terms of linear precedence in most languages. Chinese and English share the same canonical word order SVO, with Subject preceding the Verb. However, these two languages also present typological contrasts in realising Subject. Chinese allows both explicit and implicit argument in a subject position whereas English requires obligatory Subject in most cases. The following two sub-sections lay out the different forms of realising Subject, with a focus on the similarities and differences between Chinese and English.

Nominal vs Pronominal Subject

The realisation of the subject in a single clause takes generally two types of expression: a nominal subject, i.e., a noun phrase (NP), containing a noun head, or a pronominal subject (i.e., an NP with an independent pronoun) or a pronominal morpheme that encodes semantic and grammatical features of the subject and is attached to the verb. The difference between a nominal and pronominal subject is shown in the English sentences in (1) and (2) and the Italian example in (3) shows morphological marking of the Subject.

(1) *Children love dogs* (Nominal Subject)

(2) *They love dogs* (Independent Pronominal Subject)

(3) *(Loro) amano i cani* (Subject expressed by a morphological affix)

(They) love_{3PL} dog-PL

“(They) love dogs”

Most languages (e.g. 61.5% of those attested in WALS) realise pronominal subjects by adding affixes on verbs as in (3), others (29.5%) with independent pronouns (as in (2)), and few others (9%) by either attaching clitics to different elements or by mixed means. Chinese and English both have independent pronouns which occur in the same syntactic position as that of a nominal subject, but stand in contrast in the presence of the pronouns. English requires an obligatory presence of pronouns in the subject position in most situations whereas pronominal subjects in Chinese are optional. Indeed, the realisation of the pronominal subject in Chinese can take either overt or covert forms, i.e., lexical pronouns or zero pronoun, and the latter is the preferred choice in most cases, provided the referent can be inferred from discourse. The difference can be illustrated by comparing English sentences in (4) with Chinese sentences in (5).

(4) *Speaker A: Did John see Bill yesterday?*

Speaker B: Yes, he saw him. (English: lexical pronoun)

*Yes, * ϕ saw him.* (Null)

(5) *Speaker A: Zhangsan kanjian Lisi le ma?*

Zhangsan see Lisi LE Q

“Did Zhangsan see Lisi?”

Speaker B: ta kanjian ta le (Chinese: lexical pronoun)

He see he LE

“He saw him.”

ϕ kanjian ta le (Chinese: zero pronoun)

ϕ see he LE

“He saw him.”

(Examples from Huang, 1984, p. 532-533)

Considering the above discussion on subject realisation, Chinese and English are similar in two important ways. They have the same canonical word order (SVO) and realise the pronominal subject with independent pronouns not with verbal agreement¹. This means that they can both use independent pronouns in the same syntactic position as a nominal subject does. They however, diverge in the form of pronominal subjects, because Chinese allows both lexical and zero pronouns whereas English requires obligatory explicit pronouns. The null pronoun has only a very restricted use in the English Subject. This disparity is widely discussed within the Pro-Drop Parameter, also known as the Null Subject Parameter (Chomsky, 1981; Jaeggli & Safir, 1989; Rizzi, 1982; Taraldsen, 1978), which has been formulated to address the discrepancy in the possibility of licensing null arguments in a generative framework.

Null Subject

A binary typology (Taraldsen, 1978) was proposed to account for the richness of morphological marking. Languages such as Italian and Spanish are classified as “pro-drop” languages since they have a rich system of subject-verb agreement which allows definite reference to the subjects without expressing it pronominally. Conversely, languages such as English and French, whose verbal agreement is too meager to trace the content of a missing subject, are therefore identified as “non-pro-drop” languages. However, this approach is not plausible when applied to discourse-oriented languages such as Chinese, Korean, and Japanese, which allow a quite flexible realization of null argument without any morphological agreement.

Since assigning recoverability simply to the absence of a rich morphology cannot explain the possibility of using empty categories in all languages, Huang (1984, 1989) proposes a

¹There are exceptions for English, which still marks morphologically 3SG with -s in the simple present tense. Also, the copula/auxiliary *be*-forms have suppletive morphemes for person and tense (*am, are, is; was, were* and so on).

classification of null argument with a distinction between “hot”, “medium”, and “cool” languages. This “hot-cool” division takes the essence of Marshall McLuhan’s (1964) participation effort in communication, where a “hot” language requires little effort from the audience, whereas a “cool” one requires necessarily active participation. Within this classification, Huang labeled English as a ‘hot’ language, in which “pronouns cannot be omitted from grammatical sentences, and the information required to understand each sentence is largely obtainable from what is overtly seen and heard in it” (1984, p. 531). In contrast, Chinese is regarded as a “cool” language, which imposes some interpretation work on the participant for denoting meaning, as null argument is very common. Languages with rich verbal inflection, such as Italian and Spanish, are classified as typically “medium” languages, with a status somewhere between the two ends, entitled with more freedom than “hot” languages and less than the “cool” ones to license null argument. In this regard, some linguists prefer to restrict the term ‘pro-drop’ to languages that allow the subject pronoun to be null but their verbal morphology allows for recoverability of the subject, and use the term ‘zero-anaphora’ for those languages whose null argument occurs without verb agreement. In the present study, the term ‘null-subject languages’ (NSLs) is used to refer to the latter.

In recent literature (Barbosa, 2011; Holmberg, 2010; Roberts & Holmberg, 2010), the typology of null argument has been further categorized into five types along a scale of ‘liberality’ that allow the freedom of the occurrence of null subject from the least available to the highest liberal as in (6).

(6) Non-null-subject languages < expletive null-subject languages < partial null-subject languages < consistent null-subject languages < radical null-subject languages

Chinese and English are situated at the two endpoints of the continuum respectively. At one end is ‘non-null-subject’ languages, like English, Swedish, and French, which reject null subjects in all finite clauses, except in specific discourse contexts (Haegeman, 2000). At the other end are ‘radical null-subject’ languages, which lack verbal agreement but allow all arguments to be null, such as Chinese, Korean, Japanese, Thai, Vietnamese, and others. This

polarized distribution, however, does not mean that null subject expressions in Chinese are arbitrary nor that there is no occurrence of null subject in English. The afore-mentioned categorizations on the occurrence of null Subject are from the Government and Binding perspective which relies on purely syntactic explanations. However, subject realisation is not only a grammatical concept that is constrained by purely syntactic rules but also a discourse concept pertaining to cognitive, pragmatic and communication constraints. Factors and conditions that constrain the occurrence and distribution of various subject forms will be uncovered by studying how language is represented, processed, and generated from a functional perspective (Bresnan, 1982, 2001; Givón, 1983, 2018).

2.2.2 Subject in Lexical Functional Grammar

The present study takes the Lexical Functional Grammar's perspective (Bresnan, 2001; Bresnan, Asudeh, Toivonen, & Wechsler, 2015; Dalrymple, 2001; Falk, 2001; Kaplan & Bresnan, 1982) which views Subject as both a grammatical function (GF) as well as a discourse function (DF). Lexical Functional Grammar (LFG) is a lexically driven, psychologically plausible grammatical theory which describes the formal representation of language as a complex architecture consisting of various linguistic structures (Falk, 2001). At the syntactic level, three distinct structures exist in parallel and are linked through mapping relations. These syntactic structures are argument structure (a-structure), functional structure (f-structure), and constituent structure (c-structure). The a-structure encodes information selected by the predicate. The predicate is usually a verb that subcategorizes the number and the type of arguments, as shown in (7).

- (7) walk <agent>
- save <agent, beneficiary>
- feed <agent, theme, recipient>

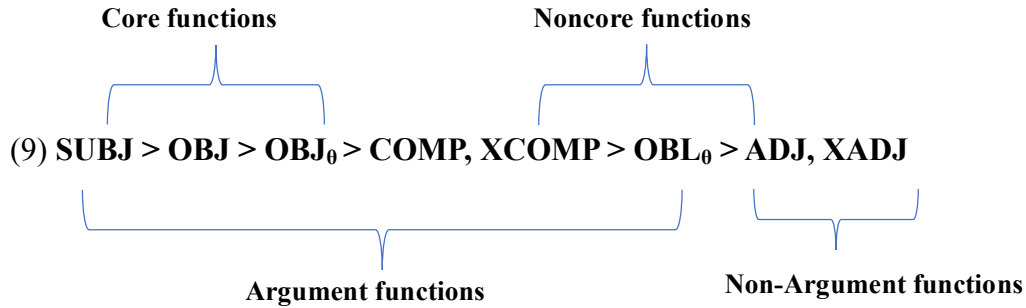
The assignment is semantically controlled and each argument takes a thematic role. Bresnan (2001, p. 307) proposed the hierarchy of thematic prominence shown in (8).

(8) agent > beneficiary > experiencer/goal > instrument > patient/theme > locative

Agent has the most prominent role with primacy not only over other participants when the verb relates to an action but also over the theme when the verb deals with space. Therefore, the agent, if present, has the highest possibility to be assigned to Subject.

At the level of c-structure, information such as word order, constituent boundaries, and phrase categories are encoded. These properties vary across languages. The hierarchy is based on sequence, which means that the constituents in the earlier positions have greater prominence than the ones following them. In languages with SVO or SOV canonical word order (i.e., the great majority of languages), the subject often occupies the initial position of a clause hence assuming the highest prominence in c-structure.

At the level of f-structure, a syntactic element may have two functions, i.e., Grammatical Function (GF) and Discourse Function (DF). The f-structure represents universal syntactic principles. In the clause-internal organisation, GF can be argument functions or non-argument functions. Argument functions such as subject (SUBJ), object (OBJ), second object (OBJ_θ) are core functions whereas the oblique (OBL_θ) and the complement (both COMP and XCOMP) are noncore functions. Nevertheless, all argument functions are selected and controlled by the predicate and hence are associated with the thematic meaning of the predicate. They allow only one single instance in each clause and are hierarchical in nature with SUBJ being the highest in the hierarchy (Bresnan, 2001; Keenan & Comrie, 1977). Both ADJ and XADJ are non-argument functions and are not predicate-dependent (i.e., they are not selected by the verb). These can have multiple instances serving as modifiers. Dalrymple et al. (2019) depicted the universally available hierarchy of GFs as in (9). Examples of COMP, XCOMP, ADJ, and XADJ are given in (10).



- (10) a. *Ryan thinks that he must go home.* (COMP)
 b. *Ryan seems to be at home.* (XCOMP)
 c. *Because he caught a flu, Ryan didn't go to work.* (ADJ)
 d. *Having a flu, Ryan didn't go to work.* (XADJ)

The recursive rule of human grammatical systems enables one clause to be embedded inside another (Kroeger, 2005, p. 218), thus COMP and ADJ can also have internal Subject as in (10a) and (10c). In other words, COMP and ADJ are closed functions whereby Subject is specified internally if it is a clause, however, XCOMP and XADJ are open functions whereby Subject is specified externally.

A grammatical function (GF) can also bear discourse functions (DFs) such as TOP (topic) or FOC (focus). TOP is the topic of the discourse, denoting given and shared information while FOC introduces new information. SUBJ is distinguished as the default discourse topic in many languages (Falk, 2006) and the only element that has both grammatical and discourse functions in the LFG framework. The discourse functions relate elements in the sentence to something beyond the sentence boundary, despite being independent from each other, the three parallel structures also have mapping relations. The mapping of a-structure and c-structure onto f-structure interprets the correspondence relationships in the LFG's linguistic architecture. By default, the most prominent argument in a-structure (i.e., agent) and the most prominent position in c-structure (i.e., the initial position) are both mapped onto SUBJ function in f-structure.

With respect to subject realisation, the most conspicuous assumption that the LFG's framework subsumed is that SUBJ has both grammatical and discourse functions, and therefore the occurrence and distribution of subjects are governed by both syntactic and discourse conditions.

According to the properties listed above, the occurrence of Subject seems to be in three major clause types, i.e., main clause; COMP clause, and ADJ clause. Since both COMP and ADJ are embedded clauses, we need to take a closer look at the syntactic organization of clauses.

Kroeger (2005) identified coordination and subordination as two basic recursive clause structures. In coordination construction, clauses are conjoined but independent, with no embedded relationship. Coordinate clauses in English are normally linked by conjunctions such as 'and', 'or', and 'but' in (11). However, in some other languages, coordinate clauses may simply be juxtaposed together without any linking devices such as the Chinese sentence in (12).

(11) *Ryan is not at home but he is about to arrive in half an hour.*

(12) *Ryan hái méi huí jiā, tā dàgài bàn xiǎoshí hòu cáinéng huílái.*

Ryan yet not back home, he probably half hour later can arrive

“Ryan has not been home. He will probably arrive in half an hour.”

Subordinate constructions, in contrast, have a main clause and a dependent clause. The three basic types of subordinate clause are: Complement clauses, Adjunct (or Adverbial) clauses, and Relative clauses. The complement clause is licensed by the subcategorization features of the verb and typically act as Subject or Object of the main (matrix) clause. Finite complement clauses such as (10a) have the function of COMP (Complement) whereas non-finite complement clauses such as (10b) have the function of XCOMP (XComplement). The Adjunct clause, on the other hand, is not subcategorized by the verb but serves as a modifier by adding various kinds of circumstantial information to the main clause such as regarding

time, place, manner, and reason. These are also called adverbial clauses. Some conjunctions including ‘because’, ‘when’, ‘although’ and ‘if’ are used to introduce adjunct clauses. Finite adjunct clauses such as (10c) have the function of ADJ (Adjunct) while non-finite adjunct clauses such as (10d) have the function of XADJ (XAdjunct). A relative clause is a clause that modifies a noun phrase. The basic construction of a relative clause as exemplified in (13) includes the head noun (*the dog*), the modifying clause ‘barking at the door’, and the relativizer ‘that’ which ties the modifying clause to the head noun. Compared to complement and adjunct clauses, relative clauses have a distinctive feature: the head noun bears two grammatical roles, one in the main clause and the other one in the modifying clause. In (13), for instance, the head noun functions as the Subject of both the main clause and the modifying clause.

(13) *The dog that was barking at the door ran away.*

The modifying clause follows the head noun in most languages such as English. In many other languages, however, the modifying clause precedes the head noun, as shown in the Chinese example of (14). The sentence before the particle ‘de’ has been nominalized to modify the head noun ‘xiǎoniǎo’ (the bird). Relative clauses are excluded from target clause types of the current study, as subject forms in relative clauses are fixed rather than optional.

(14) *zài shù shàng shuìjiào de xiǎoniǎo fēi zǒu-le*
at tree-top sleep de-NOM small-bird fly-away le-PFV
“The bird that was sleeping in the tree flew away”.

Considering the brief survey of the clause types we have been discussing, the finite clause types where Subject is required, are summarized in (15). These will be the focus of analysis in the current dissertation.

(15) a. Main clauses in a simple sentence
b. Coordinated clauses

- c. Matrix clause in the subordination construction
- d. COMP clauses
- e. ADJ clause

The present work uses the linguistic architecture depicted by the LFG framework to locate the occurrence of the subject as in (15) from a formal grammatical viewpoint. The most conspicuous assumption to make is that the occurrence and distribution of various subject forms are not arbitrary or random but constrained by syntactic and discourse conditions because SUBJ serves as both a grammatical function and as a grammaticised discourse function. It is the default Topic in most languages and it can also bear the Focus function, e.g. in questions. The syntacticised discourse functions of LFG relate to elements beyond the confines of the sentence (Falk, 2001). The syntactic treatment remains however, at the clause and sentence level and hence it is not designed to capture the mechanism of subject realization beyond the sentence, which is at the level of discourse in natural language production. The next section will then mainly follow Givón (1983) and other functionalist theoreticians in analyzing the discourse constraints.

2.2.3 Subject in Discourse

Clauses or sentences are the basic information units in communication. Each clause has topic, participants, and the predication. Clauses then combine to form coherent units of various sizes, and the unit is referred to as discourse. Subject introduces and maintains reference in discourse, which makes the communication informative and thematically coherent (Chafe, 1994; Givón, 1983, 2017). From a discourse-pragmatic perspective, the subject realisation (Givón, 1983) associates with referential continuity, which is represented by how referents in successive clauses co-relate. High referential continuity can be found in clause chains where clauses share the same topical referent. Low referential continuity can be found where a shift of referent occurs, usually signalling both an end of a preceding clause-chain and the start of a new clause-chain.

In spontaneous speech production, the speaker's choice of coding devices to manage references, reflects different degrees of referential continuity. The human mind has limited resources for processing within a certain duration of time (Levelt, 1989). Working memory capacity constrains attention allocation and coordination, hence playing a role in reference management (Chafe, 1994; Gernsbacher, 1989; Givón, 1983, 2017; Gundel, Hedberg, & Zacharski, 1993; Oberauer, 2002; Pu, 2014; Tomlin & Pu, 1991). From a speaker-hearer interactive perspective, when a referent has been activated in the discourse and stays in focus, it is more accessible and thus it is economical and efficient to code the referent with a less explicit form. Conversely, a more explicit form is preferred when the referent is not activated or is less accessible. To put it simply, the more accessible, the higher the referential continuity and thus a less explicit coding device is needed. Givón (1983, 2017, 2018) sketches major reference coding devices that are cross-linguistically attestable in a hierarchical scale from the highest continuity to the highest discontinuity as in (16).

(16) zero anaphora > unstressed/bound pronouns or grammatical agreement > stressed/independent pronouns > definite NPs > indefinite NPs > modified NPs

Nominal NPs are most commonly used to introduce a new referent into discourse or re-introduce an old referent after a considerable gap of absence. The continuity value that a full NP codes is low as it signals some “topic” break from the previous clause. Pronominals are used to code a more continuous relationship and their forms differ across languages. Zero anaphora, unstressed pronouns or grammatical agreement are typically used when a referent remains in focal attention in a stretch of sentences that describe a sequence of related events, or semantically linked actions. Stressed/independent pronouns are preferred when the link between the anaphor and its antecedent is structurally interrupted by breaks of discourse continuity. Such findings have been reported by studies investigating the distribution of referential forms in spoken narratives with speakers of typologically diverse languages, such as English, French, Hebrew, German, Brazilian Portuguese, Japanese, Chinese, Spanish, and Russian, among others (Chafe, 1994; Du Bois, 1987; Gundel et al., 1993).

Human discourse is typically multi-propositional. Speakers tend to organize utterances into coherent sequences to facilitate both the narrator's delivery and the hearer's comprehension. A high degree of coherence can be maintained by stringing together clauses that share the same referent or topic. These successive clauses combine into a clause-chain (Givón, 1983, 2018). Discourse coherence persists from one clause-chain to the next across chain boundaries with thematic continuity. The structure of a clause chain is represented by Givón as in (17).

(17) (RD), CI, CM, CM, CM, CM, ..., CF

RD = reorientation device (such as time or location)

CI = chain-initial clause

CM = chain-medial clause

CF = chain-final clause

(Example from Givón, 2018, p. 42)

Referential continuity tends to be low across clause-chain boundaries as the switch of reference occurs, so the Subject referent in the chain-initial clause is usually an NP. By contrast, within the chain boundary, referential continuity is high thus subject referents in chain-medial or chain-final clauses are commonly coded with pronominals. However, thematic pauses or breaks might cause the escalation of coding devices. The alternation between less attenuated pronominal forms such as zero anaphora and more explicit pronominal forms such as lexical pronouns is subject to the degree of thematic continuity within a clause-chain.

Major thematic pauses and breaks include: referent ambiguity, intervening information, action discontinuity, temporal-spatial discontinuity (Fox, 1987; Givón, 1983; Guerriero, Oshima-Takane, & Kuriyama, 2006; Hinds, 1979; Li & Thompson, 1976; Paradis & Navarro, 2003; Pu, 1995, 2014). Referential ambiguity refers to the presence of more than one potential referent in the immediate context. This makes the assignment of an argument to the

predicate difficult. The mere presence of another referent does not initiate the competition. A competitor must be semantically compatible with the frame of the current clause. The prominent position that the Subject holds can be exemplified in sentence (18), in which the presence of another participant ‘Mary’ does not weaken the continuity value since ‘He’, the first participant, occupies the most prominent position of a subject slot. Consequently, zero anaphora, the highest continuity device is used.

(18) *He came into the room, ϕ saw Mary, ϕ pulled a chair and ϕ sat down.*

However, when (18) is followed by information as in (19), presenting two topic shifts, a higher discontinuity device (unstressed pronoun) is used.

(19) *She seemed tired, he thought.*

(Examples from Givón, 1983, p. 57)

Intervening information consists of the introduction and description of the non-human referent, which was inserted into the discourse between two mentions of the topical referent. It does not cause any semantical ambiguity but disrupts the previous information flow and causes a thematic gap. Action discontinuity concerns the predicate of the clause. The description of the referent might alter between background information and foreground information, or between the current state or appearance and comments from the narrator’s perspective. Temporal-spatial discontinuity is mainly associated with the use of adverbs or conjunctions where new information might be introduced with low predictability. In all these cases, a more explicit form is preferred. Compared with sentence (20), examples (21-24) all feature a thematic break that precipitates an escalation of referential coding devices.

(20) *He came into the room, looked around, and sat down.*

(21) *He came into the room and looked around. He was nervous.* (action discontinuity)

(22) *He came into the room and looked around. After a while, he sat down.* (temporal discontinuity)

(23) *He came into the room, looked around. He was nervous and he saw a sofa. The sofa is red and looks comfortable. He sat down.* (intervening information)

There is a difference between (20) and (21) in the degree of action continuity without change of the topical referent. In the same vein, the adverb ‘after a while’ in (22) signals a temporal discontinuity without a break in referential continuity. In (23), there are two instances of escalation of coding devices. The first one is from zero anaphora to unstressed pronouns induced by action discontinuity. The second one is from unstressed pronoun to stressed pronoun as the inanimate referent ‘sofa’ was inserted between two mentions of the topical referent.

The above two subsections deal with the theoretical description of how subjects are constrained syntactically under the framework of LFG (Bresnan, 2001) and discourse-pragmatically under the perspective of referential continuity (Givón, 1983). In the following sub-sections these theoretical considerations are applied to interpret occurrences and the distribution of overt and null subjects in Chinese utterances. Since the focus of this study is to examine the possible influence from English to Chinese, the illustration of Chinese subject forms thus will be associated with a comparison to English patterns at both the syntactic and discourse levels. §2.2.4 deals with the syntax constraints and §2.2.5 talks about the discourse-pragmatic constraints.

2.2.4 Syntactic Constraints in Chinese

Chinese is an isolating language with very little inflectional morphology (Li & Thompson, 2009). One of the features associated with isolating languages is the lack of case marking and verb agreement, making the identification of the subject more difficult. Syntactically, the interpretation relies mainly on word order and the subcategorization features of the predicate.

As an SVO language, the subject is usually the NP preceding the verb in declarative sentences. However, as a null-subject language, subject in Chinese can be phonetically absent. The illustration will focus on subject realisation patterns in various clause types listed in (15), §2.2.2. If possible, all the explanations will be offered with some comparison to situations in English.

Subject in Simple Sentences

Subject in this type of clause is subcategorized by the predicate. Since predicates in Chinese exhibit many differences as compared to English, they are categorized into six major types according to Li and Thompson (1989). They are lexical verbs, copula verbs, auxiliary verbs, adjectival verbs, coverbs, and serial verbs. The former three types have usages similar to their counterparts in English, and we only focus on the latter three for elaboration.

Adjectival verbs are words that would be regarded as adjectives in English but behave like verbs in Chinese. Li and Thompson (1989) subsume adjectival words as a subclass of verbs because they are used predicatively. This interpretation is in line with Bresnan's (2001) argument that adjectives have argument structures akin to verbs, which also license a SUBJ argument. Adjectives in Chinese do not go with a copula and are negated by the same particle *bù* or *méi* as verbs do as in (24 and 25). An adjectival verb licenses the occurrence of a certain Subject to be its argument. Therefore, a subject is required for an adjectival verb in a finite clause.

(24) *Zhāngsān bù pàng.*

Zhangsan not fat

“Zhangsan is not fat.”

(25) *jiǔ píng méi kōng.*

wine-bottle not empty

“The wine bottle has not become empty.”

(Examples from Li & Thompson, 1989, p 143)

Coverbs are used to introduce a noun phrase to form coverb phrases. A coverb phrase precedes the main verb and shares the subject with the main verb. Since they share the same subject with the main verb, they do not require an overt form. Sentence (26) is regarded as one clause, in which *cóng* (from) is a coverb taking the same Subject with the main verb *lái* (come). Some common coverbs such as *zài* (at), *bǐ* (comparative), *bèi* (passive), *gèi* (benefactive) are used in certain grammatical constructions such as a passive construction with *bèi* in (27) and the locative construction with *zài* in (28). Coverb phrases function as prepositions to modify the verb of the sentence.

(26) *nǐ cóng nǎlǐ lái?*

you from where come

“Where have you come from?”

(27) *wǒ bèi tā zhuī-le sān tiān*

I BEI 3sg chase-PFV three days

“I was chased by him/her for three days”

(28) *tā zài hòu-yuàn-lǐ kànshū*

3sg at back-yard-in study-book

“He’s studying in the backyard.”

(Examples from Li & Thompson, 1989, p 357-358)

But in some cases, coverbs alone can also function as verbs, such as *dào* (arrive) and *zài* (at) in (29 and 30). In these cases, they function as predicate and hence licence an independent Subject.

(29) *wǒmen dào-le xiānggǎng*

we arrive-PFV Hong Kong
“We have arrived in Hongkong.”

(30) *Lǐsì zài hǎi-biān*
Lisi at ocean-side
“Lisi is by the ocean.”

(Examples from Li & Thompson, 1989, p 365)

Serial verbs represent the distinctively parataxis feature of Chinese sentence structures. Li and Thompson (1989, p. 594) defined the serial verb construction as referring to “a sentence that contains two or more verb phrases or clauses juxtaposed without any marker indicating what the relationship is between them”. The meanings of the verbs in a serial verb construction are co-related as parts of an overall event or action. The correlation between or among the meanings of the verbs breaks the serial verb construction into the following four types.

a) **Separate-event construction** depicts related events that take place separately but represent the following connections: ‘consecutive’, i.e., one event occurs after the other, like (31); ‘purpose’, i.e., the first event is done for the sake of doing the second, like (32); ‘alternating’, i.e., two actions alternate to take place, like (33); ‘circumstance’, i.e., one event occurs on the prerequisite of the other one, like (34).

(31) *wǒ mǎi piào jìn-qù*
I buy ticket enter-go
“I bought a ticket and went in.”

(32) *tā shàng-lóu shuì-jìào*
he ascend-stairs sleep-sleep
“He’s going upstairs to sleep.”

(33) *tā zǒu lái zǒu qù*

he walk-come walk-go

“He walked back and forth.”

(34) *wǒ yīgè rén wǎnshàng chūmén hěn hàipà*

I one-CL person evening exit-go very scared

“I’m scared to go out alone at night.”

(Examples from Li & Thompson, 1989, p 595-597)

As indicated by the English translation of the above examples of (31-34), in all these instances, serial verb construction is treated as a single predicate, thus only one Subject is required. Both ‘consecutive’ and ‘alternating’ having the structure of coordination construction, will be discussed later. In the other two, ‘purpose’ and ‘circumstance’, one verb phrase functions as OBL_θ such as *shuì-jào* (sleep) in (32) and *chūmén* (go out) in (34), which is determined by the other verb phrase such as *shàng-lóu*’ (go upstairs) in (32) and *hài pà* (scare) in (34).

b) Complement construction in which one verb phrase or clause is the Subject or Object of another is the equivalence of (15d) that will be discussed later in ‘Subject in complement clauses’.

c) Pivotal construction is featured by two verbs connecting by a ‘pivot’ noun phrase, which functions as the Object of the first verb and at the same time as the Subject of the second verb. In (35), the lexical pronominal *tā* serves as the Object to the first verb *qiú* (beg) and the Subject to the second verb *dàibiǎo* (represent). The second verb phrase functions as OBL_θ. The pivotal construction only has one finite verb thus requiring one subject.

(35) *wǒ qiú tā dàibiǎo wǒ*

I beg 3sg represent I

“I begged him/her to represent me.”

(Example from Li & Thompson, 1989, p 607)

d) Descriptive clause construction involves a correlation between the Object argument of the first verb and the clause that the second verb is in. It functions like a presentative sentence as it introduces a noun phrase in the first clause to be described by the second clause. If the Subject of the second verb is present in the first clause, either as the Subject like in (36) or as the Object as in (37), it is not to be realised with an overt form. When the subject to the verb argument of the second clause is not inferable from the context, an overt form is needed like in (38).

(36) *wǒ méi-(yǒu) shíjiān hē chá*
I not-(exist) time drink tea
“I don’t have time to drink tea.”

(37) *wǒ mǎi-le yī-jìàn yīfú tài dà*
I buy-PFV one-CL outfit too big
“I bought an outfit that turned out to be too big.”

(38) *nàbiān yǒu yī-kē shù wǒ yào kàn-yī-kàn*
there exist one-CL tree I want look-one-look
“Over there is a tree I want to take a look at.”

(Examples from Li & Thompson, 1989, p 614-619)

Serial verb constructions contain two or more than two verb phrases that have semantical correlations, thus are in most cases functioning as one predicate. Recall (10b) under the LFG’s (Bresnan, 2001) presentation of linguistic architecture, only requires one Subject for one predicate.

Subject in Coordinate Clauses

This type of clause has similar counterparts in English. When two or more verbs are juxtaposed they portray a string of actions occurring in a consecutive or simultaneous manner. One prominent feature of coordination construction in Chinese is the lack of conjunctions such as ‘and’ and ‘but’, which signal the relationship between the conjoined clauses, as illustrated in §2.2.2. This feature can explain the ‘consecutive’ and ‘alternating’ serial verb construction mentioned above. In Chinese, the coordinate clauses with or without the conjunction are in favour of one Subject unless the Subject of the verb phrases are not the same. English has the same structure in which only one overt subject is needed as suggested in the translation of (39-40) except that the English sentences have conjunctions.

(39) *Ryan chī-le fàn ϕ kàn-le xīnwén ϕ huí-qù jìxù gōngzuò*

Ryan eat-PFV meal ϕ see-PFV news ϕ back-to continue work

Ryan had dinner, watched the news, and went back to continue work.

(40) *Serena xiǎng mǎi gè bēizi ϕ méi zhǎodào héshì-de*

Serena want buy CL cup ϕ not find appropriate-NOM

Serena wanted to buy a cup but didn’t find a good one.

Subject in Complement Clauses

The embedded complement clause serves either as the subject or the object of the matrix clause. With respect to the subject complement clause like (41), the COMP clause is the subject, thus the matrix clause does not need any subject, despite that in English a dummy subject ‘it’ is always required as illustrated in (42a-b). With respect to the object complement clause, if the embedded clause does not have the same Subject as the matrix clause as in (43), an overt subject is required to avoid any ambiguity. However, if the embedded clause shares the same Subject with the matrix clause, the null subject is the felicitous form as in (44), which is different from the English structure where an overt pronoun must be used.

(41) *wǎnshàng páshān sànbù hěn wéixiǎn*

night climb mountain very dangerous

“It is very dangerous to climb the mountain at night.”

(42) a. *Solving the problem in a week is not easy.*

b. *It is not easy to solve the problem in a week.*

(43) *wǒ dānxīn Ryan méi-yǒu shíjiān cānjiā xiàzhōu-de huìyì*

I fear Ryan not-have time attend next:week-NOM conference

“I’m afraid that Ryan can’t make time for the conference next week.”

(44) *wǒ dānxīn ϕ méi-yǒu shíjiān cānjiā xiàzhōu-de huìyì*

I fear ϕ not-have time attend next:week-NOM conference

“I’m afraid I can’t make time for the conference next week.”

Subject in Adjunct Clauses

The general rule for subject realisation in Adjunct clauses is akin to that of complement clauses, that if the two clauses have different subjects then both need to be realised with an overt form, whereas if they share the same subject, only one subject is needed. There are three features that makes the construction distinctive in Chinese compared to English. First, the linking between the main clause and the adjunct clause may not be coded by an explicit conjunction as in (45). Second, Chinese requires only one overt Subject whereas English requires two overt forms if the subject of the adjunct clause is co-referential with that of the main clause. Third, in Chinese the dropped subject can be in the main clause or the adjunct clause, as exemplified in (46), the null form is used in the main clause.

(45) *nǐ bùxiǎng jīntiān jiàn wǒ, wǒ míngtiān zàilá*

you not want today meet me I tomorrow again come

“If you don’t want to meet me today, I’ll come tomorrow.”

(46) *nǐ jìrán bùxiǎng cānjiā huódòng, ϕ xiànzài jiù kěyǐ líkāi-le*

you since not want participate activity ϕ now then can leave-CRS

“Since you don’t want to participate in the activity, then you can leave now.”

The present paper will apply Li & Thompson’s (1989) categorization as the analytical framework for studying Chinese subject realisation in various syntactic positions.

2.2.5 Discourse Constraints in Chinese

Subject referential devices in Chinese include full NPs, lexical pronouns, and zero anaphora. The language’s universal rule is that when a referent is first introduced or re-introduced after a break, nominal NPs are used whereas pronominals are favoured in maintaining referents. Chinese takes two major pronominal forms, i.e., lexical pronouns and zero anaphors. With respect to their difference, some researchers (Li & Thompson, 1979; Pu, 1997) claim that the alternation between lexical pronouns and zero anaphors is rather subjective, not confined to a fixed pragmatic rule, but more of the speaker’s choice. Generally, zero anaphors are reported to have a wider distribution than lexical pronouns (Huang, 1984; Li & Thompson, 1976; Pu, 2019). It is widely used in chain-medial and chain-final positions of a clause-chain where referential continuity warrants the use of highest continuity device (Givón, 2017). The use of a lexical pronoun increases redundancy as Henderson put it "if the presence of a word is not needed to make the sense clearer, it is not needed at all" (1943: 9). Some studies (Jia & Bayley, 2002; Li & Thompson, 1976; Pu, 1997, 2014, 2019) have documented properties that affect the use of anaphoric devices in Chinese discourse.

Li and Thompson (1979) conducted experiments to investigate rules that govern native Chinese speakers’ uses of overt and zero pronouns as a referential device. They gave the participants some written passages in which the position of a third person anaphora had been left empty. The participants were asked to complete the passages by offering each blank a lexical or zero pronoun. The results showed that a) no participant inserted pronouns in two successive positions, and if more than one pronoun was inserted, they were placed relatively

far apart; b) the insertion of lexical pronouns showed no unanimous judgement across the participants; c) zero anaphora is most often used when the predications of successive clauses are semantically linked or describe correlated events. The authors then claimed that zero anaphora rather than pronominal anaphora is the norm in Chinese discourse and there is considerable variation among native speakers in their judgments of its occurrence. They further propose that “the degree of preference for the occurrence of a pronoun in a clause inversely corresponds to the degree of its conjoinability with the preceding clause” (1979: 330).

Pu (1997) examined the distribution of zero anaphors and lexical pronouns in Chinese narratives. He studied major coherent types that index the use of zero anaphors as well as ways that terminate the use of zero anaphor for the substitution of lexical pronouns. He calculated the rate of NPs, lexical pronouns, and zero anaphors in written narratives produced by Chinese native speakers. The data shows that the subject position has 40.2% of NPs and 40.4% zero anaphors, with 19.4% lexical pronouns. Zero anaphors have a striking bias towards subject position with 94% as opposed to 5% in object positions. Pu argues that topic chains are prevalent in Chinese discourse that accommodates continuous use of zero anaphors. A topic chain usually centres on a topical referent, which is the subject of successive clauses that describe events or actions of high thematic continuity. He also identified several types of minor thematic discontinuities that cause the upgrading of coding devices from zero anaphor to lexical pronouns. Pu’s findings are in line with research across diverse languages (Ariel, 1985; Brown, 1983; Givón, 1983; Keenan & Comrie, 1977) that claims many factors interact to code the discourse continuity. These factors may include agentivity, humanness, topicality, and the definiteness of a given referent.

Jia and Bayley (2002) studied subject pronouns in Chinese with the corpus of telephone conversation and teacher’s classroom instructions. They examined variables such as sentence type, gender, verbal aspect and the discourse context in the distribution of overt and null pronouns. They found a greater occurrence of overt pronouns in statements than in questions and imperatives. Gender and verbal aspect have no significant influence on the distribution.

Discourse context plays a prominent role in realising second person subjects. Telephone conversation shows a strong preference over lexical pronouns in coding second person plural subjects, whereas null pronouns are used more often for the second-person singular. With respect to classroom speech, lexical pronouns are used more for second-person plural and more null forms are used to code singular. These differences are attributed to the communication situation in discourse. In both settings, it is unnecessary to address the interlocutor to whom the speaker is talking, that is the person on the other side of a telephone conversation and the whole class as the interlocutor of the teacher. Li et al. (2012) found discourse difference in subject pronoun use among university students and instructors. They found singular subjects, animate subjects, and specific referents favoured overt pronouns, whereas plurals, inanimate, and non-specific referents favoured null pronouns.

There are two major differences in coding discourse anaphora between Chinese and English. First is the wide distribution of zero anaphora in Chinese discourse. Chinese is a topic-prominence language, in which messages are presented in parallel structures. Topic chains are typical discourse units in Chinese, where zero anaphora are widely used. Li (2004) proposed the definition of the topic chain as a chain of clauses sharing an identical topic that occurs overtly once in one of the clauses. All the other clauses are linked to the chain by zero anaphors co-referential with the topic. The similar phenomenon can be found in English. A referent which is talked about in a multi-clause span with action (predication) continuity (Givón, 1983), is also coded by zero anaphora in subsequent mentions. (47) is such an example. But this device is only used in restricted positions as in coordination and participles (Tao & Healy, 2005). Topic chains with more than one zero anaphora are common in Chinese but much less frequent in English.

(47) *Ryan shut the door, dropped his bag, picked up a book, and curled up on the sofa.*

Second, the alteration between lexical pronouns and zero anaphora in Chinese can be interpreted as the difference of unstressed anaphoric versus stressed/independent pronouns in English. The unstressed anaphoric pronoun signals referential continuity, so in (48), (a)

means ‘Mary left’. By contrast the stressed pronoun denotes a break of continuity, i.e., switch of referent, thus (b) is interpreted as ‘Marcie left’. In Chinese, the felicitous use for (a) is also a zero anaphor since the highest continuity is warranted.

(48) Mary talked to Marcie for a while.

- a. Then she left.
- b. Then SHE left.

(Examples from Givón, 2017)

It should be noted that the difference between unstressed and stressed pronouns in English is not easy to tell as they take the same form as lexical pronouns. Chinese and English overlap in this structure. In Pu’s (2019) recent work, five major factors that impair thematic continuity were categorized. They are found to trigger the use of lexical pronouns instead of keeping the unmarked form of zero anaphors within a clause-chain. Next, we will exemplify each category and offer corresponding English translations. Although some zero anaphors can be coded directly by zero pronouns in English (for those coordinate constructions), all of them can also be coded by unstressed pronouns.

Time and location change: an interruption in a close-knit action/event sequence, where the thematic coherence is disrupted by a time or location change in the action or event sequence.

(49) *tā ná qǐ píjiǔ, φ dǎkāi yīnxiǎng, φ táng zài shāfā tīng yīnyuè, hǎojiǔ gè xiǎoshí hòu, tā cái shuìzhào.*

he pick up the beer φ turned-on the stereo φ lay on the sofa listen to music after a few hours he fell asleep.

“He picked up the beer. He turned on the stereo. He lay on the sofa to listen to music. After a few hours, he fell asleep.”

Shift in description style: transitions in narration from the referent’s physical activities to inner thoughts, or from a portrait of the referent’s appearance to actions.

(50) *tā zǒu dào chuāng biān, φ táitóu wàngzhe xīngkōng, φ yī dòngbùdòng, tā cóng wèi rúcǐ shēngqìguò*

he go to the window φ look up at the starry sky φ not move he never more upset

“He went to the window. He looked up at the starry sky. He did not move. He has never been more upset.”

Emphatic effects: the use of lexical pronouns by the speaker to emphasize specific properties of the referent. In a because-clause, when the subject co-refers to the same referent as the matrix subject does, zero anaphor is the default form, as discussed in §2.2.4.

(51) *tā fàngshēng dà kū, yīnwèi tā zhǐ néng yīgè rén, yīnwèi tā méiyǒu xuǎnzé, yīnwèi tā hài pà shībài.*

she burst into tears because she could only be alone because she had no choice because she was afraid of failure

“She burst into tears, because she could only be alone. She had no choice. She was afraid of failure.”

Weakened topicality: when an important nonhuman entity is topicalized and placed to the clause-initial position, the human referent who is the subject of the clause will be demoted, albeit temporarily, weakening the topical status and hence creating a minor discontinuity.

(52) *tā xǐhuān gǒu, φ yǎngle yī zhǐ, φ měitiān dài chūmén sànbù, nà zhǐ gǒu tā yǎngle wǔ niánle.*

he like dogs φ raise one φ take a walk every day the dog he has been raised for five years

“He likes dogs He raises one He takes it for a walk every day. The dog, he has kept it for five years.”

Intervening materials: an overt digression from the topic of the discourse unit as the main storyline unfolds. The intervening materials are usually descriptions of nonhuman entities

related but peripheral to the development of the story. Hence the narration of the intervening materials diverts the focus of attention temporarily.

(53) *tā huí dàojiā, φ dǎkāi diànshì, diànshì méiyǒu xìn hào, tā yòu guānshàngle*

he got home φ turn on the TV TV no have signal he again close

“He got home. He turned on the TV. There was no signal on the TV. He turned it off.”

The present paper will apply Pu’s (2019) categorizations as the discourse criteria to study Chinese-English bilinguals’ performances on subject realisation in Chinese spoken narratives. Thus, the comparison between bilinguals and monolinguals, as well as among bilinguals, as a way of locating possible L2 influences or bilingual effects will be centred on the choice of overt versus null subjects in referent maintenance within clause-chains.

2.3 Empirical Studies on Bilinguals’ Subject Realisation

This section first reviews studies on bilingual subject realisation across languages and then formulates research questions and hypotheses for the current study. The empirical review consists of four sub-sections, including studies on three general groups of bilingual populations, i.e., bilingual first language acquirers, second language learners, and heritage language speakers, and the last sub-section is attributed to Chinese-English bilingual speakers.

We have discussed in §2.1 that cross-linguistic influences are more likely to be found at the syntax-pragmatics interface and in §2.2 and that subject realisation is constrained by both syntactic and discourse conditions. It is then justifiable to predict that bilingual subject realisation might exhibit instances of deviation from monolingual behaviours. Indeed, how subject realisation is one of the key issues in bilingual first language acquisition (Hacohen & Schaeffer, 2007; Haznedar, 2010; Paradis & Navarro, 2003; Serratrice et al., 2004), second language learning (eg., Belletti, Bennati, & Sorace, 2007; Sorace & Filiaci, 2006), and bilingual first language attrition (Gürel, 2008; Keating, Van Patten, & Jegerski, 2011;

Montrul, 2004; Tsimpli et al., 2004).

2.3.1 Bilingual Children

Research on children's acquisition of subject realisation has revealed a general trend that young monolingual children produce more null subjects than adult monolingual speakers regardless of whether the native language is a NSL or a non-NSL (Guasti, 2002). Nonetheless, more occurrences of null subjects are found in NSL-speaking children's utterances than those of non-NSL-speaking children (Grinstead, 2000). There are also abundant studies reporting that children can acquire syntactic and discourse-pragmatic constraints that govern the distribution of overt and null subjects in diverse languages (Greenfield & Smith, 1976; Guerriero et al., 2006; Serratrice, 2005). However, for those BFLA children who acquire two languages (one is an NSL and the other is a non-NSL) from birth or at an early age, the rate of overt subject forms is significantly higher than their monolingual peers (Hacohen & Schaeffer, 2007; Paradis & Navarro, 2003; Serratrice et al., 2004; Silva-Corvalán, 2014), covering a wide range of null subject languages including Spanish, Turkish, Hebrew, Italian. When this bilingual and monolingual divergence was observed in children's data, cross-linguistic influence is said to be the main reason (Hulk & Müller, 2000; Müller & Hulk, 2001) because structural overlapping and conflicting input from a bilinguals' two languages might trigger the occurrence of CLI (Döpke, 1998; Meisel, 2007).

Paradis and Navarro (2003) used the spontaneous language data drawn from CHILDES (MacWhinney, 2000) with a Spanish-English bilingual child (ages: 1;9-2;6) and two Spanish monolingual children (ages: 1;8-2;7 and 1;8-1;11) to look for possible differences in realising subjects. Their data shows that the bilingual child produced a much higher rate of overt subjects (35%) compared to that of the two monolingual children (around 20%), which coincides with results from other research on monolingual children of the same age (Grinstead, 2000). They further analysed the use of overt subjects regarding discourse-pragmatic functions as appropriate use with high informative value, and redundant use with low informative value. The bilingual child exhibited a striking difference in terms of the

redundant use, having a rate of 26% of total overt subject use. In contrast one monolingual child had a rate of 10% and the other had no such use. The authors concluded that the bilingual child had acquired the use and discourse function of overt and null subject in Spanish at the age of 2;6, but the distribution pattern exhibited a cross-linguistic influence from the child's other language English, which requires obligatory overt forms for subjects. However, Silva-Corvalan (2014) doubts the overproduction of overt subjects found in Paradis and Navarro's (2003) bilingual child as a purely CLI effect from the non-NSL English, but a result of the input the child received from Cuban Spanish, which displays a high proportion of overt subjects. Since in her data, when the bilingual's non-NSL English became dominant while Spanish proficiency decreased at the age of four, CLI appears to occur, although before that no overall influence was found.

Serratrice (2007) tested the possible cross-linguistic influence on anaphora resolution in eight-year old bilingual children who had been exposed to both Italian and English from birth and had a regularly daily use of the two languages. She used a picture variation task (Sorace & Filiaci, 2006; Tsimpli et al., 2004) to study the difference, in interpreting inter-sentential referent coded by null and overt pronouns, between bilingual children, age-matched monolingual Italian children and monolingual Italian adults. The results showed that bilingual children assign overt pronominal subjects as co-referential with subject antecedent, significantly more often than both monolingual children and adults. The difference was perceived as evidence of a cross-linguistic influence from English to Italian, as overt pronominal subjects are by default co-referential, with a subject antecedent in English, whereas in Italian they are more likely to refer to an object antecedent. Serratrice attributed the generalisation of overt pronominal anaphors, to cross-linguistic priming (Hartsuiker, Pickering, & Veltkamp, 2004; Loebell & Bock, 2003) in which overt pronouns are processed in the same way in Italian as in English, since bilingual children frequently input and output obligatory subject pronouns in English.

These studies seem to offer positive evidence for cross-linguistic influences as a promising explanation for bilingual children's extensive use of overt subjects in their NSL. However,

findings from empirical studies on bilingual children where both languages are NSLs, complicate the issue by showing that they also exhibit a higher rate in interpreting or producing overt subject forms, compared to monolingual children, in either of their NSLs. Sorace et al. (2009) undertook a study to test the extent to which the differences observed between bilingual and monolingual children was a result of cross-linguistic influence, or a consequence of being a bilingual in the comprehension of subject pronouns. The study employed 59 English-Italian bilingual children divided into two groups, one with 39 participants living in the UK and the other one with 20 participants living in Italy. The controls included 31 Spanish-Italian bilingual children, 38 monolingual Italian children, all age-matched. Acceptability judgement tasks were employed to record the participants' interpretations of overt and null pronouns as anaphoric expressions based on the content of an animation story they saw. The study manipulated the variables of topic-shift versus no-topic-shift. The overt pronoun is pragmatically appropriate in a topic shift context in Italian and Spanish, whereas the null pronoun is felicitous in a no-topic-shift context (Carminati, 2002).

The results showed that all bilingual children exhibit a significantly higher proportion of pragmatically inappropriate uses of overt pronouns in a no-topic-shift Italian context, no matter if the other language is English or Spanish. English-Italian bilingual children in the English environment (residing in the UK) performed with the least accuracy in the comprehension of anaphora. The results lead the authors to advocate that: a) dealing with two languages has imposed more processing costs, because bilinguals have two language systems to control; b) processing information that lies at the interface where syntax and discourse intersect, requires more coordination of resources; c) language of the community also plays a role in off-line linguistic intuition as bilingual children in the UK are likely to receive input from adult bilinguals, whose Italian contains more overt forms than monolingual peers. It is therefore crucial to notice that a higher rate of overt subjects in the bilinguals' NSL cannot only be attributed to the effect of cross-linguistic influence from the other non-NSL.

Liceras & Fuertes (2019) studied two Spanish-English simultaneous bilinguals in both their L1s and found no CLI from English to Spanish in cases of overproduction of overt subjects, but did report CLI from Spanish to English in facilitating the acquisition of obligatory overt subjects in English. In terms of the results, the authors explain that lexical saliency in one of the bilingual's languages would facilitate the same form of the other language because the overt value has been reinforced in the input of both languages.

The literature on referential expressions in bilingual children also shows an interest in whether the realisation of third person pronouns in an NSL is affected by a non-NSL (Serratrice & Hervé, 2015). Liberman, Woodward, Keysar, and Kinzler's (2017) study with young bilingual children reports an advantage when there is a sensitivity to referential cues. Allen, Hughes, and Skarabela (2015) also reports that 3-year-old bilingual children are partly sensitive to the constraints on referential choice, made by adult speakers. In Serratrice and De Cat's (2020) study, bilingual children's performances on referential subjects are reported to test CLI. They employed a large group of 87 bilingual children who were schooled exclusively in English but speak the other language at home.

All these studies seem to suggest that bilingual children can acquire both language-specific and language-universal rules in subject realisation. However, cross-linguistic influence might take the form of favouring overt subjects in the null subject language of bilinguals when the other language is a non-NSL. When one language becomes dominant as the children develop, the magnitude of influence might be more prominent if the dominant language is a non-NSL since the high frequency of overt pronominal subjects enhances the input and accessibility of the overt form over the null form in the weaker language.

2.3.2 Second Language Learners

With respect to second language learners, especially adult learners whose L1 has been fully established, it is found that they have consistent difficulties with appropriate pragmatic uses of overt pronominal subjects but not with null pronouns. It seems to suggest that for second

language learners whose first language is an NSL, the unlearning of null subjects is not difficult. When the learner reaches the intermediate level, the accuracy of using the obligatory subject can achieve a native-like level, because the overt form is also present in NSL. However, when the learner is from a non-NSL, such as English-speaking L2 learners of Spanish, the appropriate use of pragmatic null subjects tends to be problematic (Davies, 1996; Lakshmanan, 1991; Tsimpli & Roussou, 1991).

Belletti et al., (2007) studied bilinguals whose native language is English, who began to learn L2 as adults and achieved near-native proficiency. Their findings show an overproduction of overt pronouns in co-referential contexts where native speakers commonly realize a topical antecedent with a null form. The results are in line with Jegerski's (2011) study of English-speaking learners of Spanish L2, which further suggests that features of null subject at the interface present a challenge in acquisition, as no participants, not even the most advanced group in his study behaved in an entirely native-like way. However, it cannot be considered as evidence of inacquirability since the participants were not at the ultimate attainment level. It generally takes more than 10 years for an L1 child to develop pronominal references in Spanish to adult-like preferences (Shin & Cairns, 2009). The study provides empirical evidence in L2 learning that linguistic structures that occur at the interface between syntax and discourse, such as subject anaphora, present a clear challenge to the L2 learner, even for speakers of advanced L2 proficiency. Findings appear to suggest that the interface poses more difficulty in that it requires more cognitive efforts to integrate information in L2 tasks (Birdsong, 2006; Clahsen & Felser, 2006) coupled with the underlying grammatical deficit (Sorace & Filiaci, 2006).

The null subject, which sits at the interface of syntax-pragmatics, is said to be an unstable and vulnerable domain that is difficult for second language learners to acquire (Liceras, 1989; White, 1985). In a null-subject language, the alternation between overt and null subjects is regulated by morpho-syntactic and discourse pragmatic factors. The vulnerability is reflected in that although discursive properties can be learned, the level of mastery varies and even advanced learners tend to show some degree of deficit (Sorace, 2004). According to Sorace

(2004), the deficit can be seen in the overproduction of overt subjects but not in the overproduction of null subjects. In many NSL grammars, such as Spanish, overt pronominal subjects are specified for the feature of topic shift whereas in non-NSLs, such as English, overt pronouns in subject positions do not have this feature. Previous literature on this issue seems to suggest that L2 learners of NSL from a non-NSL background begin to realise subjects with null forms at an early stage but they do not discriminate between the discourse properties for the felicitous use, resulting an overgeneralization of null subjects. Only advanced learners reach a native-like pattern by constantly using an overt form for the non-topic context (LaFond, Hayes, & Bhatt, 2001; Montrul, 2006; Pérez-Leroux & Glass, 1999). Results from these studies showed an incremental development in the acquisition of the discourse conditions that govern the distribution of null and overt subject expressions in an NSL.

Perez Leroux and Glass (1999) examined the production of null and overt subjects on L2 learners and found a decreasing trend in the proportion of overt subjects and an increasing trend in the proportion of null subjects as proficiency is enhanced from the elementary to the advanced level. But the authors also pointed out that the appropriateness of pragmatic distribution was rather low even for the advanced learners. Lafond, Hayes, and Bhatt's (2001) study, L2 learners of Spanish make two major errors, i.e., the overuse of the null subject in non-topic situations and the overuse of overt pronouns in topic-maintaining situations. The rate of errors decreases when proficiency improves.

Montrul, Rodríguez-Louro, and Escobar (2006) studied English-speaking L2 learners of Spanish at various proficiency levels on the acquisition of the morpho-syntactic and discourse-pragmatic properties of subject expression in Spanish. The study confirmed that morpho-syntactic aspects of the null subject can be successfully acquired by advanced and near-native learners as their performances do not differ quantitatively or qualitatively from the native speakers. However, with respect to the discourse-pragmatic properties, L2 learners exhibit more difficulties. Overt subjects are a marked option in Spanish when accompanied by topic shift and focus. By contrast, subjects in English are obligatory in most situations and

do not carry any pragmatic force. In their study, if an overt subject is used when there is no introduction of a new referent or any sign for emphasis, it was considered redundant. Likewise, the use of a null subject is considered illicit in a switch of reference context. The results show that all learners performed differently from native speakers in null subjects. Intermediate learners under-produced null forms, with most instances found in coordinate structures where English also allows null forms (Haegeman, 2000), and constantly produces redundant overt subjects. Advanced and near-native learners produced a significantly higher rate of illicit null subjects compared to that of native speakers and they also used redundant overt subjects despite of the fact that the rate of redundant overt subjects by the near-native learners can be viewed as negligible. Their findings echo the assumption that the interface with discourse-pragmatics poses more difficulties (Sorace, 2011, 2012).

Tsimpli and Roussou (1991) examined adult native speakers of Greek, Spanish and Italian in their acquisition of L2 English. They propose that L2 learners re-structure their L1 based on the L2 data. The grammar of L2 English differs from L1 English despite the similarities they present. This is in line with Liceras (1988), who found that L2 learners of Spanish failed to acquire complete discourse constraints on null subject use, resulting in an overproduction of overt subjects in discourse contexts where a null pronoun would be appropriate. Likewise, Belletti et al. (2007) argues that there is an incomplete mastery of discourse constraints in the distribution of topic and focus in Italian L2 production of L1 English speakers, particularly in the use of overt subject pronouns. However, some research (Gürel, 2006; Rothman, 2009) reports that advanced L2 learners can fully distinguish the use of null pronouns in topic contexts, and that of overt pronouns in focus contexts.

Liceras and Diaz (1999) studied the L2 Spanish from five different language backgrounds, including both NSLs like Chinese and Japanese, as well as non-NSLs such as English, French, and German. The participants have either beginner or advanced intermediate Spanish proficiency. By analysing the elicited spontaneous speech production, the authors found that all participants can produce null subjects in matrix and subordinate clauses regardless of their L1 background and L2 proficiency. But many pronominal subjects produced by L2 learners

do not have the same value as those produced by native Spanish speakers. The results tend to suggest that non-native grammar in L2 acquisition resorts to a procedure that allows null pronouns, provided they can be identified. Roberts, Gullberg, and Indefrey (2008) carried out an investigation on L2 Dutch acquisition by Turkish L1 speakers and German L1 speakers. Dutch and German are both non-NSLs whereas Turkish is an NSL. The study found that L2 Dutch learners of L1 Turkish in contrast to L1 German learners and Dutch native speakers, favor external referents when coding an ambiguous overt pronoun. This might be CLI from L1 Turkish, as overt pronouns in Turkish tend to be co-referential to external antecedents.

Adult L2 learners are sensitive to the discourse status but are sometimes more explicit than native speakers when choosing the appropriate form for referential expressions. They are found to over use NPs in referent-maintaining contexts, where native speakers might prefer to use pronouns (Edmondson & House, 1991; Gullberg, 2006; Yoshioka, 2008). The phenomenon of over-explicitness in the L2 has been observed for learners of both NSLs (Ryan, 2015; Yoshioka, 2008) and non-NSLs (Gullberg, 2006). Over-explicitness usually occurs on L2 learners of intermediate proficiency (Frederiksen & Mayberry, 2018). In line with this research, there is a growing body of literature investigating the difficulty of the appropriate use of overt pronominal subjects in an NSL by learners from a non-NSL background. Many studies in the domain focus on morphologically rich pro-drop languages. By contrast, the acquisition of NSLs without verbal inflection, such as Chinese, Korean, and Japanese, draws attention to the co-referential property of null versus overt subject pronouns.

Di Domenico and Baroncini (2018) attempted to identify factors other than CLI in the choice of null versus overt forms in coding anaphoric subjects. They studied spoken narratives from simultaneous Greek-Italian bilinguals, adult Greek learners of L2 Italian, monolingual Italians, and monolingual Greeks. They first compared the utterances of Italian and Greek monolinguals and found no significant difference in the distribution of null versus overt forms in realising referential subjects. Thus, the CLI effect was ruled out while interpreting the bilinguals' performances. The results show that in the absence of CLI, simultaneous bilinguals and L2 learners behave in a similar way to monolingual Italians in terms of using

null pronouns, but L2 learners differ from simultaneous bilinguals and monolingual Italians in the production of overt pronouns. L2 learners produce a significantly higher rate of overt pronouns than both simultaneous bilinguals and monolinguals, while no significant difference was found between the latter two groups. By further comparing the L2 learners' L1 Greek production with monolingual Greek controls, the authors found that instances of over-use occur only in their L2 Italian and not in their L1 Greek. This led the authors to assume that the difference between L2 learners and other groups in Italian is an effect of late acquisition (age of onset of exposure): although as L2 learners they acquire Italian after puberty, they achieve a near-native proficiency as bilinguals.

2.3.3 Heritage Language Speakers and First-generation Immigrants

It is generally assumed that continuous immersion in the L2 environment might result in a growing influence from the dominant L2 on the L1. Studies on the alternation between null and overt pronominal subjects in the discourse context uncover the preference for null subjects in topic-maintaining situations and overt subjects in topic shift contexts (Holmberg, 2010; Martinez-Sanz, 2011). Reference expressions produced by bilinguals mostly focus on the pragmatic distribution of overt and null pronouns in an NSL when the other language is a non-NSL. Previous studies found that the predominant pattern is that bilinguals tend to loosen the discourse-pragmatic constraints on coding overt pronouns in NSLs. In other words, they exhibit a redundant use of overt pronouns when the context does not signal high informativeness such as contrast and topic shift (Flores-Ferrán, 2004; Gürel, 2004; Montrul, 2004; Silva-Corvalán, 1994).

In one direction, when non-NSL is in contact with an NSL in an NSL-dominant environment, Polinsky (2018) reported that heritage English in contact with Hebrew, which allows first-person and second-person pronominal subjects to be dropped in most cases, and Japanese which belongs to radical NSLs (Roberts & Holmberg, 2010), does not show any attrition effects in realising subjects. Heritage English speakers in Israel and Japan never fail to produce overt subjects. Likewise, Russian L1 speakers in Israel use few null pronouns. But

most of the literature points in the other direction, such as Koban Koç (2016) who reported a significantly higher rate of overt pronouns produced by heritage Turkish speakers in the US than the monolingual controls in Turkey.

Similarly, Azar, Özyürek, and Backus (2020) examine Turkish heritage speakers in the Netherlands on reference tracking in both Turkish and Dutch. They studied the discourse-pragmatic contexts that modulate their choice of referring expressions among NP, overt pronouns, and null pronouns. Their performances are compared to monolingual Turkish in Turkey and monolingual Dutch in the Netherlands. The spoken narrative data elicited from the participants shows that the reference tracking strategies by heritage speakers are close to the monolingual baseline in both Turkish and Dutch. There is no significant difference in the realisation of overt pronouns in Turkish. However, there are subtle differences in the use of overt pronouns in maintained reference contexts. Bilinguals used more overt pronouns and fewer NPs than monolinguals in Turkish and more overt pronouns and fewer null pronouns than monolinguals in Dutch. The authors argue for the importance of considering language proficiency and use when investigating bilingual performances. It should be noted that the heritage speakers in their study have a high level of proficiency in Turkish and Dutch and use both languages regularly within a wide range of contexts (Backus & Yağmur, 2019; Extra & Yagmur, 2010). This study offers some insights for looking at pragmatic constraints on overt pronouns in the null-subject language of bilinguals who have a high level of attainment in the heritage language.

With respect to discourse-pragmatic conditions in a co-referential context, overt pronouns are commonly used in non-NSLs (Contemori & Dussias, 2016; Hendriks, Koster, & Hoeks, 2014) while null pronouns are the default in NSLs (Montrul, 2004; Torres Cacoullos & Travis, 2011). Previous findings in bilingual subject realisation indicate that overt pronouns in NSLs are vulnerable to CLI from non-NSLs in which overt pronouns are not pragmatically marked (Gürel, 2004; Montrul, 2004; Müller & Hulk, 2001; Tsimpli et al., 2004). A body of literature has reported that first-generation immigrants and heritage speakers produce more redundant overt subject pronouns than monolinguals (Gürel, 2004; Keating et al., 2011; Montrul, 2004;

Silva-Corvalán, 1994; Tsimpli et al., 2004). Montrul (2004) documented the redundant use of overt subject pronouns by Spanish speakers in the US. There is a difference between intermediate and advanced proficiency although both produced more pragmatically inappropriate overt subject pronominals than monolingual Spanish speakers. Tsimpli (2007) looked at the production of post-verbal subjects and the alternation of null and overt subjects by L1 Greek speakers with a near-native proficiency in English, Swedish and German, and found the bilinguals performed very differently from the monolinguals. Perpiñán (2013) investigated L1 Spanish L2 English bilinguals and found an attrition effect when the discourse of focus is considered.

From a usage-based perspective (Bybee, 2006), structures that are frequently used have strong representations in memory, and are thus more accessible and retrievable (De Bot & Clyne, 1989; MacWhinney, 2012). Language use in terms of frequency and contexts has been found to be a factor that affects the appropriate use of pronouns in language contact situations (Travis, Torregrossa, & Kidd, 2017). The use of null subjects is found to be mastered successfully and earlier than that of overt pronouns. However, Rinke and Flores (2020) found that when the heritage language is maintained, both in use and proficiency, attrition effects are seldom seen. Their finding shows that bilingual groups perform roughly the same way as their monolinguals.

There is abundant research on immigrant populations of L1 Italian, Greek, and Spanish speakers in contact with L2 English. Tsimpli et al. (2004) tested attrited Italians in an L2 English environment on the production of null and overt subjects in the L1. Their experiment shows a preference for an overt pronoun to a subject antecedent by bilinguals compared to the monolingual Italians. The authors claim that the feature of topic-shift for overt pronouns and non-topic-shift for null pronouns become unspecified in an attriters' grammar, due to their contact with English where such a contrast does not exist. Sorace (2005) tested L1 Italian and L2 English bilinguals with near-native L2 English proficiency after prolonged exposure to English. The results are incongruent with Tsimpli et al., (2004) in that bilinguals overproduced overt subjects, exhibiting a significant difference from monolingual Italians in

topic continuity contexts.

In Iverson's (2012) case study of an attriter Pablo, a Spanish-Brazilian Portuguese speaker showed an extreme case of L1 shifting to L2 structures. Iverson examined Pablo's subject realisation in three different domains, i.e., external interfaces where the discourse context governs overt and null subject pronouns; internal interfaces where the concern is definite versus indefinite subjects; narrow syntax concerning specific cases of subject-verb inversion. Tasks of grammaticality, acceptability and interpretation judgment were conducted to see how Pablo performed when his two languages differed in coding the subjects. The study found that Pablo's L1 appeared to a similar extent to have a L2-modified pattern in all the three areas showing L1 syntactic restructuring.

Genevska-Hanke (2017) carried out a 17-year longitudinal case study to investigate pronominal subjects of a Bulgarian-German bilingual in Germany. The rate of overt pronouns in her L1-Bulgarian spontaneous speech was found to be significantly higher than that of a monolingual baseline. However, the high rate of overt subjects fell within the monolingual range after 3 weeks of L1 re-exposure in Bulgaria. Köpke and Genevska-Hanke (2018) continued the Genevska-Hanke's (2017) study with data collected in a 5-year period both in the L1 and L2 environments. No attrition effect was found in the realisation of pronominal subjects. The authors suggest a close relation between language use context and attrition effects. This is in line with Grosjean's (1998) concept of the language mode whereby bilinguals' language use may differ with the language environment.

De Prada Pérez (2019) studied the distribution of overt versus null pronominal subjects in Spanish spontaneous speeches in Spanish-Catalan bilinguals. The bilinguals are further categorized into Spanish-dominant and Catalan-dominant groups. There are also two control groups, i.e., Spanish monolinguals and Catalan monolinguals. Spanish and Catalan are both null-subject languages and have only slight differences on the issue in question. The author examined three main variables documented by the previous literature (Otheguy et al., 2008) that might affect the distribution pattern of pronominal subjects. These variables include the

grammatical person (first versus third person singular), speech connectivity, verb form ambiguity, and semantic verb type. It is found that for the first person, lower connectivity, higher ambiguity, stative and mental verbs are more associated with overt pronominal subjects than the third person, expressing higher connectivity, unambiguous forms, and external action verbs. The findings show contrasts between 1sg and 3sg persons are revealing across all groups (Spanish control with 19.8% versus 4.8%; Catalan control with 20.7% versus 10.6%; Spanish-dominant bilingual with 19.9% versus 14.5%; Catalan-dominant bilingual with 13.1% versus 8.2%). This difference in grammatical persons may help to explain the inconsistent results reported by previous studies attesting bilingual or CLI effects. The study highlights the necessity of distinguishing variables that might affect subject realisation, especially with 1sg and 3sg persons, on which previous literature report no contact effects in 1sg (Bayley & Pease-Alvarez, 2009; Erker & Otheguy, 2016; Flores-Ferrán, 2004; Otheguy, 2012; Shin & Otheguy, 2013; Silva-Corvalán, 1994; Toribio, 2004; Torres Cacoullos & Travis, 2011).

In conclusion, numerous studies have reported the increased use of overt subjects in NSLs, such as Spanish and Italian, when these languages are in contact with non-NSLs, such as English and German (Montrul, 2004, 2016; Müller & Hulk, 2001; Otheguy, Zentella, & Livert, 2008; Serratrice, 2007; Serratrice, Sorace, & Paoli, 2004; Silva-Corvalan, 1994; Sorace & Filiaci, 2006; Sorace, Serratrice, Filiaci, & Baldo, 2009; Tsimpli, Sorace, Heycock, & Filiaci, 2004, among others). Heritage speakers tend to use more overt subjects in an NSL because the overt form is not ungrammatical and is even clearer in production. Montrul (2016) and Otheguy et al., (2008) observed the rate of null pronouns is decreasing in the utterances of first-generation immigrants who are the major source of input for heritage languages. It should also be noted that the factors that cause the divergence from monolingual norms in heritage speakers' performances are different from those of first generation immigrants. The deviations from monolingual norms found in the utterances of the latter might be more attributable to contact induced CLI, whereas those found in the production of heritage speakers should consider both input effects and incomplete acquisition. Unlike speakers in the homeland environment, heritage speakers acquire the heritage language mainly from their

older generation who may already be experiencing attrition (Schmid & Köpke, 2007).

2.3.4 Chinese-English Bilinguals

It has been found that Chinese speakers experience little difficulty in unlearning the null subject while acquiring a second language that is a non-NSL, like English when the learners have reached intermediate L2 proficiency (Kong, 2005; Yip, 1995; Yip & Matthews, 1995; Yuan, 1997). For instance, Yip and Matthews (1995) argue that the learnability of subject-prominent features for intermediate and advanced Chinese learners of English poses little difficulty in obligatory subjects, although obligatory objects are very difficult even for proficient bilinguals.

Yuan (1997) carried out a cross-sectional study with 159 Chinese-speaking adult learners of L2 English, who had been divided into seven groups ranging from the most elementary to the most advanced according to their English proficiency. Generally, participants with the increase of proficiency levels are aware that English does not allow referential null subjects. Most L2 learners except for those with elementary proficiency have no difficulty in rejecting the use of null subjects in tensed clauses, although the accuracy in disallowing null subjects in embedded clauses is lower than that of matrix clauses. Yuan attributes the Chinese learners' success in the acquisition of obligatory overt subjects in English to the recognition of subject-verb agreement features in their L2 input.

In Kong's (2005) study, similar results are found whereby Chinese learners of L2 English have no problem in unlearning null subject in the matrix clause. But his data also indicated that learners tend to make more errors with the null subject in the embedded clauses. He then argues that the unequal performance with matrix subjects and embedded subjects is related to the topic-prominence (Li & Thompson, 1976; Yip & Matthews, 1995) feature of Chinese. Subjects in the matrix clause, parallel the topic in Chinese in that the topical subject is more frequently addressed with overt forms, whereas the co-referential subject in the embedded clause usually takes covert forms. Chinese speakers of L2 English might transfer the feature

of the topic in the acquisition of English.

In Crosthwaite's (2014) and Ryan's (2015) studies, Chinese learners of L2 English, reported an over-explicitness of referential subjects. Their findings are in line with other studies of L2 referent tracking, which indicate a trend of over-explicitness in constructions, whereby intermediate and advanced learners tend to use overt forms such as pronouns, names and lexical phrases when zero anaphora are more pragmatically felicitous or preferred for lexical phrases and names when pronouns are more suitable. This has been proposed as a general feature of learner varieties, irrespective of L1 and L2 differences, evident in Tomlin's (1990) study, in which advanced learners of English from diverse L1 backgrounds including Arabic, Korean, Japanese, Mandarin and Spanish, performed a narrative task and showed a reliance on lexical NPs over pronouns. Ryan's (2015) data revealed that L2 learners have no difficulty in dealing with highly-accessible topical referents in story-telling but use significantly more lexical NPs in less accessible or high discontinuous contexts. Ryan further argues that the infrequent use of pronouns in favour of lexical NPs as a communication strategy that bilinguals use to prioritize clarity in production can be cognitively efficient in coordinating the resources (Gullberg, 2006).

Qi's (2010; 2011) longitudinal work gives detailed information on pronominal subjects in early bilingual language development. The Mandarin-English bilingual child in her study demonstrates no systemic transfer in subject realisation. Her data shows that the child produced null subject pronouns in Chinese but no such form in her English. However, as Qi quotes, the definition of transfer from Genesee's words while interpreting the pronominal development trend as "...the incorporation of a grammatical property of one language into the other" (2000, p. 169) - it should be noted that if there is no transfer it does not mean there is no cross-linguistic influence such as the preference for overt pronouns where null pronouns are more discourse appropriate in Chinese. The rates of overt versus null pronominal subjects in Chinese are not reported in her study. Qi's finding indicates that bilingual children are sensitive to grammatical characteristics and various cues of input, hence they can perform in a language-specific way even in the very early days of bilingual development (Kim, 2000),

despite the fact that Chinese monolingual children allow more subjects than their English counterparts (Wang, Lillo-Martin, Best, & Levitt, 1992) although null subject is said to be a universal acquisition process (Jaeggli & Hyams, 1988).

Turning to the influence of Chinese on the use of English, Chen and Pan (2009) found some transfer effects. They examined Chinese-English bilinguals' use of referential subject expressions in English oral narratives. The bilingual participants were children in three age groups (5, 8, 10 year olds) living in the US. All the participants were American born Chinese who had adequate exposure to their L1 Chinese from birth. The study focused on both referent introduction and referent maintenance. They compared the bilingual children's performances with monolingual peers in either language from the data in (Schmid, 2004) and Hickmann and Hendriks (1999). They observed some difference in the development pattern of bilingual children's reference management in English compared with that of the monolingual English-speaking children. They viewed the observed difference as transfer effects from bilingual children's L1 Chinese. At the early age, when monolingual Chinese children outperformed monolingual English children, the bilingual produced more appropriate forms than the English children. At the latter stage, when English children surpassed Chinese children in the proportion of appropriate forms, the bilinguals underperformed compared to the English monolinguals. The study also includes the data of bilingual adults for comparison with monolingual adult in either language. Interestingly, English and Chinese monolingual adults achieve more or less the same proportion of 90% appropriateness, but the bilingual adults are around 10% lower in their English.

Tao and Healy (1996, 2005) studied cognitive strategies by native speakers of different L1 backgrounds in discourse reference tracking. They proposed that choices of anaphoric devices fall in rules that are both language-universal and language-specific. They conducted experiments to compare the comprehension performance of native speakers of Chinese, Japanese, English and Dutch on modified English passages with zero anaphora. Among the four languages, English and Dutch do not use much zero anaphora whereas Chinese and Japanese have abundant use. The results suggest that speakers apply the strategies they

developed in processing a native language, to process similar patterns in their second language, as both Chinese and Japanese participants performed better than English and Dutch participants in accommodating zero anaphora in modified English sentences. The results also have shown that individuals apply language-specific strategies for processing zero anaphora and transfer at least some processing strategies to comprehend a foreign language.

In the opposite direction, among studies into how English learners acquire L2 Chinese in the domain of null subject, the focus is on the distribution of zero anaphora in various syntactic and discourse contexts. According to §2.2.3 and §2.2.5, the major difference between Chinese and English in realising subjects are: a) when the subject of the subordinate clause is co-referential with that of the main clause, Chinese favours zero anaphora whereas English requires obligatory lexical pronouns - this contrast applies to both adjunct clauses and complement clauses. b) in a clause-chain where successive clauses share the same topical referent, the subsequent mentions of the same referent in the subject position are more likely to be realised with zero anaphor in Chinese, but English disallows zero anaphor except for coordinate clauses. One study reported the transfer of English syntactic structure of the subject-prominent to Chinese syntactic structure of the topic-prominent and showed some developmental pattern in acquiring null subjects in different clause types.

Jin (1994) examined forty-six English native speakers learning Chinese L2 at four proficiency levels (from lowest proficiency in level 1 to near-native proficiency in level 4). Ten native Chinese speakers were included as controls. She attempted to find out whether speakers from a subject-prominent language transfer features from their L1 in the acquisition of an L2 that is topic-prominent. Her data were collected by two oral tasks and one written task showing three major findings. First, although all proficiency groups produced null subjects, the overall rate was less than that of native speakers. Second, proficiency played a major role in the successful acquisition of null arguments. There was a developmental trend on the number and types of null subjects with proficiency improvement. For example, in the written task, native speakers only used 12 overt subject forms out of 23 sentences, much fewer than L2 learners who exhibited a proficiency correlation to the number of overt

subjects, with 26, 23, 17, and 16 from the lowest to the highest level respectively. Third, the distribution pattern of null subjects is associated with the types of sentence. The type of subjects co-referential with the subject of the previous clause is the least difficult to learn. The author attributes the high learnability of this type to the parallel structure that English has in coordinate construction, where successive clauses describing close-knit actions do so by the same referent. The type of null subject in adjunct constructions presents a similar level of difficulty as the former type, which is also not too difficult to learn. The learners first drop the subject in the main clause and then can drop both subjects in the main and adverbial clause. Complement clauses in contrast, exhibit the highest difficulty for English learners. There is a persistent use of overt subjects in embedded complement clauses, only 10% of which are realised by null forms across all levels. The author concludes that the higher rate of overt subjects reflects the feature of English. English-speaking Learners at the beginning level are reluctant to drop the subject, showing a strong reliance on English syntactic structures while organizing Chinese sentences. The study confirmed the syntactic transfer from English to Chinese.

Li (2014) studied subject pronominal expressions in L2 Chinese produced by English, Russian, Korean, and Japanese speakers, with high-intermediate and advanced levels. The study reported that all L2 learners regardless of their L1 background have acquired the use of subject pronouns successfully, with patterns similar to those of Chinese native speakers. However, they exhibited lower competence in null pronoun usage. Learners across language groups tended to overproduce lexical pronouns in the subject position, hence a lower rate of null subjects compared to native Chinese speakers. Higher proficiency learners produced more null subjects than lower proficiency learners. Korean and Japanese speakers produced more null subject pronouns than English and Russian speakers. The across-language pattern seems to mirror the rate of null pronoun usage in the learners' native language.

Bailey (2015) studied the comprehension of Mandarin zero anaphora in telephone conversations by English-speaking learners with intermediate to advanced proficiency levels. He found that the least difficult type was the one that had similar zero anaphor-like

constructions in English, such as coordination sentences. The participants in his study were found to favour explicit forms in assigning the referent of the zero anaphors. Also, they had more difficulties in interpreting zero anaphor when action discontinuity occurred by shifting from a narrative description of an event to a comment on that event. He argued that both pragmatic and semantic cues are important for successful comprehension.

All these studies confirmed the influence of English on the acquisition of Chinese on null subject forms, however, there are also studies that argue the bilingual processing load rather than CLI is the reason of difference. Polio (1995) examined null pronoun usage in the subject position by English-speaking and Japanese-speaking learners of L2 Chinese, and compared the data with Chen's (1986) data of native speakers. The study found that L2 learners produced fewer null pronouns than native speakers and the use of null pronouns increased with proficiency improvement. Polio explained the over use of full NPs and lexical pronouns in the L2 speakers' utterance as a strategy for reducing the cognitive burden of keeping the reference. Polio also suggested that the teacher's input played a role in the distribution pattern of pronominals whereas native language had little influence.

In summary, previous studies of Chinese-English bilingual subject realisation are mainly on CLI from the forward direction, that is how bilingual's L1 influence the acquisition and usage of their L2. Conversely, how learning an L2 might change the way the bilingual behaves in their L1 is understudied. But as we have discussed in the preceding subsections, the influence between an NSL and a non-NSL has generated abundant literature in the domain of bilingual subject realisation, it is tempting to see how advanced Chinese learners of L2 English who have high frequency of using both languages in an L1 environment might differ from their monolingual peers in the production of null versus overt subjects.

The next chapter will introduce research questions and the design of the empirical study.

Chapter 3 Empirical Study

This chapter proposes research questions and describes the methodology of investigation. Upon reviewing empirical studies on the subject realisation of bilinguals in the previous chapter, the author predicts that proficient Chinese-English bilinguals might exhibit some distinctive features in producing subjects in spontaneous speech. Previous literature has investigated the issue of first language performance in bilinguals under the influence of frequent use or constant exposure to, and in the environment of, their L2. Most languages under investigation, however, turn out to be morphologically rich null-subject languages such as Italian and Spanish. Chinese, on the other hand, a radical pro-drop language that has no inflection or agreement, is less studied. The purpose of the current empirical study is to examine the potential influence of the L2 on the bilingual's L1 in the case of advanced L2 learners within their L1 environment, in the domain of subject realisation. This will offer an opportunity, moreover, to test whether there will be any further differences in performance in the bilingual speakers between their production in monolingual mode and that in their bilingual mode (Grosejean, 1998). The specific research questions are as follows:

Research Questions

RQ 1): Do Chinese-speaking learners of English L2 at the advanced level produce fewer null subjects in their L1 Chinese than functionally-monolingual Chinese peers?

RQ 2): Does the language mode affect the use of null subjects in the L1 of advanced Chinese-English bilinguals?

RQ 3): What are the differences, if any, in the distributional properties of subject realization?

RQ 4): Are these differences grammatically and discourse-pragmatically acceptable?

Hypotheses

H 1): Chinese-speaking learners of English L2 at an advanced level prefer to use lexical pronouns rather than zero anaphora when realising co-referential subjects in L1 Chinese, resulting in a reduced use of null subjects compared to their monolingual peers.

H 2): Language mode affects the subject realisation in L1 in these bilingual speakers, with a further reduced use of null subjects found in a bilingual mode, (i.e., when both L1 and L2 languages are activated) than in a monolingual mode, when only L1 was activated.

H 3): Bilingual speakers' subject realisation in their L1 Chinese, exhibit changes of a quantitative nature under the influence of their obligatory subject L2 (English) in a range of syntactic and discourse contexts.

H 4): Bilingual speakers' subject realisation in their L1 Chinese remains within the confines of grammaticality and discourse-pragmatic appropriateness.

The current study uses empirical speech data elicited through communicative tasks to answer the research questions and test hypotheses. The design of the experiments, as well as the ways to elicit empirically production data from informants that may shed some light on whether subject realization in Chinese exhibits signs of influence from English. Chinese is the native language of the target bilingual population while English is their L2. Also, data from the bilingual informants will offer some clues to the effects of the language mode on bilingual performance, i.e., whether producing their native Chinese in a bilingual mode (BM) has any difference in the bilingual speaker as against when they are producing their native Chinese in a monolingual mode (MM).

3.1 Design

To find out whether L2 may influence L1, an experimental group of fifteen Chinese-English adult bilingual speakers and two control groups of functionally monolingual speakers are

recruited. The experimental group will perform two cartoon-based narrative tasks (further details below) aimed at eliciting a variety of spoken structures involving subject realization. The speaking modality is chosen as the bilingual's speech production exhibits both similarities to and differences from that of monolinguals (Levelt, 1989; Bock & Levelt, 1994).

The first control group, made up of fifteen Chinese functional monolinguals (to be explained later), will undertake the same narrative tasks in Chinese as the experimental group. This first control group is necessary to draw comparisons between subject realization in their native language (unaffected by the frequent use of another language), as against the production of bilingual Chinese speakers who are frequent users of English. This will help provide some answers to research question 1. The second control group comprising two English native speakers, will perform the same communicative tasks as the other groups but in their native English language. Data from the English control group will not be used for comparison with that of the experimental group. The inclusion of the English control group is to provide a baseline for how the subject is realised in English (the source of influence) in an equivalent context. Major comparison will be made between the experimental group and the Chinese control group. All informants are invited to participate in a single individual session, to be conducted in similar conditions as every other informant.

The experimental group alone, however, will also engage, individually, in an additional session to perform a second set of cartoon-based narrative tasks in a bilingual mode (BM) to test whether their performance in this mode is significantly different from their performance in the monolingual mode (MM). This comparison might provide some answers for research question 2. The bilingual group will be the only group to perform in this mode (since the control groups are monolingual) and so provide its own control for comparison.

3.2 Participants

To conduct the study, thirty adult native speakers of Chinese and two adult native speakers of English were recruited for the experimental group (n=15), the Chinese control group (n=15)

and the English control group (n=2) according to selection criteria which will be explained in the next section. Potential informants for this project were approached through notices posted on a university campus in China after obtaining ethics clearance. Those who expressed their willingness to participate in the project were sent a questionnaire (see Appendix A), via e-mail. These questionnaires helped ensure participants fulfilled the selection criteria for each group. The two native English informants are acquaintances of the author and were approached through personal contacts.

Participants' demographic information and language use behavior will be detailed in the following subsections. Some variables were manipulated to meet the matching criteria in participants screening:

- a) Age range: 20-30 adult language users;
- b) Education: college-level to reduce metalinguistic variation;
- c) Language dominance: Mandarin Chinese for Chinese natives and English for English natives;
- d) Environmental language: Mandarin Chinese
- e) Dwelling place: the city of Xiamen, where Mandarin Chinese is the dominant language for work and study.

3.2.1 The Experimental Group

The experimental group was comprised of adult bilingual users, who actively use their two languages daily in substantially different contexts. They were recruited by advertisement from a Master program for translators and interpreters. Translator/Interpreter trainees are potentially good examples of the bilingual population that might exhibit signs of cross-linguistic influence. First, they are advanced L2 learners. Second, they use both L1 and L2 in their study and work and are continuously producing L2, thus they can be characterized as active bilingual users. Thirdly, the language use behavior of translator/interpreter trainees reflects the different contexts of language use, or language mode (Grosjean, 2001), which

relates to the second research question this dissertation attempts to answer. When these trainees communicate with monolingual speakers, be it Chinese or English speakers, they are in a relatively monolingual language mode; whereas when they are doing translation or interpretation, they are in a highly-activated bilingual mode. With Grosjean (2001) it is hypothesized that CLI is more significant in a bilingual mode than in a monolingual mode, hence more instances of L2 effects on subject realisation would be detected when participants perform L1 tasks in a bilingual mode than in a monolingual mode.

Selection Criteria

Candidates for the experimental group would be:

- a) Born and raised in China and L1 Chinese native speakers;
- b) No significant L2 immersion experience;
- c) Self-rated English language proficiency ≥ 7 (0-10 in scale, with 0 = no knowledge and 10 = native speaker level);
- d) IELTS (The International English Language Testing System) score ≥ 7 ;
- e) English-L2 use (either study or work) ≥ 3 hours/day or 20 hours/week;
- f) No other foreign language with a proficiency rated above 5 (0-10 scale, with 0 = no knowledge and 10 = native speaker level);
- g) Mandarin Chinese is the language they use to communicate with other native Chinese speakers. Even though some of them may know one or two Chinese dialects, they seldom speak that language and regard themselves as Mandarin speakers, rather than dialect speakers.

Table 3.1 details the relevant background information of the selected informants. The fifteen bilingual participants ranged between age 21 to 24. Thirteen of them are female and only two are male. Females tended to show a higher willingness to major in translation and interpreting training programs as 90% of the master students in the selected university are female. All bilingual participants began learning L2 English around the age of 10-12. All of them have attended IELTS tests and most of them regard the results as an important indicator of their English proficiency. The average IELTS score among these participants is 7.5 (a scale of 0-

9) with the highest ones scoring 8 and lowest ones scoring 7. Their self-rating in English proficiency is usually a little higher than their IELTS score which might reflect their confidence in viewing themselves as competent and active users of English.

Table 3.1 Demographic information and language use behaviour of the experimental group

Participant Code	Age	Gender	Age of beginning L2 English Instruction	English IELTS Score
E01	23	F	10	7
E02	23	F	12	7.5
E03	22	F	11	7.5
E04	22	F	10	7
E05	23	M	11	7
E06	22	F	10	7.5
E07	23	F	11	7
E08	24	F	12	8
E09	23	F	12	8
E10	24	M	13	7.5
E11	22	F	11	8
E12	21	F	11	7
E13	23	F	10	7
E14	22	F	10	7.5
E15	23	F	10	7.5

All bilingual participants show a tendency to use more L1 Chinese outside the classroom and more L2 English in classroom activities. Twelve participants out of fifteen reported some exposure to a variety of L3 languages including French, German, Japanese, and Spanish. However, no participant reported any active use on the L3 and rated their L3 language proficiency as no more than 4 on a scale from 0 (no knowledge) to 10 (native-like knowledge). They also reported that they had no experience of residing in a foreign country with a duration longer than three months in the past two years. Their L2 English was acquired mainly through classroom instruction in China, but they had daily exposure and active use of English over many years.

3.2.2 Chinese Control Group

The Chinese control group is comprised of fifteen functionally monolingual Chinese adults, who are not confident in producing L2 English utterances except for some greeting formula or simple words. They were recruited from private enterprises doing business in various fields, such as trade, finance, design, and real-estate by advertisement via city library bulletin boards. These functionally monolingual participants are incompetent in carrying out casual conversations in English.

Selection Criteria

Candidates for the Chinese control group would be:

- a) Self-rated English proficiency ≤ 3 (0-10 in scale, with 0 = no knowledge and 10 = native speaker level);
- b) University educated;
- c) Use Mandarin Chinese as the language for communication both at work and at home;
- d) Have not actively produced any English sentences over the past two years.

The reasons for recruiting functional monolingual language users rather than pure monolinguals as controls are two-fold. First, English is a compulsory subject from high school to college level in China since the early 1980s (Chang, 2006; Hu, 2005). It is thus unlikely to find young people born after 1990 without any instruction of English, particularly people with a higher education background. Since the educational level and age are taken as crucial matching factors in comparing linguistic performances (Schmid, 2004, p 248), a practical consideration was to recruit people from similar educational and age levels, but with a very low L2 English proficiency and hardly any active use in their daily or professional lives.

Second, this research examines language production rather than language comprehension: people who once had some L2 instruction but have no competence or opportunity to produce the language in real life can be viewed as functionally monolingual language users that may

provide a valid comparison with bilingual users who frequently use both their native L1 and their later acquired L2, and have high language proficiency in both. As some researchers have noted, many Chinese learners of English L2 in China are silent learners or dormant users (Feng, 2012; Kachru, 1992). They have no intention or competence to participate in real-life communication. In most cases, they learn English with some proficiency in comprehension but without fluency in speaking. Therefore, they are not considered to be bilingual language users.

Participants in this group had all finished college education and worked in Xiamen. They were aged between 23 and 30, five males and ten females. They rated their English proficiency as less than 3 on a scale from 0 (no knowledge) to 10 (native-like knowledge) and their output of L2 English over the past two years comprised less than 10 sentences. They also reported their chance of speaking English as none and their intention to use English as none. All of them had English L2 instruction in high school and university, but they had very poor performance when listening and speaking, so had no active use of English in their daily lives. Table 3.2 shows their detailed profile in personal information and language use behaviour.

Table 3.2 Demographic information and language use behaviour of the Chinese control group

Participant Code	Age	Gender	Age of beginning English Instruction	Self-rated English Proficiency	Last Time of Active English Use
C16	30	F	11	2	8 years
C17	26	M	12	1	2 years
C18	27	F	11	2	3 years
C19	30	M	12	2	6 years
C20	24	F	12	1	2 years
C21	23	M	11	1	1 year
C22	29	F	12	2	6 years
C23	28	F	11	2	2 years
C24	29	F	12	2	4 years
C25	23	F	11	3	1 year
C26	24	M	12	1	2 years

C27	23	F	12	3	1 year
C28	24	F	11	2	2 years
C29	24	F	11	2	2 years
C30	23	M	11	1	1 year

3.2.3 English Control Group

The present research investigates the possible L2 effect on L1 subject realisation. It is hypothesized that the frequent use of the other language might cause the bilingual speakers to exhibit cross-linguistic influence while producing online speeches. To investigate the potential L2 impact, patterns of subject realisation in English, the source language of influence will be presented by including an English control group.

The English control group included two native English monolingual speakers. One female aged 27 and one male, aged 26. They were currently working in China but had minimal knowledge of Chinese. Neither of them could speak Chinese except for some greeting words *Nihǎo* (hello), *Zàijiàn* (goodbye), *Xièxiè* (thank you) and neither had regular use of a foreign language other than English. They both performed the same tasks as the controls in the Chinese monolingual group but in English. The rate of overt versus null arguments will offer some clue to the typological difference between English and Chinese subject realization. The male speaker is from the UK but lived in South Africa from five to seven years of age. He claimed to know a little African language but hardly used it after he moved back to the UK. The other speaker is an American who came to China after college graduation and married a Chinese about one year before the time of the present field-work. She once learned some French at school but had not used it for many years. She speaks only English both at home and at work. Table 3.3 shows their detailed profile in personal information and language use behaviour.

Table 3.3 Demographic information and language use behaviour of the English control group

Participant Code	Age	Gender	Nationality	Language at Work	Language at Home	Duration of Residence in China
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EN1	27	F	US	English	English	2 years
EN2	26	M	UK	English	English	1 year

3.3 Interlocutors

The experiment design includes three interlocutors. One is the author who was present in all situations to ensure the smooth conduct of the procedure and to take notes that may help in data analysis afterward. She was also the one who controlled the recording device and the playing of cartoons for elicitation. As for the other two interlocutors: Interlocutor CH is a Chinese native speaker (female; 27) and Interlocutor EN an English native speaker (male; 28). Both are acquaintances of the author and were approached through personal contacts. They were unknown to the participants and were instructed to speak only their mother tongue to the participants. Before the actual experiment was carried out, a pilot test that included all the procedures was practised so that all interlocutors had the same understanding of the process. The inclusion of two other interlocutors was for generating different language use contexts as required for creating a monolingual mode (MM) or a bilingual mode (BM) language context (Grosjean, 2001) respectively as will be detailed in later sections.

3.4 Tasks and Materials

Natural speech data offers a vivid picture of how people use their languages intuitively. Research on language acquisition and cross-linguistic influence relies on spoken data to reflect “the actual state of an individual’s knowledge or proficiency,” and a reasonable way to do it is “by asking the participants to do what they usually do with language: talk” (Schmid, 2011, p 186). Cross-linguistic influence may be easily detected in online tasks where the processing effort is a significant constraint, and the inhibition of the non-targeted language requires much cognitive load (Green & Abutalebi, 2013). Narrative production was elicited for the examination of how subjects are realized in L1 Chinese, because in narratives there is considerable potential for the dropping and recovering of subjects with referent shifts, introduction, and mentioning, which allow for discourse and pragmatic differences to be

detected.

Story-telling has been widely applied as a method to prompt narratives both in L1 and L2 studies (Berman & Slobin 1994; Jarvis & Odlin, 2000; Schmid & Köpke, 2007), including stories based on picture books such as *Frog, Where Are You?* (Mayer, 1969) and films such as *Modern Time* and the *Pear Story* (Chafe, 1980). This made spoken production more comparable among participants because the referents and storylines are pre-determined by the story content. A common practice of film retelling elicitation is to play a 10-minute excerpt to the participants to elicit a 5-minute retelling. Some researchers even filmed their own videos for specific investigation purposes (Pavlenko, 2003). Compared to film retelling, shorter picture stories may challenge memory capacity to a lesser extent, but they do not offer as much detail as a short video. The current study then, attempts to elicit narratives through short cartoon films. These films are excerpts or clips from a series of Chinese children's fables with an animated video version, which can be viewed online (see Appendix B).

The four cartoon clips were carefully chosen in terms of comprehensibility and length or duration. Each cartoon video lasts about four minutes, with a traditionally well known plot, thus easy to follow and remember. The cartoons were played with the volume muted completely (the online version was dubbed but the sound could be switched off) and without subtitles. Participants were instructed to tell a story based on their comprehension after watching each cartoon. They were told that there were no rules to follow or no preferred way of telling the story. They were encouraged to make up a story in their own words by recalling as much information as possible. The interlocutor used only facial expressions and simple words like “yes”, “em” (in Chinese) to encourage the informant along in their delivery while narrating the story, and to avoid priming effects. A brief description of the four cartoons is offered just below.

Cartoon film 1 *the Ant Story*: One day there was an ant walking by the river. He looked tired and thirsty, so he went closer to the river to get a drink. But he accidentally fell into the river and was struggling. There was a bird in the tree who saw the ant was struggling and

couldn't get out of the water. The bird flew over the water and dropped a lily pad into the river. The ant climbed onto the lily pad and was saved from drowning. The next day, the ant was by the river again, and the bird was sleeping in the tree. There was a hunter who came to the river and was trying to shoot at the bird with an arrow. The ant saw what the hunter was trying to do and bit him on the toe. The hunter was in pain, and the arrow missed the bird. The bird woke up and flew away. The ant protected the bird, who had just saved him the day before. They both felt very happy and grateful.

Cartoon film 2 *the Bird Story*: One day there was a bird who was flying around a farm. He was very thirsty when he saw a well. He flew over to the well and saw that there was water in a pot next to it. The bird tried to reach into the well to get the water but was not able to reach the water. He was very frustrated. He tried to push the bowl over with his head but was not able to and got hurt. Later, he realized that if he put rocks into the bowl the water would rise, then he could reach the water to drink it. He, then put rocks in the bowl with his beak. After a while, the water was high enough so that he could drink it and he was very happy.

Cartoon film 3 *the Wolf Story*: Once upon a time there were three shepherd dogs and a big flock of sheep on a farm. The dogs guarded the sheep against the wolves living not far away. One day a wolf came and wanted to catch one sheep for dinner. The dogs soon noticed the danger and drove him away. But the wolf never gave up. The next day, the wolf put on a sheepskin and sneaked into the sheep flock. It managed to stay away from the dogs and waited for good timing to initiate the attack. When the wolf was about to attack, it got very excited with its tail wagging unconsciously. It immediately caught the attention of the dogs. They recognized that the wolf was in disguise and rushed toward it to protect the sheep. The wolf turned around and fled.

Cartoon film 4 *the Farmer Story*: One day a farmer was working hard in the field under the scorching sun. At noon, he was sitting in the shade of a tree. A rabbit was running in the nearby area and accidentally bumped into the tree and fainted. The farmer then caught the rabbit without any effort and was very excited. When he told the lucky experience to his wife,

he realized this might be an easy way of making a fortune. Since that day on, he stopped working hard in the field. Instead, he spent all day standing by the tree, expecting more rabbits to bump their head against it to be caught.

3.5 Procedures

The administration of the experiment was organised into two sessions for the experimental group, Session 1, in a monolingual language mode (MM) environment and Session 2 creating an environment favourable to a bilingual mode (BM). As for the control groups only Session 1 (i.e., the monolingual environment) was required, and was conducted in the same way and with the same materials as for the experimental group.

3.5.1 Control for Language Mode

When investigating cross-linguistic influence, one of the variables that must be controlled is the context of bilingual language use. According to Grosjean (2001), studies of CLI should consider the effect that language mode might exert when examining bilingual participants' performance. A growing number of studies have integrated this concept into their methodology (Brown & Gullberg, 2013; Kersten et al., 2010).

This issue relates to the second research question that this study aims to answer, i.e., whether language mode affects the way bilingual speakers realise L1 subject. The experiment tried to simulate two contrastive language modes to test the possible language mode impact.

During Session 1 only L1 was needed to understand what to do and how to perform the tasks, which was meant to promote a monolingual mode (MM). Thus, all instructions were in Chinese; the interlocutor spoke Chinese only to the participant; the materials used were in Chinese; the small talk and all necessary communications were also in Chinese. By contrast, Session 2 was meant to promote a bilingual mode (BM) environment, where both L1 and L2 were used to attune the participant to this production mode. To provide for such environment,

there were two interlocutors interacting with the participants: a native Chinese speaker and an English native speaker. Participants were asked to respond by shifting between two languages based on the instructions they heard. The Chinese interlocutor only used Chinese to give instructions and raise questions and the English interlocutor did both in English. Table 3.4 presents the administration of the experiment.

Table 3.4 Administration of the experiment

	Session 1	Session 2
Language Mode	MM	BM
Participant Group	Experimental Chinese Control English Control	Experimental
Cartoon Film Retelling	<i>the Ant Story</i> <i>the Bird Story</i>	<i>the Wolf Story</i> <i>the Farmer Story</i>
Duration	30 minutes per participant	40 minutes per participant

3.5.2 Cartoon Retelling in Monolingual Mode (MM)

All participants took part in Session 1 (MM), performing cartoon retelling in a monolingual mode environment. The venue was in the local University Library. A separate quiet room was booked in advance, to ensure adequate recording conditions. The fifteen participants in the Chinese control group and the fifteen participants in the experimental group spoke Chinese to Interlocutor CH, while the two participants in the English control group spoke English to the English native Interlocutor EN. The tasks were conducted for each participant individually. Participants had first a warm up chat (see Appendix C) with the interlocutor for 5 minutes and then were instructed to watch two cartoon films (*the Ant Story*, and then *the Bird Story*) and retell the stories consecutively.

Participants were asked to tell a story in their first language according to their interpretation of the cartoon. They were also told that there was no evaluation of their performance, or judgement on content, nor a preferred way of telling the story. They were encouraged to make

up a story in their own words by recalling as much of the information as possible. No participant reported any problem in understanding or memorizing the content. The retelling was recorded right after each cartoon was played to avoid heavy memory burden. Each retelling engaged the participants for approximately 2 minutes of speech production. There was also some time for the discussion of any doubts before the narration and some for small talk before the tasks, so the total duration for the session with each participant was approximately 30 minutes.

3.5.3 Creating a Bilingual Mode (BM) for Cartoon Retelling

Four weeks later, participants in the experimental group were called on again to join Session 2 (BM), undertaking cartoon retelling in a bilingual mode. The creation of a bilingual mode was initiated by the participation of both Chinese and English interlocutors, as well as by the listening and summarizing exercises presented before cartoon-retelling tasks. In this session, each participant first made a small talk (see Appendix D) in their L1 Chinese with Interlocutor CH and L2 English with Interlocutor EN, for about 5 minutes. The participant was then instructed to watch two cartoon films (*the Wolf Story* and *the Farmer Story*), which were in the same format and duration as the ones used in session 1 but with different plots and characters. Before each cartoon was played, an English passage (see Appendix E) with a length of approximately 300 words was audio-played to them. After listening to it they were asked to summarize the content in L2 English as much as possible. In this way, the participants were immersed in a bilingual language-use context, where their two languages were both highly activated. When they made the English summary and conversation, they talked to Interlocutor EN; when they made the story narration in Chinese, they spoke to Interlocutor CH. Consequently, a high activation level was created for both languages. This session took approximately 40 minutes for each participant.

3.6 Data

All elicited utterances from cartoon-retelling tasks were audio-recorded with the portable

digital voice-recorder Sony ICD-UX560F. The recorded narratives were then transcribed according to the conventions of the Child Language Data Exchange System, or CHILDES (MacWhinney, 2000). The CHILDES system has a series of language analysis programs (CLAN), including Mandarin Chinese. The author, who is a native speaker of Chinese, first transcribed the recording, and to assess rater reliability, the two interlocutors, who are native speakers of either Chinese or English, were invited to review the transcripts.

3.6.1 Coding

Utterances were transcribed verbatim. Fillers, repeated words, and false starts were excluded. All transcripts were divided into finite clauses. The segmentation for finite clauses was based on the grammatical description outlined in §2.2.4. Each adjectival verb and coverb phrase was deemed as one predication that required only one subject in a finite clause, such as in (54) and (55). Further, following Li and Thompson's (1989) categorization of serial verb construction, when the two or more verb phrases in the structure depict 'purpose', 'alternating' and 'circumstance' relations, they were counted as one predication, such as indicated by the translation of examples (56-58). However, if they only presented a 'consecutive' connection, they were counted as two predications as in coordinate construction, as shown in (59).

(54) 这只鸟不好看 (adjectival verb)

zhè-zhǐ niǎo bù hǎokàn

this bird not good-looking

"This bird is not good-looking."

(55) 鸟儿用嘴叼来了一片树叶 (coverb phrase)

niǎo-er yòng zuǐ diāo lái le yī piàn shù yè

bird use beak hold come a leaf

"The bird carried over a leaf with his beak."

(56) 猎人拿出弓箭要将小鸟射下来 (serial verb: ‘purpose’)

lièrén ná chū gōngjiàn yào jiāng xiǎo niǎo shè xiàlái

hunter take out bow and arrow want to shoot bird down

“The hunter took out the bow and arrow to shoot the bird.”

(57) 蚂蚁在水里拼命地呼叫不停地挣扎 (serial verb: ‘alternating’)

mǎyǐ zài shuǐ lǐ pīnmìng dì hūjiào bù tíng de zhēngzhá

ant in water yelling struggling

“The ant was desperately yelling and struggling in the water.”

(58) 蚂蚁浮在一片叶子上漂到了岸边 (serial verb: ‘circumstance’)

mǎyǐ fú zài yīpiàn yèzi shàng piào dào le àn biān

ant float at one leaf up drift to shore

“The ant drifted ashore on top of a leaf.”

(59) 蚂蚁不小心滑倒了, φ掉进了水里 (serial verb: ‘consecutive’)

mǎyǐ bù-xiǎoxīn huá dǎo-le φ diào jìnle shuǐ-lǐ

ant carelessly slip down (ant) fall into water

“The ant slipped down and fell into the water.”

Next, all finite clauses were further chunked into various clause-chains. Within each clause-chain, one topical referent takes the prominent position as the focus of the discourse. The subject of each finite clause was marked for the following features:

Subject form:

Nominal Subject (NP); Pronominal subject (P); Null subject (NS).

Position of the subject in a clause-chain:

First-mentioned Subject (FM); Subsequently-mentioned Subject (SM).

Based on the structure discussed in § 2.2.3, in (60), each line (a-g) presents a finite clause

and they together combine a clause-chain talking about *the crow*.

(60) a. 这时有一只乌鸦飞过 (NP-FM)

zhè shíhòu yīzhī wūyā fēi guò

this time one crow fly over

“Then a crow came.”

b. ϕ 落在了井边的树干上 (NS-SM)

ϕ luò zài le jǐng biān de shùgàn shàng

ϕ (crow) fly to well side

“The crow flew to the well.”

c. 乌鸦发现 (NP-SM)

wūyā fāxiàn

crow discover

“The crow realized ...”

d. 缸里面有水 (NP-FM)

gāng lǐmiàn yǒu shuǐ

jar inside has water

“There is some water in the jar.”

e. ϕ 可开心了 (NS-SM)

ϕ kě kāixīn-le

ϕ (crow) very happy-CRS

“The crow was very happy.”

f. 但是因为水太浅 (NP-SM)

dànshì yīnwéi shuǐ tài qiǎn

but because water too shallow

“But because the water was too shallow, ...”

g. 他老是喝不到水 (P-SM)

tā lǎoshì hē bù dào shuǐ

3sg (crow) always drink no water

“He was unable to drink the water.”

(Example from Chinese monolingual participant C28)

Within a clause-chain, the introduction and maintaining of a reference might be realised in various forms (Givón, 1983; 2018). When a new referent is introduced or an old referent is re-introduced into the discourse after a considerable gap, an overt nominal form is most commonly used, as *the crow* in (60a) and *the water* in (60d). However, once the referent has been established, an attenuated form can be used (Givón, 1983; 2018). In Chinese, either an overt pronominal form as in (60g) or a null form as in (60b) and (60e) can be used to encode the referent. It should be noted that an NP can also be used as in (60c) and (60f). In English, the situation is the same for first-mentioned referents, e.g. (60a), and the contrast with Chinese primarily concerns the choice for subsequently-mentioned referents, e.g. (61b-d). Under most circumstances, English does not allow null forms except for coordinate clauses, as illustrated in (66c).

- (61)a. *One day there was a bird who was flying around a farm* (NP-FM)
b. *He was very thirsty and* (P-SM)
c. *saw a well* (NS-SM)
d. *He flew over to the well* (P-SM)

3.6.2 Calculation

The current study looks at the possible English effect on subject realisation in Chinese. Thus, for the calculation of null-subject percentages produced by an individual participant, we excluded from the count the clause with first-mentioned subjects because both Chinese and English encode them with an overt form. Consequently, in (60-61), (60a) and (61a) are excluded. Further, since such variables such as humanness, person and plural forms also affect null-subject realisation in Chinese discourse (Jia & Baylay, 2002; Pu, 1997), the calculation includes only clauses with third person singular subjects. All cartoon films used in the elicitation tasks feature one or many animate characters. It is supposed that many occurrences

of how the third person singular referent is introduced and maintained in discourse would be found, whereas inanimate subject referents were quite few. Thus, (60c) and (60f) were excluded. Imperatives and interrogatives, as well as existential clauses, formulaic expressions and direct quotes were also excluded from the calculation. Examples are given in (62-67).

(62) *φ* 快跑呀 (imperative)

φ kuài pǎo ya

φ fast run ya-interjection

“Run away.”

(63) *φ* 怎样才能喝到罐子里的水? (interrogatives)

φ zěnyàng cáinéng hē-dào guànzǐ-lǐ-de shuǐ

φ how can drink jar water

“How can (somebody) drink the water in the bucket?”

(64) 天上飞来了一只乌鸦 (presentative)

tiānshàng fēi lái le yī-zhī wūyā

sky fly come one bird

“There comes a bird in the sky.”

(65) 树上有一只小鸟 (existential)

shù shàng yǒu yī-zhī xiǎo niǎo

tree up have one small bird

“There is a little bird on the tree.”

(66) 功夫不负有心人 (formulaic expression)

gōngfū bù fù yǒuxīn rén

efforts not disappoint hard-working people

“Hard work pays off.”

(67) 小鸟说, “没什么, 你救了我, 我应该回报你” (direct quotes)

xiǎo niǎo shuō “méishénme nǐ jiùle wǒ wǒ yīnggāi huìbào nǐ”

small bird say “never-mind you save me I should return you”

“The bird says ‘Never mind. You saved me. I’m just returning the favour.’”

Once such refinement of the data was completed, an individual participant’s percentage of null subjects could be worked out. This was done by dividing the number of clauses with null subjects over the total number of clauses with subsequently mentioned subjects. Individual performance was calculated for different tasks, i.e., the Ant Story task and the Bird Story task, as well as modes, i.e., the monolingual mode and the bilingual mode.

3.6.3 Analysis and Statistical Tools

It was first hypothesised that bilinguals who are advanced learners of L2 English would use fewer null forms in realising co-referential subjects in their L1 Chinese, compared to their Chinese monolingual peers. To test the hypothesis 1, between-group comparison will be made on null-subject values in the Ant Story and the Bird Story tasks performed by participants between the experimental group and Chinese control group. T-test will be conducted on group mean values and generate a result for each task separately. Also, qualitative analysis will be carried out to uncover the distributional properties of bilinguals’ subject realisation.

Further, it was also hypothesised that the language mode affects the use of null-subjects in these bilingual speakers’ L1 Chinese utterances, with fewer occurrences found in a bilingual mode (BM) than in a monolingual mode (MM). To test the hypothesis 2, within group comparisons will then be offered on the null-subject values between MM tasks and BM tasks performed by the same participants in the experimental group. T-test will also be conducted to judge the difference of significance.

The next chapter will present the results. If the results from the T-test show any significant difference, further analysis will be made to illustrate how these differences are related to syntactic and discourse conditions, with discussions presented accordingly in Chapter 5.

Chapter 4 Results

This chapter presents the results of narrative elicitation tasks conducted to answer the first and second research questions of the current study. The first section offers a framework for looking at subject realization by monolingual Chinese and monolingual English speakers so their behaviour may be compared and serve as a baseline to interpret the behaviour of bilinguals. The results of bilingual participants' performances on narrating the Ant Story and the Bird Story tasks follow in the second section. Performances between the experimental group and the Chinese control group will be compared relating to Research Question 1, i.e., whether bilinguals produced fewer null subjects than their monolingual counterparts in Chinese narratives. The third section deals completely with the results of the bilingual participants from the experimental group, looking at their performance in both the monolingual mode and the bilingual mode relating to Research Question 2, i.e., whether the language mode affects bilingual performances in using null subjects.

4.1 Monolinguals' Subject Realization

All monolingual participants watched the same cartoon films, i.e., the Ant Story and the Bird Story, and narrated stories in their native language. Performances by Chinese monolinguals who formed the Chinese control group will be firstly displayed, followed by those of the two English monolingual participants. Hence, a framework for the monolingual baseline will be offered by comparing Chinese and English subject realisations.

4.1.1 Chinese Subject Realisation

Table 4.1 shows individual performances by the Chinese control group, i.e., monolingual Chinese participants on subject realisation in the Ant Story. Fifteen participants (C16-C30) produced a total of 275 tokens of clauses with subsequently-mentioned subjects. The percentages of null subjects range from 55.6% to 88.2%, with a mean value of 72.4%. The maximum value was found in participant C30, who produced 17 target clauses and 15 of

them are realised with a null subject while only two have an overt subject. The minimum value was found in C28, who produced 18 target clauses, among which ten are with a null subject and the other eight are with an overt subject.

Table 4.1 Performance by the Chinese control group in subject realisation in the Ant Story task

Participant	Number of Clauses	Number of Overt Subjects	Number of Null Subjects	Percentage of Null Subjects
C28	18	8	10	55.6%
C17	21	9	12	57.1%
C16	15	6	9	60.0%
C22	14	5	9	64.3%
C26	35	12	23	65.7%
C25	13	4	9	69.2%
C19	14	4	10	71.4%
C18	22	6	16	72.7%
C23	17	4	13	76.5%
C27	13	3	10	76.9%
C24	22	5	17	77.3%
C29	16	3	13	81.3%
C20	22	4	18	81.8%
C21	16	2	14	87.5%
C30	17	2	15	88.2%
Total	275	77	198	72.4%

Table 4.2 shows individual performance by the Chinese control group on subject realisation in the Bird Story task. Fifteen monolingual Chinese speakers (C16-C30) produced a total of 376 tokens of clauses with a subsequently-mentioned subject. The individual percentage of null subjects ranges from 50.0% to 69.6%, with a mean value of 57.1%. The maximum value was yielded by participant C19, who produced 23 target clauses and 16 of them were realised with a null subject and only seven with an overt subject. The minimum value was yielded by C26, who produced 28 target clauses, among which 14 were with a null subject and the other 14 with an overt subject.

Table 4.2 Performance by the Chinese control group in subject realisation in the Bird Story task

Participant	Number of Clauses	Number of Overt Subjects	Number of Null Subjects	Percentage of Null Subjects
C26	28	14	14	50.0%
C21	25	12	13	52.0%
C17	28	13	15	53.5%
C27	20	9	11	55.0%
C20	27	12	15	55.6%
C29	27	12	15	55.6%
C22	25	11	14	56.0%
C25	23	10	13	56.5%
C24	35	15	20	57.1%
C28	14	6	8	57.1%
C23	26	11	15	57.7%
C16	18	7	11	61.1%
C18	29	11	18	62.1%
C30	28	10	18	64.3%
C19	23	7	16	69.6%
Total	376	160	216	57.1%

Two trends emerge when results from the two tasks are displayed together as in Table 4.3. First, in each story task, the percentages of null subjects differ among participants. The range is wider in the Ant Story than the Bird Story task. Second, for each individual speaker, the percentages of null subjects differ across tasks. Most participants produce lower rates in the Bird Story than in the Ant Story. The only participant with a slightly higher rate in the Bird Story is C28, who yielded the minimum rate in the Ant Story task.

Table 4.3 Percentage of null subjects used by the Chinese control group in the Ant Story and the Bird Story tasks

Participants	Ant Story	Bird Story
C16	60.0%	61.1%
C17	57.1%	53.5%
C18	72.7%	62.1%
C19	71.4%	69.6%

C20	81.8%	55.6%
C21	87.5%	52.0%
C22	64.3%	56.0%
C23	76.5%	57.7%
C24	77.3%	57.1%
C25	69.2%	56.5%
C26	65.7%	50.0%
C27	76.9%	55.0%
C28	55.6%	57.1%
C29	81.3%	55.6%
C30	88.2%	64.3%
Mean	72.4%	57.1%

It seems that Chinese subject realisation does not present a uniform pattern. Grammatically speaking, co-referential subjects can take either an overt form, i.e., nominal or pronominal subject, or a null form, i.e., zero anaphora. It is the speaker's pragmatic choice in realising a co-referential subject in context. Monolingual Chinese speakers exhibit a preference for null subjects over nominal or pronominal subjects.

4.1.2 English Subject Realisation

Table 4.4 shows the two English speakers' performances on subject realisation in the Ant Story task. EN1 produced 20 clauses with subsequently-mentioned subjects, two of which were realised with a null form. EN2 produced 14 target clauses, three of which were null subjects. The percentage of null subjects is 10.0% for EN1 and 21.4% for EN2, with a mean value of 15.7%.

Table 4.4 Performance by the English control group in subject realisation in the Ant Story task

Participant	Number of Clauses	Number of Overt Subjects	Number of Null Subjects	Percentage of Null Subjects
EN1	20	18	2	10.0%
EN2	14	11	3	21.4%

Table 4.5 shows the two English speakers' performances on subject realisation in the Bird Story task. EN1 and EN2 each produced 22 target clauses. EN1 realised all co-referential subjects with overt forms while EN2 used 18 overt against four null forms. The percentage of null subjects is 0% for EN1 and 18.2% for EN2, with a mean value of 9.1%.

Table 4.5 Performance by the English control group in subject realisation in the Bird Story task

Participant	Number of Clauses	Number of Overt Subjects	Number of Null Subjects	Percentage of Null Subjects
EN1	20	20	0	0%
EN2	22	18	4	18.2%

In both tasks, null subjects produced by English monolingual participants were all in coordinate clauses, such as illustrated in (68) and (69). This is consistent with the grammatical literature that English, as a non-null subject language, generally disallows the use of null subjects in finite clauses except for coordination constructions.

(68) *He lifts him out of the water and ϕ puts him on the ground.* (EN1-Ant)

(69) *He tried to reach into the well to get the water but ϕ was not able to reach the water.*
(EN2-Bird)

The choice over null or overt subjects in coordinate clauses is pragmatic rather than grammatical, thus showing individual and contextual difference, as indicated in Table 4.6.

Table 4.6 Percentage of null subjects used by the English control group in the Ant Story and the Bird Story tasks

Participant	Ant Story	Bird Story
EN1	10.0%	0%
EN2	21.4%	18.2%
Mean	15.7%	9.1%

4.1.3 Chinese versus English Subject Realisation

So far, Chinese and English monolinguals' performances in subject realisation have been presented. It seems that for all monolingual participants, subject realisation differs among individuals and between tasks. In this subsection, comparisons of Chinese and English monolingual behaviours on subject realisation will be presented. For both Chinese and English monolinguals' performances, the Ant Story task associates with a higher null-subject rate than the Bird Story task, as indicated in Figure 4.1. In the Ant Story task, the narration of the story shifts among events to three major topical referents, and the length of clause-chains are not too long. The Bird Story however, talks about one major topical referent, generating longer clause-chains. When the clause chain is long, the distance between the antecedent and the referent tends to be far. Thus, overt forms might be used now and then to keep track of the reference.

Figure 4.1 Mean value of null subjects by monolingual Chinese and English participants in the Ant Story and the Bird Story tasks



With respect to Chinese and English difference in the percentage of null subjects, monolinguals' performances reflect their respective language character: a null-subject language versus non-null subject. As indicated in Table 4.7, the average rate of null-subjects in the Chinese control group is 63.6% against that of 11.5% by English monolinguals. English show strong preference towards overt forms whereas Chinese favours null subjects.

Table 4.7 Null-subject rates of Chinese monolinguals versus English monolinguals in the Ant Story and the Bird Story tasks

	Chinese monolinguals	English monolinguals
Number of clause tokens	651	78

Number of null-subjects	414	9
Null-subject rate	63.6%	11.5%

Differences between Chinese and English in subject realisation appear to be more prominent in their use of the pronominal, when overt subjects are further divided into nominal subjects and pronominal subjects. As indicated in Table 4.8, nominal subjects present a similar ratio in Chinese and English, with 11.1% and 6.4% respectively. Chinese monolinguals show preference towards null subjects whereas English monolinguals use far more pronominal subjects.

Table 4.8 Types of overt subject realisation used by Chinese monolinguals versus English monolinguals in the Ant Story and the Bird Story tasks

Participant	Nominal Subjects	Pronominal Subjects	Total Overt Subjects
Chinese monolinguals	11.1%	25.3%	36.4%
English monolinguals	6.4%	82.1%	88.5%

When a topical referent is first introduced into the context as a subject, it is a grammatical issue that both Chinese and English must encode it with a nominal phrase. Once the topical subject has been established, it is unnecessary to repeat it with a full NP and an attenuated subject form is preferred. Chinese and English converge on this grammatical requirement. However, they diverge on the choice of subject forms in maintaining the topical referent. For English, the grammatical choice can only take overt forms except for coordination constructions. The dominant overt form is a lexical pronoun. In contrast, Chinese allows either an overt form or a null form in realising co-referential subjects. The dominant form seems to be null rather than pronominal.

To summarize, monolingual performances suggest that Chinese subject realisation is biased towards null forms in contrast to the strong reliance on overt forms in English subject realisation.

4.2 Bilinguals' Subject Realisation in the Monolingual Mode (MM)

This section presents the performance of bilinguals in subject realisation on narrating the Ant Story and the Bird Story tasks, both of which simulated a monolingual language use context, i.e., monolingual mode (MM) by Grosjean’s (1998) definition. Illustrations will be made by comparing bilingual performances with the baseline offered by Chinese monolinguals obtained in the previous section.

4.2.1 The Ant Story Task

Table 4.9 shows individual performance by the experiment group in subject realisation in the Ant Story. Fifteen participants in the experimental group (E01-E15) who are bilingual Chinese-English speakers, produced a total of 335 tokens of clauses with a subsequently-mentioned subject. The individual percentage of null subjects ranges from 24.0% to 52.9%, with a mean value of 43.6%. The maximum percentage was performed by participant E08. Among the 17 target clauses that E08 produced, nine are with a null form and eight are with an overt form in the subject position. The minimum percentage is from participant E15, who produced 25 target clauses, among which 6 are with a null-subject and the other 19 are all with an overt subject.

Table 4.9 Performance by the experimental group in subject realisation in the Ant Story task

Participant	Number of Clauses	Number of Overt Subjects	Number of Null Subjects	Percentage of Null Subjects
E15	25	19	6	24.0%
E02	23	16	7	30.4%
E04	27	17	10	37.0%
E11	26	16	10	38.5%
E14	13	8	5	38.5%
E03	23	14	9	39.1%
E07	17	9	8	47.1%
E12	19	10	9	47.4%
E01	21	11	10	47.6%
E05	29	15	14	48.3%

E10	33	17	16	48.5%
E06	18	9	9	50.0%
E13	25	12	13	52.0%
E09	19	9	10	52.6%
E08	17	8	9	52.9%
Total	335	190	145	43.6%

Figure 4.2a depicts the overall use of null subjects across the experimental and Chinese control groups in the Ant Story task. Dots on the blue curve represent the percentage of null subjects by each bilingual participant whereas the those on the orange curve are for monolingual performance. The two curves show that the internal variation of both groups is similar. It is observed that in retelling the Ant Story, bilingual participants in the experimental group show a general preference for overt subjects in positions where either a null form or an overt form is acceptable in realising the subject. The majority are with a value below 50%. Only four bilingual participants produced a value just over 50% but not exceeding 53%. By contrast, monolingual participants in the Chinese control group have a strong preference for null subjects with the minimum value still above 50%. Group difference is also observed by the fact that the maximum value from the experimental group (52.9%) is lower than the minimum value from the Chinese control group (55.6%). Table 4.10 shows group comparison on the mean value of null subjects. The experimental group rendered a mean value of 43.6%, which is 28.8% lower than that of the Chinese control group (72.4%).

Figure 4.2a Percentage of null subjects used by Chinese-English bilinguals and Chinese monolinguals in the Ant Story task

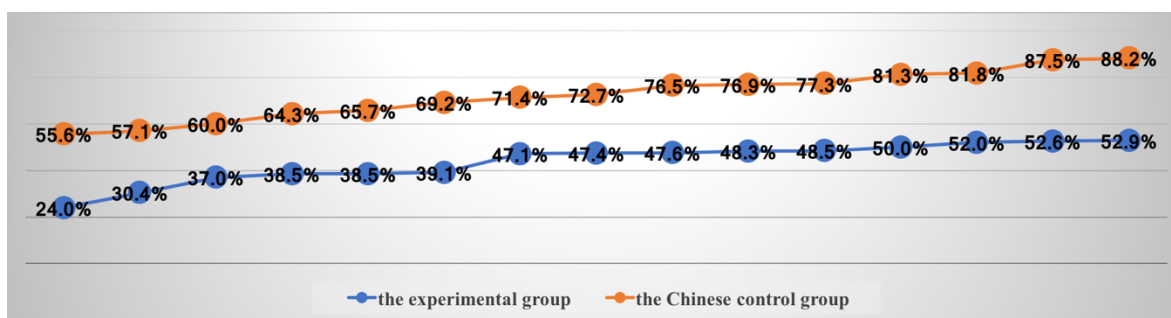
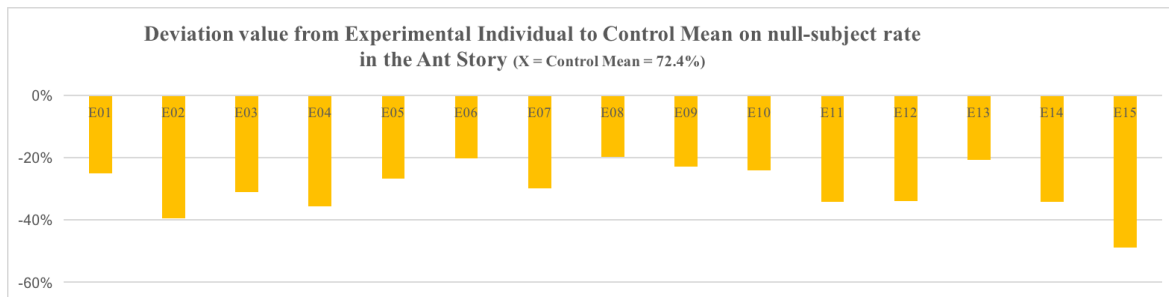


Table 4.10 Mean value of null subjects used by Chinese-English bilinguals versus Chinese monolinguals in the Ant Story task

Chinese-English bilinguals	Chinese monolinguals
43.6%	72.4%

Figure 4.2b reflects the deviation value of the null subjects from each bilingual participant in the experimental group in contrast to the mean value of monolingual Chinese participants in the Chinese control group. The X-axis represents the mean value of the control group, i.e., 72.4%. The negative percentage value indicates how much lower the percentage of null subjects produced by each bilingual is to the mean value of the monolingual Chinese participants. Bilinguals showed an average of 28.8% lower rate of subject to the Chinese monolingual mean value. The highest deviation is 48.4% and the lowest value is 19.5%.

Figure 4.2b Deviation value of null subjects used by Chinese-English bilinguals from the mean value of Chinese monolinguals in the Ant Story task



Statistical comparison of null subject percentages between the experimental and the Chinese control groups in the Ant Story task can be seen in Table 4.11. T-test results show that the percentages of null subjects produced by bilingual participants in the experimental group were significantly different from those produced by monolingual participants in the control group ($t(27) = -8.635, p < 0.0001$). Inspections of the two group means indicate that the average percentage of null subjects produced by bilingual participants in the experimental group (0.44) is significantly lower than that of the monolingual participants in the control group (0.72). The difference between the means is 0.28. The two groups have similar Standard Deviation.

Table 4.11 T-test result of the comparison between the percentage of null subjects of Chinese-English bilinguals and Chinese monolinguals in the Ant Story task

Percentage of Null Subjects	Chinese-English Bilinguals (n = 15)		Chinese Monolinguals (n = 15)		<i>MD</i>	<i>t</i> (27)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
	0.44	0.08	0.72	0.10	0.28	-8.635*

* $P < 0.0001$

4.2.2 The Bird Story Task

Table 4.12 shows individual performances by the experimental group in subject realisation in the Bird Story. Fifteen participants in the experimental group (E01-E15) produced a total of 392 token of clauses with a subsequently-mentioned subject. The percentages of null subjects range from 14.3% to 44.4%, with a mean value of 35.3%. The maximum value was performed by participant E02. Among the 36 target clauses that E02 produced, 16 are with a null form in the subject position, and the other 20 are in overt forms. The minimum value is from E05, who produced 21 target clauses, among which only three are with a null subject and the other 19 are all with an overt subject.

Table 4.12 Performance by the experimental group in subject realisation in the Bird Story task

Participant	Number of Clauses	Number of Overt Subjects	Number of Null Subjects	Percentage of Null Subjects
E05	21	18	3	14.3%
E07	19	14	5	26.3%
E12	17	12	5	29.4%
E11	37	26	11	29.7%
E06	23	16	7	30.4%
E14	29	20	9	31.0%
E15	28	18	10	35.7%
E09	28	17	11	39.3%

E04	30	18	12	40.0%
E03	22	13	9	40.9%
E08	22	13	9	40.9%
E10	24	14	10	41.7%
E01	21	12	9	42.9%
E13	35	20	15	42.9%
E02	36	20	16	44.4%
Total	392	251	141	35.3%

Figure 4.3a depicts the overall performance on null subjects across the experimental and the Chinese control groups in the Bird Story task. Dots on the blue curve represent the percentage of null subjects by each bilingual participant whereas the those on the orange curve are for monolingual performances. Despite the significant differences the two curves show, again, that the internal variation of both groups is similar. Notably, in retelling the Bird Story, bilingual participants in the experimental group show a strong preference for overt subjects in positions where either a null form or an overt form is acceptable in realising the subject. Not a single participant in this group generated a value exceeding 50%. By contrast, monolingual Chinese participants in the control group have an overall preference for null subjects as no value in this group is less than 50%. Between-groups difference is also observed by the fact that the maximum value from the experimental group with 44.4% is again lower than the minimum value from the control group (50.0%). Table 4.13 shows group comparison on the mean value of null subjects. The experimental group rendered a mean value of 35.3%, which is 21.8% lower than that of the control group (57.1%).

Figure 4.3a Percentage of null subjects used by Chinese-English bilinguals and Chinese monolinguals in the Bird Story task

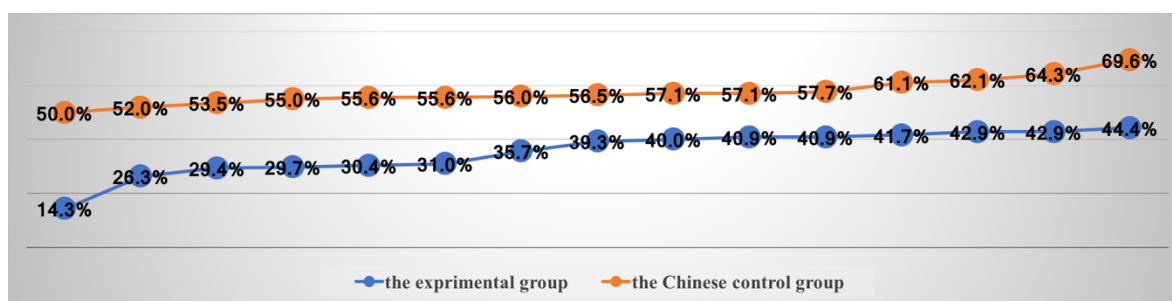
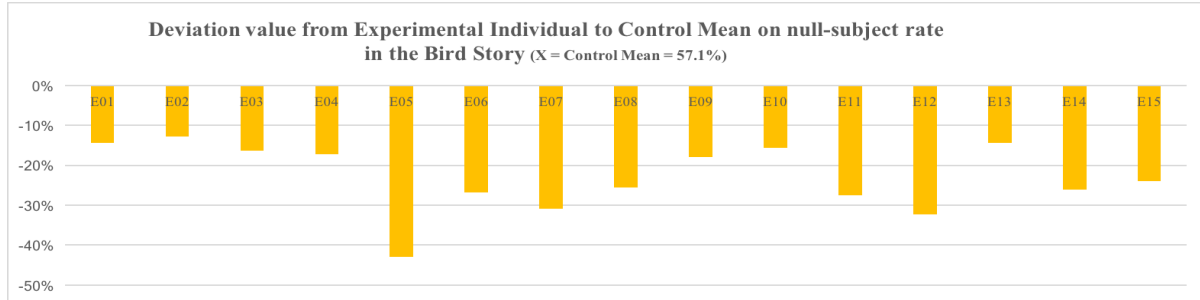


Table 4.13 Mean value of null subjects used by Chinese-English bilinguals versus Chinese monolinguals in the Bird Story task

Chinese-English bilinguals	Chinese monolinguals
35.3%	57.1%

Figure 4.3b reflects the deviation value of null subjects from each bilingual participant in the experimental group in contrast to the mean value of the Chinese control group. The X-axis represents the mean value of the control group, i.e., 57.1%. The negative percentage value indicates how much lower the percentage of null subjects produced by each bilingual is to the mean value of the monolingual participants. Bilinguals showed an average of 21.8% lower rate of subject to the monolingual mean value. The highest deviation is 42.8% and the lowest value is 12.7%.

Figure 4.3b Deviation value of null subjects used by Chinese-English bilinguals from the mean value of Chinese monolinguals in the Bird Story task



Statistical comparison of null subject percentages between the experimental and the Chinese control groups in the Bird Story task can be seen in Table 4.14. T-test results show that null subject percentages produced by bilingual participants in the experimental group were significantly different from those produced by monolingual participants in the control group ($t(24) = -8.816, p < 0.0001$). Inspections of the two group means indicate that the average percentage of null subjects produced by bilingual participants in the experimental group (0.35) is significantly lower than the null-subject rate produced by monolingual participants in the control group (0.57). The difference between the means is 0.22. The two groups have similar

Standard Deviation.

Table 4.14 T-test result of the comparison between the percentage of null subjects of Chinese-English bilinguals and Chinese monolinguals in the Bird Story task

Percentage of Null Subjects	Chinese-English Bilinguals (n = 15)		Chinese Monolinguals (n = 15)		<i>MD</i>	<i>t</i> (24)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
	0.35	0.08	0.57	0.05	0.22	-8.816*

**P* < 0.0001

4.2.3 Overall Results from the Ant Story and the Bird Story Tasks

In this subsection, results from the Ant Story task and the Bird Story task are collated to provide an overview of the performance of bilingual participants on subject realisation in the monolingual mode (MM), as shown in Table 4.15. In the monolingual mode (MM), bilingual participants in the experimental group produced a total of 727 token of clauses with a subsequently-mentioned subject. Out of these, 286 clauses (39.3%) had a null subject. The individual percentage of null subjects ranges from 30.2% to 46.7%, with a mean vaule of 39.4%.

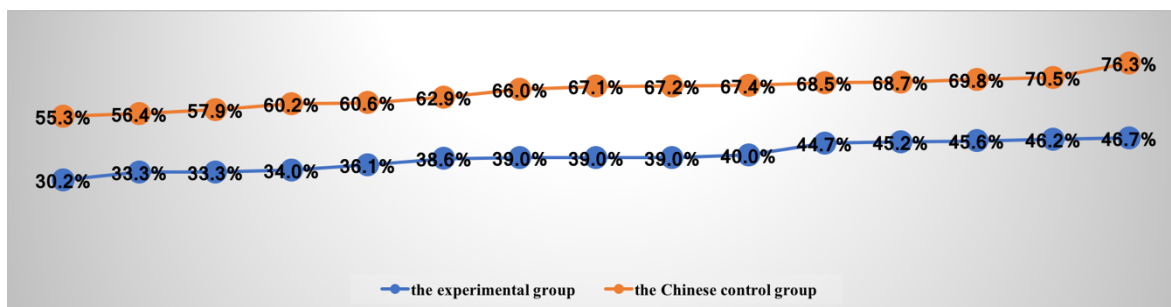
Table 4.15 Performance by the experimental group in subject realisation in the monolingual mode (MM)

Participant	Number of Clauses	Number of Overt Subjects	Number of Null Subjects	Percentage of Null Subjects
E15	53	37	16	30.2%
E11	63	42	21	33.3%
E14	42	28	14	33.3%
E05	50	33	17	34.0%
E07	36	23	13	36.1%
E04	57	35	22	38.6%
E02	59	36	23	39.0%
E06	41	25	16	39.0%

E12	36	22	14	39.0%
E03	45	27	18	40.0%
E09	47	26	21	44.7%
E01	42	23	19	45.2%
E10	57	31	26	45.6%
E08	39	21	18	46.2%
E13	60	32	28	46.7%
Total	727	441	286	39.4%

The bilinguals' performance as a group is then compared to that of Chinese monolinguals as shown in Figure 4.4 as it would be legitimate to ask whether indeed the two groups may be compared given the discrepancies shown in subject realisation. As it turns out, the two groups consistently display a remarkably similar degree of internal variation, which is a good indication, I believe, of their comparability.

Figure 4.4 Percentage of null subjects used by Chinese-English bilinguals and Chinese monolinguals in the monolingual mode (MM)



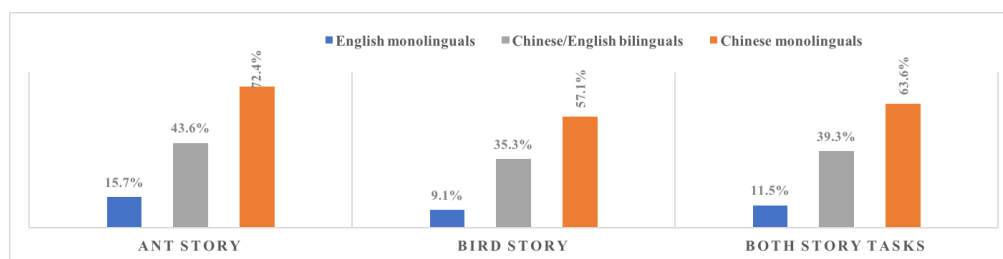
As Table 4.16 shows Chinese-English bilinguals' mean value of null-subject rates takes a middle position as against the behaviour of monolinguals. Bilinguals produced a significantly lower rate than Chinese monolinguals but substantially higher than English monolinguals.

Table 4.16 Mean value of null subjects used by Chinese monolinguals, Chinese-English bilinguals, and English monolinguals in the monolingual mode (MM)

Chinese monolinguals	Chinese-English bilinguals	English monolinguals
63.6%	39.3%	11.5%

This trend is observable when a performance is studied in each task and pooled, as illustrated in Figure 4.5. It is important at this point to note that the bilinguals' subject realisation pattern swings a little closer to the English patterns of subject realisation and away from the monolingual Chinese patterns.

Figure 4.5 Comparison of the percentage of null subjects used by English monolinguals, Chinese-English bilinguals, and Chinese monolinguals in the Ant Story and Bird Story tasks



Also, it is worthwhile at this point, to identify which forms the participants use to realise co-referential subjects in their narrations and whether these forms exhibit different patterns, particularly in comparison with the bilingual experimental and the Chinese control groups. Table 4.17 shows the different forms produced by all participants to realise co-referential subjects. It turns out that the major contrast between the experimental group and the Chinese control group lies in the use of pronominal forms whereas the difference in the use of nominal subjects is not so dramatic.

Table 4.17 Forms of subject realisation used by Chinese-English bilinguals, Chinese monolinguals, and English monolinguals in the monolingual mode (MM)

	Experimental	Chinese Control	English Control
Bare nominal subject	99 (13.6%)	62 (9.5%)	2 (2.6%)
Classifier nominal phrase	5 (0.7%)	6 (0.9%)	/
Modified nominal phrase	5 (0.7%)	4 (0.6%)	0 (0%)
Pronominal subject	332 (45.7%)	165 (25.3%)	67 (85.9%)
Null subject	286 (39.3%)	414 (63.6%)	9 (11.5%)
Total number of clauses	727	651	78

As a way of concluding this section, results show that bilingual participants in the experimental group who are advanced learners and regular users of English L2 yielded a significantly lower percentage of null subjects in L1 Chinese than their monolingual Chinese peers in the Chinese control group. That is, bilinguals produce more overt subjects than monolinguals, which is closer to the English pattern of subject realisation. The results seem to support Hypothesis 1 that advanced learners of English L2 produce fewer null forms when realising co-referential subjects in L1 Chinese than their monolingual counterparts. In the next section, we present results from the experimental group only, comparing their behaviour in different modes. Such comparison is to test whether the bilingual participants would behave differently in terms of subject realisation when they are producing narratives in a bilingual mode (BM) as against their MM behaviour which we just presented in this section.

4.3 Bilinguals' Subject Realisation in the Bilingual Mode (BM)

Bilingual participants in the experimental group, as detailed in the previous section produced an average of 39.3% null subjects in performing the Ant Story and Bird Story tasks in a fully monolingual environment. In that session, all interaction with each participant, including the instructions to narrate stories in Chinese, were delivered exclusively in Chinese to generate a monolingual language environment where they only need their L1 to interact with the interviewers and perform the tasks. To attest Grosjean's (1998) proposal that language mode, i.e., language use in context, has some impact on language production, a separate follow-up session was conducted two weeks later with the same group of bilingual participants. They were instructed to narrate two different cartoon films in Chinese, but this time the experimenter attempted to generate a bilingual context, in which both L1-Chinese and L2-English were activated. In this bilingual mode (BM), an English assistant and a Chinese assistant first chatted with each participant for about five minutes. The participant was also asked to do a retelling task in English before narrating the two cartoon films in Chinese. This procedure was designed to make sure the participant's L2-English was activated when they switched to produce the cartoon stories in Chinese.

4.3.1 Performance in the Bilingual Mode

Table 4.18 shows the collated performance in subject realisation by the fifteen bilingual participants in the experimental group (E01-E15) while narrating two stories in the bilingual mode. These bilingual participants yielded a total of 578 tokens of clauses with a subsequently-mentioned subject. Out of these, 170 clauses (29.4%) are with a null-subject. The percentage of null subjects they produced in the bilingual mode range from 15.8% to 40.9%, with a mean value of 29.6%.

Table 4.18 Performance by the experimental group in subject realisation in the bilingual mode (BM)

Participant	Number of Clauses	Number of Overt Subjects	Number of Null Subjects	Percentage of Null Subjects
E15	38	32	6	15.8%
E01	33	25	8	24.2%
E10	48	36	12	25.0%
E06	34	25	9	26.5%
E09	34	25	9	26.5%
E11	26	19	7	26.9%
E04	44	32	12	27.3%
E14	42	30	12	28.6%
E12	41	29	12	29.3%
E02	37	26	11	29.7%
E13	52	36	16	30.8%
E03	72	46	26	36.1%
E05	27	17	10	37.0%
E07	28	17	11	39.3%
E08	22	13	9	40.9%
Total	578	408	170	29.6%

4.3.2 Comparison of the Bilingual Mode versus the Monolingual Mode

The individual percentage of null subjects in the bilingual mode was then compared to that in the monolingual mode, i.e., the one produced in performing the two tasks in the previous

section. Table 4.19 shows the null-subject rates each bilingual participant produced in both modes as well as the deviation value across the modes.

Table 4.19 Percentage of null subjects used by Chinese-English bilinguals in the bilingual mode (BM) versus the monolingual mode (MM)

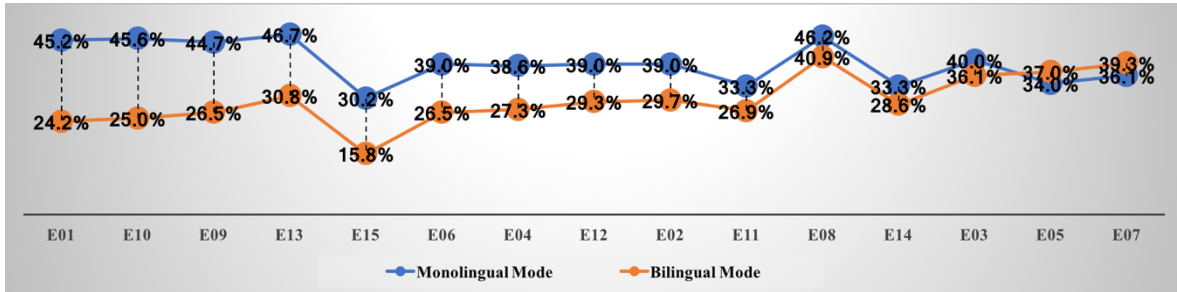
Participants	Value in MM	Value in BM	Deviation Value (BM-MM)
E01	45.20%	24.20%	-21.00%
E10	45.60%	25.00%	-20.60%
E09	44.70%	26.50%	-18.20%
E13	46.70%	30.80%	-15.90%
E15	30.20%	15.80%	-14.40%
E06	39.00%	26.50%	-12.50%
E04	38.60%	27.30%	-11.30%
E12	39.00%	29.30%	-9.70%
E02	39.00%	29.70%	-9.30%
E11	33.30%	26.90%	-6.40%
E08	46.20%	40.90%	-5.30%
E14	33.30%	28.60%	-4.70%
E03	40.00%	36.10%	-3.90%
E05	34.00%	37.00%	3.00%
E07	36.10%	39.30%	3.20%
Mean	39.4%	29.6%	-9.8%

The deviation value across modes ranges from -21.0% to 3.2% with a mean -9.8%. Every participant, bar two, produced fewer null subjects in the bilingual mode (BM) than in the monolingual mode (MM), which takes the pattern of subject realisation even closer to the English pattern of obligatory subject. Thus, both MM and BM mean values are very much conforming to the general bilingual pattern of moving away from the Chinese monolingual pattern and towards the English pattern. The two participants (E05 and E07), who had a slightly higher value of null subjects in the bilingual mode than the monolingual mode, are with a deviation value of 3.0% and 3.2 respectively.

Figure 4.6a shows the paired percentages of null subjects that participants in the experimental

group realised in both monolingual and bilingual modes. Dots on the blue curve represent the percentage of null subjects in the bilingual mode whereas dots on the orange curve are for the monolingual mode.

Figure 4.6a Within-group comparison between the percentages of null-subjects of BM and MM used by the Chinese-English bilinguals



To demonstrate the mode effect in bilinguals' performances on null subject realisation, the deviation values that the bilingual participant yielded across two modes are presented in Figure 4.6b. The X-axis represents the percentage of null subjects each participant performed in the monolingual mode (MM), where the green columns reflect the deviation value of null subjects from the bilingual mode (BM) to that of MM. The positive percentage value reflects a higher rate in BM than in MM; the negative percentage value indicates that the rate of null subjects in BM is lower than MM. Most participants had a lower rate in BM than that of MM, with a mean deviation value of -9.8%, the highest deviation value is -21.0%. Two participants, E05 and E07, yielded small positive deviation values, which means that the percentage of null subjects in BM is slightly higher than that of MM.

Figure 4.6b Deviation value of null subjects in BM from MM in the experimental group

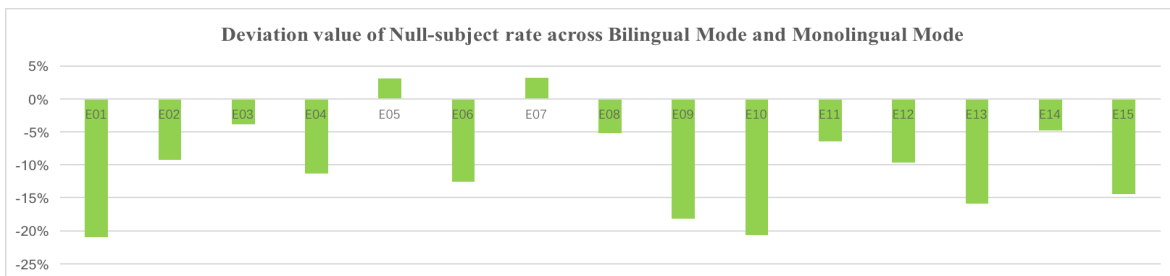


Table 4.20 shows that the difference in null-subject rates in bilingual participants' performance in bilingual mode was significantly different from that produced by the same group of bilinguals in the monolingual mode ($t(14) = -5.601, p < 0.0001$). Inspections of the two means indicate that the average percentage of null subjects produced in the bilingual mode (0.29) is significantly lower than that of the monolingual mode (0.39). The difference between the means is 0.10.

Table 4.20 T-test on the comparison of the percentage of null subjects between BM and MM by the experimental group

Percentage of Null Subjects	Bilingual Mode		Monolingual Mode		<i>MD</i>	<i>t</i> (14)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
	0.29	0.07	0.39	0.05	0.10	-5.601*

* $P < 0.0001$

From the results comparing a bilingual's performance across the bilingual and the monolingual modes, we attempt to answer Research Question 2 by concluding that language mode affects the rate of null subjects in the L1 Chinese of bilinguals who are advanced learners of English L2. Further, Hypothesis 2 seems to be confirmed as fewer occurrences of null subjects were found in the bilingual mode when both L1 and L2 languages are activated than in the monolingual mode when L1 is predominantly activated. Table 4.21 indicates the rates of overt subjects used by these participants. It seems that bilinguals used more pronominal subjects in the bilingual mode than in the monolingual mode.

Table 4.21 Types of overt subject realisation by Chinese-English bilinguals (MM vs. BM)

Participant	Nominal Subjects	Pronominal Subjects	Total Overt Subjects
Monolingual Mode	15.0%	45.6%	60.6%
Bilingual Mode	17.0%	53.4%	70.4%

To conclude this section, it is worth pointing out that the results are consistent with Grosjean's proposal that bilinguals behave differently in different language use environments.

4.4 Summary

So far it seems that the initial hypotheses are both supported. In response to Research Question 1, results confirmed that bilingual participants had a lower rate of null-subjects in realising co-referential subjects in L1 Chinese, compared to their Chinese monolingual peers. Further, regarding Research Question 2, results also confirmed that null-subject rates were even lower when bilinguals performed tasks in a bilingual mode than in a monolingual mode.

The results obtained from this study may be placed on the following null-subject realisation continuum, where Chinese-English bilingual participants produced fewer null-subjects in their Chinese narratives than monolingual peers, gradually converging towards English patterns of realising subjects.

NULL SUBJ REALIZATION CONTINUUM

11.5% English Monolinguals

< 29.4% Chinese-English bilinguals in the bilingual mode

< 39.3% Chinese-English bilinguals in the monolingual mode

< 63.4% Chinese monolinguals

The next chapter analyzes various kinds of syntactic and discourse contexts in which bilinguals use the non-null realisation in Chinese where the monolinguals may prefer to use null realisation. This may help throw light on the more qualitative issues of where exactly the influence from the L2 happens, hence tackling Research Questions 3 and 4.

Chapter 5 Analysis and Discussion

In the previous chapter the quantitative results are seen to offer a remarkable degree of support for the first and second hypotheses initially advanced in this thesis, i.e., bilinguals have a lower rate of null-subjects in their own L1 than monolingual peers performing the same tasks. The between-group difference was found to be statistically significant. Similarly, language mode also appears to impinge on the rate of null-subjects in so far as the same bilingual experimental group uses, by and large, fewer null subjects when they perform tasks in the bilingual mode than when they perform similar tasks in the monolingual mode. Again, the within-group difference was found to be statistically significant.

Assuming the bilinguals' behaviour is not haphazard, it would be useful to know in which syntactic and discourse-pragmatic environments their behaviour differs from that of the monolingual. Likewise, assuming the bilinguals' different performances between the monolingual mode and the bilingual mode is not haphazard, it is critical to know in what sort of syntactic and discourse-pragmatic environments, the difference may occur and, indeed, what may trigger these behavioural preferences in the bilinguals. To pinpoint the different preferences between groups as well as between language modes in bilinguals, a focused analysis might allow for some inferences to be drawn.

In fact, there is a clear *prima facie* task effect, which is that the Ant Story task, appears to elicit, across participants, a greater number of referent shifts in the story. This, in turn, generates a greater number of clause chains than the Bird Story task. At the same time the length of the clause chains in the Ant Story is shorter than the Bird Story's which is reflected, consequently, in more opportunities for null subjects in the Ant Story. These consistent differences in the participants' production of each story in the respective tasks are possibly due to the fact that the Ant Story has three actors on stage while the Bird Story only has one.

As explained in Chapter 2 and 3, human discourse is multi-propositional and utterances can be divided into clause-chains (Givón, 1983; 2018). A clause-chain is made up of a string of

clauses that share the same referent or topic. When the topical referent is first introduced into a clause-chain, a more explicit form is used to encode the referent to the subject, thus first-mentioned subjects are usually NP forms with a noun head. Once the referent has been established, less explicit forms can be used in the discourse to code the referent, so subsequently-mentioned subjects can take pronominal forms or (in many languages) null forms. In Chinese, the first-mentioned subject in a clause chain takes a NP form whereas the subsequently-mentioned subjects can take three forms: i.e., a pronominal, zero anaphora, or NP (Pu, 2019). So, in our analysis below, the choice of overt versus null subjects deals with subject realisation in subsequent clauses, excluding first-mentioned subjects. The stories produced by participants in the present research, following the proposed elicitation tasks, reflect Chinese subject realisation as just explained: all first-mentioned subjects are in NP forms with noun heads while individual choice for subsequently-mentioned subjects varies. The analysis will hopefully throw some light on where the subject forms in bilingual performance are consistently different from those of monolinguals and why bilinguals behave differently when operating in monolingual contexts versus bilingual contexts.

In the remainder of this chapter, the first section presents a general comparison of subject distributional patterns between the experimental and Chinese control groups. The second section looks at the syntactic contexts of subject realisation, and the third section examines the discourse-pragmatic contexts. The final section looks at within-group differences when bilingual participants produce their stories in the monolingual mode and then in the bilingual mode (Grosjean, 1998). The discussion will be developed within each specific section with overall issues brought together in the final part of the chapter.

5.1 Overall Distributional Patterns of Subject Realisation

This section portrays the distributional pattern of subject forms in the oral production of bilinguals as compared to that of monolinguals resulting from the corpus data of the experimental and Chinese control groups. Three participants were selected from each group for each story task, i.e., the Ant Story and the Bird Story, for a focused, fully distributional,

qualitative analysis. These were, respectively, the participants with the maximum, intermediate, and minimum values of null-subject percentage from each group. The intermediate value is the closest to the group mean value. The analysis for each story task is presented separately as a control for a possible task-related effect.

5.1.1 Subject Realisation in the Ant Story

Table 5.1 shows a between-group comparison of null-subject percentages from individual representatives in the Ant Story task. For the intermediate value comparison, the bilingual participant, E07, had a 25.6% lower rate than the monolingual participant C18. For the maximum values the bilingual participant E08, had a 35.3% lower rate than monolingual counterpart C30. Similarly, for the minimum values, the bilingual participant E15's rate is less than half that of the monolingual counterpart C28. So, at each point of comparison the bilinguals' null-subject percentage is far lower than that of the monolingual's. Moreover, the maximum value produced by the bilingual participant E08 is still 2.7% lower than the minimum value from the monolingual participant C28.

Table 5.1 Between-group comparison between participants with the Maximum/Intermediate/Minimum values of null-subjects in the Ant Story task

	Experimental	Chinese Control
Maximum	E08: 52.9%	C30: 88.2%
Intermediate	E07: 47.1%	C18: 72.7%
Minimum	E15: 24.0%	C28: 55.6%
Group Mean	43.6%	72.4%

To analyse comparatively and in greater detail the subject realization behaviour between groups, the performance by the participants producing as in the previous table, the maximum, minimum and intermediate values in each group is presented below in a graph showing the clausal development of each story. This may reveal differences that can hardly be deduced from the purely quantitative analysis.

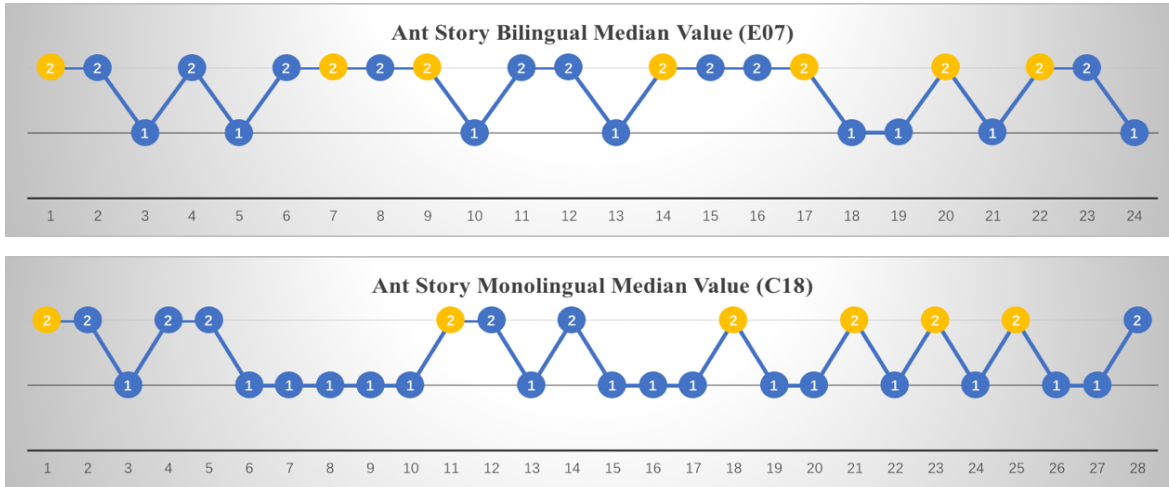
Accordingly, the story as told by a participant, is represented by a line subdivided by the number of clauses used by that participant. Each participant tells the story in their own way and uses any number of clauses as they see fit. For instance, Figure 5.1 below shows that the participant (E07 in this case) told the Ant Story over 24 clauses where each clause is represented by a coloured dot. Clauses in turn form clause-chains where each chain shares the same subject. When the subject changes, the clausal chain stops and a new one begins. The clause that contains first-mentioned subject is represented by a yellow dot whereas the clause that contains a subsequently-mentioned subject is represented by a blue dot. The length of each clause-chain and the number of clause-chains can thus be easily identified. For each clause, if the subject is realised with an overt form (either a referential NP or a pronominal), the dot is valued with ‘2’. Clauses whose subject is realised with a null form, have their dot valued with ‘1’. Since a first-mentioned subject, i.e., the subject in the chain-initial clause is always in an explicit referential NP, all yellow dots are valued as ‘2’. The computation of the null-subject percentage for the story thus excludes first-mentioned subjects and is determined by the value of blue dots. So, Figure 5.1 for instance shows at a glance that the 24 clauses produced by the participant (in this case E07) to tell the Ant Story, can be grouped into seven clause chains. For the 17 clauses with subsequently-mentioned subjects, nine have an overt subject and eight have a null subject.

Intermediate Values

In narrating the Ant Story task, Figure 5.1 portrays the subject realisation patterns from the participants who produced the intermediate value of null-subject respectively in the experimental group (E07) and the monolingual control group (C18). As can be gathered from the figure, the bilingual participant E07 produced only one continuing use of null forms in contiguous clauses as against four continuing uses of overt forms in contiguous clauses, with the longest extending over three clauses. By contrast, the monolingual participant C18 developed the story over 28 clauses subdivided into six clause chains producing 22 subsequently-mentioned subjects. Among these 16 are in a null form and six are in overt forms. There are three continuing uses of null forms and three continuing uses of overt forms.

However, the longest successive use of null forms extends over five contiguous clauses while that of the overt forms extends over only two contiguous clauses.

Figure 5.1 Intermediate values of subject realisation in the Ant Story task

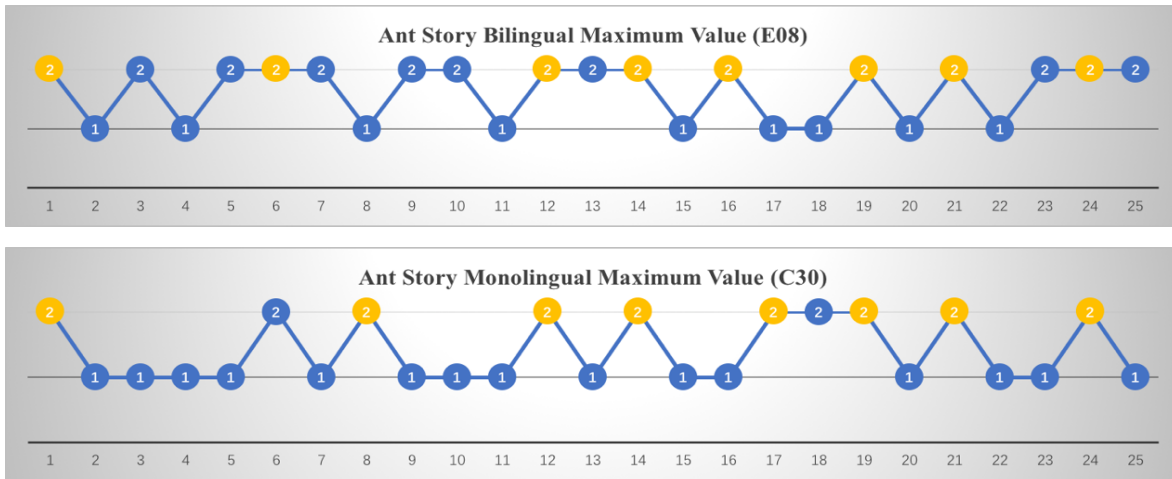


Comparing the distribution pattern of the intermediate values, it seems that the bilingual participant is reluctant to use continuing null forms and shows a slight preference for overt forms in coding co-referential subjects. The monolingual behaviour, however, shows strong reliance on null forms and includes multiple continuing null realizations.

Maximum Values

Figure 5.2 represents the distribution pattern of subject realisation by participants with the maximum values of null subject forms in the Ant Story, i.e., the bilingual participant E08 and the monolingual participant C30. E08 produced eight clause chains for a total of 25 clauses with 17 subsequently-mentioned subjects, out of which, nine are in a null form and eight in overt forms. Also, C30 produced the same number of clause chains (eight) and the same total number of clauses as well as the same number of subsequently-mentioned subjects (17).

Figure 5.2 Maximum values of subject realisation in the Ant Story task

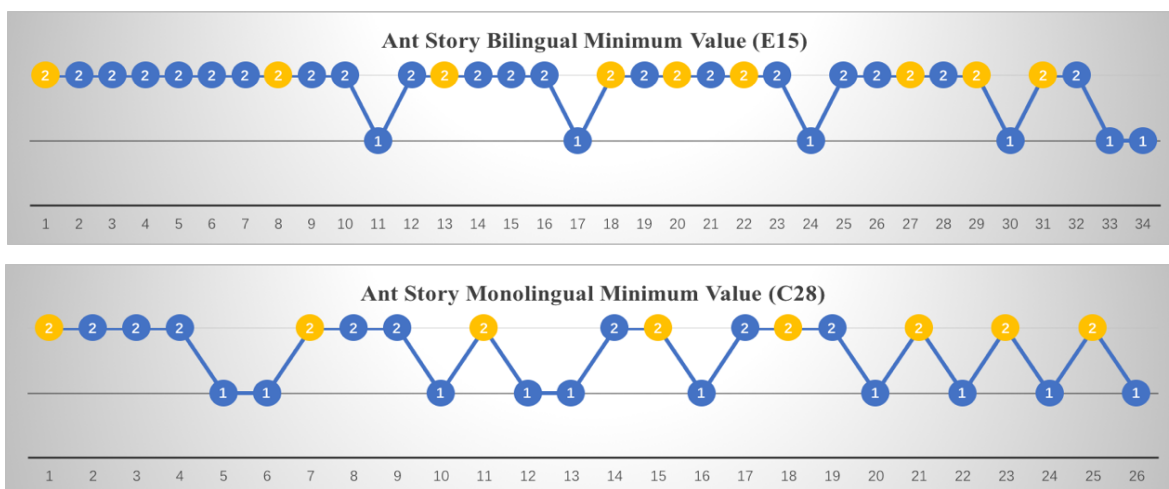


Remarkably however, these two participants differ considerably in their use of null forms. The monolingual produces 15 null forms (as against nine in the bilingual) and only two realizations are overt forms. The contrast is also very clear in the clusters of continuing uses of null forms where E08 only produced one cluster over two contiguous clauses but C30 produced four continuing clusters over and up to four contiguous clauses. So, despite representing the maximum null-subject value in the experimental group, this bilingual participant still relied more on overt forms than null forms for subsequently-mentioned subjects in her discourse.

Minimum Values

Figure 5.3 represents the distribution of subject forms as produced by the participants (E15 and C28) with minimum values in the respective groups in the Ant Story narration. E15 produced the narrative with the highest number of clauses (34) in the group but at the same time the lowest number of null forms with some chains having none. For instance, the first clause chain with seven clauses, has no null form at all. Indeed, only six null forms are utilised over all the 25 subsequently-mentioned subjects. C28 was the participant with the lowest null subject realizations in the Chinese control group, yet she produced more null (ten) than overt (eight) subjects over her 18 subsequent mentions.

Figure 5.3 Minimum values of subject realisation in the Ant Story task



The distribution patterns of the participants with minimum values of null forms, confirms the strong preference for overt forms in the bilinguals. Null-subjects barely reach a quarter (24%) of subsequently-mentioned subjects, as against well over half (56%) for the monolingual participant who, despite representing the minimum value in the monolingual Chinese group, still produced more of them than overt forms.

The Ant Story task shows that bilinguals, as against monolinguals, are more likely to use overt forms than null forms in realising co-referential subjects. Further, bilinguals tend to produce many continuing uses of overt subjects and dis-prefer continuing null forms, which, on the other hand are frequently observed in monolinguals.

The reader may recall that the Ant Story has a greater number of actors (three) than the Bird Story task (one). So, it will be useful to check whether a similar pattern of null subject realisation emerges from the Bird Story task below.

5.1.2 Subject Realisation in the Bird Story

Table 5.2 shows a between-group comparison of null-subject percentage from individual

representatives in the Bird Story task. For the intermediate value comparison, the bilingual participant E15 had a 21.4% lower rate than the monolingual participant C24. For the maximum value comparison, the bilingual participant E02 had a 25.2% lower rate than monolingual participant C19. Similarly, for the minimum value comparison, the bilingual participant E05's rate is less than 1/3 of the monolingual counterpart C26. So, at each point of comparison the bilinguals' null-subject use is far fewer than that of the monolingual's. Moreover, the maximum value produced by the bilingual participant E02 is still 5.6% lower than the minimum value from the monolingual participant C26. It should be noted that among these participants, only E15's performance has been presented in the previous subsection, where she represents the minimum value in the Ant Story task. This means that within group performance also differs across tasks, thus the analysis does not collate results from the two stories but deals with them independently.

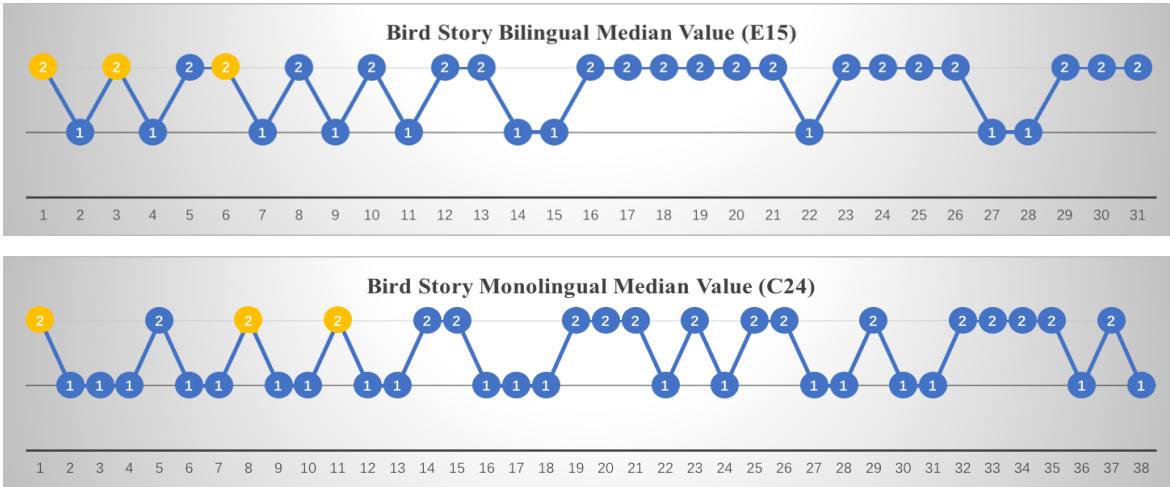
Table 5.2 Between-group comparison between participants with the Maximum/Intermediate/Minimum values of null-subjects in the Bird Story task

	Experimental	Chinese Control
Maximum	E02: 44.4%	C19: 69.6%
Intermediate	E15: 35.7%	C24: 57.1%
Minimum	E05: 14.3%	C26: 50.0%
Group Mean	35.3%	57.1%

Intermediate Values

Figure 5.4 portrays the distribution of subject forms as produced by the bilingual participant E15 and the monolingual participant C24, who present the intermediate values of null-subjects in narrating the Bird Story. E15 produced three clause chains with 28 subsequently-mentioned subjects, out of which, ten are in a null form while 18 are in overt forms. This means the number of null realisations is nearly half that of the overt.

Figure 5.4 Intermediate values of subject realisation in the Bird Story task

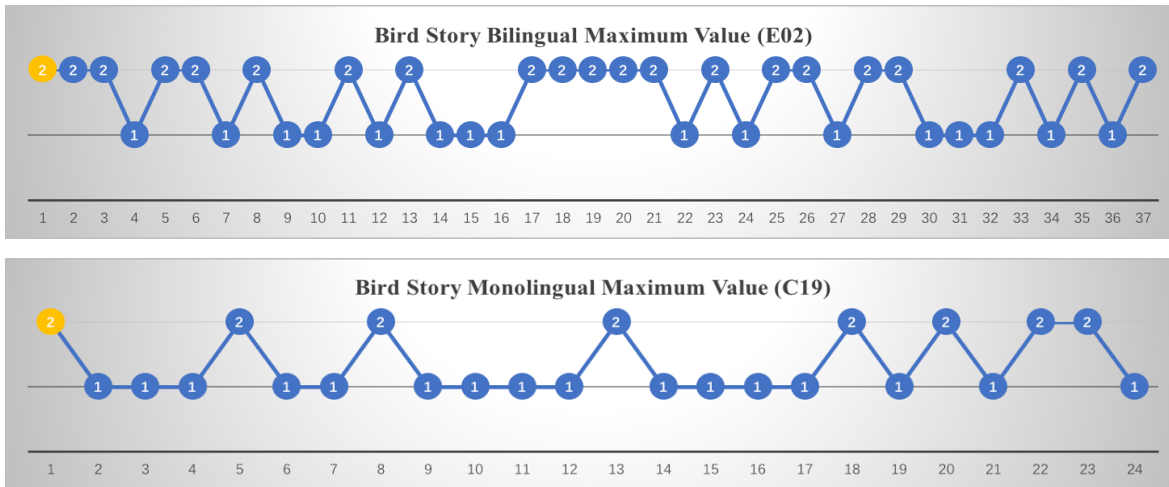


By contrast, among the 35 subsequently-mentioned subjects produced by C24, 20 are in a null form and 15 are in overt. The contrast is also evident in the cluster of continuing uses of null forms. E15 only produced two null clusters whereas C24 yielded seven.

Maximum Values

Figure 5.5 presents the distribution of subject forms as produced by the participant (E02 and C19) with the maximum values of null-subject rate in the Bird Story narration. Both participants produced only one clause chain, but the distribution patterns are different. E02 used 16 null forms and 20 overt forms in realising the 36 subsequently-mentioned subjects. So, despite representing the maximum null-subject value in the experimental group, this bilingual still relies more on overt forms than null. Her preference for overt forms can also be seen in using five clusters of continuing overt uses. The longest cluster extends to five clauses.

Figure 5.5 Maximum values of subject realisation in the Bird Story task

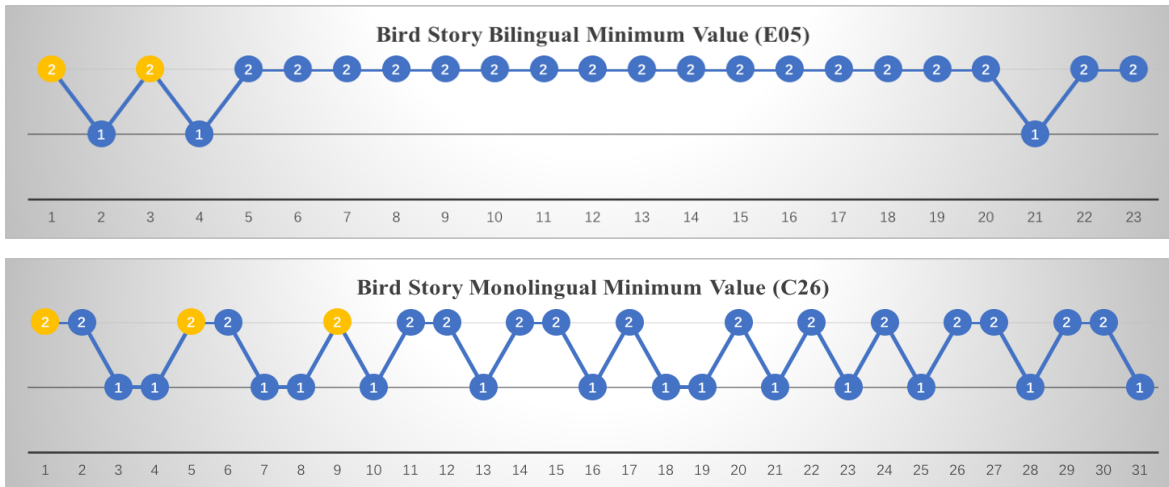


By contrast, C19 produced fewer clauses than E02. Among the 23 subsequently-mentioned subjects, 16 are in a null form and seven are in overt forms. C19’s preference for null-subject against overt subjects is apparent in the cluster of null uses, with two clusters over four contiguous clauses. In addition, the first three subsequently-mentioned subjects are all in a null form.

Minimum Values

Figure 5.6 shows patterns of subject realisation of the minimum values of null-subject rate produced by the participants, i.e., the bilingual speaker E05 and the monolingual speaker C26. E05 produced two clause chains with 21 subsequently-mentioned subjects, among which, only three are in a null form and the other 18 are in all overt forms. There is no continuing use of null form at all. However, in the second clause chain which includes 20 subsequently-mentioned subjects, a remarkably long cluster of overt uses extends to 16 contiguous clauses.

Figure 5.6 Minimum values of subject realisation in the Bird Story task



By contrast, C26 exhibits no preference for subject forms. Among the 28 subsequently-mentioned subjects she produced, half are in a null form and the other half are in overt forms. Similarly, the cluster of continuing uses, both for null and overt forms only extends to two contiguous clauses.

In the Bird Story task, bilingual participants also show strong preference for overt forms over null forms in realising co-referential subjects. Continuing uses of either the null form or the overt form are frequently observed as all participants have produced a long clause-chain that extends over 20 clauses. Bilinguals behaved differently from monolinguals in the cluster of continuing uses. Bilinguals allow a much longer span of successive overt forms than null forms, in that the longest cluster of overt forms extends to 16 clauses, however, the longest null cluster only extends to 3 clauses.

To summarise, regarding the overall distribution pattern, bilingual participants show strong reliance on overt forms, as compared to their monolingual counterparts who favour null forms in realising co-referential subjects. Bilingual participants do use null subjects, notably the minimum value representative has produced three null forms. In spite of their shifting between overt and null forms, bilinguals tend to allow more successive uses of overt subjects than null subjects. This brings us to the question: in what circumstances do bilinguals use

overt subjects while monolinguals use null subjects? In the next two sections, bilingual performance on subject realisation will be looked at in syntactic and discourse contexts.

5.2 Syntactic Contexts of Subject Realisation

This section deals with syntactic conditions on subject realisation in L1-Chinese. Syntactic conditions as discussed in §2.2.2 are said to affect the choice of subject forms (e.g. Taraldsen, 1978; Huang, 1984; Roberts and Holmberg, 2010), so in this section we will see which structures attract overt subject preferences, in other words fewer null subjects, by bilinguals as against monolinguals. The focus here will be on sentence level syntactic structures such as single-clauses, coordinate and adjunct subordinate sentences, and object embedded sentences, which are explained in §2.2.2, following Kroeger (2005) by reference to Li & Thompson (1989) and Huang (1984) on Chinese specifics. The discourse-pragmatic conditions (Givón, 1983) on the other hand, will be focused on in the next section.

5.2.1 Single-clause Sentences

Chinese allows both overt and null forms in realising co-referential subjects in single-clause sentences, as exemplified by the two chains of single-clauses in (70-71). However, in the elicited production data, bilingual participants show a preference for overt forms, e.g. (70), whereas monolingual counterparts favour null forms, e.g. (71).

(70) 他不小心一脚滑进了河里, 他在河里挣扎, 小蚂蚁他不会游泳, 他就一直喊救命
(E15-ANT)

*tā bùxiǎoxīn yī jiǎo-huá jìn-le hé-lǐ, tā zài hé-lǐ zhēngzhá, xiǎo mǎyǐ tā bù huì yóuyǒng,
tā jiù yīzhí-hǎn jiù mìng*

HE carelessly slip into river, HE in river struggle, little ant HE not can swim, HE then shout help

“He accidentally slipped into the river. He was struggling in the river. He can’t swim. He kept shouting for help.”

(71) 他..., ϕ 一不小心脚一滑, ϕ 滑到了河里去了, ϕ 就在水里扑腾, ϕ 感到绝望 (C18-ANT)

tā ... , ϕ yī bù xiǎoxīn jiǎo yī huá , ϕ jiù huá dào le shuǐ hé lǐ qù le ϕ jiù zài shuǐ lǐ pū téng , ϕ gǎn jué dào jué wàng .

HE ..., ϕ (HE) carelessly slip, ϕ (HE) slip to river in, ϕ (HE) then in water struggle, ϕ (HE) feel desperate

“He slipped. He slipped into the river. He was struggling in the water. He was desperate.”

The bilinguals’ preference for overt subjects is illustrated below by the single-clause chain in (70) compared with that produced by a monolingual counterpart in (71). The two chains describe similar content but, after the first-mentioned subject the monolingual participant (C18) realised all subjects with null forms, in the usual Chinese style. By contrast, the bilingual participant (E15) kept using overt subjects with pronominal *ta* (HE) even after subject was already mentioned at the start of the chain, which is remarkably similar to what the English speaker produced as in (72).

(72) *The ant is very interested in the water ... he approaches the water ... he falls in ... and he starts to drown ... and he is struggling ...* (EN1)

In general, rates of null-subjects from the Ant Story task are higher than values from the Bird Story task, possibly for the reasons explained in the introductory section of this chapter. The Ant Story has multiple actors, among which shifts of major reference are frequent, whereas the Bird Story has only one actor. However, it is notable that the task effect does not undermine the group differences observed, as in both tasks the bilinguals’ rates of null subjects are much lower than the Chinese monolinguals’. The deviation value is 30.3% in the Ant Story task and 21% in the Bird Story task. In other words, in single-clause sentences bilingual participants used many more overt subjects than monolingual Chinese as shown in Table 5.3. The English controls had no null use in this type of sentence.

Table 5.3 Null subject realisation in single-clause sentences

		Experimental	Chinese Control	English Control
Ant Story	No. of clauses	198	185	16
	Null-subject rate	39.4%	69.7%	0%
Bird Story	No. of clauses	299	294	19
	Null-subject rate	34.1%	55.1%	0%
Mean		36.8%	62.4%	0%

Bilinguals, however, do use null subjects in single-clause chains but they do so typically after a clause with an overt subject, such as in (73-75). It is noteworthy that this pattern in bilinguals resembles the coordination construction in English. Bilingual participants are generally reluctant to use null forms in contiguous single-clause sentences, unlike monolinguals who use that pattern frequently such as in (71).

(73) 小鸟也惊醒过来, ϕ 赶快飞走了 (E07-ANT)

xiǎoniǎo yě jīngxǐng-guòlái, ϕ gǎnkuài fēi zǒu-le

BIRD also wake up, ϕ (BIRD) immediately fly away

“The bird woke up and flew away.” (coordination)

(74) 他看了看 ϕ 发现... (E02-BIRD)

tā kànlekàn, ϕ fāxiàn...

HE have-a-look, ϕ (HE) find (that)...

“He had a look and realised that ...” (coordination)

(75) 他非常着急, ϕ 不知道... (E15-ANT)

tā fēicháng zhāojí, ϕ bù zhīdào...

HE very anxious, ϕ (HE) no know...

“He was very anxious and didn’t know...” (coordination)

“He was very anxious, wondering...” (participle)

After examining a total of 497 single-clause sentences in the bilingual data, only 13 occurrences of null-subjects in contiguous single clauses are found. All these contiguous uses include two null subjects. Both (76) and (77) contain three contiguous single-clause sentences, describing close-knit actions done by the same subject referent. The use of null-subjects in such a context also mirrors the null-subject use in English coordinate constructions. The bilinguals' contiguous use of null subjects never extends beyond more than two clauses.

(76) 他飞回来, ϕ 看到小蚂蚁, ϕ 对小蚂蚁说... (E15-ANT)

tā fēi huílái, ϕ kàn dào xiǎo mǎyǐ, ϕ duì xiǎo mǎyǐ shuō...

HE fly back, ϕ (HE) see little ant, ϕ (HE) to little ant say ...

“He flew back, saw the little ant, and told him that ...”

(77) 他飞到空中, ϕ 把小石块投到了坛子里面, ϕ 然后又站在坛子边上观察了一下
(E02-BIRD)

tā fēi dào kōngzhōng, ϕ bǎ xiǎo shí kuài tóu dào le tánzi lǐmiàn, ϕ ránhòu yòu zhàn zài tánzi biān shàng guānchá le yīxià

HE fly to sky, ϕ (HE) BA-stone-throw into jar, ϕ (HE) then again stand by the jar to inspect

“He flew to the sky, threw the stone into the jar, then stood by the jar.”

Turning now to the monolinguals' performance, many cases of longer continuous uses of null subjects are found, such as in (78-79). These contiguous null referents in single clause chains are hard to convert to coordination construction as they represent a typical feature of Chinese syntax (Huang, 1984). When the subject of the succeeding clause co-refers to the subject referent in the previous clause, it is felicitous and common to apply the zero anaphor, i.e. the null form, to code the subsequently-mentioned subjects (Li & Thompson, 1989).

(78) 小鸟听到呼救声, ϕ 然后跑去救小蚂蚁, ϕ 就想到一个办法, ϕ 就将树叶放在水里
(C30-ANT)

*xiǎo niǎo tīng dào hūjiù shēng, φ ránhòu pǎo qù jiù xiǎo mǎyǐ, φ jiù xiǎngdào yīgè bànfǎ,
φ jiù jiāng shùyè fàng zài shuǐ lǐ*

BIRD hear shout, φ (BIRD) then run to save little ant, φ (BIRD) then think a way, φ
(BIRD) then let leaf put in water

“The bird heard the shout. He ran to save the ant. He then got a good idea. He dropped
a leaf onto the water.”

(79) 天上飞来一只乌鸦, φ 飞呀飞呀, φ 飞到枝头上, φ 休息了一会儿 (C24-BIRD)

tiānshàng fēi lái yī zhī wūyā, φ fēi ya fēi ya, φ fēi dào zhītóu shàng, φ xiūxiē yīhuǐ'er

sky fly come one BIRD, φ (BIRD) fly and fly, φ (BIRD) fly to tree top, φ (BIRD) rest
a while

“A bird came over. He was flying in the sky. He landed on the tree and rest for a while.”

To conclude this sub-section, the main difference observed between the two Chinese groups in single-clause sentences is that bilingual participants dis-prefer successive null subjects in single clause chains and allow null subjects only in coordinated-like pattern, whereas monolinguals do use multiple successive null forms as typical in Chinese.

5.2.2 Coordinate and Adjunct Subordinate Sentences

Coordinate and adjunct subordinate sentences are analysed together as they both belong to Li & Thompson's (1989: 631) category of *the linking construction* in Chinese. The constituent clauses within a linking construction are juxtaposed with the speaker's intention to relate one clause to the other in a particular sense, as exemplified in (80-83). Such a linking relationship between the two constituent clauses can be established by a conjunction word, such as *jiǎrú* (if) in (80) and *bùguò* (but) in (81) or without an overt linking element, e.g. (82) and (83).

(80) *jiǎrú wǒ shì nǐ fùqīn, wǒ zǎo jiù bǎ nǐ gǎn-chū-qù le*

if I be you father, I early then BA you chase-exit-go CRS

“If I had been your father, I would have kicked you out.”

(81) *tā hěn bèn, bùguò kǎo-shàng dàxué le*

3sg very stupid, but exam-ascend university CRS

“He’s very stupid, but he passed the university entrance exam.”

(82) *tā chuān-shàng-le dàyī, jiù chū-qù sànbù*

3sg wear-ascend-PFV coat, then exit-go promenade

“He put on his coat and went out for a stroll.”

(83) *wǒ yǒu shíjiān, yīdìng lái kàn nǐ*

I exist time, definitely come see you

“When I have time, I’ll definitely come to see you.”

(Examples from Li & Thompson, 1989)

Also, when the linked construction lacks an overt linking element, the interpretation of the sentence meaning can vary. For example, (82) can be rendered in English as either a coordination sentence (*He put on his coat and went out for a stroll*) or an adjunct subordinate sentence (*When he put on his coat, he went out for a stroll*).

Table 5.4 shows a null-subject realisation in the linking construction, i.e., in coordinate and adjunct subordinate sentences. In narrating the Ant Story, the experimental group yielded a null-subject rate of 41.3%, which is 25.6% lower than that of the Chinese control group (66.7%). The contrast is even greater in the Bird Story task where the experimental group’s rate of null-subjects (35.1%) is only half of the Chinese control group’s (70%). The English controls also had some null uses in this type of sentence. With respect to the mean group value, the experimental group with a percentage of 38.2% is closer to the English control group (20.5%) than to the Chinese control group (68.4%).

Table 5.4 Null subject realisation in coordinate and adjunct subordinate sentences

		Experimental	Chinese Control	English Control
Ant Story	No. of clauses	104	66	22
	Null-subject rate	41.3%	66.7%	22.7%
Bird Story	No. of clauses	94	80	22
	Null-subject rate	35.1%	70.0%	18.2%
Mean		38.2%	68.4%	20.5%

With respect to Chinese linked construction, including coordinate or adjunct subordinate sentences, the corresponding referent of the subject can be inferred in discourse. The realisation of the co-referential subjects can take three possible patterns: (a) Both-Overt, i.e., subjects of both constituent clauses are overt, e.g. (84-85); (b) Both-Null, i.e., subjects of both constituent clauses are null, e.g. (86-87); or lastly (c) Either-Null, i.e., one subject is null, either in the adjunct or the main clause, e.g. (88-89). English, on the other hand, can only take the Both-Overt pattern in realising adjunct subordinated construction (Kroeger, 2005) as in the translation of (84-88). The only exception is for coordinate constructions, where English can also take the Either-Null pattern with a null subject used in the second clause, e.g. (90).

(84) 他突然感到口渴, 所以他来到小河边喝水 (Both-Overt: E15-ANT)

tā tūrán gǎndào kǒu kě, suǒyǐ tā lái dào xiǎo hé biān hē shuǐ

HE suddenly feel thirsty, so HE come to river to drink water

“He suddenly felt thirsty so he went to the river for some water.”

(85) 他有点渴, 于是他来到了河边喝水 (Both-Overt: C28-ANT)

tā yǒudiǎn kě, yúshì tā lái dào le hé biān hē shuǐ

HE a-bit thirsty, so HE come-CRS river-side drink water

“He feels thirsty, so he goes to the river for water.”

(86) ϕ 由于够不着, ϕ 就掉到了河里 (Both-Null: C30-ANT)

φ yóuyú gòu bùzháo, φ jiù diào dào le hé-lǐ

φ (HE) because reach not, *φ* (HE) then fall into river

“Because he couldn’t reach the water, he fell into the river.”

(87) *φ* 费了好大的劲, *φ* 却够不着那个水面 (Both-Null: E03-BIRD)

φ fèile hào dà-de jìn, φ què gòu bùzháo nàgè shuǐmiàn

φ (BIRD) spend very big effort, *φ* (BIRD) but reach not that water

“Although the bird spent a lot of effort, he couldn’t reach the water.”

(88) 他听到小蚂蚁的呼救声, *φ* 便跑过来一探究竟 (Either-Null: E08-ANT)

tā tīng dào xiǎo mǎyǐ de hūjiù shēng, φ biàn pǎo guò lái yī tàn jiùjìng

HE hear little ant’s shouting, *φ* (HE) then run over to check

“When he heard the little ant’s shouting, he ran over to have a check.”

(89) 他埋头往里想喝水, *φ* 但怎么也喝不到水 (C26-BIRD)

tā mái tóu wǎng lǐ xiǎng hē shuǐ, φ dàn zěnmeyě hē bù dào shuǐ

HE bury head to inside to drink water, *φ* (HE) but however drink no water

“He buried his head inside the jar to drink water, but couldn’t get any.”

(90) *He tried to push the bowl over with his head but was not able to.* (EN2)

Table 5.5 shows the pattern of subject realisation in linked constructions, whether coordinate or adjunct subordinate, in both tasks by all groups.

Table 5.5 Subject realisation patterns in coordinate and adjunct subordinate sentences

Patterns	Experimental	Chinese Control	English Control
Both-Overt	30 (30.3%)	4 (5.5%)	13 (59.1%)
Both-Null	7 (7.1%)	31 (42.5%)	0 (0%)
Either-Null	62 (62.6%)	38 (52.1%)	9 (40.9%)
Total no. of sentences	99	73	22

The bilingual and the monolingual Chinese participants produced a total of 99 and 73 linking construction sentences respectively. Although the ‘Either-Null’ pattern is the one used most by both groups, a mirror image effect can be noticed with the other two patterns. Bilinguals show a stronger preference for the ‘Both-Overt’ pattern, with 30.3% of sentences in such pattern. However, monolinguals favour the ‘Both-Null’ pattern, with 42.5% of sentences in this pattern. Bilingual participants’ reluctance to use contiguous null subjects is well illustrated in this type of sentence. As for the English controls, all the nine occurrences of the ‘Either-Null’ pattern are in coordinate clauses. Most of their linked clauses, as may be expected, display the ‘Both-Overt’ pattern.

To conclude, the bilingual’s performance on coordinate and adjunct-subordinate sentences exhibits distinct features in their reluctance to use the ‘Both-Null’ pattern as well as willingness to use the ‘Both-Overt’ pattern by reference with the monolingual performances.

5.2.3 Sentences with an Object Embedded Clause

Turning now to the object embedded clauses, only a few cases where the subject of the embedded clause co-refers with that of the matrix clause were found in both story tasks. Despite the paucity of this type of sentence, bilinguals’ performances exhibit a difference from that of monolinguals. As shown in Table 5.6, the null-subject percentage in the experimental group (76.4%) is 23.6% lower than that of the Chinese control group (100%). The English control group rejected the use of null forms in object embedded clauses.

Table 5.6 Null subject realisation in object embedded clauses

		Experimental	Chinese Control	English Control
Ant Story	No. of clauses	5	4	/
	Null-subject rate	80%	100%	/
Bird Story	No. of clauses	11	20	4
	Null-subject rate	72.7%	100%	0%
Mean		76.4%	100%	0%

Subject realisation in object embedded clauses is contrastive between Chinese and English. Such contrast is evident in monolingual participants' performance observed in the narration tasks. All Chinese control monolinguals use a null form to realise the co-referential subject in the embedded clause, e.g. (91). By contrast, the English controls use the lexical pronoun 'he' to code the re-ferential subjects, e.g. (92).

(91) 乌鸦想着, ϕ 把水瓶撞倒 (C22-BIRD)

wūyā xiǎngzhe, ϕ bǎ shuǐpíng zhuàng dào

BIRD think, ϕ (BIRD) Ba-jar knock down

“The bird was considering that he needed to knock down the jar.”

(92) *He realizes that if he pushes the bucket over the water will fall out.* (EN1-BIRD)

Bilingual participants' behaviour in this type of sentence also show some convergence towards the English pattern. Among 16 co-referential subjects in embedded clauses, five of them are with the lexical pronominal *ta* (he), such as in (93-94). Such pattern is a shared structure with English as in (106).

(93) 他发现, 他怎么也够不到里面的水 (E05-BIRD)

tā fāxiàn, tā zěnmeyě gòu bù dào lǐmiàn de shuǐ

HE notice, HE on-no-account reach-not inside water

“He noticed that he simply couldn't reach the water.”

(94) 他首先想到, 也许他可以把水缸撞倒 (E09-BIRD)

tā shǒuxiān xiǎngdào, yěxǔ tā kěyǐ bǎ shuǐ gāng zhuàng dào

HE first think, maybe HE can Ba-jar knock down

“At first he thought that he might be able to knock down the jar.”

Except for the uses of overt subjects, the bilinguals' subject realisation in embedded clauses are similar to their Chinese monolinguals. Null-subjects dominate bilingual's choice in embedded clauses, e.g. (95). The percentage of null subjects (76.4%) in embedded clauses approximately doubles those in the single clauses (36.8%) and linked clauses (38.2%).

(95) 他想到, ϕ 应该可以用这个办法喝到水 (C18-BIRD)

tā xiǎngdào, ϕ yīnggāi kěyǐ yòng zhège bànfǎ hēdào shuǐ

He think, ϕ (HE) can use this way drink water

“The bird thought that he can drink the water like this.”

Further, like monolinguals, bilinguals sometimes attach the reflexive morphem *ziji* (self) to a null subject in the embedded clause. By reference to Li & Thompson (1989: 138), the morphem *ziji* (self) in (96-97) functions as an adverb rather than a reflexive pronoun as in (98). All uses of *ziji* (self) observed in the embedded clauses belong to the adverb function and serve to contrast oneself to others. In such cases, the reflexive morphem occurs after the subject (null subject) and before the verb phrase (Li & Thompson, 1989: 139).

(96) 小鸟发现, ϕ 自己身处危险的境地 (E12-ANT)

xiǎoniǎo fāxiàn, zìjǐ shēn chǔ wéixiǎn de jìngdì

BIRD find, SELF stay dangerous situation

“The bird realised that he was in a dangerous situation.”

(97) 一只乌鸦觉得, ϕ 自己渴得实在不行了 (C25-BIRD)

yī zhī wūyā juéde, ϕ zìjǐ kě dé shízài bùxíngle

one BIRD feel, ϕ SELF thirsty very much

“The bird realised that he was extremely thirsty.”

(98) *Lìsì zài zébei (tā) zìjǐ*

Lisi DUR blame (3sg) self

“Lisi is blaming himself.”

(example from Li & Thompson, 1989: 137)

5.2.4 Syntactic Convergence Towards English Patterns

Syntactical analysis shows that overt subjects seem to dominate the bilinguals' choice for co-referential subjects, which suggests some shift in preference towards the use of the structure with overt subjects, which Chinese shares with English. Such a preference is consistent in three syntactic constructions. In single-clause sentences, the bilinguals' use of null subjects resembles the English structure of coordination or participle constructions. In coordinate and adjunct-subordinate sentences, bilinguals do not use the 'Both Null' pattern that is frequently observed in the monolinguals' production. Bilinguals are also more likely to use overt subjects for embedded object clauses than their monolingual peers. These findings strongly suggest that the bilinguals' subject realisation in their L1 Chinese tends to favour overt argument, a structure shared with their L2 English.

The bilinguals' preference for overt subjects can primarily be interpreted as a cross-linguistic influence caused by the frequent use of their L2 English. The experience in L2 English has caused the bilingual to be aware that the subject is obligatorily explicit in English, thus the structure with overt subjects becomes very active and easily accessible. At the same time, shared syntactic representations (Hartsuiker, Pickering, & Veltkamp, 2004) co-activate the structure with null subjects whenever obligatory subjects are expressed in English. However, the structure with null subjects needs to be suppressed since it violates English syntactic rules. Such suppression or inhibition (Green & Abutalebi, 2013) might have a long-term effect on the bilinguals' reluctance to use null subjects even in their L1 Chinese, because the competing overt subjects are less costly as a strategy because they work in both Chinese and English for bilingual processing efforts (cf., Cutler, Mehler, Norris, & Segui, 1992, for a parallel processing tendency in bilinguals' speech segmentation).

In the domain of subject realisation, previous research has reported an increased use of overt

subjects in null-subject languages, in contact with non-null subject languages (Genevska-Hanke, 2017; Montrul, 2004). In Montrul's (2004) cross-sectional study, Spanish heritage speakers in the US with intermediate and advanced L2 English proficiency produced more overt pronominal subjects than monolingual natives in Spanish-speaking countries. Likewise, in Genevska-Hanke's (2017) longitudinal case study, the Bulgarian-German bilingual's percentage of overt pronouns in her L1-Bulgarian is significantly higher than that of monolingual baseline. However, bilinguals in the latter two studies are heritage language speakers who live in an L2 environment with limited exposure to L1. The change of their L1 is ascribed to attrition or incomplete acquisition (Schmid, 2016).

Unlike the case of immigrant populations, the observed L2 influence on L1 in the current study cannot be attributed to attrition because their use of L1 is not ungrammatical or pragmatically inappropriate. Bilingual participants in this study keep using their L1 Chinese as the dominant language in their L1 environment. Intuitively, L1 should not experience such a noticeable change once it is mature, well established and highly functional in an L1 environment. However, counter-intuitively, empirical findings in the present study show that the bilinguals' subject realisation patterns exhibit differences from those of their monolingual peers and convergence towards L2 English patterns (cf., Liu, Qi, & Di Biase, 2021). Such syntactic convergence has also been reported in the previous literature (Dussias, 2004; Jarvis, 2003; Su, 2001). In Jarvis's (2003) study, the Finnish-English bilingual rejected some grammatical L1 Finnish sentences that violated her L2 English rules. Likewise, Dussias (2004) found L2 effects from English on bilingual L1 Spanish in parsing strategies. Bilingual participants show a preference for a local attachment strategy, which is used by monolingual English controls, towards non-local attachment strategy, which is used by monolingual Spanish controls. As for Chinese-English bilinguals in an L1 environment, Su (2001) reported an increasing reliance on L2-based cues in the interpreting strategy of L1 sentences. All these studies, together with the current one, seem to suggest that bilinguals can adapt their syntactic processing mechanism, which economizes their efforts in producing grammatical utterances in both languages.

5.3 Discourse Contexts of Subject Realisation

Along with syntax, discourse context also governs the realisation of subjects (Givón, 2001) as illustrated in §2.2.4. The coding of the data in the current study follows Pu's (1997; 2019) categorization of continuity degrees in Chinese narrative discourse as outlined in §3.5. Accordingly, discourse contexts are divided into continuity and discontinuity. In continuity contexts, actions or states that the predicate of the succeeding clause depicts, have a simultaneous or no-pause continuous relation with the predicate of the previous clause. Continuity contexts can be illustrated with (99), where the subject (*he*) is the same actor (*he* = the bird) throughout the predicates of the chain.

(99) 他首先想到, 也许 he 可以把水缸撞倒

tā shǒuxiān xiǎngdào, yěxǔ tā kěyǐ bǎ shuǐ gāng zhuàng dào

HE first think, maybe HE can Ba-jar knock down

“At first he thought that he might be able to knock down the jar.”

Discontinuity contexts refer to those chains that introduce a minor thematic break, including interference with other information, a change of descriptive style, a sudden shift in time or location, as well as a pause for emphatic effect. For instance, the subject of the second clause in (100) is different from the actor in the main clause, generating a thematic break with interfering information.

(100) 这时候他发现, 水好像稍微漫上来了一点, ϕ 好像比之前更能够到一点

zhè shíhòu tā fāxiàn, shuǐ hǎoxiàng shāowéi màn shàngláile yīdiǎn, ϕ hǎoxiàng bǐ zhīqián gèng néng gòudào le yīdiǎn

this time HE find, water seem slight raise up little, ϕ (HE) seem compare past more able reach little

“He realized at this moment that as the water rose up, he was able to reach a little bit of it.”

The next two subsections will analyse the bilinguals' performance in subject realisation, showing how it differs from monolingual behaviour in continuity and discontinuity discourse contexts.

5.3.1 Discourse Continuity

Table 5.7 shows a null-subject rate in continuity contexts in both the Ant Story and Bird Story tasks. Both the experimental group and the Chinese control group behaved in more or less the same way across the two tasks. The bilingual group's mean value is 58.3% and that of the monolingual group is 88.1%. In continuity contexts, both groups used more null subjects than overt subjects. Nevertheless, monolinguals used many more null subjects. The deviation value between the two groups is as great as almost 30%.

Table 5.7 Null subject realisation in continuity contexts

		Experimental	Chinese Control
Ant Story	No. of clauses	226	187
	Null-subject rate	58.5%	89.8%
Bird Story	No. of clauses	232	208
	Null-subject rate	58.2%	86.5%
Mean		58.3%	88.1%

The monolingual participants' strong preference for null subjects in realising co-referential subjects in continuity contexts can be illustrated in (101), where null realisation occurs in all subsequent clauses after the subject has been introduced into the discourse.

(101) 一只小蚂蚁口渴了, ϕ 就到河边喝水, ϕ 由于够不着, ϕ 一不小心, ϕ 就掉到河里了
(C30-ANT)

yīzhī xiǎo-mǎyǐ kǒukě-le, ϕ jiù dào hé biān hē shuǐ, ϕ yóuyú gòu bùzháo, ϕ yī bù xiǎoxīn, ϕ jiù diào dào hé lǐ

one ANT thirsty, ϕ (ANT) then to river drink water, ϕ (ANT) because reach not, ϕ (ANT)

careless, ϕ (ANT) fall into river

“An ant was thirsty. He came to the river for water. But he was very careless so he fell into the water.”

Bilinguals, however, tend to use many overt forms in contexts where a less attenuated form could be used, as in (102).

(102) 小乌鸦就很生气, 他然后看到了旁边的石子, 他就非常生气地往罐子里面丢了一个石子进去, 可是这时候他发现... (E05-BIRD)

xiǎowūyā jiù hěn shēngqì, tā ránhòu kàn dào pángbiān-de shízǐ, tā jiù fēicháng shēngqì-de wǎng guǎnzi lǐmiàn diūle yīgè shízǐ jìnqù kěshì zhè shíhòu tā fāxiàn ...

BIRD then very angry, HE then see side stone, HE then very angrily to jar inside throw one stone into, this time HE find ...

“The bird was very upset. He saw some stones nearby. HE then threw one stone into the jar. However, he at once realised that ...”

In (102), there are four successive clauses, all of which share the same subject referent, depicting tight-knit actions occurring to the topical referent ‘the bird’. Bilingual participant E05 realised all these co-referential subjects with the lexical pronoun ‘HE’. However, (103), which presents similar continuity contexts with (102), shows a contrastive monolingual behaviour in realising co-referential subjects. The monolingual participant C19 realised all three subsequently-mentioned subjects were with a null form.

(103) 忽然他看见一只大水罐, ϕ 满心欢喜, ϕ 飞到水罐旁, ϕ 一看... (C19-BIRD)

hūrán tā kànjiàn yī zhī dà shuǐ guǎn, ϕ mǎnxīn huānxǐ, ϕ fēi dào shuǐ guǎn páng, ϕ yī kàn...

suddenly HE see a big jar, ϕ (HE) very happy, ϕ (HE) fly to jar, ϕ (HE) have a look...

“Suddenly he saw a big jar. He was very excited. He flew to the jar. He had a look...”

In the above examples, bilinguals seem to repeatedly use the lexical pronoun ‘HE’ to realise co-referential subjects in contexts where monolinguals might use null subjects. In addition to pronominal subjects, bilinguals also used nominal subjects, i.e., NPs in realising co-referential subjects in continuity contexts, as exemplified in (104).

(104) 这时有一位猎人经过, 他想要射杀小鸟, 转眼间猎人已经把弓箭对准了小鸟
(E07-ANT)

*zhè shí yǒu yī-wèi lièrén jīngguò, tā xiǎng-yào shèshā xiǎoniǎo, zhuǎnyǎnjiān lièrén
yǐjīng bǎ gōngjiàn duìzhǔnle xiǎoniǎo*

this time have one HUNTER pass, HE want shoot bird, quickly HUNTER already Ba-
arrow target bird

“At this moment, a hunter went by. He wanted to shoot the bird. He was soon targeting
the bird with his arrow.”

In (104), E07 produced three clauses to depict a situation in which the hunter saw the bird while passing by the tree and immediately wanted to shoot him down. The first clause introduces the topical referent *the hunter*, which needed a referential NP to code the antecedent. However, as there is no major thematic break in narrating the action in the second clause, where a less attenuated form, i.e., a zero anaphor could also be used instead of an overt form. Likewise, in the third clause, the more explicit form of NP, i.e., ‘the hunter’ can be weakened to a zero anaphora without causing any difficulty in tracking the reference.

5.3.2 Discourse Discontinuity

Table 5.8 shows the null-subject rate in bilingual and Chinese monolingual productions in discontinuity contexts in the Ant Story and Bird Story tasks. In such contexts, characterised by a thematic break in discourse, both groups used many more overt subjects than null subjects. Bilingual participants produced a total of 270 clauses, among which only 20 clauses are with a null subject. Monolingual Chinese participants produced a total of 258 clauses and 69 of them are with a null subject. It seems discontinuity contexts favour overt subjects

against null subjects. However, on average, the bilinguals' null-subject rate is 18% lower than that of monolinguals.

Table 5.8 Null subject realisation in discontinuity contexts

		Experimental	Chinese Control
Ant Story	No. of clauses	108	90
	Null-subject rate	11.1%	27.7%
Bird Story	No. of clauses	162	168
	Null-subject rate	4.9%	25%
Mean		8%	26%

Bilinguals seldom use null forms to code co-referential subjects in discontinuity contexts, the average group value of a null-subject percentage is only 8%. According to the discussion offered in §2.2.5, following Pu's (1997; 2019) categorization, there are four types of minor thematic breaks that might call upon the use of overt subjects to replace a zero anaphor. Despite its scarcity, both groups find null-subject realisation in all four types. Bilinguals' null subject realisation does not violate monolingual rules but only exhibits difference in frequency of use.

As exemplified in (105-107), all three samples include a minor thematic break introduced by the non-topical subject referent *water* in the middle of a clause chain, where the topical subject referent is *he* (the bird). However, since the predicate of the succeeding clause after the intervening *water* is an action, i.e., *drink* in (105) and *reach* in (106-107), its antecedent can only be assigned to an animate referent, i.e., *he* (the bird), thus the use of null subjects in such a discontinuity context cause no ambiguity. Both (105) by the monolingual participant C26 and (106) by the bilingual participant E07 are with a null subject whereas (107) by the bilingual participant E13 is with an overt subject.

(105) 他先想到, ϕ 把那个水罐推倒, 然后水可以流出来, ϕ 然后可以喝水... (C26-BIRD)

tā xiān xiǎngdào, bǎ nàgè shuǐguǎn tuī dǎo, ránhòu shuǐ kěyǐ liú chūlái, ránhòu kěyǐ hē

shuǐ

HE first think, ϕ (HE) Ba that jar push down, then WATER can flow out, ϕ (HE) then can drink water

“He first thought that he would push down the jar so the water would spill out and he could drink the water.”

(106) 这时候他发现, 水好像稍微漫上来了一点, ϕ 能够到了 (E07-BIRD)

zhè shíhòu tā fāxiàn, shuǐ hǎoxiàng shāowéi màn shàngláile yīdiǎn, ϕ néng gòudàole

this time HE find, water seem slight raise up little, ϕ (HE) can reach

“He realized that as the water rose up, (he) was able to reach it.”

(107) 他发现, 瓶子里的水实在是太低了, 他根本就够不到 (E13-BIRD)

tā fāxiàn, píngzi lǐ de shuǐ shízài shì tài dī-le, tā gēnběn jiù gòu bù dào

HE find, bottle inside's water indeed is too low, HE at all then reach not to

“He found that the water in the bottle was too low for him to reach.”

The discontinuity context in the above examples concerns only an inanimate referent which does not cause interference in tracking the reference of the null subject. However, in the discontinuity context where interference is caused by the description of an animate referent, the difference between bilingual and monolingual performance in subject realisation seems to be greater. In (108) and (109), both of which contain similar semantic information, i.e., ‘the bird heard the ant’s shout and went to offer some help’, the monolingual participant C30 continues to use null subjects while the bilingual participant E15 repeatedly uses overt subjects.

(108) 在树上的一只小鸟听到, 小蚂蚁在呼叫, ϕ 然后就跑去救小蚂蚁, ϕ 就想了一个办法, ϕ 就是将树叶放在水里 (C30-ANT)

zài shùshàng-de yī-zhǐ xiǎoniǎo tīng-dào, ϕ xiǎo mǎyǐ zài hūjiào, ϕ ránhòu jiù pǎoqù jiù xiǎo mǎyǐ, jiù xiǎngle yīgè bànfǎ, jiùshì jiāng shùyè fang-zài shuǐ-lǐ

at tree one BIRD hear, little ANT at shout, ϕ (BIRD) then then run to save little ant, ϕ (BIRD) then think one way, that is ϕ (BIRD) Ba leaf put at water

“The bird on the tree heard the ant’s shouting. He flew there to save the ant. He came with an idea. He put the leaf on the water.”

(109) 这时岸上一棵树上的一只小鸟听到了小蚂蚁的呼救声, 他急忙飞过来, 他盘旋在小蚂蚁头上 (E15-ANT)

zhè shí ànshàng yīkē shù-shàngmiàn-de yīzhǐ xiǎoniǎo tīng-dàole xiǎo mǎyǐ de hūjiùshēng, tā jí máng fēi guò lái, tā pán xuán zài xiǎo mǎyǐ tóu shàng ϕ xiǎng...

this time bank one tree one BIRD hear little ant’s shout, HE hurry fly come, HE hover at little ant head

“At that moment, the bird on the tree heard the ant’s shout. He flew over. He hovered above the ant.”

In contrast to the bilinguals’ reluctance to use null forms in a discontinuity context, monolinguals seem to allow many more uses of zero anaphors. In (110), the first clause describes the main character’s ongoing effort, while the last clause talks about the result of the effort with the second clause commenting on the behaviour. According to Pu’s (2019) discourse categorization, this sentence includes three discontinuity contexts, i.e., a shift between actions to the status of the referent; the interruption of information that is out of the main storyline; and a possible emphatic effect with the word ‘finally’. Despite these discontinuity signals, the monolingual participant C19 opted for a zero anaphor rather than an overt referential subject.

(110) 他不厌其烦地一块一块地用嘴叼石头, 功夫不负有心人, ϕ 终于放了很多的石头 (C19-BIRD)

tā bù yàn qí fán dì yī kuài yī kuài dì yòng zuǐ diāo shí tóu, gōng fū bù fù yǒu xīn rén, ϕ zhōng yú fàng le hěn duō de shí tóu

HE tirelessly persistently use beak pick stone, hard work pays off, ϕ (HE) finally put

many stones

“He kept picking up stones. Hard work pays off. Finally, he was able to get enough stones.”

5.3.3 Functional Clarity versus Functional Efficiency

From the point of view of discourse, the null-subject, i.e., zero anaphora, is governed by the degree of con-joinability between successive clauses (Li and Thompson, 1979). If the predication of the subsequent clause is closely linked semantically with that of the preceding clause, a null subject is preferred over an overt subject. Bilingual participants in this study behaved differently compared with monolingual controls. They used considerably more overt subjects even in high continuity contexts. Further, they showed a greater preference for overt subjects in discontinuity contexts, where thematic breaks occur, i.e., in a temporal/spatial change; a shift in descriptive style; and the presence of intervening materials. The discourse-pragmatics analysis seems to suggest that bilinguals value clarity in communication. At the same time, the preference for overt forms can also be a strategy for saving processing costs.

In speech production, there is a conflict between economy and clarity. Once a referent has been established in discourse, the subsequent mention of the referent can be encoded with a less attenuated form, provided its assignment can be deduced from the context. In a multi-clause chain, where the topic remains unchanged and the major referent keeps taking the subject position, the first mentioned is always realised with an NP subject for both Chinese and English. However, under most circumstances, the subsequent mentions have only one option in English but two in Chinese. In English, pronominal subjects are used whereas in Chinese, either pronominal or null subjects can be used. It is the speaker's choice for the form of the subsequently-mentioned subject. Following the principle of economy, a null subject is more efficient than an overt form. It is simpler and easier in expression than an overt subject, thus saving the effort of the speaker. By contrast, with respect to communication effectiveness, an overt form is clearer and straightforward in terms of comprehension, thus saving the effort of the listener. The bilingual participants' preference for overt forms reveals

their striving for functional clarity at the cost of functional efficiency in communication (cf., Kawaguchi, 1998).

Moreover, making decisions between two options means a greater processing cost than when there is only one option. Bilingual speech production shares the same procedures as monolingual speech production, described by Levelt's model (1989). However, it is also different, as bilinguals need to make decisions to ensure their discourse choices satisfy the grammatical determination of the sentence structure. For Chinese-English bilinguals, their choice of overt subjects applies to both languages hence no efforts are needed to distinguish syntactic rules. The use of the null-subject, on the other hand, calls for extra distinguishing efforts. Since the processing capacity for human beings is limited it is possible when speakers coordinate their cognitive resources according to their own perceived needs. In discourse discontinuity contexts, where processing efforts are needed to handle thematic breaks such as the introduction of new information units, there are fewer resources available. Therefore, using an overt form for coding subjects is more efficient than applying null subjects, which include extra distinguishing efforts.

Both syntactic and discourse-pragmatic considerations reflect the variations in bilingual processing, which are different from monolingual processing. Bilinguals tend to develop a processing strategy that coordinates their cognitive resources to fulfil various processing needs as they frequently shift between using both languages. They also lean towards clarity as against economy in on-line speech production.

5.4 Language Mode Differences in Syntax and Discourse

The second research question asks whether the language mode affects bilingual performance in subject realisation. The experiment addressing that question follows Grosjean's (1998) proposal that the context of language use, i.e., whether the speech production is occurring in a bilingual mode (BM) where both languages are highly activated, or a monolingual mode where one language is predominantly activated, would influence bilingual behaviour.

Accordingly, it is hypothesized (as Hypothesis 2 in §2.4) that bilinguals would generate lower null-subject rates when producing narratives in a bilingual mode than when they do it in a monolingual mode. The reader might recall that the control for the language mode in elicitation tasks described in §3.5.1 (i.e. the Ant Story and Bird Story tasks) was set up in a monolingual mode, whereas for the second part of the experiment a bilingual mode context was set up for the Wolf Story and Rabbit Story tasks. The research assistant who gave instructions in the monolingual tasks is a monolingual Chinese speaker who carried out a five-minute casual talk with each participant before proceeding to the story elicitation tasks. This means participants only used Chinese to perform the tasks in the monolingual mode.

For the second experiment, which was carried out one month later, the experimental environment was set up differently. To attune the participants to a bilingual mode environment, a research assistant who is a native speaker of English together with a bilingual Chinese-English assistant, chatted with each of the bilingual participants in English for five minutes before starting the story elicitation and instructions were given in both languages (first in English and then in Chinese). In this way, both languages were called upon. In the previous chapter, results from the bilingual participants' null-subject rates in the Monolingual Mode were presented in §4.2.3 and their performance in the Bilingual Mode was reported in §4.3.1, followed by a cross-modal comparison in §4.3.2. These results seem to support Hypothesis 2 that bilinguals generally tend to produce fewer null subjects in the bilingual mode than in the monolingual mode. In fact, the rates of null-subject by the bilingual participants in the monolingual mode were found to be between 30.2% and 46.7% with a mean value of 39.4%. By contrast, the null-subject rates produced in the bilingual mode by the same bilingual participants range between 15.8% and 40.9% with a group mean of 29.6%. Table 5.9 shows the mean value in each mode as well as the rather considerable deviation across modes in the bilingual participants' group.

Table 5.9 Group mean value of null subjects in MM, BM, and Deviation across modes

Mean Value in MM	Mean Value in BM	Deviation Value
39.4%	29.6%	9.8%

The majority of the bilingual participants, i.e., 13 of 15, produced a lower null-subject rate in the bilingual mode than that in the monolingual mode, with within-subject deviation values ranging from 21.0% to 3.9% fewer null realisations. The two outliers, i.e., E05 and E07, display a behaviour which is opposite to the dominant trend values, rendering a higher null-subject value in the bilingual mode than in the monolingual mode but with a slight difference between the modes.

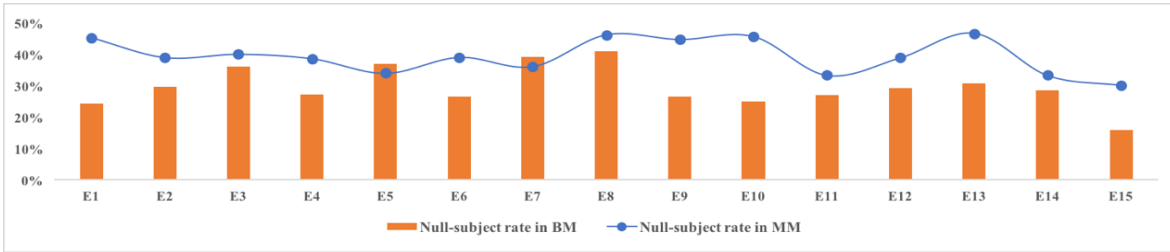
Table 5.10 shows the representatives' null-subject realisation across modes. E12 with a deviation value of -9.6% is the closest to the group's overall mean deviation of -9.8%. The maximum deviation value of -21% was generated by E01, whose null-subject rate dropped from 45.2% in the monolingual to 24.2% in the bilingual mode. As for the two outliers, E05's null-subject rate in the bilingual mode (37%) is 3.0% higher than his rate in the monolingual mode (34%). The other outlier E07, produced a similar deviation value of 3.2%, with a null-subject rate of 39.3% in the bilingual mode and 36.1% in the monolingual mode.

Table 5.10 Representatives' null-subject realisations across modes (MM vs. BM)

	Participant	MM	BM	Deviation (BM-MM)
Maximum	E01	45.2%	24.2%	-21.0%
Intermediate	E12	38.9%	29.3%	-9.6%
Outlier 1	E05	34.0%	37.0%	3.0%
Outlier 2	E07	36.1%	39.3%	3.2%

Within-group differences in null-subject realisation by each participant are further illustrated in Figure 5.7, which also shows that two out of the 15 participants did not conform to the general pattern.

Figure 5.7 Bilingual participants' percentages of null subjects in MM and BM



In the previous sections, we looked at the differences in subject realisation between the bilingual group and the Chinese control group, with a focused analysis on a range of syntactic and discourse environments. This allowed us to appreciate exactly where the bilingual differed from the monolingual participants in their null subject realization while maintaining grammaticality. In the next section, a similar analysis will be conducted to compare the bilinguals' performance across modes over the same range of syntactic and discourse contexts to check whether the kind of null subject realization patterns found between groups is replicated in within-group performance.

5.4.1 Syntactic Contexts of Subject Realisation in MM versus BM

As shown in Table 5.11, the mode effect is observed in single-clause sentences. In narrating stories in the monolingual mode, bilinguals produced a total of 497 tokens of single clauses. 36% of them are realised with a null subject. In the bilingual mode, the total number of single clauses is 392 and the null-subject rate dropped by almost ten percent to 26.3%.

Table 5.11 Bilinguals' null-subject realisations in single-clause sentences across modes (MM vs. BM)

	MM	BM
No. of clauses	497	392
Null-subject rate	36%	26.3%

The bilinguals' preference for overt subjects against null subjects is consistent across modes. There are few cases of using a null subject in contiguous clauses. In other words, although bilinguals do use null subjects, they seldom use them in chains. The use of null-subjects is

mainly associated with conjoining clauses that depict an immediate succession of actions and simultaneous states, e.g. (111-113). These sentences resemble the coordination construction in English as shown in the translation, where the first clause subject is overt and the second clause subject is encoded by a null form. Such a pattern is consistent with what has been found earlier in the comparison between monolingual and bilingual groups.

(111) 他无法跳出去, ϕ 最终寡不敌众 (E12-BM)

tā wúfǎ tiào chūqù, ϕ zuìzhōng guǎbùdǐzhòng

HE cannot jump out, ϕ (HE) finally outnumbered

“He couldn’t escape and was finally defeated.”

(112) 他没头没脑地撞到了正在休息的农民的树桩上面, ϕ 死掉了 (E01-BM)

tā méi-tóu-méi-nǎo-de zhuàng-dào-le zhèngzài xiūxi de nóngmín de shùzhuāng shàngmiàn, ϕ sǐ-diào-le

HE unintentionally bump onto resting farmer’s stump, ϕ (HE) die

“He carelessly bumped onto the stump that the farmer was lying on, and died.”

(113) 这只狼有点跟不上脚步, ϕ 觉得... (E12-BM)

zhèzhǐ láng yǒudiǎn gēn bù shàng jiǎobù, ϕ juéde ...

this WOLF slightly follow not up pace, ϕ (WOLF) feel ...

“The wolf couldn’t keep up with pace and felt that...”

However, overt subjects dominate the position of co-referential subjects in single clauses. As exemplified in (114), which contains a string of five single clauses, all of them are realised with the lexical pronoun *he*.

(114) 他拎起兔子回家了, 他把死兔子交给他的老婆, 然后第二天他又去地里, 他又去种田, 然后他发现... (E15)

tā līn qǐ tùzǐ huí jiāle, Tā bǎ sǐ tùzǐ jiāo gěi tā de lǎopó, ránhòu dì èr tiān tā yòu qù dì lǐ,

tā yòu qǔ zhòngtián, ránhòu tā fāxiàn...

HE pick up rabbit back home, HE Ba dead rabbit give to his wife, then the next day HE again go field inside, HE again go farming, then HE find ...

“He picked up the rabbit and went home. He gave the dead rabbit to his wife. The next day, he went to the land. He went there for farming. He then noticed that...”

Turning to the coordinate and adjunct subordinate sentences, i.e., linked constructions in Li and Thompson’s (1989: 631) categorization, the mode effect is observed as shown in Table 5.12. The null-subject rate dropped from 38.4% in the monolingual mode to 30.7% in the bilingual mode.

Table 5.12 Null-subject realisations in coordinate and adjunct subordinate sentences across modes (MM vs. BM)

	MM	BM
No. of single-clause sentences	198	150
Null-subject rate	38.4%	30.7%

The mode effect can also be seen by comparing the pattern of subject realisation across modes as shown in Table 5.13. The three patterns are all found in both modes, with the Both-Null pattern least used. The Both-Overt pattern, the structure shared with English is more often used in the bilingual mode than in the monolingual mode.

Table 5.13 Subject realisation patterns in coordinate and adjunct subordinate sentences across modes (MM vs. BM)

Patterns	MM	BM
Both-Overt	30 (30.3%)	32 (42.7%)
Both-Null	7 (7.1%)	3 (4%)
Either-Null	62 (62.6%)	40 (53.3%)
Total no. of sentences	99	75

In the bilingual mode, only three occurrences of the Both-Null pattern are found. Interestingly, the three cases were produced by the two outliers, i.e., E05 and E07. No such pattern of

realising subjects in linked constructions is found in the other thirteen participants. As for the Both-Overt pattern, cases are found in both coordination and adjunct-subordination sentences. Examples are given in (115-116).

(115) 他尝试了几次都没有得手, 于是他决定在晚上的时候再对那些可怜的羊们下毒手 (E01-BM)

tā chángshìle jǐ cì dōu méiyǒu déshǒu, yúshì tā juéding zài wǎnshàng de shíhòu zài duì nàxiē kělián de yángmen xià dúshǒu

HE try several time but no succeed, so HE decide in the evening to those poor sheep murder

“He had tried several times but all failed, so he decided to strike a vicious blow on the poor sheep at night.”

(116) 它想要抓只羊来吃, 但是它想到 (E15-BM)

tā xiǎngyào zhuā zhǐ yáng lái chī, dànshì tā xiǎngdào

HE want catch CL sheep to eat, but HE realise

“He wanted to catch a sheep, but he realied ...”

Table 5.14 shows the bilinguals’ use of the null subject in object embedded clauses. Despite the paucity of such type of sentences where the subject of the embedded clause co-refers with that of the matrix clause in the data, the mode effect seems to be unclear, but bilinguals also use overt subjects in embedded clauses, e.g. (117). Nevertheless, bilinguals use far more null subjects than overt subjects, e.g. (118) in this type of clause, regardless of modes.

Table 5.14 Bilingual null-subject realisations in object embedded clauses across modes (MM vs. BM)

	MM	BM
No. of clauses	16	15
Null-subject rate	75%	80%

(117) 他很高兴, 他今晚有肉吃了 (E03-BM)

tā hěn gāoxìng, tā jīnwǎn yǒu ròu chīle,
 HE very happy, HE tonight have meat eat
 “He is very happy that he has meat tonight.”

(118) 他心想, ϕ 既然昨天遇到了一只兔子 (E12-BM)

tā xīnxiǎng, ϕ jìrán zuótiān yùdào le yī zhī tùzǐ
 HE think, ϕ (HE) since yesterday meet one-CL rabbit
 “He thought that since he got a rabbit yesterday, ...”

With respect to the syntactic contexts, the mode effect is prominent in the decreased use of null subjects in both single-clause and linked-clause sentences. Bilinguals seem to be apt at sharing structures for realising subjects with English patterns. However, no mode effect is observed in embedded clauses.

5.4.2 Discourse Contexts of Subject Realisation in MM versus BM

Looking now at the discourse contexts, the mode effect is stronger in the continuity context than in the discontinuity context. Table 5.15 shows a cross-mode comparison of bilinguals’ null-subject realisations in discourse contexts. In both contexts, the null-subject rate is dropping.

Table 5.15 Bilinguals’ null-subject realisations in continuity contexts across modes (MM vs. BM)

Discourse contexts		MM	BM
Continuity Contexts	No. of clauses	458	351
	Null-subject rate	58.3%	45.7%
Discontinuity Contexts	No. of clauses	279	225
	Null-subject rate	8%	4.4%

Cross mode comparisons can be drawn from (119-122), all of which associate with continuity context, where smooth information flows without any thematic breaks. The two constituent clauses in each sentence, sequence tight-knit actions made by the same topical referent, thus

a null form can be used in the second clause. However, E01 and E12 both behaved differently by using an overt form in the bilingual mode, e.g. (119) and (121) and a null form in the monolingual mode, e.g. (120) and (122).

(119) 他不知道去哪里取来了一张羊皮披在自己的身上, 他照了照镜子 (E01-BM)

tā bù zhīdào qù nǎlǐ qǔ láile yī zhāng yángpí pī zài zìjǐ de shēnshang, tā zhàole zhào jìngzi

HE regardless of where get one sheep-skin dress up, HE have a look mirror

“He got a sheep skin from somewhere to cover his body. He had a look in the mirror.”

(120) 树上的小鸟听到了动静, ϕ 赶紧飞过来查看 (E01-MM)

shù shàng de xiǎoniǎo tīngdàole dòngjìng, ϕ gǎnjǐn fēi guòlái chákàn

tree top BIRD hear movement, ϕ (BIRD) fly to check

“The bird on the tree heard some movement and came over to have a check.”

(121) 小刘卖的菜还不错, 于是他就回家去他的地里面继续开垦, 他不停的刨自己的地 (E12-BM)

xiǎoliú màide cài háibùcuò, yúshì tā jiù huí jiā qù tā dì lǐmiàn jìxù kāikěn, tā bù tíng de páo zìjǐ dì dì

Liu sell vegetables good, so HE then go home to his land inside continue farm, HE continuously farm his land.

“Liu’s vegetables are good. He went home to grow his lands. He continued to cultivate his land.”

(122) 乌鸦飞行太久, ϕ 觉得非常口渴 (E12-MM)

wūyā fēixíng tài jiǔ, ϕ juéde fēicháng kǒu kě

BIRD fly too long, ϕ (BIRD) fell very thirsty

“The bird has been flying all the time, so he feels very thirsty.”

The mode effect is not prominent in discontinuity contexts, where minor thematic breaks exist. In such a context, the use of null subjects is scarce, with 8% in the monolingual mode and 4.4% in the bilingual mode. Recall the monolingual participants' performance offered in §5.3, where null-subject rate drops substantially from 88.1% in the continuity context to 26% in the discontinuity context. It seems that a discontinuity context disfavours null-subject use, and bilinguals' performance is consistent across modes.

5.4.3 Outliers' Performance

E05 and E07 are the two participants who behaved contrastively to the dominant trend by yielding a higher overall null-subject rate in the bilingual mode than in the monolingual mode, despite the difference being marginal. For a finer-grained qualitative analysis, null subject realisation in syntactic and discourse contexts will be examined in these two outliers. Table 5.16 shows E05's and E07's null subject realisations across the two modes. The mode effect is most obvious in discontinuity contexts. Both participants avoid using null subjects in contexts where thematic breaks exist. Although the null-subject rates in contiguous contexts also vary across modes, the difference is not substantial.

Table 5.16 Outliers' null-subject realisations across modes (MM vs. BM)

	Contexts	MM	BM
E05	Single-clause sentences	27.6%	30.8%
	Coordinate and adjunct-subordinate sentences	33.3%	28.6%
	Discourse continuity	43.3%	50%
	Discourse discontinuity	20%	0%
E07	Single-clause sentences	37.5%	36.8%
	Coordinate and adjunct-subordinate sentences	30%	62.5%
	Discourse continuity	55.6%	61.1%
	Discourse discontinuity	16.7%	0%

In syntactic contexts, the pattern for single-clause sentences is similar across modes, with the rates of null-subjects never exceeding 40%, indicating a consistent preference for overt

subjects. For adjunct subordinate sentences, both E05 and E07 behaved similarly on the ‘Either-Null’ and the ‘Both-Overt’ patterns with other bilingual participants, but they differ from the general trend on the ‘Both-Null’ pattern. E05 used one such pattern in the bilingual mode and E07 used it twice. Examples are given in (123-125).

(123) ϕ 不管怎么叫, ϕ 都叫不醒 (MM: ‘Both-Null’)

ϕ bùguǎn zěnmě jiào, ϕ dōu jiào bù xǐng

ϕ (ANT) no:matter:how shout (at BIRD), ϕ (ANT) still wake (BIRD) up

“No matter how hard the ant tried, he couldn’t wake up the bird.”

(124) 牧羊人每天都会放羊, ϕ 日出把羊放到草地上吃草, ϕ 日落再把他们赶回羊圈
(E07-BM)

*mùyáng rén měitiān dūhuì fàngyáng, ϕ rìchū bǎ yáng fàng dào cǎodìshàng chī cǎo, ϕ
rìluò zài bǎ tāmen gǎn huí yáng juàn*

FARMER everyday do herding, ϕ (FARMER) sunrise BA sheep herd to grass eat, ϕ
(FARMER) sunset again BA them herd back sheepfold

“The farmer went herding every day, herding the sheep onto the grass at sunrise and herding them back at sunset.”

(125) ϕ 看到牧羊犬在旁边虎视眈眈地盯着, ϕ 不敢下手 (E07-BM)

ϕ kàndào mùyán quǎn zài pángbiān hǔshìdāndān-de dīngzhe, ϕ bù gǎn xiàshǒu

ϕ (WOLF) see dog at side alertly staring, ϕ (WOLF) not dare take-action

“The wolf saw the dog staring closely at him, so he did not dare to take action.”

The two outliers’ performances on this type of syntactic structure seems to diverge from the general bilingual behaviour as reported in §5.3.2. The ‘Both-Null’ pattern, which is frequently observed in the monolingual Chinese data, is rarely noticed in the bilingual data. However, they both show a strong tendency towards clarity in discourse contexts.

5.4.4 Language Mode Influences Bilingual Performances

To conclude this section, the author argues for the role of the language mode on bilinguals' subject realisation. Quantitative and qualitative analyses of individual performances across modes seem to support Hypothesis 2 that bilinguals would produce fewer null subjects in a bilingual mode than in a monolingual mode. The average deviation value is -9.8% among the 15 bilingual participants. Although there are two outliers, i.e., E05 and E07 who behaved marginally against the prevailing tendency, their deviation values (3% and 3.2%) are smaller than the statistically accepted margin of 5%.

Meanwhile, the bilinguals' performances across modes seem to vary between syntactic and discourse contexts. Syntactically, the bilinguals' patterns of null-subject uses remain unchanged across modes, favouring structures that also exist in English syntax. For single-clause sentences, null-subjects are used once at a time rather than in chains, thus to some extent resembling coordinate structures in English. The rates of the use of null-subjects are low in both modes (never exceeding 40%), although the bilingual mode is usually associated with even lower values than the monolingual mode. For coordinate and adjunct-subordinate sentences, null-subject uses in both modes are mostly in the 'Either-Null' and the 'Both-Overt' patterns. However, more occurrences in the 'Both-Overt' pattern were found in the bilingual mode than in the monolingual mode.

From a discourse point of view, the bilinguals' preference for overt subjects are most evident in discontinuity contexts. They almost avoided the use of null subjects in such contexts when they were in the bilingual mode. Most bilingual participants show reluctance to use null subjects in discontinuity contexts in the bilingual mode. Such reluctance remains consistent even for those two outliers. Contrary to a strong reluctance to use null-subjects in discontinuity contexts, the use of null-subjects is quite infrequent in continuity contexts. Nevertheless, recall that the monolingual participants in the Chinese control group had an average of 88.2% null-subject rate in the continuity contexts, and the bilinguals' behaviour indicates that their reliance on null forms is less frequent than monolinguals.

With respect to cross-linguistic influence, it is rare for studies to report the mode that bilingual participants are in. Grosjean (2001) has been proposing for years that there are two kinds of cross-linguistic influence, i.e., a static one reflecting permanent impact, such as ‘foreign accents’ in L2 usage. The other was termed as performance influence, which is momentary due to processing effects. The author assumes that features of L1 performance observed in the monolingual mode reflect a somewhat long-term influence, while those observed in the bilingual mode are associated with both permanent and temporary effects. Bilingual participants in this study exhibit a constant L2 influence in subject realisation, as in both modes they hardly used continuing null subjects, which is typical in the monolingual data. Hence, although they still used null-subjects, the structure converges towards such an English construction. The avoidance for null-subjects and the preference for overt subjects, no matter if due to L2 influence or bilingual effect, are therefore regarded as a constant change rather than a transient one.

On the other hand, deviations across modes are statistically significant. Syntactically, bilinguals tend to have even fewer cases of null-subjects. They had more uses of the ‘Both-Overt’ pattern in realising adjunct-subordinate constructions, these differences might be attributable to an easier retrieval of overt forms than null forms as in the bilingual mode, both languages are active. With respect to discourse contexts, bilinguals almost rejected null-subjects in discontinuity contexts, i.e., when the description of the topical subject was interrupted by the introduction of other information, bilinguals tend to use overt forms to code a co-referential subject. This can also be interpreted as a trade-off of cognitive resources. The introduction of unexpected information costs extra cognitive resources, thus the speaker resorts to overt subject forms, which in usage do not need distinguishing efforts.

The current study responds to the Grosjean’s proposal of controlling the language mode while testing bilingual behaviours and confirms the effect of the language mode, which plays a role in shaping bilingual performance. Since the co-activation of the two languages is non-selective (Hartsuiker and Pickering, 2007), cross-linguistic priming might increase the

possibility of using overt subjects. Once a structure is produced in one language, similar structures in the other language will be activated to some extent. Before narrating the story, if the participants use English to interact with the research assistant, their activation of overt subjects in English will make the overt forms more accessible in Chinese. Bilingual participants used more overt subjects in Chinese narration tasks after they had used English to perform spoken tasks. The within participant analysis between BM and MM seems to suggest that bilinguals' performance in the target language is subject to the co-activation level of the non-target language. It is in this regard that we need to consider the specific language environment, i.e., language use context, which the bilingual speaker is in when studying bilingual utterances.

5.5 Summary

In the above sections, we compared the bilinguals' performance on subject realisation to that of their monolingual peers and in different language use contexts, i.e., the monolingual mode versus the bilingual mode. By analysing their use of overt subjects versus null subjects in various syntactic and discourse contexts, the current study suggests that Chinese-English bilinguals' subject realisation in their L1 Chinese differs from that of their monolingual peers. In response to Research Question 3, bilingual speakers' subject realisation in their L1 Chinese, exhibits changes of a quantitative nature under the influence of their obligatory subject L2 (English) in a range of syntactic and discourse contexts. They are more willing to use overt subjects that also conform to English syntactic rules, against null subjects that are favoured by their monolingual counterparts. This result indicates that cross-linguistic influence can also occur from the other direction, i.e., L2 to L1. Further, the mode effect is identified in both syntactic and discourse contexts, the study also confirms Grosjean's (1998) proposal of language mode effects on bilingual performance. Regarding Research Question 4, bilingual speakers' subject realisation in their L1 Chinese remains within the confines of grammaticality and discourse-pragmatic appropriateness, regardless of language mode.

Together, the findings support Cook's (1992, 2003, 2016) Multi-competence perspective of

looking at bilingual behaviours in that the two languages in the same mind are constantly interacting with each other. Cross-linguistic influence, therefore should be bidirectional rather than unidirectional. The bilinguals' behaviour is thus different from monolingual speakers both in their L2 and L1. Meanwhile, since the interaction of the two languages is dynamic, cross-linguistic influence is also subject to other constraints such as in a language use context. A stronger influence might be detected more when the two languages are both highly activated than when only one language is predominantly activated. The bilingual seems to have developed a processing strategy that economizes the cognitive efforts to be communication effective in both of their languages. In the next chapter, the conclusion will be made on how the findings of the current research contribute to the understanding of the Multi-competence perspective for studying bilinguals.

Chapter 6 Conclusion

This final chapter will present the outcomes of the investigation particularly in response to the proposed research questions and hypotheses. It will then discuss the significance and implications of the present study and conclude with its limitations and some suggestions for further research.

6.1 Major Findings

This study investigated the bilinguals' performance on subject realisation in their L1. The primary purpose was to identify possible changes in the L1 of bilinguals in their own L1 environment under the influence of a frequently used L2. It also manipulated the linguistic context where bilingual behaviours were being examined with an aim of attesting the effect of language mode on the bilingual performance. Fifteen advanced L2-English learners of L1-Chinese participated in the study. Oral narratives elicited by cartoon-film tasks were presented to these bilinguals in two sessions. The first session was in the context of a monolingual mode whereas the second session was in the context of a bilingual mode. The bilinguals' performances from the first session were compared to that of fifteen Chinese monolingual controls for the observation of group difference. Also, a further control group of two English monolingual natives was recruited to generate a baseline for subject realisation in English. This allowed the measurement of the difference between native speakers and bilinguals' subject realisation. Bilingual performance across sessions was also tested for the language mode. Quantitative and qualitative analyses were conducted on the collected data.

Empirical results show that while performing the same tasks, bilingual participants in the experimental group produced significantly fewer null subjects than their monolingual counterparts in the control group. This pattern is consistent across subjects and across tasks. On average, the bilinguals' null-subject rate (39.3%) is significantly lower than that of the monolinguals (63.4%). This resolves the first research question in the positive. The first major

finding strongly supports the hypothesis that the bilinguals' spoken production would have a lower percentage of null forms in realising co-referential subjects in their L1-Chinese compared to that of their monolingual peers. It seems that the frequent use of English, the second language of the bilingual participants, that requires obligatory subjects, has an impact on their choice in coding co-referential subjects in Chinese, their first language, where null subjects prevail in the resolution of anaphoric relations, as shown by the rate of null subjects produced by the functionally monolingual control group.

The second major finding, which responds to the second research question, robustly supports the hypothesis that the bilinguals' spoken production would yield fewer null subjects in the bilingual mode than in the monolingual mode. In fact, the average null-subject value drops further, by almost 10 percentage points, from 39.3% in the monolingual mode to 29.4% in the bilingual mode. The mode difference is syntactically observable particularly in single-clause chains and linked construction sentences but not in object embedded clauses. With respect to discourse contexts, the mode effect is more observable in continuity contexts than discontinuity contexts. Such findings offer empirical support for Grosjean's (1998) claim that the language mode is a confounding variable that constrains bilingual behaviour. In the case of the present experiment, when participants are speaking L1 in a bilingual mode, that is in a context where the non-target language L2 is substantially activated, the influence of the L2 is even stronger than in the monolingual mode, suggesting that a lesser effort is exerted in the suppression of the L2 in this mode than in the monolingual mode.

The third research question enquired about the distributional properties of subject realisation. Upon the analysis of all the available data for the distributional property of subjects in three types of syntactic environments and two types of discourse contexts, the third major finding is that the bilinguals' preference for overt subjects is found to follow a consistent pattern. In single-clause and linked construction sentences, bilinguals produced many overt subjects in contiguous clauses but hardly any use of null subjects in contiguous clauses. Their use of null subjects in contiguous clauses resembles the patterns found in English coordination construction. In discourse continuity contexts, where the monolingual Chinese controls

yielded an average null-subject percentage as high as 88.2%, bilinguals, on the other hand, realised many cases of overt subjects, with a null-subject group rate of 58.4%. In discontinuity contexts, where there may be a higher risk of ambiguity or uncertainty about the referent, the bilinguals' null-subject rate drops to their lowest group rate of 8% as against the monolinguals' 26.4%, showing an overwhelming reliance on overt subjects in discontinuous contexts. Bilinguals appear to prefer the syntactic structure shared with English in subject realisation thus assigning greater value to clarity than efficiency in communication.

The fourth major finding answers the fourth research question: the bilinguals' subject realisation remains within the confines of grammaticality and discourse-pragmatic appropriateness despite the considerable differences in their preferences from the monolingual baseline. There was not a single example of ungrammaticality or discourse-pragmatic infelicity in the database.

6.2 Other Findings

In addition to these major findings, it must be noticed that all the monolingual speakers in this study manifest differences in subject realisation among themselves, i.e., their performance may be plotted over a range of null-subject frequencies. However, even the lowest percentage of null subjects in the monolingual group is higher than the highest percentage in the bilingual group. Similarly, the two monolingual English controls also differ in their null subject frequencies but they are considerably lower than the lowest percentage of bilinguals in the experimental group. Such findings testify to the complex nature of subject realisation since producing a subject in spontaneous speech concerns syntactic rules on the one hand and discourse-pragmatic considerations in the communication context on the other hand. However, although the choice of subject forms is patently subject to individual preferences, participants in the current study exhibit substantial within-group similarities and cross-group differences in their reliance on null forms for co-referential subjects. Based on

the quantitative results obtained in the experiment, a null-subject realisation continuum was drawn in the final section of Chapter 4 and is repeated here for the reader's convenience:

11.5% English Monolinguals

< 29.4% Chinese/English bilinguals in the bilingual mode

< 39.3% Chinese/English bilinguals in the monolingual mode

< 63.4% Chinese monolinguals

The above continuum shows that the bilinguals' null-subject rate is significantly lower than that of Chinese monolinguals but substantially higher than English monolinguals. It also reveals that the rate slides a little closer to the English monolingual end when bilinguals are performing in a bilingual mode. Nevertheless, the maximal differential between any two points in the continuum remains that between monolinguals and bilinguals performing the same task (24.1%).

6.3 Significance and Implications

Findings from the present study support the application of a Multi-competence perspective (Cook, 1992; 2003; 2012; 2016) in the study of bilingual behaviour. Firstly, cross-linguistic influence can occur in either direction, i.e., not only can L1 influence L2 but also vice versa. Bilingual participants in this study exhibit significant differences in the realisation of subjects in their L1 compared with their monolingual counterparts. Such differences are reflected by their increased use of overt subjects and decreased use of null subjects, without producing grammatical errors. This contributes evidence to Cook's (2003) understanding of the inter-relationships that are obtained between the bilingual's two languages. The bilingual's languages do not work independently from each other: the use of one language impacts on the management of the other and vice versa. Since overt co-referential subjects belong to a shared and highly frequent clause structure by Chinese and English (the L1 and L2 respectively of the bilinguals in the current study), whereas null subjects are only accepted in Chinese, the bilinguals' preference for the overt subject over null subjects in their L1

narratives can primarily be interpreted as cross-linguistic influence exerted by the second language on the use of the first.

Secondly, the influence of the L2 on the L1 also exists in an L1-dominant environment. For advanced Chinese-speaking learners of L2 English in the present study, their L1 Chinese is still the dominant language with frequent and functional use. This type of L2 influence is distinct from that identified on an emigrant population in an L2-dominant environment. It offers insights, with empirical support, to the claim that an L2 influence on L1 is not confined to bilinguals in L2-dominant environments. This points to the need for bilingualism theory to address changes in the L1 within the L1 environment. Such studies should include the mass population of L2 users in L1 dominant environments.

Thirdly, cross-linguistic influences can be neutral in effect and do not necessarily result in interference or mistakes. L2 effects are sometimes not easy to notice. The consequence of the dynamic interaction between a bilinguals' two languages might be evident implicitly rather than explicitly with preference for or avoidance of certain structures. The bilingual speakers' L1 performance in the present study adds empirical evidence to Cook's (2012) claim of viewing bilinguals as distinctive and competent language users other than merely imitators of monolingual speakers of either language, such as illustrated by his analogy of "not comparing an apple with a pear".

Fourthly, the existence of two languages in the same individual mind has some effect on bilingual processing. Bilingual language production concerns the issue of language co-activation as well as the consumption of cognitive resources in non-target language inhibition (Green and Abutalebi, 2013). Bilinguals in this study seem to have developed a processing strategy which assists their needs for frequent shifts between their two languages. The preference for overt subjects over null subjects to some extent reflects a strategy of economizing on cognitive effort, as the former is a shared structure between their two languages and the latter is not. This further supports a Multi-competence characterization of the bilingual mind: a bilingual's multi-competence concerns the whole mind of the bilingual

user, not just language, but also wider cognitive processes. The bilingual's multi-competence can be demonstrated in their ability to coordinate their two languages and orchestrate their cognitive resources to the needs of various communication contexts.

Fifthly, both L2 effects and bilingual mode effects show up in varying degrees, as the inter-relationship between the two languages in the same mind is dynamic and constantly changing. The study applied a methodology that set up two different contexts for language use while eliciting utterances, each context corresponding to a different co-activation status. Results show that when both languages are highly activated, i.e., within a bilingual mode, L1 behaviour is more affected by L2 influence and bilingual effects than when co-activation is lower, i.e., only one language is highly activated. The effect of the language mode (Grosjean, 1998) on bilingual behaviour is plausibly attested and it underscores the significance of controlling the language mode in the study of bilingual production.

Beyond its support from the multi-competence perspective, changes in the L1 offer a glimpse of language evolution with potential historical and societal implications. Despite their synchronic nature, findings from this study signal the possibility of diachronic changes that might be occurring in Chinese under the influence of English at least among the growing population of L2-English learners. Subject realisation in their L1-Chinese seems to edge towards the English monolingual end. It appears possible to predict that increasing exposure and active use of English in the Chinese society might induce, over time, some changes in the Chinese language itself.

6.4 Limitations

The most obvious limitation in this research is its relatively small sample size. The number of participants in the experimental group is fifteen. With a larger sample size, including bilinguals with different L2 proficiency levels, the behavioural differences exhibited by bilinguals may have emerged over a wider spectrum. The limited size did manage to highlight, however, the bilinguals' distinctiveness in L1 subject realisation compared to their

monolingual counterparts. Further studies can recruit more participants with subgroups corresponding to L2 proficiency levels, to see when and whether L2 effects, bilingual effects, as well as language mode effects can be observed on bilinguals at different levels of L2 proficiency.

The study was also limited by the nature of the tasks used to elicit narratives to compare bilingual performances across language modes. The cartoon films used differ in content across modes, thus they may generate an unequal number of targeted structures, i.e., co-referential subjects. This might lead to difficulties in ensuring statistical accuracy. Nonetheless, findings are assumed to be valid since the distributional analysis of syntactic and discourse-pragmatic contexts corroborated the results. It is reasonable to suggest that further research could apply the same, or similar, cartoon films in elicitation across two sessions, but be conducted with longer breaks to rule out possible priming effects.

Finally, it would also be interesting to ascertain whether a mirror-image of this study would find a complementary pattern of subject realisation in English L1 speakers who are advanced speakers of Chinese L2 and use Chinese regularly in their English-speaking environment.

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Appendix A Questionnaires for Recruiting the Participants

Chinese-English Bilingual Speakers

1. Name: _____
2. Age: _____
3. Gender: _____
4. First language: _____
5. Do you speak any dialect?
-Yes. Please specify it here: _____ (e.g., Cantonese, mainly at home)
-No.
6. Second language(s): _____
-Please list all the second languages that you can speak and put the self-rate your proficiency (e.g., English-6; Japanese-3). The score is given according to the following scale:

No knowledge											Native speaker level
0	1	2	3	4	5	6	7	8	9	10	
7. IELTS test score: _____
8. Language(s) spoken at home/dormitory: _____
9. Language(s) spoken at study/work: _____
10. At what age did you start learning English? _____
11. How many hours are you exposed to use or actively use English on average per day (including reading, writing, listening, attending classes, watching videos, surfing internet, and chatting, etc.)?
_____ (e.g., approximately 2 hours a day)
12. Do you have any experience living in a foreign country for more than a month?
-Yes. (How long: _____ months)
-No.
13. Which language do you use most on a daily basis?

-Chinese (Mandarin)

-Chinese (Dialect rather than Mandarin)

-English

-Others

14. Which language do you prefer to use when talking to someone fluent in both Chinese and English?

-Chinese

-English

-mainly Chinese with some English

-mainly English with some Chinese

15. Other things you want to mention concerning your language use behavior:

Today's Date: _____

Functional Monolingual Chinese Speakers

1. 姓名 Name: _____

2. 年龄 Age: _____

3. 性别 Gender: _____

4. 母语 First language: _____

5. 如果有使用方言，请注明使用频率和场合（例如：广东话，很少使用）

If you do speak a dialect, please specify the frequency and context of dialect use. (e.g., Cantonese, rarely used, mainly back in hometown)

- _____

-不使用方言 No.

6. 外语 Second language: _____（例如：英语-2; e.g., English-2）

-请注明你的自我评价外语水平，评价标准参考 0-10 数值范围

Please put the self-rating score of proficiency. The score is given according to the following scale:

完全不会 No knowledge 母语水平 Native speaker level

0 1 2 3 4 5 6 7 8 9 10

7. 在家时使用的语言 Language(s) spoken at home: _____

8. 工作时使用的语言 Language(s) spoken at work: _____

9. 从几岁开始学习外语? At what age did you start learning the L2?

10. 最近一次使用外语进行交流是何时何地? (例如用外语进行对话或写作)

Last time and occasion of active use of the L2? (e.g., Producing a complete sentence in communication in chatting or writing)

11. 近两年来主动使用外语或被动接触到外语的时间?

How many hours in total are you exposed to the L2 in the past two years?

_____小时 hours.

12. 是否能使用外语进行有效交流? Can you use the L2 in communication?

-可以 Yes, I can.

-不可以 No, I can't.

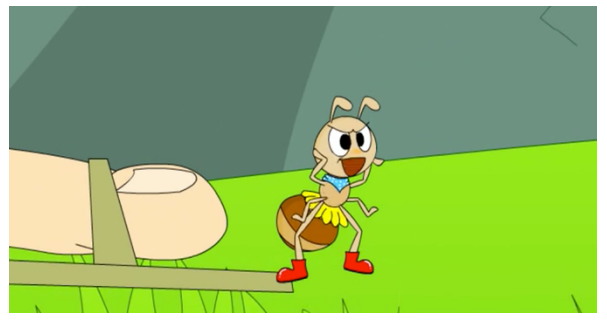
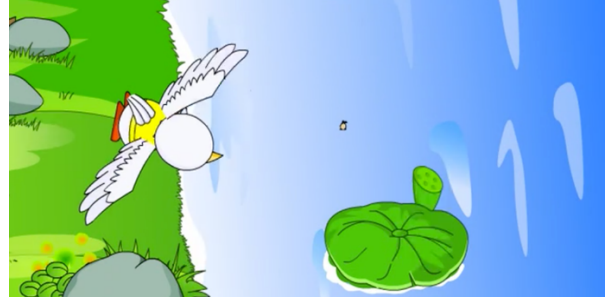
13. 个人语言使用情况的补充说明 Other things you want to mention concerning your language use behavior:

填表日期 Today's Date: _____

Appendix B Cartoon Films

Cartoon film 1 *the Ant Story* can be viewed online at (it can be played mute):

https://www.iqiyi.com/v_19rrfwlb50.html



Cartoon film 2 *the Bird Story* can be viewed online at (it can be played mute):

https://www.iqiyi.com/v_19rrgfx5z8.html



Cartoon film 3 *the Wolf Story* can be viewed online at (it can be played mute):

https://www.iqiyi.com/v_19rrgxne3c.html



Cartoon film 4 *the Farmer Story* can be viewed online at (it can be played mute):

https://www.iqiyi.com/v_19rrg9n43c.html



Appendix C Topics Used in the Chat before Monolingual Mode Tasks

The following topics are used by the Interlocutor CH to chat with the participants in Chinese before conducting film-retelling tasks.

1. 最近有看过什么好看的电影吗?

Have you seen any good movies recently?

2. 在你认识的人中, 有谁让你特别佩服?

Among the people you know, who do you particularly admire?

3. 有没有什么旅行经历让你现在依然印象深刻?

Have you had any travel experience that still impresses you?

4. 如果推荐一本小说, 你会推荐哪本?

If you were asked to recommend a novel, which one would it be?

5. 你在压力大的时候会用什么方式来进行放松?

In what ways do you relax when you are stressed?

6. 对于人工智能有什么样的看法?有没有听说过人工智能的负面影响?

What do you think about artificial intelligence? Have you heard of any negative effects of artificial intelligence?

7. 最想见到的历史人物是哪一位?如果见到会问什么样的问题?

Which historical figure do you most want to meet? What kind of questions would you ask if you met him/her?

8. 有没有做过让自己特别骄傲或自豪的事情?

Have you done anything that makes you particularly proud of yourself?

9. 怎么看待直播销售?有没有哪位主播的产品是你经常购买的?

How do you think about live sales? Are there any media or online hosts that have often led you to place orders to buy?

10. 在网上买得最多的东西是什么?为什么?

What is your most purchased item online? Why?

Appendix D Topics Used in the Chat before Bilingual Mode Tasks

The following topics are used by the Interlocutor CH and the Interlocutor EN to chat with bilingual participants in either Chinese or English before conducting film-retelling tasks in the bilingual language use context.

1. Who is your favourite person in the history book? Why do you like him/her? (EN)

2. 朋友里面你最佩服的人是谁? 为什么? (CH)

Among the people you know, who do you admire most? Why?

3. What is the most unexpected thing about college life? (EN)

4. 有没有去现场观看过体育竞技赛事, 和在电视机前观看有和不同? (CH)

Have you ever watched a sports event in person? Is it different from watching it in front of the TV?

5. What are your thoughts on environmental protection and what measures have you taken? (EN)

6. 对无人驾驶汽车的态度如何? (CH)

What is your attitude towards driverless cars?

7. Do you care about fashion? Is there any particular style you prefer? (EN)

8. 有什么遗憾的事情吗? (CH)

What do you regret most?

9. Have you ever experienced culture shock when hanging out with people from other countries? (EN)

10. 如果有机会去国外生活一年, 哪个城市是你最向往的, 为什么? (CH)

If you had the opportunity to live abroad for one year, which city would be the most desirable to you and why?

Appendix E Passages Used in the Simulation of a Bilingual Mode

Passage 1. Smoking Facts and Figures (before playing *the Wolf Story*)

Many people, including doctors, parents, teachers, and others, are concerned about the health risks of cigarette smoking. According to the latest statistics, active smoking kills 400,000 smokers in the United States each year, and secondhand smoke kills 50,000 nonsmokers in the United States each year. Equally disturbing is the fact that 80% of smokers have their first cigarette before they are 18 years old.

Before trying to solve the health problems related to cigarette smoking, an important question to ask is why people start smoking to begin with. Some factors involved in beginning to smoke are environmental. For example, family history influences whether or not a child becomes a smoker.

When parents smoke, they model smoking behaviour, and children often copy what they see their parents do. Many people, especially young people, have their first cigarette because of peer pressure. They want to be accepted in their social group, and if smoking is part of the group's activities, young people will begin to smoke in order to be accepted into the group.

Personal factors also affect whether a person will begin to smoke. People with tendencies toward risk-taking behaviour are more likely to start smoking than people who tend not to take risks. Outgoing people are also more likely to become smokers than shy people are. People also take up smoking to alleviate stress, or to help themselves lose weight. Finally, people, especially young people, begin to smoke because they believe smoking makes them appear mature, self-confident, and independent.

When we understand the reasons why people become smokers, we can help smokers become nonsmokers again. We can also help nonsmokers remain lifetime nonsmokers.

Passage 2. The History of Money (before playing *the Farmer Story*)

Today, our currency is a mixture of coins and paper money, but it wasn't always that way. Before metal coins and paper bills existed, people used a lot of unusual things to buy what they needed. In one part of the world, for example, people used sharks' teeth for money. In some places, brightly colored feathers and rare seashells were money.

No one knows for sure when people started using metal coins for money. Archaeologists have found coins dating from 600 B.C., so we know they have been around for a long time. At first, people used precious metals, such as gold and silver, to make coins.

In the 1200s, people in China used iron coins for their currency. These coins weren't worth very much, so people had to use a lot of them to make their purchases. Because it was inconvenient to carry around a large number of heavy iron coins, the government started printing paper receipts. People took these receipts to banks and traded them in for coins. This is the first example we have of paper money.

Today, most countries use a mixture of coins and paper bills for their currency. In the United States, the paper bills are all the same size and colour. For example, the one-dollar bill is the same size and colour as the one-hundred-dollar bill. In many other countries, the bills come in various sizes and colours. The smaller sized bills are worth less money. This makes it easier for people to tell the value of their money at a glance.