

**Early Stages of Adult L2 Acquisition of Mandarin:
An Organic Grammar Approach**

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A thesis presented to

the School of English Literature, Language and Linguistics

in partial fulfilment of the requirements for the degree of

Doctor of Philosophy

at

Newcastle University

October 2017

To the Lord Jesus Christ

ABSTRACT

There has been debate over whether the theory of Organic Grammar (OG) (Vainikka and Young-Scholten 1994, 1996a and 2011) can predict L2 development in languages other than European ones. Specifically, OG argues that second-language learners move from an initial bare VP stage to intermediate IP-level stages to a final CP stage, regardless of their L1 or L2 status. Moreover, the order of acquisition of the relevant elements is the result of the interaction between Universal Grammar and the target language input. Counter-arguments have been found in Schwartz and Sprouse (1994, 1996), Epstein, Flynn and Martohardjono (1996), Haznedar (1997, 2003), Lardiere (1998, 2008) etc. with discussion focused on L1 functional transfer and the stage-like development of functional projections.

This thesis investigates the extent to which the theory of OG can explain aspects of Mandarin Chinese acquisition by native English-speakers. Extending existing proposals, I hypothesise a clausal structure model for Mandarin, which includes the functional projections $AspP_l$, BaP , $BeiP$, $AspP_m$, $NegP$, $AspP_h$, headed respectively by *le/guo/zhe*, *ba*, *bei*, *zai*, *bu/mei* and *le_h* respectively. Based on OG, L2 Mandarin learners are predicted to start with a bare VP and demonstrate word order consistent with their first language, and to develop over time in the following functional sequence: $AspP_l > BaP$ [lower IP stage] $> BeiP > AspP_m > NegP_h > AspP_h$ [upper IP stage] based on access to UG and the input. Oral production and grammaticality judgement data were collected through administering repeated multi-task tests to eight instructed English-speaking learners of Mandarin during their first and their second years of university study between October 2014 and June 2015. Emergence and accuracy criteria were used to analyse the production data, while the grammaticality judgement data were analysed through the repeated measures of the SPSS General Linear Model.

The thesis presents three main findings. Firstly, when the word order in the verb phrase is different in English and Mandarin, the learners in this study use the order similar to their L1 English, thereby indicating the learners' transfer of their L1 word order. Secondly, there was largely a distinctive stage-like development based on hypothesised hierarchical functional projection structure; nonetheless, variability was also found in the development of individual learners. Thirdly, the acquisition results could be attributed to a great extent to the interaction between Universal Grammar and target language input; although the role of cognitive factors like memorisation should not be ignored. Overall, the results revealed the predicted stages; thereby supporting OG's explanatory value by extending it to the analysis of L2 Mandarin.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank the Lord Jesus Christ for his everlasting faithfulness and love, grace and provision over the past four years. Had it not been for his compassion and blessings, there would have never been the completion of the present thesis.

Next, it is a great delight and privilege to give thanks to those, without whose generous guidance, support and encouragement, the thesis would not have been so desirable as it is now. My heartfelt thanks go to my supervisors, Professor Martha Young-Scholten and Dr William van de Wurff, for their expertise and inspiration, encouragement and patience in facilitating me to build up my inventory of knowledge and training me to be a scholar. I thank Professor Martha particularly for her profound understanding of the nature of PhD study and great insight into the disentanglement of the issues in my doctoral research. I thank Dr William for leading and guiding me in every aspect of the study, never avoiding even the most exquisite details: how to operationalise basic concepts in syntax, how to write precisely and concisely, how to make effective presentations at international conferences. The present thesis is owed to their joint supervision with professionalism, knowing when to let me explore independently and when to steer me back on track. I sincerely cannot thank them enough for the guidance, which has smoothly and skilfully led me to the level of academic work required for a doctoral degree and also secured my abundant scholarly harvest at Newcastle University within a 4-year-long PhD journey.

The successful PhD journey cannot leave many other names unmentioned. One of them is Professor Anne Vainikka, to whom I will be forever profoundly indebted for her resourcefulness, patience, and forever-encouraging remarks throughout our correspondences and Skype meetings over the past four years. A single memory of her fills my heart with sweetness and gratitude.

Another person to whom I owe great thanks is Professor Anders Holmberg, whose syntax modules and the reading group have enlightened my understanding of the generative syntax, and whose expertise, kindness and patience indeed revealed themselves when he listened to any of the generative syntax questions my colleagues, and I raised. The answers have always been straightforward, insightful and constructive.

I also thank honourable Professor C.-T. James Huang and Professor Rint Sybesma for their discussion of certain aspects of the Chinese linguistics. In the same vein, I thank my colleagues

Basharyer Alotaibi and Marwan Jarrah for the discussion of formal syntactic issues, Hadi Alsamdani for his suggestions on the format of the thesis, Dr Simon Kometa for his steadfast support on the SPSS analysis. All issues remain to be mine. Thanks also go to my colleagues in the Syntax Reading Group and my basement buddies, Callum Hackett, Ekhlas Mohsin, Enas Filimban, Man Li, Ourooba Shetewi, Qi Wang, Rebecca Musa, Xiangjie Cao, Xinliang Jiang and Rui Zhang for their sharing of happiness and sorrows, encouragement, friendship or/and teamwork in different projects.

My sincere thanks also go to Reverend Catherine Lark, Pastor Sam Wong, Dr Jing Chen, Dr Yingxin, Mr Jianhong Chen, Mrs Philip Kitcher and Mrs. Hilary Kitcher, Mrs Judie Davis, Mrs Felicity Davis and our close brothers and sisters in Jesmond Parish Church, for their love and support when I experienced the most challenging part of my life.

I also wish to thank the School of English Literature, Language and Linguistics and the Faculty of Humanities and Social Sciences, Newcastle University for a wide range of generous financial support I have received during the PhD study, which included the Postgraduate Innovation Fund, Research Support Fund, Writing-up Fund and international conference grants. Directly or indirectly, they have nourished the different aspects of this doctoral research.

My thankfulness also go to my annual progress review panel and teachers whose modules that I have attended: Professor Maggie Tallerman, Dr Danielle Turton, Dr SJ Hannahs, Dr Geoffrey Poole, Dr Joel Wallenberg, Dr Hieker Pitchler, Professor Karen Corrigan and Dr Cristina Dye. They are the sources of inspirations and have helped me to gain a better understanding of the nature of language and the approaches applicable to a scientific study of linguistic issues.

I must also thank Daniel Bell and Harold Thampoe, my faithful friends in Christ, who have prayed for me since the summer of 2016. Their unwavering encouragement has made the PhD journey enjoyable.

The next group to be thanked are my participants, Alice, Beth, Charles, Daisy, Emily, Fiona, Grace and Harry (pseudonyms), sincerely for their commitment and dedication to the nine-month-long data collection period. Without their devotion and generous contributions, the present thesis would have been a daydream.

I thank my late Father, Mr Hongqi Chen, my beloved Mother, Mrs Zeyu Liu and my sister, Xiaoyan, and my other brothers and sisters for their love and support, which never reduce with the passage of time.

Last but not least, I share my harvest of joy particularly with Sumu and Ziya for their never-wavering belief in my capacity in completing the present work even in the toughest time. Thank you, Sumu and Ziya, for going through with me all the hardships of life with deep love, extraordinary patience and steadfast emotional support over the last few years, which have greatly inspired and encouraged me in the pursuit and fulfilment of the doctoral dream.

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LIST OF ABBREVIATIONS

AH	Aspect Hypothesis
AspP	Aspect Phrase
AspP _h	High Aspect Phrase
AspP _l	Low Aspect Phrase
AspP _m	Middle Aspect Phrase
BaP	<i>Ba</i> Phrase
BeiP	<i>Bei</i> Phrase
CL	Classifier
DP	Determiner Phrase
DUR	Durative
FP	Finite Phrase
FT/FA	Full Transfer/Full Access Hypothesis
GB Theory	Government and Binding Theory
LF	Logical Form
<i>le_h</i>	High <i>le</i>
<i>le_l</i>	Low <i>le</i>
L1	First language
L2	Second Language
MSBA	Modulated Structure Building Approach
NegP	Negation Phrase
NP	Noun Phrase
OG	Organic Grammar
PF	Phonetic Form
PFV	Perfective
PRG	Progressive
PT	Processability Theory
SLA	Second Language Acquisition
TP	Tense Phrase
UG	Universal Grammar
VP	Verb Phrase
vP	little <i>v</i> Phrase

CHAPTER 1 INTRODUCTION

1.1 Introductory Remarks

While the literature contains extensive discussion of functional projections and their acquisition sequences in Generative Grammar, their nature and acquisition status remain unclear cross-linguistically in both theoretical and empirical terms. A very limited number of studies (Vainikka and Young-Scholten 1994, 1996a, 2011; Mobaraki 2007, etc.) have been conducted on the second-language acquisition of functional projections of Germanic languages like German and English from the position taken by Organic Grammar (OG) (Vainikka and Young-Scholten 1994, 1996a, 2011). Therefore, it remains unclear whether the stage-like development of functional projections found in those studies is applicable to languages with typological differences, for instance, Mandarin. The present thesis reports on an empirical study of adult English speakers' acquisition of Mandarin functional projections to explore whether their acquisition of functional projection sequences follows the developmental pattern based on OG (Vainikka and Young-Scholten 2011). It will also shed some light on the stances of Full Transfer/ Full Access Hypothesis (Schwartz and Sprouse 1993/1994, 1994, 1996) and the Modulated Structure Building Approach (Hawkins 2001). This chapter provides an overview of the context that motivates the current thesis and outlines the scope and structure in which the thesis is to be presented.

1.2 Setting the Scene

1.2.1 The design of language from the perspective of Generative Grammar

Following the standard views of traditional grammar, early work in Generative Grammar, Chomsky (1965) recognises that the phrases of a sentence are hierarchical, and that grammatical relations exist among the items or their heads, and that sentences can be categorised into different systematic grammatical constructions with some being more basic than others (Chomsky 1995). As it is argued that the input into children's language acquisition does not provide full information on what children come to know, that is, there is a poverty – of- stimulus issue in language acquisition (Chomsky 1980), the early works initiate the hypothesis of a species-specific device, which involves an endowed knowledge referred to as Universal Grammar (UG). Thus, language acquisition is a natural consequence of the interaction between UG and the primary linguistic data to which children are exposed (Chomsky 1986).

Over the past five decades, the contents of UG have been stated in numerous ways (Cinque 1999, 2013; Ernst 1995, 2002, 2004, 2007, etc.). Initially, UG was captured through base-rewrite rules together with transformations (Chomsky 1965), later through universal principles and parameters (Chomsky 1981b, 1993), subsequently, features of functional categories and currently the computational operations.

Most research in Generative Grammar, including those on L1 and L2 acquisition, has been conducted within the Principles-and-Parameters framework, where categories and principles are thought to be universal, i.e. innately endowed, while variation is attributed to parametric differences across languages. Under the framework of Principles and Parameters, the properties of UG and the nature of the variation found across languages are accounted for in a wide range of ways. One of these is Cinque's (1999, 2004, 2013) influential proposal of functional universality, i.e. a cartographic system of functional projections as UG. According to Cinque, a universal hierarchy exists across all languages, and it consists of up to 40 functional projections with each headed by a functional morpheme. Moreover, the relative position of the functional projections is rigid, lacking cross-linguistic variation. For instance, one hierarchical sequence is AspP>TP>MoodP. It contains the functional notions of Mood, Tense and Aspect and is fixed and shared cross-linguistically (Cinque 1999). Furthermore, Cinque argues that each sentence in a language has a structure containing the entire default hierarchy of functional projections of all languages, irrespective of whether the corresponding head or specifier is morphologically realised.

Moreover, Cinque (1999, 2013) claims universal AdvP sequences as an extension of UG. He contends that previous studies have underestimated the grammatical role of adverbs: rather than being captured as adjuncts, adverbs should be integrated into clause structure. Therefore, he formulates independent AdvP functional projections, where an adverb is posited in the specifier position, while the head of the AdvP is empty. Cinque's motivation for proposing this cartographic model of AdvPs is based on three observations: (1) there are only limited number and types of AdvPs; (2) the relative order of AdvPs is primarily fixed across languages; (3) the types, number, and relative order of AdvPs strikingly resemble those of functional morphemes, which are conceived of as head of functional projections. Therefore, variation is a matter for which categories are phonologically realised.

Cinque's approach to the structural hierarchy is a syntactic one, where the relative order of functional projections is interpreted to be a "property of the computational component of UG"

(Cinque 1999: 141). In other words, the sequence of functional projections is generated by the insertion of functional heads via UG. Thus, UG imposes universality on clause structure, even when some functional heads are not realised morphologically.

Cinque's claim of universality has encountered opposition (Ernst 2004, 2007; Ramchand and Svenonius 2014; Chomsky, Gallego and Ott 2017). The most detailed criticism has come from Ernst (2004, 2007). Responding to Cinque's (1999) syntactic approach, Ernst (2004, 2007), argues from a semantically-based approach that cross-linguistically shared similarities in a sequence or hierarchy of adverb syntax are subject to lexical/semantic properties of the relevant items. That is, semantic principles play a significant part in determining the hierarchical structure of adverb syntax. In other words, the functional sequence/hierarchy is not given by UG, at least not in its entirety. Semantic principles like scope, polarity and related patterns provide more compelling and comprehensive explanations for adverb syntax and variation in the distribution of the adverb sequences.

Organic Syntax, the theoretical perspective adopted in the present thesis, contrasts starkly with the standard view of a universal set of functional projections. Firstly, in sharp contrast to Cinque (1999, 2004, 2013), OG does not subscribe to the idea "that all languages share a single syntactic tree" (Vainikka and Young-Scholten 2011: 12). Rather, it contends that hierarchical functional projections have language-specific features and that each language has a Master Tree with all possible projections of that language. Thus, OG holds that the hierarchy of functional projections varies from language to language. OG recognises the role of semantics through lexical projections, which are proposed alongside functional projections to appear in the Master Tree. Like Muysken (2008) and others, Organic Syntax (Vainikka and Young-Scholten 2011) maintains that lexical projections are provided directly by UG and that "the inventory of lexical projections may be universally uniform" (Vainikka and Young-Scholten 2011: 11). Under OG, variation across languages resides in differences from cross-linguistic functional projections. Consistent absence of functional projections within learners' interlanguage is attributed to the lack of instantiations of functional features in a particular language.

One important step in Generative Grammar has been the proposal of the Minimalist Programme by Chomsky (1993) and the subsequent re-design of language architecture (Chomsky 2005). In the on-going Minimalist Programme, grammar is supposed to be built up universally from the bottom by merging words from the lexicon, and UG is reduced from a system of principles

and parameters to the lexicon and the computational operation of MERGE (Chomsky 1993, 1995, 2005, 2013; Chomsky, Gallego and Ott 2017). The process involves combining lexical items with binary structures and the derivation of the recursive and discretely infinite structure through the upward computational operation MERGE. In the minimalist re-design of language architecture, language acquisition is attributed to three factors. They are the genetic endowment, i.e. UG, language experience which supplies the primary linguistic data, and general computation and cognition principles. However, the exact role of such general principles remains to be established, and Holmberg (2017) warns against a tendency that explains the syntactic structure in extra-linguistic or non-syntactic terms, namely, the interpretation of language acquisition in semantic or phonological terms. After all, Holmberg (2017: 294) argues that UG is “an irreducibly rich system of categories and conditions which are not learned by experience”.

The changes in the minimalist approach to UG properties and the reinterpretation of the factors leading to acquisition make conducting acquisition research from the Minimalist perspective hugely challenging. Meanwhile, acquisition research within the Principles and Parameters paradigm has been widely accepted as being established and fruitful research paradigms. The present thesis, therefore, adopts the Principles and Parameter framework.

Importantly, acquisition studies within the broad framework of Principles and Parameters usually take one of two theoretical stances with regard to the presence of functional projections in the process of acquisition. One stance accepts a full representation of syntactic structure from the initial state of language acquisition and is in line with Cinque’s (1999, 2013) stance of a bestowed structure of universal functional projection. Cinque’s cartographic programme is also supported by Chomsky, Gallego and Ott (2017: 27), who argue that “there is no conceivable evidence that a child could rely on to learn these hierarchical sequences from experience”, but on his innate knowledge. The other stance claims that language acquisition involves the incremental construction of hierarchical syntactic representations (Vainikka and Young-Scholten 1994, 1996a, 1996b, 1998, 2011, 2013), starting with the acquisition of lexical projections.

The full-representation approach is conceived as taking a strong continuity view, while the incremental approach is based on the view that there is weak continuity. In second-language acquisition studies they are usually known as the Full Transfer and Full Access Hypothesis (Schwartz and Sprouse 1996) on the one hand and OG (including its early version Structural

Building Hypothesis) on the other hand. Therefore, theoretical stances can be divided into a full representation of functional projections or partial representations through structure-building from the bottom-up, beginning with lexical phrases. As with the mainstream hypotheses, the Structural Building Hypothesis (Vainikka and Young-Scholten 1996; see also Clahsen and Muysken 1986; Clahsen 1991; Clahsen, Eisenbeiss and Vainikka 1994), demonstrated in the early version of OG, recognises universal functional projection sequences. It also emphasises language-specific features as can be seen from the proposal of ‘a master tree’ in each language, which reveals the whole range of possible projections in that particular language (Vainikka and Young-Scholten 2011: 11). OG argues that children are not born with a full-fledged set of functional projections; instead, they gradually construct one functional projection upon another on the basis of the VP lexical projection via the universal grammar tool --- ‘X’ theory. Critiques of the OG approach will be discussed in Chapter 2.

To date, OG has been adopted to examine adult L2 acquisition of German and English with promising results (Vainikka and Young 1994, 1996a, 2011); nonetheless, it is unclear whether the acquisition of functional projects in an ordered sequence is also applicable to the acquisition of a typologically different language, for example, Mandarin Chinese.

Further to a brief account of the theoretical postulation of UG and its acquisition over the last few decades, the following section describes briefly Mandarin Chinese acquisition studies from the generative perspective.

1.2.2 L2 Mandarin acquisition studies and the generative perspective

Throughout the past 30 years, the study of Mandarin Chinese as a second language has been a thriving line of academic inquiry. The first work on its L2 acquisition was carried out in China in 1984 (Shi 2006), followed by a good body of work in the field (Zhao 2011). Nevertheless, compared with the teaching of Chinese as an L2, L2 Chinese acquisition studies matured later as an independent discipline and, consequently, has been much less explored by the entire field. For example, the first academic journal on L2 Chinese teaching, *Chinese Teaching in the World*, was founded in 1987, while it was only in 2012 that the first journal dedicated to L2 Chinese acquisition, namely *Chinese as a Second Language Research* (CASLR), came into being. The same view regarding the delay in acquisition studies is expressed by Zhao (2011: 586): “Although L2 Chinese teaching has had decades of history [...], L2 Chinese acquisition is a relatively new area of study”.

The existing studies on the acquisition of Chinese, while smaller in quantity compared with L2 Chinese teaching research, have revealed that L2 Chinese acquisition is an essential development in the field of SLA that is leading to a more insightful understanding of important issues in language acquisition. These include the role that L1 plays in acquiring a typologically distant L2, the causes of morphological variability in L2 learners' aspect marking, and the applicability to L2 Chinese acquisition of so-called 'universal' developmental paths (Wright and Zhang 2014) that are based primarily on the data from the acquisition of European languages. From a different perspective, there is also the question of whether L2 Chinese acquisition can shed light on the 'classical' difficulty that Chinese learners have in acquiring the verbal morphology of English.

To date, L2 Chinese acquisition studies, while representing a relatively new area of inquiry, have contributed to L2 acquisition by verifying, modifying and challenging hypotheses which were formulated on the L2 acquisition of European languages, such as English, French and German (Zhao 2011). These languages are typologically and, arguably, sociolinguistically related to some extent (Wright and Zhang 2014). Yuan's (2004, 2010) studies are good illustrations of how the study of the acquisition of Chinese is challenging ideas on the role of the L1. Yuan (2004) examines L1 English, French and German learners' acquisition of the syntax of Chinese negation at clausal level, finding that learners showed evidence that they had acquired Chinese clausal negation in a native-like manner, regardless of their L1 backgrounds and their levels of Chinese proficiency. Based on this data, he argues against the two well-established hypotheses about L2 acquisition discussed above (the Full Transfer and Full Access Hypothesis (Schwartz and Sprouse 1994, 1996) and the Minimal Trees Hypothesis (Vainikka and Young-Scholten 1994, 1996 a and b), as well as the Valueless Features Hypothesis (Eubank 1993/1994, 1994, 1996). Moreover, in the face of the recent growing interest in the Interface Hypothesis, Yuan (2010) argues against a proposal of domain-wide interpretation of the Interface Hypothesis on the basis of L1 English and Japanese learners' acquisition of Mandarin *wh*-words as existential polarity words. Conversely, Yuan finds that learners can only establish a relationship between some existential polarity words and their licensors but not between existential polarity words. Yuan attributes the acquisition outcomes to the influence of such variables as the categorical status of the specific elements, the status of these in the target language grammar, input and cross-linguistic features. Yuan's (2004, 2010) findings help to motivate researchers not only to reflect on established L2 acquisition hypotheses and theories but also make a closer contrastive analysis of L1 syntactic features and those of

Mandarin. They can explore whether there are universally driven developmental acquisition patterns across typologically different languages, or the extent to which UG and/or L1 facilitates or constrains L2 development.

While this sounds appealing, it must be recognised that few L2 Chinese acquisition studies have been conducted from a generative perspective. Shi (2006) noted that, over a decade ago, there were almost no UG-based L2 Chinese acquisition studies in mainland China. The trend can be seen as continuing by reflecting on the “theoretical landscape” that Han (2017: 3) sketches in the book *Key Issues in Chinese as a Second Language Research*. This landscape includes the concept-based approach and the usage-based approach like Skill Acquisition Theory and Complexity Theory but contains no signs of generative work. While it is certainly true that no author can be expected to be inclusive in his/her scope, it is also true that the generative approach as a research perspective has had a low profile. Han’s landscape successfully mirrors the prevailing trend in L2 Mandarin acquisition research, which favours non-UG constrained approaches. The following paragraph gives a brief account of second language acquisition from the generative perspective.

The generative approach to second language acquisition is based on Chomsky’s (1959, 1965, 1986) inquiry on ‘Plato’s problem’, that is, how children can acquire a language with impoverished language data. Chomsky assumes that an innate language faculty endows human beings with Universal Grammar, which governs language acquisition. Concerning L2 acquisition research in this perspective, it has been accepted that the field of SLA includes an exploration of “the extent to which the underlying linguistic competence [that is, unconscious knowledge] of L2 speakers is constrained by the same universal principles that govern natural language in general” (White 2003: 1). Researchers adopting this perspective also accept that “L2 learner language [interlanguage] is systematic and that errors produced by learners do not consist of random mistakes but, rather, suggest rule-governed behaviour” (White 2003: 1). The research from this perspective can be approximately divided into two periods. During the first period (between the 1980s and the 1990s), research was conducted under the principles-and-parameters framework, while work in the second period (after the 1990s) is conducted in a feature-based framework. This largely parallels the revolutionary changes proposed by Chomsky for views of the design of the language in the Minimalist Programme.

Given that, this thesis holds that the relative lack of attention paid to the generative theory in L2 Mandarin acquisition studies is likely to be due to two main reasons. In the first instance,

the lack of consensus on the syntactic structure of clauses and phrases in Mandarin makes it difficult to carry out L2 Mandarin acquisition research within the generative framework. Researchers have argued convincingly that grammatical morphemes mirror syntactic structure (e.g. Baker 1985; Holmberg and Roberts 2013) and are the heads of functional projections. Nonetheless, there has been great debate on how many functional projections there are in Mandarin, whether there is a functional projection NegP and in what order the functional projections are positioned in the syntactic tree for Mandarin. Chinese differs typologically from European languages in several other aspects. Unlike European languages, many of which have rich inflectional morphemes for tense, agreement, case and gender, heading functional projections like TP and AgrP Mandarin and other varieties of Chinese lack such overt inflections (Li and Thompson 1981); nonetheless, they abound in free morphemes marking aspect (i.e. *le*, *guo*, *zhe* and *zai*). Also, Mandarin possesses particular syntactic structures, like the *ba* and *bei* constructions, which are not present in European languages (see Zhao 2011 for further discussion of Mandarin morphemes and syntactic elements). For instance, Huang, Li and Li (2009). argue that, while much attention has been paid to the *ba* construction, there lacks a clear consensus on how to best represent the properties of the *ba* construction

A second reason for the relative paucity of generative work on the acquisition of Mandarin is that with the advent of the minimalist program (Chomsky 1995, 2001, 2005), concerns have been voiced, whether explicitly or implicitly, over the appropriateness of conducting further research within the Principles-and-Parameter framework established in Chomsky (1981b). However, as discussed above, the minimalist programme remains in a state of flux and is not sufficiently established to enable the problem-less application to fields such as second language acquisition (see Holmberg (2017: 294) for the general point; Vainikka and Young-Scholten (2011) for an SLA perspective). Such an understanding means that it is still valuable to conduct language acquisition studies within the Principles-and-Parameters framework from the GB theory or a feature-based framework in the Minimalism. These considerations are of essential importance, as they remove any perceived barriers to SLA research because of the introduction of Minimalism.

Given all of the above, it is unsurprising to find that very few studies, particularly longitudinal ones, of L2 Mandarin development, have been conducted under any generative approach. Indeed, there have existed some existing longitudinal works on the development of L2 Mandarin, such as Zhang (2001), Gao (2009) and Wang (2011). It needs to point out that those

works focus on the acquisition of noun phrases under the theoretical framework of Processability Theory (henceforth PT) (Pienemann 1998, 2011). This approach is based on an early version of lexical-functional grammar (Kaplan and Bresnan 1982) and attaches much importance to processing constraints in language acquisition. It argues that to acquire an L2 is to learn procedural skills, which build up incrementally over different stages. Moreover, it proposes that L2 learners benefit most from language instruction that is just above the learners' current development stage, which is the so-called Teachability Hypothesis. Valuable though such works are, it is unclear how functional morphemes like *zhe*, post-verbal *le* and sentential *le* would fit into the predicted developmental stages posited in Zhang (2001), Gao (2009) and Wang (2011), which do not take into account the Mandarin-specific properties in verbal domain or clause structure, particularly in relation to aspect, negation, and the *ba* and *bei* constructions.

To investigate whether hypotheses only applied European languages to date can also account for patterns of development in L2 Mandarin, the present thesis approaches adult L2 Chinese development from the perspective of OG (Vainikka and Young-Scholten 2011). OG, unlike Processability Theory, approaches language acquisition from a generative perspective. It is more affiliated with the Principles-and-Parameters/Government and Binding Theory than with Minimalism (Vainikka and Young-Scholten 2011). Based on data from child L1 and adult L2 acquisition of German, OG argues that each language has a master tree that develops in L1 and L2 acquisition in an incremental fashion. As to L2 learners, they are observed to start with a bare VP, suggesting that L2 learners begin with transferred L1 VP headedness, then advance to an intermediate IP stage and finally reach a CP stage, in line with the proposed hierarchical functional projections of the syntactic tree. Acquisition occurs due to the interaction between UG and L2 input (Vainikka and Young-Scholten, e.g. 1994, 1996a, 2011). It is worth noting that OG has been debated extensively, particularly its early versions of the Minimal Trees Hypothesis with a structure building model (e.g. Schwartz and Sprouse 1994; Epstein, Flynn and Martohardjono 1996; Yuan 2002; Haznedar 1997, 2003; White 2003) due to its weak continuity stance. By this stance, Vainikka and Young-Scholten proclaim that L2 learners, like L1 learners, have full access to UG and gradually construct their mental grammar in response to language input. L2 acquisition starts with L1 lexical projections, and L1 functional projections do not transfer into the L2 grammatical system at the initial state. Thus, there is no continuity regarding the acquisition of functional projections. The competing theory, the Full Transfer and Full Access Hypothesis (Schwartz and Sprouse 1993/1994, 1994, 1996) argues

for full access to UG. That is, L2 learners, as well as infants, know the full syntactic tree from the initial state of language acquisition. For L2 learners, it also means that L1 functional projections are fully transferred into the L2 grammatical system—that is a strong continuity view.

The present study contributes to second language acquisition (SLA) research in three respects. It is the first study that has applied OG to the study of L2 Mandarin development. Theoretically, it will help shed light on whether there are universal functional projection sequences, as predicted by OG, by tracing adult L2 Mandarin Chinese development over the course of one academic year. The goal will be achieved, as the thesis proceeds, by a theoretical postulation of a full syntactic tree of Mandarin, extended on Vainikka and Young-Scholten (2015).

Methodologically, this study contributes to the long-standing issue in longitudinal studies, i.e. the problems of missing data by introducing the missing value analysis in the SPSS software package into the present research. The investigation will help to obtain a better developmental view of longitudinal data, which would be impossible otherwise.

At a practical level, this study contributes to the progress in SLA research by sharing the transcripts of the oral production data (story narration) of seven participants on the Child Language Data Exchange System (CHILDES) (MacWhinney 2015). The sharing of the transcripts will allow other researchers to make cross-linguistic studies and examine features not covered in the present longitudinal study of L2 Mandarin morpho-syntax. Moreover, the development route and stages found in this study will also be useful to syllabus developers and Mandarin language instructors in designing teaching materials, assessing the stages of L2 Mandarin learners' grammatical competence and setting up next achievable goals for L2 learners.

One introductory note concerns a matter of terminology. Mandarin is the official language of the People's Republic of China, the standard language used in China. In the present study, Mandarin will be used consistently in that sense. However, the label 'Chinese' will be used interchangeably with 'Mandarin' when discussing analyses from other sources.

1.3 The Scope of the Study

This thesis examines the early stages of adult L2 Mandarin development in learners' acquisition of Mandarin functional projections at VP and IP levels. This study is motivated by the earlier noted gaps in the study of L2 Mandarin acquisition. It uses the second language acquisition

hypothesis of Organic Grammar, which has been developed by data from the acquisition of European languages but makes interesting (and testable) predictions for the acquisition of Mandarin too. Specifically, this study examines eight L1 English learners' acquisition of Chinese over nine months. The functional projections investigated are $AspP_l$, BaP , $BeiP$, $AspP_m$, $NegP$ and $AspP_h$, headed by *le/guo/zhe*, *ba*, *bei*, *zai*, *mei/bu* and *le_h* respectively. Note that the CP layer of functional projections falls outside the research scope of this study, except for one specific element, namely *le_h*, which will be argued to be involved in movement from its base position in IP into a derived position in CP.

1.4 The Structure of the Thesis

The thesis is structured into eight chapters. The current chapter provides an overview of the entire study. The next three chapters review the literature on L2 Mandarin acquisition and motivate the research questions of this study by highlighting the theoretical background and reviewing the main features of L2 Mandarin syntax. Subsequent chapters address the methodology, results and data analysis while the final chapter provides a conclusion to the thesis.

Chapter 2 reviews some of the principal theoretical approaches to the acquisition of L2 morpho-syntax in European languages, with the aim of constructing a plausible working model for the study of L2 Mandarin acquisition. The review covers both early morpheme acquisition studies, approaches to the initial state and approaches to the steady state. It also argues that OG is currently the most feasible working model to test L2 development. At the end of the chapter, the following research questions will be raised:

- (1) Where the word order in the verb phrase is different in English and Mandarin, do the learners in this study use the order of their L1 English or the order of Mandarin?
- (2) Do L2 Mandarin learners project functional elements in a stage-like manner, that is, from bottom to top, in accordance with the route predicted for this based on a syntactic Mandarin tree?

Chapter 3 has the dual purpose of constructing a unified Mandarin syntactic tree and establishing basic equivalent concepts across English and Mandarin, i.e. VP and IP. It reviews previous arguments concerning what functional objections are at the IP layer and what hierarchical relationships exist between the different functional projections for the construction of a Mandarin syntactic tree. Such investigations can help predict the development displayed by L2 Mandarin learners.

Chapter 4 evaluates second language development studies conducted in China. It gives special attention to the study of L2 acquisition development from the Processability Theory since it is under this theory that the most work has been carried out. The development of individual functional projections will also be discussed. Emphasis will be laid on previous longitudinal studies of aspect markers, negation and the *ba* and *bei* constructions.

Chapter 5 reports the methodology used to collect data in order to answer the proposed research questions. It explains why this study adopted a mixed design with both cross-sectional and longitudinal data. It also gives some details about the early state learners that were investigated. All of them had an L1 English background, and none of them had been exposed to L2 Mandarin instruction before they participated in the Mandarin programme for their undergraduate degrees. This chapter also specifies the test batteries, data collection processes, and details of how the data were collected, transcribed and coded, and what kind of measurement tools were used for the analysis of both production data and grammaticality judgement data.

Chapter 6 reports the development results from both production and grammaticality judgement data. In the production data, the development over time of each functional projection is examined. The results of the grammaticality judgement task are examined in some detail to test whether one particular learner's involvement skews the interpretation of the data.

Chapter 7 discusses the acquisition results to address the question of whether they demonstrate evidence for L1 transfer of VP headedness and the L2 development stages predicted under the OG approach. This involves examining whether the various functional projections develop in the predicted order as learners gradually build up the full syntactic tree. It also proposes an account of the variability that emerges in the data.

Chapter 8 summarises the results and discusses how they can help facilitate L2 Mandarin textbook designers and L2 Mandarin teachers to establish stage-like learning objectives. It will also discuss its relations with language assessment. Some reflections will also be made on further research opportunities that can be explored on the L2 acquisition of Mandarin morpho-syntax in the near future.

CHAPTER 2 THEORETICAL APPROACHES TO THE ACQUISITION OF L2 FUNCTIONAL PROJECTIONS

2.1 Introduction

The status of L2 functional categories in relation to UG and L1 transfer are hotly debated within a generative framework in second language acquisition (Lardiere 2008; Slabakova 2009; Vainikka and Young-Scholten 2011, 2013). This chapter reviews the existing generative approaches to the acquisition of L2 functional categories and identifies a model applicable to the testing of existing debate, based on the acquisition of European languages.

First, the basic account of syntactic structure in generative syntax is that it does not have a linear structure but a hierarchical structure, which is described through lexical and functional categories (Chomsky 1986; Abney 1987). Lexical categories generally include NP (noun phrase), VP (verb phrase), AP (adjective phrase) and PP (preposition phrase), respectively headed by N, V, Adj and P to express the meanings of a clause. Functional categories involve IP (inflectional phrase), DP (determiner phrase), and CP (complementiser phrase). IP is subcategorised into TP (tense phrase) and AgrP (agreement phrase) (Pollock 1989), denoting features like tense, and agreement. NegP (negation phrase) and AspP (aspect phrase) are another two widely assumed functional categories.

Under a generative perspective on the L2 acquisition, one question is whether, like L1 learners, L2 learners are endowed with Universal Grammar, the innate knowledge of the architecture of language owing to the Faculty of Language, which is human-specific. The difference between L1 and L2 learners relies on the extent to which both younger and older L2 learners can access UG, and how. The present thesis takes the position that UG is accessible to older L2 learners and focuses on UG-driven accounts of development.

One of the longstanding issues in the generative perspective of L2 acquisition is the status of L2 functional categories. There are three major approaches to this issue. The first, the Full Transfer/Full Access approach (Schwartz and Sprouse 1994, 1996; Haznedar 2003; Lardiere 2008), argues that functional categories are fully accessible to L2 learners, as UG continues to be accessible (=Full Access) at the initial state of second-language acquisition. Moreover, it argues that all the first language functional categories are available in L2 (=Full Transfer). A second approach (Vainikka and Young-Scholten 1994, 1996a, 1996b, 1998, 2011, 2013) maintains that, while UG continues to guide adult L2 acquisition, both L1 and L2 functional categories are absent from the initial state of L2 acquisition. They hold that functional

projections must be constructed incrementally through the interaction between UG and the target-language input. A third approach argues that functional categories can only be acquired partially due to some permanent functional deficiency after puberty; instead, that functional categories from the learner's L1 can be transferred successfully (Hawkins and Chan 1997). The following sections will examine more closely these three approaches regarding how L2 development occurs under each method and what practical issues must be considered in the examination of L2 development.

This chapter is structured as follows. Section 2.2 reviews the theoretical perspectives and empirical studies of the first approach, where scholars generally accept a full access to UG and full transfer of L1 functional projections into L2. Section 2.3 presents the second approach to L2 acquisition, i.e. Organic Grammar, which claims full access but partial transfer. Section 2.4 evaluates an approach that shares similar claims with OG but has its distinctive proposal on the role of L1 in L2 development. Section 2.5 touches briefly upon one non-generative approach, which predicts a stage-like development of L2. Section 2.6 summarises the methodological issues in the L2 empirical studies. Section 2.7 calls for the investigation of the inclusive claims by adopting a typological language. Finally, Section 2.8 concludes the chapter.

2.2 Full Transfer/Full Access Approach to L2 Development

In the Full Transfer/Full Access (henceforth FT/FA) approach, we home in on stances taken by researchers whose claims are in line with this hypothesis. FT/FA, first proposed by Schwartz and Sprouse (1994, 1996), provides an account of the initial state of L2 acquisition. The purpose of accumulating stances also from Haznedar (1997, 2003), Lardiere (1998), Prevost and White (2000) is to paint a complete picture of how FT/FA researchers view L2 development.

2.2.1 FT/FA's accounts of L2 development

The FT/FA hypothesis assumes that the L1 grammar system transfers wholly into the L2 system (Full Transfer) at the initial state and that UG is fully available to L2 learners, either through the L1 (indirectly) or by directly functioning when the L1 system fails to work in L2 grammar (Full Access). Schwartz and Sprouse (1994, 1996) insist that the initial state of L2 acquisition is "the final state of L1 acquisition" (1994: 40-41); in other words, except for L1 phonetic matrices and the lexicon, whereby all the principles and parameter values of L1 grammar enter into L2 grammar at the initial state. Restructuring of the L2 grammar system takes place when L2 learners are unable to assign L1 grammatical representations to L2 input. The hypothesis also holds that the initial state, UG, input and learnability all play a role in L2 syntactic development. FT/FA Hypothesis takes a 'strong continuity' stance in second-language

acquisition. In other words, this line of researchers maintains that both L1 learners and L2 learners have full access to Universal Grammar and that the mechanisms that underline L1 and L2 acquisition processes are the same (Schwartz and Sprouse 1996). The L2 develops over interlanguage stages; nonetheless, the end-state grammar of L2 learners may not necessarily be the same as the target grammar. The reason is that L2 development is determined by multiple factors, involving the initial state, input, the operation of UG and the learnability issues (Schwartz and Sprouse 1996). Additionally, missing inflectional morphology in L2 data, whether it is at the very early stage or the end-state, is not due to L2 learners' failure in projecting functional categories, but their failure to map the phonetic forms to the functional categories (Hazendar 1997, 2003; Lardiere 1998, 2008).

The underlying assumption of the FA/FT is the Strong Continuity Hypothesis (see Boser, Lust, Santelmann and Whitman 1992), which assumes that all functional projections are available at the initial state of L1 acquisition. In other words, the Strong Continuity Hypothesis argues that a full CP-tree is innate in the minds of children, being present from the outset of L1 acquisition. Acquiring a language for a child is a process where s/he based on primary language data sets parameters in reaction to L1 input. As noted previously, in L2 acquisition, FT/FA assumes that the full L1 grammatical system is transferred to L2 and comprises the initial state of L2 acquisition. Then, learners reset the values of parameters in the course of acquisition.

2.2.2 Work on early-stage learners

Supporting evidence for the FT/FA hypothesis comes from Schwartz and Sprouse's study (1994) of German word order and nominal case acquisition by an adult L1 Turkish speaker, Cevdet. Data were collected when Cevdet, learned German with classroom instruction for one year with more than 30 hours' instruction per week, over a period of 26 months. Cevdet's data are summarised in Table 2.1, in which we can observe that by the time the data collection ended, Cevdet's German experienced a three-stage-like development.

Table 2.1 Declarative main clauses with two or more nonverbal constituents

stage	Pronominal subjects						Total	100%
	Preverbal				Postverbal			
	SVX	XSV	...VS					
1	18	86%	3	14%	0	0%	21	100%
2	109	50%	38	18%	69	32%	216	100%
3	48	41%	2	2%	67	57%	117	100%

Stage	Nonpronominal subjects						Total	100%
	Preverbal				Postverbal			
	SVX	XSV	...VS					
1	11	92%	1	8%	0	0%	12	100%
2	93	78%	26	21%	1	1%	120	100%
3	46	75%	7	11%	8	13%	61	100%

(Source: Schwartz and Sprouse 1994: 339)

Notes: the numbers in the table are instances of interlanguage occurrences while the percentages refer to the interlanguage occurrences in each session over the total interlanguage occurrences across sessions.

Schwartz and Sprouse (1996) state that Cevdet's L2 German SOV order at the initial stage adheres to his L1 Turkish word order and that interlanguage word order SOV for pronominal subjects and non-pronominal subjects is as high as 86% and 92%. The result is similar to Vainikka and Young-Scholten's finding of the VP headedness transfer. Moreover, Schwartz and Sprouse (1996) argue that the subordinate clauses are not overtly marked in lexical terms. Example (2.1 a) clearly illustrates the above points. Cevdet modifies his word order in the second stage, where pronominal subjects were inverted, as presented in example (2.1 b). It is also at this stage that Cevdet began to mark the subordinate clauses with lexical morphemes as complementisers. At the third stage, inverting VS also occurred to non-pronominal subjects.

(2.1) a. *Der Mann seine Frau gekußt.*
 The man his wife kissed
 'The man kissed his wife.' (Schwartz and Sprouse 1994: 335)

b. *dann trinken wir bis neun Uhr*
 Then drink we until nine o'clock
 'Then we will drink until nine o'clock.' (Schwartz and Sprouse 1994: 336)

c. *das hat eine andere Frau gesehen.*
 That has an other woman seen
 'Another woman saw that.' (Schwartz and Sprouse 1994: 338)

Schwartz and Sprouse argue that Cevdet's word order and nominative case were constrained by case-checking mechanisms and that his interlanguage word order should not be interpreted by matching the L2 system with target-like grammar. Instead, they hold that interlanguage should be studied in its own right, as proposed by Bley-Vroman (1983).

To test FT/FA, Haznedar (1997) conducts a longitudinal study of an L1 Turkish child's acquisition of L2 English IP, his optional use of infinitives and his CP system. More recently, Özçelik (2009) studies the acquisition of quantificational scope by nine L1 English learners of Turkish and by 19 L1 Turkish learners of English.

The question of whether the absence of inflectional morphology in L2 learners' data evidence the lack of mental representation has been pursued by researchers such as Prévost and White (2000). They examine the finiteness of verbs produced by two adult L1 Arabic learners of French, and one L1 Spanish and one L1 Portuguese speaker's acquisition of German to test whether the lack of tense or agreement morphology means the absence of TP or AgrP. Based on their findings, they argue that "L2 learners have unconscious knowledge of the functional projections and features underlying tense and agreement" and that the absence of overtly-marked tense and agreement morphology is due to L2 learners' ongoing difficulty in assigning them to surface morphologies" (Prévost and White 2000: 103). That is known as the Missing Surface Inflection Hypothesis (Prévost and White 2000).

The discussion has been held on the validity of the FT/FA hypothesis and the consistency of its empirical evidence. White (2003) raises two points at the methodological level. Firstly, the supporting evidence for FT/FA at the time comes primarily from a single case study (Cevdet); therefore, the extent to which this case is representative is unclear. Secondly, Schwartz and Sprouse's (1994) data was collected from spontaneous production; which can be problematic, as it is difficult to decide whether or not linguistic features not present in the data are mentally represented. Others have raised issues at the conceptual level. For instance, Smith and Truscott (2006: 201) argue that the FT/FA hypothesis gives "little" or "no" elaboration of the "developmental" or "transition" issue. Similarly, Vainikka and Young-Scholten (2011, 2013) contend that, as the FT/FA hypothesis assumes a strong continuity from L1 to L2 grammar or a full syntactic tree right from the beginning of acquisition, it lacks power in explaining interlanguage developmental patterns and the variability of ultimate attainment typically found in L2 learners.

2.2.3 *Studies on the end state of an L2 acquisition*

With the introduction of the Minimalist Programme (Chomsky 1995, 2001, 2005), the generative L2 acquisition studies have also focused on examining the end state/steady state of L2 learners. Researchers are interested in describing the nature of the near-native-like end-state and questioning whether UG constrains interlanguage at this steady state, and which linguistic properties are easier or more difficult for L2 learners, and why.

To address the end-state, Lardiere (1998, 2008, 2010) who adopts a strong continuity FT/FA stance, proposes Feature (Re)assembly Hypothesis in second language acquisition. Under this approach, the acquisition is defined as a process of delinking configuration features in L1 and reassembling or remapping those “features into new or different formal configurations in the L2” (Lardiere 2008: 107). Lardiere’s account is based on an interpretability view of languages at Logical Form/LF, a semantic level based on Chomsky (2001: 4). Such a stance requires that “all languages include the same primitive semantic features and operators...regardless of whether these are overtly spelled out or not”.

Lardiere traces the naturalistic acquisition of English definite and indefinite articles, plurals, questions and relative clauses and two syntactic operations; raising subjects and *wh*-movement in relative clauses by Patty, a Mandarin and Hokkien speaker of L2 English to demonstrate the inadequacy of the parameter setting approach and the strength of feature assembly. Both aural and written data (25 emails) were collected from Patty over 16 years. Data from the first three sessions were used in Lardiere (2008). There was an eight-year interval between her first and second data collection sessions, with two months separating the second and third collections. Lardiere discovers that:

- Even if Patty’s suppliance of articles is not entirely nativelike, her total production is high (with definite article 84.09% and indefinite articles 75%). There is no evidence of replacing demonstratives for definite articles nor one for indefinite articles, as found in Robertson (2000).
- There is a significant increase (from the first data collection session to the third data collection session) in learners’ suppliance of plural marking, i.e. from 8.70 % to 58.33 %.
- Patty can produce, with ease, tag questions, negation questions or other most complex types of embedded questions with correct word order.
- Patty seems to have “acquired English feature-value in relative clauses”, including the preposition stranding through operator movement (Lardiere 2008: 125).
- There is 100% correct marking of nominative, genitive and accusative cases over the three data collection sessions. The missing apostrophe-s marking is not a syntactic issue but one of morphological marking, part of the morphological competence.

Lardiere concludes that unlike the Failed Functional Features Hypothesis, L2 learners' morphological suppliance is permanently impaired; they can establish features of morphological inflections in the DP and CP domain, such as [+definiteness], [+plural], [+case marking] and operations such as subject raising and *wh*-movement. Thus, inflectional competence involves a broad range of knowledge like the knowledge of precisely matching of forms with features, the conditioning factors for obligatory or optional contexts, whether these features are linked phonologically, morpho-syntactically or in semantics or discourse, and in what domain features can be combined with other features. According to Lardiere (2008: 114), the additional knowledge of contexts, may it be obligatory or optional, must be acquired with painstaking efforts and becomes "part of [a] learner's developing morphological competence".

It is worth noting that Lardiere (1998) reported that Patty marked only 34% of the tense in obligatory contexts. By comparing case-marking and tense marking, Lardiere argues as such that the paths to syntactic and morphological development do not depend on each other and that the mapping between them is far less straightforward than what was previously conceived. Slabakova (2009) highlights the Feature Reassembly Hypothesis overtly stresses differences in learners' acquisition of morphological inflections. Thereby, it runs the risk of rejecting the universal feature computation operations, and favouring emergence or item-based learning, thus falling into the usage-based L2 acquisition camp. This thesis further argues that Feature Reassembly Hypothesis says little about the role of input in the feature re-assembly.

The reason for the Feature Reassembly Hypothesis' tendency to reject the universality in second language acquisition seems to be a result of its underlying assumption of a full transfer of L1 functional features. Lardiere describes the appropriate route for the acquisition of L2 English features as setting the right value of a parameter and making L1 constraints apply to L2.

The acquisition of definiteness and plural marking is not a matter of mere parameter-setting from a minus value in Chinese to a plus value in English for either feature. Rather, it involves a more complex process of developing morphology competence - the reassembling [of] the relevant features from the way they are conditioned and realised in the L1 to that of L2.

(Lardiere 2008: 123)

Lardiere (2008) proceeds to comment that the process of the acquisition is truly a process of delearning the features of L1 and reassembling those that must be acquired in target L2. Elsewhere, she mentions that if selecting a feature in the L1 is inadequate, learners will also

need to “painstakingly” acquire contexts and restrictions for the appropriate use of the features. Lardiere’s accounts can quickly lead to a conclusion that failure in the L2 acquisition at the end state is highly likely to be related to partially, if not wholly, L2 learners’ failure to delink features related to L1. Lardiere’s stance helps us reflect on the fundamental assumption of a full transfer of L1 functional categories and features from the very beginning of second language acquisition. If Slabakova’s (2009) observation of the tendency in adopting usage-based account to accommodate variation in L2 learners’ knowledge of functional morphology is correct, it will mean that excessive proposals have been made of the initial state of L2 acquisition. In other words, it may be inappropriate to hypothesise that, from the very beginning, L2 learners are fully endowed with, or obtain full access to, L1 functional projections. It is very likely that Feature Reassembly Hypothesis (Lardiere 2008) implies that learners will experience difficulties more in situations where L1 and L2 grammatical features need re-assembling than in places where only simple mapping of morphemes is required between the L1 and L2 (Slabakova 2009).

2.3 Organic Grammar

An alternative to FT/FA is OG (Organic Grammar), which is a weak continuity approach proposed by Vainikka and Young-Scholten first in 1994 and 1996 (a and b), as the Minimal Trees Hypothesis and the Structure Building Hypothesis and then as Organic Grammar in 2006. OG was later discussed in the acquisition of German by three American students immersed in German contexts. Vainikka and Young-Scholten (2006, 2011) define OG in those studies not only as a theory of syntax but also as a theory of second language acquisition.

2.3.1 OG as a syntax theory: organic syntax

Since the 1990s, Vainikka and Young-Scholten have conceived the architecture of language, particularly its grammatical system, as comprising both lexical projections and functional projections of phrase structures. The bottom part of the architecture is the lexical projection VP, headed by V. VP consists of V + complement with the subject as the specifier. Directly above the lexical projection are functional projections at different layers, IP or CP layers. Each functional projection represents the acquisition of a functional phrase with a functional morpheme as a head. Functional projections at the IP level include the split functional types, as proposed by Pollock (1989), namely TP (tense phrase), AgrP (agreement phrase), NegP (negation phrase) and AspP (aspect phrase). At the CP layers, *wh*-markers or complementisers of embedded clauses introduce functional projections.

Similarly, the proposal of the 'X'-theory (Jackendoff 1972, 1977) maintains that above the lexical projection, here VP, lie the functional projections, one above the other; each corresponding to an overtly marked functional morpheme. Vainikka and Young-Scholten specify OG's stance in relation to GB and Minimalism, as follows:

The theory of Organic Grammar is strictly speaking, post-1990s and post-Minimalist; however, OG shares perhaps more features with the Principles and Parameters approach and Government and Binding (GB) Theory (Chomsky 1981[a]) than with Minimalism (1990 and beyond).

(Vainikka & Young-Scholten 2011: 25)

In the above remarks, Vainikka and Young-Scholten affiliate more with the post-1990 versions than pre-1990 versions of generative grammar. Their stance can be elaborated in two aspects. First, Organic Syntax agrees with Chomsky's pre-1990s design of language structure where UG is innate, dedicated to the Faculty of Language in human beings' minds. Nonetheless, Organic Syntax does not accept a syntactic tree, which has fully-fledged branches of projections for all the languages of the world but lack developmental stages. Instead, Organic Syntax assumes learners' gradual projection of a full tree of a given language based on lexical projection VP. OG also shares some earlier proposals of Principles and Parameters/GB, which include GB style of movement, for instance, head-movement, A-movement and A' movement and X' theory. In other words, it rejects the postulation of the movement of a linguistic item for the checking of agreement or tense feature; instead, it holds that movement is mobilised to fill up syntactic positions.

Second, Vainikka and Young-Scholten posit OG as belonging to the post-Minimalism period. As with Minimalism, OG recognises the derivation of structure from the bottom-up, the economical design of syntactic architecture, the universal features in the lexicon and computational mechanisms. Organic Syntax differs from the Minimalist Programme, which reduces the previous language design to operation of the lexicon through the universal computational operations like Merge and Move. Vainikka and Young-Scholten (2011: 1) argue that the Minimalism actually reduces syntax into a state of having no syntax. For acquisition, syntax is acquired in response to the input that learners receive through the universal mechanism that operates across languages, i.e. UG, by which, Vainikka and Young-Scholten mean X' theory.

According to Vainikka and Young-Scholten (2011), Minimalism has shed some light on the design of the language and the derivation of syntactic structure. However, one significant issue is that it fails to address two essential phenomena: stages of acquisition in L2 data and the existence of syntactic structures in relation to functional projections or movement, for instance, long-distance *wh*-movement. Another issue is that Minimalism lacks adequacy in explaining language acquisition. Vainikka and Young-Scholten (2011) argue that since the lexicon is the locus of phonological, morphological, semantic and syntactic information in Minimalism, learning a language under Minimalism is likely to be assumed as learning the specific information of the lexicon.

Nevertheless, Vainikka and Young-Scholten state explicitly that the sole similarity between OG and Minimalism is the bottom-up derivation of the structure. In other words, in Minimalism, lexicon with certain features is selected (Select), incorporated (Merge) with another one with a particular feature and then re-positied (Move) at another position for feature checking, which finally allows the configuration between syntactic features and features of the lexical heads. This is similar to their structural building of functional projections based on X²-theory.

Assumptions in Organic Syntax are mostly consistent with what was proposed in the Minimal Trees Hypothesis and the Structure Building hypothesis. The core difference is the addition of the Master Tree to emphasise the speciality of each particular language. Specifically, OG consists of the following ten assumptions:

Assumption 1: Each language has a master tree that includes all possible projections in that language.

Assumption 2: All and only those projections occur in the Master Tree for which there is evidence in the language.

Assumption 3: Universal Grammar provides the tools for acquiring the Master Tree based on input.

Assumption 4: The Master Tree is acquired from the bottom up.

Assumption 5: The Acquisition–Syntax Correspondence: syntax mirrors acquisition

Assumption 6: Actual instantiations of the tree are projected from the bottom up, based on the Master Tree.

Assumption 7: Partial trees may be projected for constructions, which do not involve the full Master Tree Structure.

Assumption 8: Lexical and functional projections differ in terms of how they are represented in the grammar.

Assumption 9: Cross-categorical generalization about structure are possible.

Assumption 10: Only as much adjunction is posited as necessary in the Master Tree.
(Vainikka and Young-Scholten 2011: 11-15)

The core feature of Organic Syntax is the proposal of a Master Tree as the speciality of each language. The Master Tree involves all feasible projections in a particular language, and the projections must be evidenced in the language. As can be seen from the list of assumptions, Assumption 5 is the natural consequence of the first four assumptions. It explicates the close paring relationship between syntax and language acquisition. Assumptions 6-7 explain how the proposed mechanism is applied to syntax. Assumption 8 holds that functional projections are not embraced in the Master Tree; rather, lexical projections are involved in the Master Tree. Moreover, lexical categories are cross-linguistically similar. Assumption 9 maintains the possibility of making a cross-categorical generalisation between specifier and complement positions. The final assumption assumes that, in the tree, adjunctions headed by adverbs are postulated at a minimal level in OG. It is noted here that possibly partial trees are projected for constructions not involving the Full Master Tree. OG maintains that it is UG that enables the acquisition of the Master Tree based on the L2 input. The acquisition of the Master Tree proceeds from the bottom up and is mirrored by the supplience of functional morphemes.

2.3.2 OG as a language acquisition theory

OG is a proposal for second-language acquisition. Vainikka and Young-Scholten also hold from the past three decades that the acquisition of the grammatical properties of a language is the acquisition of its functional projections and that the mental representation of its syntactic structure is gradually built up. Specifically, they argue that language acquisition begins with the (bare) VP, the bottom part of a syntactic tree. Such an argument is re-stated in Vainikka and Young-Scholten's Assumption 4 "each stage of acquisition corresponds to the acquisition of a new functional projection---in effect, a new layer of the syntactic tree" (Vainikka and Young-Scholten 2011: 23). The syntactic tree grows upward owing to tools from UG and input data (Assumption 3). The syntax of learners reflect acquisition outcomes (Assumption 5), and it is possible that learners will only be able to project partial trees based on input (Assumption 7).

2.3.2.1 *Assumptions underlying OG (MT+SB)*

The thematic argument of OG, along with research conducted on the Minimal Trees (MT) and the Structural Building (SB) hypotheses is whether these weak continuity hypotheses hold for both first and second-language acquisition. Specifically, based on L1 acquisition, the Weak Continuity Hypothesis (Pinker 1984; Radford 1988, 1990, 1995) holds that at the outset of acquisition, children can access only parts of the components of UG (X' -theory). For Radford, functional categories matured at a certain age. However, Vainikka and Young-Scholten (1994, 1996a, 2011) argue that L2 acquisition resembles L1 acquisition in the initial state and the path of development and dismiss the idea that functional categories mature. Although the central argument of OG, MT and SB is rooted in the Weak Continuity Hypothesis, maturation is not deemed a determining factor in the outcomes of L2 acquisition (cf. Hawkins and Chan 1997 as some researchers also adopting the Weak Continuity Hypothesis). Instead, Vainikka and Young-Scholten have argued for about two decades that L2 acquisition results from the interaction between UG and its L2 input and that the acquisition of syntactic representation is triggered by different syntactic morphemes in L1 and L2.

L2 learners have an entire system of L1 syntax, but according to Vainikka and Young-Scholten, they transfer this knowledge only partially, namely, their lexical projection VP. Based on their empirical work, Vainikka and Young-Scholten (1994, 1996a, 1996b and 2011) argue that adult L2 learners can acquire L2 syntax with access to UG, and they build up syntactic representation in a gradual manner.

2.3.2.2 *Evidence from three empirical studies (Vainikka and Young-Scholten 1994, 1996a, 2011)*

Vainikka and Young-Scholten (1994) examine 11 Turkish and six Korean immigrants' acquisition of German in naturalistic environments to verify whether L2 learners still have direct access to UG. It is worth noting that all three languages are considered to be head-final languages, though, in matrix clauses, verbs are in the second position in German, which is thought to be raised to that position. Empty subjects are allowed in both Korean and Turkish but not in German. Subject-verb agreement is required in German and Turkish but not in Korean. Their dataset is composed of both cross-sectional and longitudinal oral data, of which the great majority of Vainikka and Young-Scholten's data were collected through interviews, narratives based on strips of comics, describing hand-drawn pictures, researchers' actions and tea-making processes. Vainikka and Young-Scholten adopted two criteria for acquisition; in other words,

60% correct production in obligatory contexts and the acquisition of at least two out of four agreement morphemes as the acquisition of the agreement paradigm.

Vainikka and Young-Scholten find that learners go through an early head-final VP stage (Figure 2.1), an intermediate stage (Figure 2.2) and an advanced stage (Figure 2.3). During the initial stage, learners' production did not expose their acquisition of any functional projection; the VP headedness, in learners' data indicates the transfer of L1 Turkish or Korean lexical projection. At the intermediate stage, the functional projection AGRP and pro-drop became optional. At the advanced stage, the data revealed non-pro-drop and the raising of verbs to the head of AGRP to get agreement overtly marked (Figure 2.3).

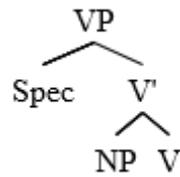


Figure 2.1 VP stage

(Source: Vainikka and Young-Scholten 1994: 285)

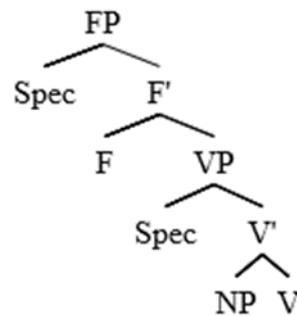


Figure 2.2 FP stage

(Source: Vainikka and Young-Scholten 1994: 290)

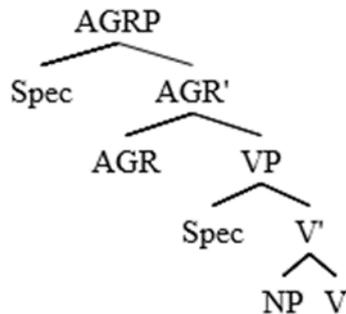


Figure 2.3 AgrP stage

(Source: Vainikka and Young-Scholten 1994: 286)

Vainikka and Young-Scholten (1996a) investigate four Italian (longitudinal) and seven Spanish (cross-sectional) learners' acquisition of German. As part of ZISA project, the Italian data was collected through interviews conducted fortnightly over two years. As a part of the LEXLERN project, the Spanish data was elicited using various research techniques, including interviews. The two stage-like development of syntactic structure, VP and IP, are captured in Italian and Spanish learners' data. Different from the Turkish and Korean learners, the VP stage of the Italian and Spanish speakers is composed of two sub-stages, the head-initial VP stage (Figure

2.4), from their L1s, and the head-final VP stage (Figure 2.5) in response to the German input. In other words, at the head-initial VP stage, L2 learners transfer their L1 VP headedness, and at the following stage, L2 learners acquire German VP headedness. No functional projection was found in data from the earliest point in time, that is, at the proposed stage I, no evidence could indicate the acquisition of auxiliaries or modals signalled the positioning of projections pertinent to the agreement, complementisers, *wh*- and inverted yes-no questions. At stage II (Figure 2.6), learners demonstrate an FP stage, an unspecified head-initial stage. The L2 learners studied progressed at different speeds. One learner developed beyond IP and into the CP stage and another remained at the head-final sub-stage. Moreover, it was apparent that the language of some learners had fossilised when data was collected.

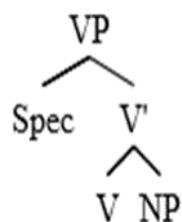


Figure 2.4 Stage 1a

(Source: Vainikka and Young-Scholten 1996a: 159)

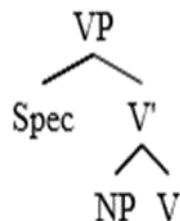


Figure 2.5 Stage 1b

(Source: Vainikka and Young-Scholten 1996a: 20)

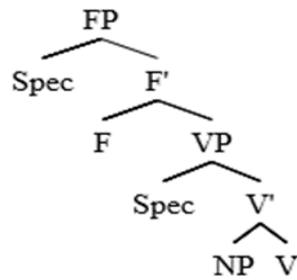


Figure 2.6 Stage II FP stage

(Sources: Vainikka and Young-Scholten 1996a: 169)

Vainikka and Young-Scholten (2011) trace three *ab initio* post-puberty American exchange students' acquisition of German in a one-year overseas exchange programme. They were immersed in German schools that did not offer German as a second language, but they needed to survive in German classrooms. Vainikka and Young-Scholten adopt both broad and narrow elicitation techniques (refer to Table 4.15 on p.148) to elicit oral production data showing learners VP, copulas, models, verb suffixes, negation, questions and word order. From their data, they find no functional projections at IP or CP layer at the initial stage, three weeks after the learners had arrived in Germany. Rather, L2 German starts with initially transferred head-initial VP and then switches to head-final VP like their Italian and Spanish learners. Furthermore, all three participants started with head-initial IP or CP but only two of them, Paul and Joan succeeded after a year in switching the headedness to the final position. George, the other learner, projected a head-initial AgrP and head-initial CP but failed to acquire the target German head-final AgrP. George's production is considered to be "consistent with the L1 English pattern of head-initial projections throughout the grammar" (Vainikka and Young-Scholten 2011: 343). The following table presents the development of three learners' functional projections by the three learners.

Table 2.2 Three American English speakers' acquisition of German

Projection acquired	Paul	Joan	George
Bare VP	1-2	1	1
NegP	1-2	1	1-2
FP/TP	3-4	2-3	2-3
AgrP	5	5	4
CP	7-8	6-7	6-8

(Source: Vainikka and Young-Scholten 2011: 342)

Notes: the figures in the table represent the file numbers of the collected data.

The table indicates the overall stage-like development in line with Vainikka and Young-Scholten's observation (1994, 1996a, 2001). Moreover, it demonstrates that, as pointed out by Vainikka and Young-Scholten (2011), the data for one learner (George) differs from that of the other two learners to some extent, if the differences were not substantial. In other words, George produced forms relevant to NegP at the bare VP stage, and yet, unlike the other two, George did not show evidence of projecting the German head-final AgrP.

2.3.3 *Supporting evidence from other studies*

Mobaraki (2007) addresses the issues raised by Schwartz and Haznedar in a longitudinal study of the acquisition of English morpho-syntax by two Farsi-speaking children, Bernard and Melissa from the earliest stage and beyond. The children were respectively 7; 4 and 8; 4 at the start of the study. Data were collected by using the children's spontaneous speeches and a test battery of tests, such as translation and collected diaries over twenty months. He examines the development of the following linguistic aspects: word order, copula and auxiliary be modals, questions, case marking, null subjects, agreement (subject-verb), tense marking and negation.

Firstly, Mobaraki finds that 93% of sentences have the SOV order before the 7th data collection session¹ and that sentences with SVO order follow in the ensuing sessions (between the 7th-the 13th data collection session). Moreover, he notes that the switch of headedness occurred while learners were still in the VP stage and that their data are compatible with the transfer of VP

¹ The 7th data collection took place around the 7th week after the first data collection session, and the interval between the 7th and 13th data collection was also close to seven weeks. The 14th data collection session occurred one week after the 13th data collection session.

directionality by the Italian and Spanish learners in Vainikka and Young-Scholten (1996). Secondly, the occurrences of null subjects correlate with SVO production at the 14th data collection session. Again, Mobaraki holds that this accord with Vainikka and Young-Scholten's claim regarding L2 German acquisition that raised verbs have a direct link to the absence of subjects. Thirdly, case was not assigned in the children's data, again implicating the lack of functional projection at the IP layer, which is consistent with the findings in Vainikka (1993/1994), Haegeman (1995), Radford (1995), Rizzi (1993/1994), etc. Fourthly, what accompanies the decrease in null subjects is the high percentage of inflectional verbs marked for finiteness in obligatory contexts. While Mobaraki claims that this is in line with Haznedar and Schwartz's (1997) study, no correlation is found between null subjects and the inflection of verbs. Mobaraki argues that is not a case instantiating the missing surface form of the inflection as referred to in the Missing Surface Inflection Hypothesis. Rather, he insists that the absence is due to non-linguistic factors, like verbal fluency, short-term memory and language processing speed. Fifthly, Mobaraki observes the following order in the children's production of INFL-related components: copula be>auxiliary be> modal>verbal inflections (tense and agreement, for instance, -ed and -s). Mobaraki points out that the children had particular difficulty in supplying -s. Following Goldschneider and Dekeyser (2001), Mobaraki (2007: 230) assumes that "semantic complexity of this morpheme which stands for number, person, tense, and aspect makes it difficult to acquire [the inflectional morpheme -s]". Sixthly, NegP was found in the children's early production, but the headedness of the supplied NegP violates the NegP headedness of both Farsi and English. Mobaraki argues that the positing of negation is decided semantically rather than by their syntactic positions and that "the early L2 structure are only lexical and [that] the lexical meaning of the verb plays an important role in the syntactic position of the elements" (2007: 231). The evidence mentioned above is contradictory to Schwartz and Sprouse's (1996) proposal of the entire L1 grammar making up of the initial state of L2 acquisition. It also goes against Haznedar's (1997) claims of the transfer of the NegP headedness from her participant's L1 Turkish. Conversely, it supports Vainikka and Young-Scholten's proposal of the lexical category transfer at the initial state. Furthermore, it is recognised that the acquisition rate and outcomes of the children vary considerably due to the focus in literacy classes at school and internal learner differences in verbalness and processing speeds.

Furthermore, Kahoul (2014) examines the acquisition of verbal morphology in L2 English by adults. He investigates the agreement and tense morphology produced by L1 Chinese and

Arabic learners of English at three proficiency levels: low, intermediate, intermediate and high. He used native English-speakers as a control group and collected production data through a sentence elicited imitation task, where perception and comprehension data was gathered from a computerised picture-choice task. The outcomes were measured by reaction time in the eye movement tests. As revealed in Kahoul's production and perception test results, Chinese and Arabic speakers' morphology marking varied at the low and intermediate levels. For advanced learners, the variability in morphology suppliance remained for the Chinese learners, while Arabic speakers show the least variability. The same results are consistently revealed in Kahoul's processing data. Thus, he argues that learners follow similar stages of development, and that continued morphological variability is due to the lack of syntactic representation related to the speakers' L1s. Such an inquiry raises the issue of when L1 influence applies, as addressed by Hawkins (2001).

2.3.4 Counter-arguments against OG

Aside from supporting evidence, critiques have been made of the different assumptions of OG. The following section summarises the significant evaluations (Epstein, Flynn and Martohardjono 1996; Schwartz and Sprouse 1996; Haznedar 1997, 2003; Lardiere 1998, 2000; White 2003; Yuan 2004, etc.).

White (2003) questions the validity of the Minimal Trees Hypothesis at empirical, methodological and conceptual levels. White (2003) reasons, at a conceptual level, why and how functional categories should be absent from the initial state when the L1 grammar is in a steady state, and that UG has an inventory of functional projections. Moreover, White (2003) summarises findings from some research and argues that claims of the Minimal Trees Hypothesis are inconsistent with empirical data collected from learners with a wide range of L1s, where a wide range of functional categories like DP, NegP, TP, CP, occurs at an early stage. White (2003) even cites examples from Vainikka and Young-Scholten's study (1994), in which functional projections seemed to have occurred. She further argued that it is questionable to assume that the absence of functional categories in production data is the absence of the abstract types in grammar. Moreover, she contends at the methodological level that it was arbitrary to set 60% of presence of a linguistic item in the obligatory contexts as having been acquired. Critiques other than those of White (2003) are presented in Table 2.3.

Table 2.3 Counter-arguments against OG

	Opposed claims	Evidence
Schwartz and Sprouse (1994)	No transfer of functional projection of L1 at the initial stage	There was early fronting of finite auxiliary and modal verbs in finite positions and the fronting of non-subject elements to be assigned with the nominative case in Turkish adult's acquisition of German word order.
Epstein, Flynn and Martohardjono (1996)	The syntactic analysis of German; Stage-like development	Experimental tasks and acquisition criteria were not reliable in eliciting and testing L2 syntactic knowledge; the German syntax could be analysed differently; stage-like development was unconvincing, as there was evidence of IP stage production within the VP stage and CP production within the ArgP stage.
Haznedar (1997, 2003)	Morpheme-syntax coupling; VP-IP-CP development; Missing surface morphemes as missing functional projections	CP prior to IP in a Turkish-speaking child's acquisition of English and the absence of morphological forms in interlanguage data mirrored the realisation problem of surface morphology other than the deficiency in functional projections.
Lardiere (1998, 2008)	Implicational development; IP>CP	A Chinese-speaking learner of English produced the most difficult types of questions but had difficulties in marking past tense.
Yuan (2001, 2004)	L1 VP headedness transfer	There was no instance of head-final VP transfer from German into Mandarin; rather, German-speaking learners at different proficiency levels used the head-medial VPs in their negative sentences.

Given the above, alongside Vainikka and Young-Scholten (2011), it is summarised that the following cases that pop up in the data can be accounted as being sufficient to disapprove OG, for instance,

1. transfer of L1 functional projection at the initial stage;
2. L1 functional projection transfer at some other stages;
3. functional projection stages contradictory to the incremental development based on the prediction of OG

Regarding the fourth phenomenon, the previous studies have argued for the occurrences of the following instances at an early stage of L2 acquisition of Germanic languages as indicators of suppliance of CP functional projections, i.e. yes-no questions and *wh*-questions with subject-verb inversion, embedded clauses introduced by syntax morphology like complementisers and infinitival clauses. In other words, presumably, any such incidence evidence that learners have had a full syntactic tree from the start. Among all the instances, the most common argument for learners having a full tree with functional projection right from the beginning is that questions are comprehended from the outset. As this thesis does not include questions at all, it is necessary to outline briefly the absence of CP layer of functional projections in empirical studies from the OG's perspective, which involves Vainikka and Young-Scholten (1994, 1996a and 2011) and Mobaraki (2007).

In the study of the German acquisition by Korean and Turkish speakers, Vainikka and Young-Scholten (1994) note only sporadic production of CP projections. Thus, six out of 17 participants produced some *wh*-questions and yes/no questions at the third stage, the AgrP stage (the first two stages are VP and FP stages). However, according to Vainikka and Young-Scholten (2011), it is unclear whether the participants have acquired the CP layer of functional projections, as their production shows head-initial projections, which is different from native German speakers' functional head-final suppliance. Additionally, Vainikka and Young-Scholten (1996) report that at the FP stage of German acquisition by Spanish and Italian speakers, there occur *wh*-questions and related constructions, which may suggest "an emerging CP projection". The following example cannot be deemed as having a full CP projection, as it is likely that the subject *wh*-phrase remains in its subject position:

- (2.2) *wo kenn?*
 Where meet-*1SG
 'Where (did you) meet (him)?
 (Wo hast du ihn kennengelernt?)² (Vainikka and Young-Scholten 1996 a: 171)

In the investigation of L2 German acquisition by three young adults of L1 English natives, Vainikka and Young-Scholten contend that data from their second and third data collection sessions are instances of adjunction of *wh*-phrase to VP due to the lack of overt subject (Example 2.3.a) or subject-phrase in spec VP position (Example 2.3.b). The three learners'

² When no target-like sentence is given in a parenthesis, an utterance is assumed target-like. Such a rule applies to all the examples in the thesis.

AgrP occurred at the fifth data collection session, while their full CP projections is thought to have emerged at the seventh session.

- (2.3) a warum sprechen Deutsch?
Why speak*-INF German
(Warum spricht man Deutsch?)
'Why does one speak German?'
- b. Wer sprechen Deutsch?
Who speak German
(Wer spricht Deutsch?)
'Who speaks German?'

(Vainikka and Young-Scholten 2011: 289)

In support of Vainikka and Young-Scholten's stage-like development, Mobaraki (2007) argue that CP projection is absent from either the VP or IP stage due to the lack of subject-auxiliary inversion in both yes-no questions and *wh*-questions. Thus, the evidence from Vainikka and Young-Scholten (1994, 1996a, 2011) and Mobaraki (2007) seems to indicate a stage-like development from IP to CP functional projections.

It is worth mentioning that another significant argument of Vainikka and Young-Scholten (1996b) against those who claimed to hold evidence of presence of functional categories in L2 grammar, was that most participants in those studies, as well as in their own, might have gone beyond the initial state of L2 acquisition. For instance, Grondin and White (1996) had collected data from learners who might have passed the non-functional projection stage, for VP headedness transferred at an early stage. They further maintain that their statement applied to early German studies where the researchers conclude Turkish L2 learners of German began with SVO. They contend that these learners were already somewhat advanced, and were raising verbs.

2.4 The Modulated Structure Building Approach

Another approach that claims stage-like development based on L2 learners' development of functional projection is Hawkins' Modulated Structure Building Approach (2001) (henceforth MSBA). It argues that:

- the initial state of L2 grammar involves lexical projections;
- the formulation of L2 functional projections occurs after that of lexical projections on positive evidence from the input;
- Properties of L1 enter L2 at the relevant point of the structural building.

It is apparent that MSBA (Hawkins 2001) shares several assumptions with OG but is also distinctive. Conceptually, like OG, MSB recognises that its underlying postulation is UG through X'-theory. Similarly, MSB also claims a lack of L1 functional projection transfer at the earliest stage of L2 acquisition and the construction of functional projection sequences from VP to IP and then to CP. MSB differs from OG in light of the role that the L1 exerts in the structural building process beyond the initial stage. Specifically, MSBA contends that while L1 functional projections are not transferred at the initial state, they emerge when L2 functional projections are constructed at relevant points. In other words, in contrast to OG, MSBA argues that L1 functional projections do not transfer at the initial stage but at later stages; nonetheless, MSBA concurs with the incremental development based on the prediction of OG.

2.5 Processability Theory: Another Account Regarding L2 Development

Further to the review of L2 development from the generative perspective, attention is drawn to a theoretic approach, which takes a non-generative perspective in L2 development, i.e. the Processability Theory, proposed by Pienemann (1998). In theory, a universal architecture of human language processor is postulated to constrain learners' operation of logico-mathematical space. Thus, language acquisition involves "the acquisition of procedural skills", which govern the sequence of acquisition.

... the task of acquiring a language includes the acquisition of the procedural skills needed for the processing of the language. It follows from this that the sequence in which the target language (TL) unfolds in the learner is determined by the sequence in which processing routines develop which are needed to handle the TL's components.

(Pienemann 1998: 1)

Processability Theory comprises two parts. The core element involves the acquisition of the processing procedures that constrain and predict structural target language outcomes, as is shown in Table 2.4. According to the theory, language acquisition is composed of five stages, from word/lemma access to the sub-clause procedure with structural outcomes from words to main and sub clauses.

Table 2.4 Processing procedures and structural outcomes

Processing procedures	Structural outcomes
5. <i>Sub.-clause procedure</i>	<i>main and sub clause</i>
4. <i>S-procedure</i>	<i>inter-phrasal info. exchange</i>
3. <i>Phrasal procedure</i>	<i>phrasal info. exchange</i>
2. <i>Category procedure</i>	<i>lexical morphemes</i>
1. <i>Word/lemma access</i>	<i>'words'</i>

(Source: Pienemann 1998: 9)

It is worth highlighting that Pienemann's stage-like development is implicational. In other words, the acquisition of a higher procedural stage must be based on the acquisition of a lower stage. For instance, to acquire S-procedure (stage 4), L2 learners will have to first acquire the phrasal procedure (stage 3), as the phrasal procedure cannot be skipped over. The grammar adopted for the interpretation of the hierarchical processing in the Processability Theory is Kempen and Hoenkamp's (1987) procedural and incremental explanation of syntax formulation from left to right and emphasises that L2 acquisition is lexically driven.

The other part of the Processability Theory is the Teachability Hypothesis, which hypothesises (1) the stages of acquisition are not skipped even for L2 learners under formal instruction; and (2) instruction that focuses on 'the next stage' of L2 development benefits L2 learners. The theory proposes the employment of emergence criteria to capture L2 learners' linguistic knowledge. Empirical work that testifies the validity of the theory has been conducted on a wide range of L2s regarding the acquisition of various aspects of L2 morpho-syntax. The efforts to verify the theory lead to inconclusive results. It is important to highlight that the theory has been applied to the examination of the stage-like development of L2 Chinese grammar; nonetheless, it offers little insight into the acquisition of rich aspect morphology. As to conceptual and empirical issues with the existing empirical studies on the acquisition of Mandarin, they will be reviewed in Chapter 4.

2.6 Methodological Issues

Based on the review of the previous empirical data, several practical issues, whether explicit or implicit, have emerged in the existing studies on the early stage of L2 development from the generative perspective. First, the research designs, either longitudinal or cross-sectional +

longitudinal, could have been more desirable and effective. White (2003) raises concerns over the generalisability of the results from Schwartz and Sprouse' longitudinal study of a single case. Meanwhile, Vainikka and Young-Scholten (1994, 1996) effectively elicits data from longitudinal and cross-sectional participants. The present thesis argues that tracing L2 development of the same population with different learning stages longitudinally may yield steadier developmental features than the combined longitudinal and the cross-sectional data.

Second, participants of the previous studies (e.g. Schwartz and Sprouse 1994, 1996; Eubank 1994, Vainikka and Young-Scholten 1994, 1996a; Hawkins and Chan 1997) share one common feature. In other words, they are not complete beginners; rather, when data collection started, L2 acquisition had been in progress for the various duration (White 2003). Therefore, the characterisation of early stage features, for instance, the transfer of VP head directionality, may not have genuinely reflected L2 learners' acquisition status, as it is likely that the learners will have progressed from the initial state.

Finally, the criteria for capturing learners' acquisition of L2 morpho-syntax knowledge vary across the studies from the generative perspective. Section 5.7.1 will discuss the acquisition criteria for the present research in detail.

2.7 Testing the Acquisition of Functional Projections with a Typologically Different Language

As discussed above, either the FT/FA approach or OG has conceptual and empirical issues. Therefore, a greater understanding of the universal features requires L2 development to be approached by testing the essential questions in the generative perspective of L2 acquisition with a typologically different language.

...L2 acquirers with typologically distinct L1s do in fact differ with respect to their developmental paths for a given TL; this is particularly so in regard to syntactic development.

(Schwartz and Sprouse 1996: 67)

The present thesis maintains that Mandarin fits the purpose, as it is assumed to lack the functional morphology, such as tense, agreement and case. In the absence of some functional projections, a vibrant system of aspectual morphology as well as *ba* and *bei* constructions, this thesis maintains that Mandarin can be a test language for the re-examination of the existing

hypotheses that are unclear about languages without overt-marked functional morphology regarding L2 development.

It is worth mentioning that almost all the functional projections at CP layers are reserved for future study due to three considerations. Syntactically, functional sequences at CP layers in Mandarin are under-explored. Empirically, early productions of questions by L2 child learners have been characterised as being non-productive, as they are just functioning as a formulaic language to fulfil pragmatic purposes (Myles, Hopper and Mitchell 1998; Hakuta 1974, 1976, Wong-Fillmore 1976). The production is counted merely as language performances closely related to rote memorisation but not language knowledge. The real acquisition is argued to be a process of breaking down the formula and rebuild the mental grammar. In this study, Charles, one Year 1 participant, could ask *ni chi le fan le ma?* ‘Have you had your meal?’ during the first data collection when he was struggling with a complete production of even a declarative clause. Thus, it can be argued that there is no mental representation of the syntactic structure at the initial stage. In a practical sense, to provide convincing argumentation for the existence of CP ahead of IP needs a systematic study of questions and clauses, which falls beyond the time limits of the present project. Based on the previous review of the two theoretical approaches (FT/FA and OG), it is appropriate to say, as suggested by White (2003), that either of the theoretical approaches has its conceptual and empirical strengths and weaknesses. OG, which shares the Minimalist Programme’s stances like lexical elements and the upward derivation of syntactic structure, stands out as a theoretical approach by seriously addressing L2 development or predicting an L2 stage-like development model based on functional projections. Therefore, this study considers OG to be a desirable working model for the examination of a typologically different language, like Mandarin.

Given the review above, the following questions are asked to test the descriptive adequacy and the explanatory power of OG as a cross-linguistic theory, and as a second-language acquisition theory.

Q1: Where the word order in the verb phrase is different in English and Mandarin, do the learners in this study use the order of their L1 English or the order of Mandarin?

Q2: Do L2 Mandarin learners project functional elements in a stage-like manner, that is, from bottom to top, in accordance with the route predicted based on a syntactic tree for Mandarin?

2.8 Conclusion

This chapter has reviewed the major theoretical approaches to the acquisition of the clause structure with reference to the features in the acquisition of functional projections, the role of L1 and UG. The L2s examined in the previous studies are mostly European languages. The present thesis argues that while it is appealing to assume that L2 learners can fully transfer L1 functional categories and fully access UG, researchers supporting the hypothesis fail to offer a descriptive model that can account for L2 development from the initial state to the end state, not even the interlanguage of a targeted L2. We conclude that while OG has some issues as a development issue, it can still be a good model to test the existing hypotheses proposed based on European languages and contribute to the problems long-standing like UG, the role of L1 and stage-like development of L2 from the generative perspective.

CHAPTER 3 THE STRUCTURE OF THE CLAUSE IN MANDARIN

3.1 Introduction

Following an extensive review of existing theoretical approaches to the acquisition of syntax, I have concluded in Chapter 2 that OG provides a good working model for the account of L2 Mandarin development. As noted previously, the distinction between Organic Syntax and the Minimal Trees Hypothesis is the emphasis of Organic Syntax on language-specific features, which is demonstrated through its call for a Master Tree for each language. That is expressed explicitly as follows: “[each] language has a master tree that includes all possible projections occurring in that language” (Vainikka and Young-Scholten 2011: 11). In accordance with Organic Syntax, this chapter reviews existing proposals regarding functional projections in the clause in Mandarin. It uses the resulting tree structure to make predictions about the stages in L2 Mandarin development, which will be tested in later chapters.

This chapter is structured into six further sections. Sections 3.2 and 3.3 establish the fundamental properties of VP at the lexical level and specify the available functional projections at the IP layer. Most projections will be discussed in light of their semantic features, making comparisons where possible with more or less equivalent concepts in English. Section 3.4 discusses the co-occurrences of functional elements in the IP domain. Section 3.5 presents the full syntactic tree of the clauses in Mandarin that will be used as a model throughout the present thesis and discusses the hierarchical relations between the functional projections. Section 3.6 presents the specific predictions that follow for L2 Mandarin development on the basis of the tree, while section 3.7 concludes the chapter.

3.2 The Structure of the VP in Mandarin

This section discusses the claims made by linguists for the structure of the VP in Mandarin, including its headedness and the meaning of the bare VP. The properties of VP are approached through four aspects: (1) what is VP in Mandarin? (2) How have linguists described its structure? (3) What is its head directionality? (4) What is its bare form?

Huang, Li and Li (2009) note that the VP in Mandarin, as in any other language, is a string of words formed with V as a head through a schema, which contains constituents of different categories, either proceeding or following V. These constituents are PP, ADV and object NPs; I will return to the order of these in Section 3.3.

In this thesis, in line with X'-theory, the syntactic representation of VP is assumed to be composed of the head V, with XP1 as its specifier and XP2 as a complement, as shown in Figure (3.1). The structure of the example (3.1) is illustrated in Figure (3.2).

(3.1) <i>Wo xihuan shu.</i> 1SG like book 'I like books.'

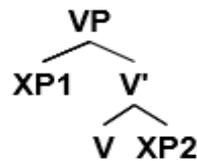


Figure 3.1 The structure of VP

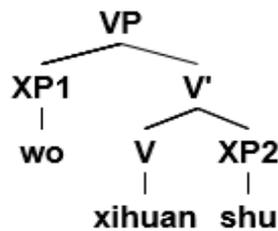


Figure 3.2 A VP clause structure

The present thesis, in line with Huang, Li and Li (2009), assumes that in Mandarin, as in other languages (Chomsky 1995), there is a *vP*, residing right above VP. The *vP* is considered to be in the lexical domain, introducing one more argument position in the syntactic tree. The syntactic structure is depicted in Figure (3.3). The proposal is necessary as it will help us with the future analysis of *ba* and *bei* constructions. In the tree, we continue to follow Vainikka and Young-Scholten (2011) and present the subject as the Spec VP, on the understanding that the subject is now considered to be in the Spec *vP*.

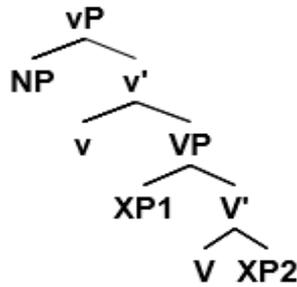


Figure 3.3 vP projection in Mandarin

(Source: Huang, Li and Li 2009: 83)

3.2.1 *The head directionality of the Mandarin VP*

The preverbal constituents in Mandarin are PP and ADV, and the post-verbal constituents include double objects, the *V-de* construction and frequency/duration phrases. The head directionality of the Mandarin VP has been under persistent debate. Some consider it head-final (e.g. Tai 1973; Li and Thompson 1974; P. Li 1990; Tang 1990; M. Li 2007), others head-initial (e.g. Huang 1982; Mulder and Sybesma 1993; M. Li 2009; Paul 2015, etc.) and still others head-medial (Yuan 2004; Liu 2016).

The head-final school claims there is sufficient evidence that modern Mandarin has verb-final (OV) features (Tai 1973, 1976). In Li and Thompson (1974), this idea is given a historical interpretation, whereby there is a general tendency towards increasing use of OV in Mandarin. The main points of their view are:

- Word order changes as follows: SOV (prior to 11th century BC) → SVO (10th to 3rd century BC) → SOV (3rd century BC---today);
- Current uses of SVO word order are remnants of the earlier SVO structure;
- Relic SVO sentences are being replaced by the dominant SOV, and newly-emerged constructions will have SOV order.

This school also holds that a syntactic change occurs due to the placement of post-verbal elements (PP and object) in a pre-verbal position; that involves the particles *ba* and *bei*, described by Li and Thompson (1974) as follows:

- (3.2) $S + V + PP \rightarrow S + PP + V;$
 $SVO \rightarrow S + ba + O + V;$
 $SVO \rightarrow O + bei + S + V.$

Referring to the relationship between adjuncts and V, M. Li (2007) and Tang (1990) argue that VPs in Chinese are head-final with pre-verbal adjuncts licensed by Pred(icate)P, a functional projection, and that post-verbal adjuncts are licensed by lexical V. Consequently, the pre-verbal adjuncts are posited to either Spec or attached to the PredP (i.e. x' level of projection), while post-verbal ones are attached to the X' level of projection.

The VO school argues that that VO is the unmarked order in Mandarin (M. Li 2007) and that Mandarin VP has unconditionally always (Paul 2015) been head-initial (Mulder and Sybesma 1993). They mention as evidence that locative PPs in Mandarin reside on the left of the verb and predicative complements follow it. Moreover, they hold that the SOV word order in the *ba* construction is similar to that in non-*ba* construction, as all clauses have a head-complement configuration at logical form LF (Paul 2015). Furthermore, it has been demonstrated that even in pre-archaic Chinese (13th -11th century BC; as presented in Djamouri's 1988 corpus data), 94% of Chinese sentences appear to have SVO order and only 6% SOV order (Paul 2015).

In the head-medial school, Liu (2016) maintains that both VO and OV structures co-exist in Mandarin. Like many researchers in the other two schools, he analyses historical data, proposing a hybrid word order in traditional as well as modern Mandarin; in other words, a mixed VO and OV order, with the number of clauses with VO order being just slightly higher than those with OV order. When investigating L1 French, English, and German learners' acquisition of the syntactic positions of negators and frequency adverbs in clauses, Yuan (2004) takes the stance that Chinese has head-medial VP and IP³. Such a stance indicates that Yuan treats negators as adjuncts adjoined to the V' position.

In light of the above, we have seen three schools of thought with regard to the headedness of VP in Mandarin, i.e. head-initial, head-final, and head-medial. In this thesis, I follow Huang (1982), as quoted below, that VP directionality of Mandarin is head-initial; nonetheless, the

³ Yuan also holds that English IP and VP are head-medial, as cited in "both VP and IP in English are head-medial" (2004: 170)

head directionality of IP and CP is head-final. That is, “[a] major word order property of Chinese is that it has the head-initial rule only for the lowest level expansion but requires the head-final rule for all higher levels” (Huang 1982: 41). Many researchers are in line with the hypothesis of the co-existence of head-initial VP and head-final functional projections in Mandarin (Simpson 2014).

3.2.2 *Bare VP*

After the discussion of VP and its head directionality, we look briefly at how ‘bare VP’ is defined given its use by Vainikka and Young-Scholten in their work on L2 acquisition to refer to a purely lexical projection. It is worth noting that previous literature on Chinese linguistics reveals that the term ‘bare VP’ has been used somewhat inconsistently. For instance, Lü (1995) considers verbs without adverbials, objects, complements and functional words, to be bare VPs. Moreover, for him, a bare VP may or may not have a subject. Liu (2008) holds that a bare V has all those elements. Thus Lü’s (1995) claim reduces a bare VP to only a verb while Liu’s (2016) conceptualisation of bare VP is sufficiently inclusive to accommodate Huang, Li and Li (2009) and Sybesma (1999), as noted in section 3.2. In line with Vainikka and Young-Scholten (1994, 1996a, 2011), the present thesis takes the position that bare VP is the verb phrase without functional elements. Furthermore, VP involves the minimal lexical projection with little *vP* residing above VP and the spec VP position hosting external arguments.

3.3 The Structure of the IP in Mandarin

This section covers linguists’ discussion on the functional projections at the IP layer in Mandarin are $AspP_l$ (low aspect phrase), $AspP_m$ (middle aspect phrase) and $AspP_h$ (high aspect phrase), as well as NegP (negation phrase), *BaP* (*ba* phrase) and *BeiP* (*bei* phrase). They are headed respectively by *le_l* (lower *le*), *zai*, *le_h* (higher *le*), negators *bu* and *mei*, *ba* and *bei*. I examine the functional projections in the IP layer by following the sequence of $AspP$, TP, *BaP*, *BeiP* and NegP.

3.3.1 *AspP*

3.3.1.1 *Aspect markers and their semantic features*

Aspect expresses the internal temporal composition of a situation (Comrie 1976). Conversely, tense is the grammatical location of events in time (Comrie 1985). Mandarin lacks overtly-

marked tense but possesses an aspectual system, which is more extensive than English, composed of such overt markers as *zhe*, *le*, *guo* and *(zheng)zai*.⁴

Comrie (1976) provides the standard framework for the description of aspect, where he classifies aspect into two categories according to the status of the situation, i.e. perfectivity and imperfectivity. The former refers to a situation as a whole, while the latter attends to the internal composition of the situation. Figure 3.4 summarises Comrie's account of aspect with both English and Mandarin aspectual information given as examples. Meanings shared by both languages are underlined in the figure. The aspects included in it are, firstly, perfectivity which is expressed in English by *ed* (past tense) and in Mandarin by *le_l* and *le_h*. Secondly, English *(be+ing)* is equivalent in semantics with Mandarin *zai*. Thirdly, experiential *guo* and durative *zhe* are Mandarin specific; no markers semantically equivalent to them are found in English. The analysis accords with M. Li's (2007) claim that perfective *le* and imperfective *zai* are unmarked aspectual elements whose properties are available in other languages; meanwhile, the perfective *guo* and imperfective *zhe* are marked due to their distinctive properties only displayed in Mandarin.

⁴ Further aspectual markers are completive *wan*, discussed in Tsai (2008), and *you*, discussed in Huang, Li and Li (2009). These are not included in the exploration of their L2 acquisition in the present thesis.

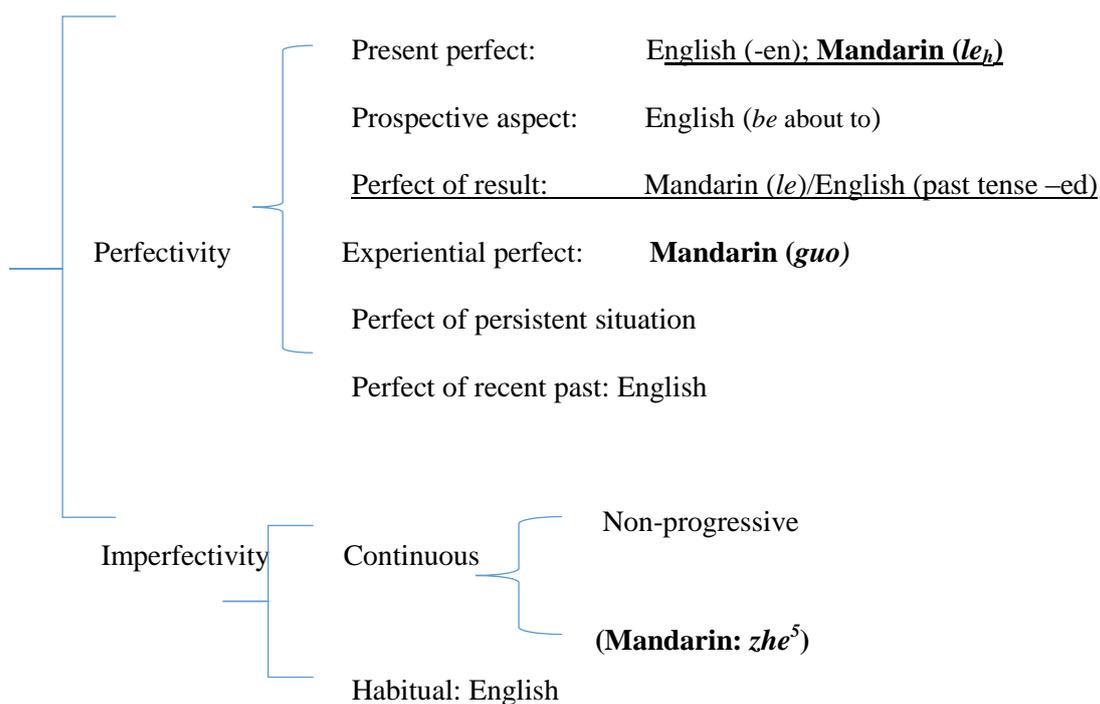


Figure 3.4 Aspectual categories in English and Mandarin

(Adapted from Comrie 1976: 25, 52-64)

It is now agreed that, unlike the proposals in Li and Thompson (1981), the aspect marker *zai* emphasises progressiveness of action while *zhe* stresses the state of action (M. Li 2007; Simpson 2014). Table 3.1 demonstrates how aspect markers are categorised. The categorisations will serve as a fundamental description of English and Mandarin aspectual features in the present thesis.

Table 3.1 Properties of aspect markers in Mandarin

	Category (Comrie 1976)	Sub-category (Li and Thompson 1981)	Syntactic position
<i>zhe</i>	imperfectivity	durative	postverbal
<i>le_l</i>	perfectivity	perfective	postverbal
<i>guo</i>	perfectivity	experiential	postverbal
<i>(zheng) zai</i>	imperfectivity	durative	preverbal
<i>le_h</i>	perfect	current relevant status (perfective/ future)	post complement

⁵ *zhe* was not presented initially in Comrie's (1976) discussion but added by the author of the thesis to Figure 3.4 to gain the semantic equivalence of the English imperfectivity.

3.3.1.2 AspP: split vs unified

In English, AspP has been proposed to be above ν P (Thompson 2006), to be between ν P and VP (Macdonald 2008) or to consist of two AspPs (H(igh)- Aspect or L(ow) -Aspect), with L-Asp being located between ν and VP and H-Asp above ν P (Fukuda 2008, and Macdonald 2011). A unified or split/multi-layer argument also applies to the analysis of Mandarin AspP. The former claims that all aspect markers reside in one single AspP head position; while the latter proclaims several AspPs headed by different aspect morphemes.

The unified analysis, as illustrated in Figure 3.5, appears straightforward for preverbal aspect markers like *you* and *zai* due to their linear position in the clauses. It is difficult to derive the post verbal aspect markers due to the Head Movement Constraint caused by AdvP. Assuming that it is acceptable for V to move over the head of AdvP and incorporate *zhe/le/guo*, the movement culminates in ungrammatical surface order, as demonstrated in example (3.8). To address the issue, scholars have proposed two accounts: lowering the suffix to V' and then incorporating it into V (Tang 1990; Cheng and Li 1991; Cheng 1997;) or one or two-step covert movement for feature checking (Huang, Li and Li 2009, M. Li and Zhao 2008). Figures 3.5-3.6 respectively sketch the V-AspP and lowering suffix accounts and the resulting issue with each perspective.

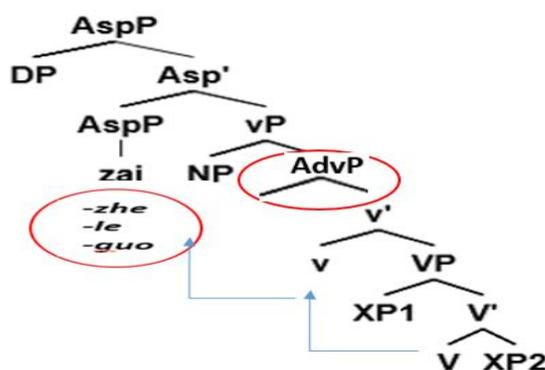


Figure 3.5 Unified AspP analysis: raising V to AspP

Issue: surface order problem after V-v'-AspP

- (3.8) a. **ta hui le qiaoqiaode jia.*
 3SG return LE_i quietly home
 'He went home quietly.'

- b. *Ta qiaoqiaode hui le jia.*
 3SG quietly go LE_t home
 'He went home quietly.'

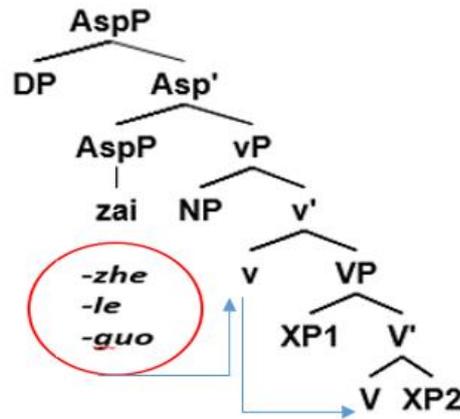


Figure 3.6 Unified analysis: lowering suffixes

ECP issue: traces after moving *zhe*, *le* and *guo* are not c-commanded after being lowered to V (M. Li 2007; M. Li and Zhao 2008).

As highlighted above, suffix-lowering and V raising are both problematic. Huang, Li and Li (2009) propose the possibility of deriving a linear surface order from first V-*v'* movement, and then verbs move covertly to $AspP_h$. M. Li and Zhao (2008), instead, argue against the overt movement of suffixes and insist that all change occurs at the covert level in accordance with the movement constraints. The present thesis argues that while the covert analysis addresses ECP and linearisation issues, the coupling of aspect markers, as seen in Example (3.8), is left unaddressed. A similar view is expressed by Wang and Liu (2014).

To sum up, different derivations have been proposed to address this issue (e.g. Cheng 1989, 1997; Tang 1990; Cheng and Li 1991; M. Li and Zhao 2008), but they involve problematic operations like lowering and they struggle to account for the position of adverbs (which are preverbal). Moreover, as Wang and Liu (2014) point out, it is possible for one clause to contain two aspectual markers, as in Example (3.9), for which the single $AspP$ hypothesis cannot accommodate.

- (3.9) *Ta zai kan zhe wo.*
 3SG ZAI look ZHE 1SG
 'He is looking at me.'

The present AspP analyses, as in Simpson (2014), tends to propose a multi-layer of aspectual functional projections; a natural move given that the aspect markers differ in their semantics and position in relation to the verb. Huang, Li and Li (2009) sketch a two-layer analysis, as given in Figure 3.7, and also hint that it is likely that each aspect marker has its functional projection.

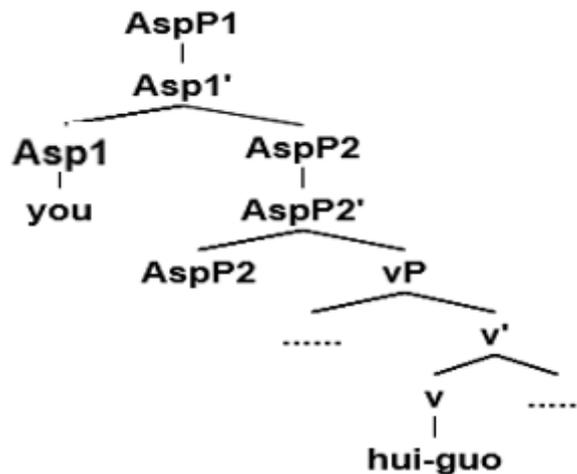


Figure 3.7 A proposal of a two-layer aspect analysis (Huang, Li and Li 2009: 105)

AspP1: <i>zai/you</i>	— preverbal
AspP2: <i>zhe/le/guo</i>	---- postverbal ⁶

In Huang, Li and Li's (2009) analysis, YOU heads $AspP_1$, while GUO is a suffix to the verb *hui* 'return'. An exemplary clause can be as follows:

- (3.10) *wo* *you* *hui* *guo* *jia*.
 1SG YOU return GUO home
 'I once returned home.'

The positing of the AspPs in Figure 3.6 corresponds to the preverbal and post-verbal positions of the aspectual markers. The head of $AspP_1$ can be realised by one of the two preverbal free morphemes *you* and *zai*⁷, while the head of $AspP_2$ is one of the suffixal aspect markers, *guo* *zhe* or *le*. In Figure 3.6, the verb *hui* 'return' has moved from V to v; subsequently, it will move

⁶ The tree was taken from Huang, Li and Li (2009: 105) with the annotation added by the author of the present thesis.

⁷ *zai zhe* and *le* are not shown in the tree.

to the head of AspP2, ending up immediately to the left of the Asp2 head *guo*. One question with the analysis is that it remains undressed why the negative form of perfective aspect must be coordinated with *you* instead of *le* (Huang, Li and Li 2009).

Tsai (2008) goes even further by arguing for a three-layer analysis of AspP, as presented in Figure 3.8. The projected AspP1, AspP2 and AspP3 are respectively named high aspect, middle aspect and inner aspect. Tsai's analysis has the following characteristics: (1) *guo* is posited to have the same status as *zai*; (2) *zhe* is divided into two layers according to its meaning; (3) AspP2 is posited between *v*P and VP and (4) *wan*, which is not often discussed in the literature, is proposed at the lowest layer of the aspectual system. It is likely that the tree will have several issues, but here I only mention one crucial issue in the present thesis; namely, the positing of *guo* as a top AspP. Tasi (2008) argues that proposing *guo* and *zai* to head outer AspP is because they are the candidates for moving from AspP to TP, with *guo* representing past tense and *zai* present tense. Similar proposals of three layers of aspect analysis can also be found in other studies, for instance, Tenny (2000). Although the proposal AspP-T movement sounds plausible, the derivation of *guo* in linear order is highly problematic. As has been previously analysed, *guo*-lowering will create an empty category principle (ECP) issue, while raising verb will generate a surface order issue due to adjuncts joined to *v*'.

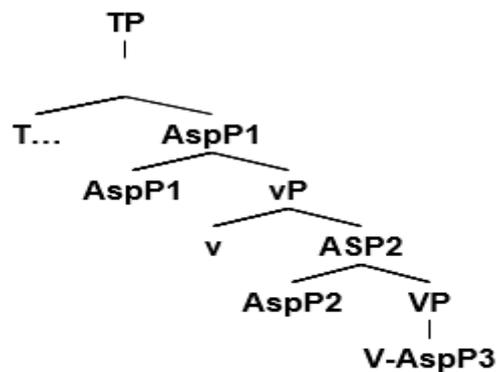


Figure 3.8 A proposal of three-layer AspPs

(Tsai 2008: 9)

AspP1: <i>zai/guo</i>	— outer aspect
AspP2: <i>le/zhe-P</i>	---- middle aspect
AspP3: <i>zhe-R/wan</i>	--- inner aspect

The present thesis adopts an alternative three-layer analysis, based primarily on Huang, Li and Li (2009). The difference between this analysis and that of Tsai (2008) is that, firstly, it locates

all AspPs above *vP* and, secondly, sentence-final *le* heads the highest AspP, i.e. AspP_h. This is in line with the split *le* proposal in literature, i.e. treating *le* as two different *les* in light of their semantic and syntactic functions. For instance, in Example (3.6), it is generally accepted that the *le* in the clause means perfectivity. Many assume (though see Li 1990 for a dissenting view) the functions and the syntactic derivation of sentence-final particle *le*, which, according to Li and Thompson (1981), mean the action in the clause is relevant to the status of the situation. As the two *les* share the same phonetic form, they differ not only in syntactic position but also semantically. The present thesis follows the line of thought that they are two separate *les*, *le_l* and *le_h*. *le_l* resides right above the *vP* while *le_h* is posited as the top of AspP projection, i.e. AspP_h.

It is noteworthy that different from the conventional *le₁* and *le₂*, where *le₁* refers to verbal *le* and *le₂* the sentential *le*. The present thesis adopts *le_l* and *le_h* to avoid the fuzziness caused by the use of *le₁* and *le₂*. Lǚ (1980) first differentiated two types of *les*, *le₁* and *le₂*. According to Lǚ (1980), *le* in V+*le*+O structure is *le₁*, while *le* in V+O+*le*, n/quantifier/adj+*le* is *le₂*. Categorising *le* in this way, however, is problematic in two respects. Firstly, there are cases of thematic verbs that are intransitive verbs, as presented in example (3.10). It is difficult to assess whether *le* in a clause is a *le₁* or *le₂*. Xu (2015) holds that it is impossible to differentiate *le₁* and *le₂*, while Li and Thompson (1981) and Huang (2017) insists that contextual meaning plays a significant role in distinguishing *le₁* and *le₂*. In other words, when there is a contrast between two events, the *le* following the verb and also at the sentence-final position is counted as *le₂*, as it is related to the current status. Otherwise, *le* should be considered as an instance of *le₁*.

For instance, examples (3.11 a-b) would be interpreted without controversy as featuring *le₁* and *le₂* respectively. Example (3.11 c) is a case where *le₁* and *le₂* can co-occur in one clause. The interpretation of (d), however, relies on researchers' understanding of the context, i.e. whether there is a null object as in (3.11 a-c). Superficially, (3.11 d) can be categorised as a *le₂* as *le* is at the sentence-final position, suggesting perfectivity. However, if it is a response to a question "Have you read the book?" the clause will become (3.11 a), where *le* is a typical *le₁*. Some scholars like Xu (2015) even hold that it is impossible to classify *le* into *le₁* or *le₂* when there is no other element following verbs.

- (3.11) a. *wo* *du* *le* *na* *ben* *shu.*
 1SG read LE_l that CL book
 'I read the book.'

- b. *wo* *du* *na* *ben* *shu* *le.*
 1SG read that CL book LE
 ‘I have read the book.’
- c. *wo* *du* *le* *na* *ben* *shu* *le.*
 1SG look LE_i that CL book LE_h
 ‘I have read the book.’
- d. *wo* *du* *le.*
 1SG read LE
 ‘I have read it.’

The issue of categorising V+*le* into with *le*₁ and *le*₂ is to sweep all SFPs into *le*₂. That has been problematic in two aspects. Firstly, in some cases, there exists a null object that is retrievable. For instance, in response to a question: Have you read the book? The answer can be *wo du le* ‘I have read it’. Therefore, it is inappropriate to categorise it into *le*₂. Secondly, when the verb of a clause is intransitive, the categorisation has not been consistent, particularly in SLA literature. P. Li (1990), Duff and Li (2002), Bell and Wright (2015), following Li and Thompson (1981), clustered intransitive verb+*le* with perfective *le* (V+*le*+O). However, there are some other studies which categorise *le* into *le*₂ (see the review on L2 Mandarin acquisition in Chapter 4). Additionally, categorising *le* in *ba* and *bei* constructions as *le*₂ is problematic. The present thesis specifies that *le*_i refers to V+*le* or V+*le* +O; while V+O+*le* is called higher *le*, as it falls out of being part of the inner object and reside in a higher position than all the other aspect markers.

The proposed AspP projections are presented in Figure 3.9. Such a proposal attends to Tsai’s (2008) concern over the candidate for the head of TP if it is proposed for Mandarin. *le*_h has been argued by Sybesma (1999) to reside in TP but eventually move to CP, which will be discussed in the next section.

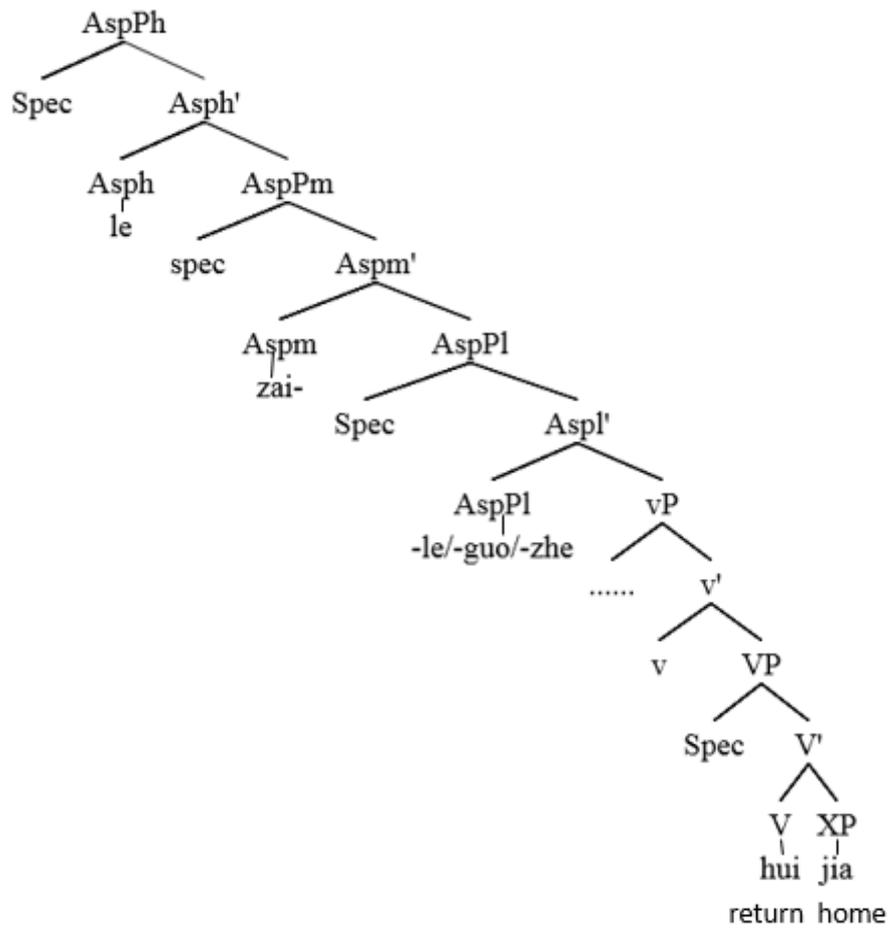


Figure 3.9 The aspectual system assumed in this thesis

Table 3.2 Aspect phrases in the present thesis

Aspect phrases	Annotation	Functional heads
AspP _l	lower aspect phrase	<i>zhe, le_l, guo</i>
AspP _m	middle aspect phrase	<i>(zheng)zai</i>
AspP _h	higher aspect phrase	<i>le_h</i>

This section has provided a review of the properties of the Mandarin aspect markers and has adopted an analysis in which there are three different aspect phrases. Having addressed the aspectual part of the clause, we now turn to the *ba* construction in Mandarin.

3.3.2 TP in Mandarin

The postulation of a functional projection for a tense phrase (TP) is no less controversial than hypothesising AspP in Mandarin. Some researchers (e.g. Norman 1988; Klein, Li and Hendriks 2000) have explicitly denied that there is a tense system in Modern Mandarin (Sybesma 1997b), which would imply the absence of a TP. Some argue that Mandarin is an aspect language rather than “a tense language” (Norman 1988:163) due to the lack of inflectional morphology (Klein, Li, and Hendriks 2000). Nonetheless, other researchers (e.g. M. Li 2007; Huang, Li and Li 2009; N. Li 2014, etc.) argue that, as tense is widely postulated cross-linguistically, Mandarin should also have a TP projection. Tsai (2008: 675), for example, argues for the necessity of postulation of TP by referring to mature adult speakers’ language instinct: “[i]t has to do with native speakers’ feeling of incompleteness” towards a cluster of sentences which are inflected for aspectual construals on the surface, but still lack the ability to stand alone”.

The challenge for proponents of a Mandarin TP is to identify the evidence; namely, the functional morphemes that mark tense. To date, inconsistent proposals have been made regarding what those markers might be. Both *le_l* (Chiu 1993) and *le_h* have been proposed as a tense marker (Sybesma 1997b). The proposal of a TP in Mandarin by Sybesma (1997b, 2007) is based on an analogy between the function of D in DeikP⁸ in the nominal domain to the role of T in TP in the verbal domain. To be more specific, according to Sybesma (1997b), D (determiner) and T (tense) play similar functions in the nominal and verbal domains. He argues that the division of labour between D and NP is the same as that between T and VP: That is, NP describes something and D anchors this entity in the world; similarly, VP describes an event

DeiKP is highly likely to mean ‘deictic phrase’.

and T allocates the fact on the time axis. Thus, as Li and Thompson (1981) conceive sentential *le* as a referential connection between a past event and the current situation (Current Relevant State), a TP should be conceptualised as the head of TP in Mandarin. Sybesma also argues that the proposal is both semantically adequate and empirically practical, as one can arrive at the surface order straightforwardly by applying XP movement of the entire TP to Spec CP. Sybesma's proposal is illustrated in Figure 3.10, where (a) indicates the base structure and (b) demonstrates the structure following the movement of TP to the Spec CP position. It is worth noting that this is how Sybesma achieves a head-final CP with the starting head-final V.

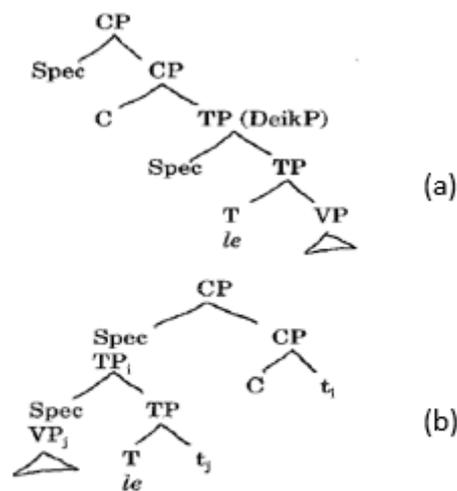


Figure 3.10 Sybesma's syntactic tree (1997: 4)

Subsequently, Sybesma (2007) proposes a null T account where Mandarin *le* is compared with Dutch past tense markers. He argues that past is overtly marked in Dutch but covertly denoted in Mandarin. This means tense is present in Mandarin but not spelt out phonologically as *le*. However, if there is a TP projection, it is suspicious that *le* would head it. More recently, Sybesma (2015, p.c.) states that Mandarin *le* may share similarities with the status of a sentence-final particle like *ne*, *ma* and other C-elements. Thus, it is right to say that there has been great indeterminacy in conjecturing TP or *le* as the head of TP.

Other functional elements have been postulated to head TP. Apart from the sentential *le*, aspect markers like *guo*, verbal *le* and sentential *le* have also been argued to be related to TP in some way. For instance, researchers like Chiu (1993), Bell and Wright (2015) highlight that the use

of verbal *le* in Mandarin marks a clause as indicating the past. Since *le*, the lower *le* in example (3.12), expresses perfective aspect, the clause that refers to the action of eating an apple is viewed as one completed whole; thereby implying that the action occurred in the past.

- (3.12) *ta* *chi* *le* *pingguo.*
 eat PAST LE apple
 ‘He ate an apple.’

Alongside the syntactic considerations, M. Li (2007) also argues from a semantic perspective that *le_l* does not always refer to past events but sometimes it denotes future. M. Li’s view is verified by Li and Thompson (1981), who provide empirical evidence that *le* does not signpost past tense. Thus, *le_l* can be in “non-past perfective sentences as imperatives” like Example (3.13), in simple future sentences like Example (3.14), etc.

- (3.13) *he* *le* *ta.*
 drink LE 3SG
 ‘Drink it.’⁹ (Li and Thompson 1981: 213)

- (3.14) *mingtian* *wo* *jiu* *kaichu le* *ta.*
 tomorrow 1SG then expel LE 3SG
 ‘I will expel him/her tomorrow!’ (Li and Thompson 1981: 213)

Therefore, the proposal that *le_l* is a past tense marker is unsatisfactory.

As noted previously, some lexical morphemes have been postulated as heads of a potential TP; for example, *mei* in N. Li (2014) and *jiang* in M. Li (2007). With regard to the latter, M. Li argues that while there is little evidence of present and past tense in Mandarin, *jiang* is an element that expresses future tense in a formal register. She proposes the structure of TP in Mandarin as depicted in Figure 3.11 where *jiang* heads the proposed TP.

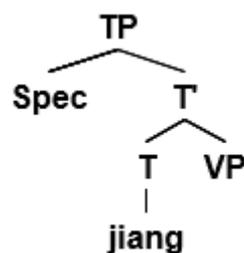


Figure 3.11 M. Li’s (2007) TP headed by *jiang*

⁹ The inverted commas were added by the author of the thesis.

While *jiang* indeed refers to a future event, I argue that identifying *jiang* as a future tense marker is untenable, as *jiang* is not grammaticalised such that it can be counted as a functional morpheme. In other words, *jiang* functions as an accessory word along with *chulai* ‘come out’ *qilai* ‘get up’ where its meaning equals ‘just’, denoting the perfectivity of an event, applicable to informal contexts. Still, others argue that temporal reference in Mandarin is expressed by an adverbial of time or contextual means (Ramsey 1989).

Given the above, it is fair to say that the postulation of a TP in Mandarin remains far from conclusive. As the present thesis focuses on L2 acquisition, it will not propose a TP in Mandarin. Apart from the above theoretical arguments regarding an independent TP, this thesis emphasises that the Master Tree for each language is constructed from the input during acquisition. Linguistic functions without instances in the input are thought not to be projected. It is necessary to point out that OG argues that there is cross-linguistic variation regarding which categories are realised in the Master Tree, which may further justify the absence of TP in Mandarin in the present study.

3.3.3 *BaP*

What is referred to as the *ba* construction or phrase is specific to Mandarin (Zhao 2011). Recall the main descriptive facts about the construction. This section examines arguments on whether there is an independent *BaP* projection and, if so, how it is projected.

3.3.3.1 *Linguistic features of the ba construction*

The *ba* construction is one of the most heatedly-debated topics in Chinese linguistics (Wang 1954; Li and Thompson 1981; Sybesma 1999; Huang, Li and Li 2009; Paul 2015, etc.). The significant issues revolve around the semantics of the *ba* construction, the lexical and functional categories of *ba* and the syntactic derivation of its structure. *Ba* is generally held to be grammaticalised from *ba*, which means ‘hold’. Li and Thompson (1981: 463) describe the *ba* construction as a phrase with “the direct object “placed immediately after *ba* and before the verb”, resulting in the word order subject + *ba* + direct object + verb. Unlike Li and Thompson (1981), Huang, Li and Li (2009) consider the *ba* construction as a variant of the SVO structure, where the object in an SVO clause is placed after *ba*. The surface difference between SVO and SOV can be illustrated by the difference between (3.15 a) and (3.15 b).

- (3.15) a. *wo* *diu* *le* *na* *ben* *shu*.
 1SG lose LE that CL book
 ‘I lost the book.’
- b. *wo* *ba* *na* *ben* *shu* *diu* *le*.
 1SG BA that CL book lose LE.
 ‘I had the book lost.’

Based on the animacy of the post-*ba* NP, the *ba* construction is generally divided into two types: canonical and non-canonical (Sybesma 2013). Example (3.15b) exemplifies a non-canonical kind of *ba* construction, because the post-*ba* NP *nabenshu* is inanimate, while (3.16) illustrates a canonical construction with an animate post-BA NP. Though there are arguments concerning the meaning of *ba* construction, the underlying meanings of the *ba* construction are ‘disposal’ as expressed in (3.15b), ‘causativity’ or ‘affectedness’ in (3.16).

- (3.16) *ta* *de* *hua* *ba* *wo* *qi* *huai* *le*.
 3SG DE remark BA 1SG irritate badly LE
 ‘His remarks got me irritated kan badly.’

As the debate on the lexical and functional characteristics of *ba* is not the focus of the present thesis, I merely provide a brief account of the discussion. To date, the arguments on *ba*’s lexical category have centred upon whether *ba* is a lexical verb (Hashimoto 1971), a preposition (Chao 1968; A. Li 1990) or a light verb (Huang, Li and Li 2009). Through verb-hood and constituency tests, Huang (1997), Lin (2001) and Huang, Li and Li (2009) conclude that the only possible interpretation for *ba*’s lexical function is that it is a light verb.

Regarding the functional category of *ba*, questions have been asked about: (1) whether *ba* assigns a thematic role to the post-*ba* NP and the subject of a sentence; and (2) how *ba* construction is represented in the syntactic structure and how the linear order is derived (Huang, Li and Li 2009). The following section focuses on the discussion of (2) by examining three accounts regarding the representation of the functional projection of *ba* construction.

3.3.3.2 No independent functional projection BaP

The earliest structural account of *ba* construction, i.e. Li’s (1924) Hypothesis of Object Raising, counts *ba* construction as a PP. Specifically, the hypothesis holds that *ba* is grammaticalised from a verb, meaning ‘hold’ as a preposition, which requires the raising of the object of a clause as its object. The very early attempt to explain the syntactic relationship between SVO and the *ba* construction has been shared by Chao (1968), Li (1990) and many other researchers. In the

generative grammar, the hypothesis can be illustrated in Figure 3.12. The surface order of the *ba* construction can be derived from this approach, but it is problematic in at least two respects. Firstly, it cannot explain why some SVO clauses cannot be turned into *ba* constructions (Liu 2007); secondly, this analysis entails raising NP into the complement position of a PP, which is impossible within most versions of the grammatical theory.

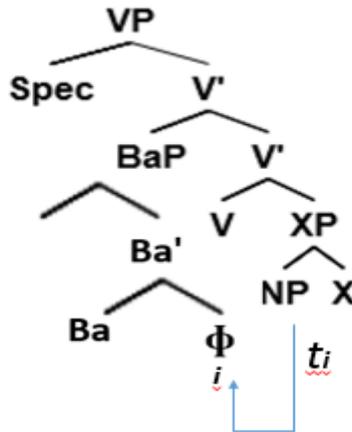


Figure 3.12 Movement of object *BaP*

The absence of an independent functional projection *BaP* is also found in Sybesma (1999: 133), as “all *ba* sentences are really causative”. Sybesma’s ideas about the projection of CAUSP are illustrated in Figure 3.12. This analysis implies that all *ba* constructions (canonical and non-canonical) are a type of CAUSP in an abstract sense.

Another account proposed by Sybesma (1999) is exemplified in Figure 3.13. In the figure, NP1 is the subject, CAUS is spelt out as *ba*, NP3 is the object of V, NP2 is the post-*ba* NP, and X is any extended element in the verbal domain. A non-*ba* clause is derived by raising the verb to the CAUS position. That is a straightforward means of deriving the surface forms of all causative clauses, including the *ba* construction. The issue with the proposal is that, while it works well for the non-canonical type with causative meaning, it does not apply so straightforwardly to the canonical model, which has a disposal meaning.

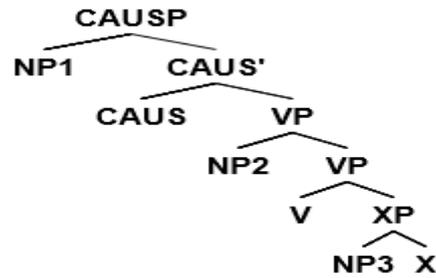


Figure 3.13 *BaP* as a type of CAUSP (Sybesma 1999: 169)

3.3.3.3 *BaP* as a functional projection with *vP* and internal *VP* subject (Huang, Li and Li 2009)

Huang, Li and Li (2009) propose a *BaP* analysis which incorporates a *vP* shell (Chomsky 1995) and internal *vP* specifier. In this analysis, the specifier of the *vP* shell is the subject. In this analysis, little *v* is not phonetically spelt out as *ba*. Instead, *ba* heads *BaP*. The surface order of the *ba* construction is derived as *ba*+NP+V+XP. A non-*ba* sentence can be derived by raising V to the *v* position. In this account, *ba* is classified as a light verb. Huang (2015) argues that light verbs are a general feature of Mandarin and they generally have the meaning of causativity. In essence, Huang, Li and Li (2009) arrive at the same syntactic representation as Sybesma (1999) but they deemphasise causativity. Huang, Li and Li's proposed projection is [*BaP* Subject [*ba*' *ba* [*vP* NP[*v*' *v* [*vP* V XP]]]]]. Figure 3.14 illustrates the proposal with movement added by the author of the present thesis.

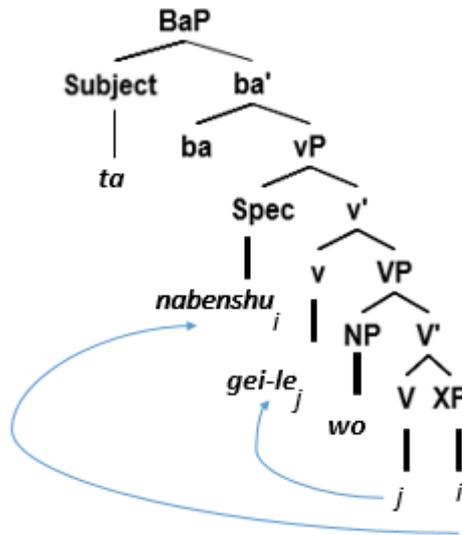


Figure 3.14 Illustration of Huang, Li and Li's proposed *BaP* (2009: 182)¹⁰

Regarding the syntactic description of the *ba* construction, this thesis follows Huang, Li and Li's (2009) *BaP* account, as presented in Figure 3.14.

3.3.4 *BeiP*

In addition to the *ba* construction, the *bei* construction is a structure containing OSV word order in Mandarin. It encodes passivity and can be written as $NP_2 + bei + (NP_1) + VP$, where NP_1 is the agent and NP_2 the patient. English passivity is achieved by obligatory compulsory linguistic means, while it is an option in Mandarin whether passivity is overtly marked (Huang, Yang, et al. 2007). In Mandarin, the unmarked option can be realised by the topicalisation of an object to the front of the clause, and the marked option one is highlighted by free morphemes, such as lexical words like *bei*, *jiao* 'call, be named, order', *rang* 'let, allow', *gei* 'give' (Li and Thompson 1981: 506). While it is maintained that the preference of the four passive markers resides in which type of Chinese dialect is desired, passive introduced by *bei* is the most typical type used for linguistic analysis.

According to Feng (1995, 2013), *bei* constructions can be categorised into two types, long *bei* constructions and short *bei* constructions. A short *bei* construction lacks a post-*bei* NP, while

¹⁰ *BaP* was expressed in Huang, Li and Li (2009:182) as $[baP \text{ Subject } [ba' \text{ be } [vP \text{ NP } [v' \text{ V } [VP \text{ V } XP]]]]]$. Note that the example in Figure 3.14 was supplied by the author of the thesis.

long *bei* has a post-*bei* NP. Example (3.17 a) illustrates a short *bei* construction and example (3.17 b) a long one.

- (3.17).a. *zixingche* *bei* *tou* *zou* *le.*
 Bicycle BEI steal away LE
 ‘The bicycle was stolen.’
- b. *zixingche* *bei* *ta* *tou* *zou* *le.*
 bicycle BEI 3SG steal away LE
 ‘The bicycle was stolen by him.’

Issues similar to those with the *ba* construction arise from the investigation of the *bei* construction: (1) the grammatical category of the *bei* +VP, i.e. the presence or absence of a functional projection *BeiP* and (2) the derivation of the *bei* construction.

There are longstanding arguments concerning the grammatical category of *bei*+VP. Here I summarise the discussion presented in Huang, Li and Li (2009). In other words, *bei* in the *bei*+VP structure has been assigned different grammatical categories, as a preposition, a thematic verb or a modal auxiliary or light verb (2009: 135). Correspondingly, *bei*+VP is considered a PP, VP or *vP*¹¹. I first demonstrate how *bei*+VP is achieved in the first two grammatical categories in the following example.

Figures 3.15 and 3.16 present *bei* +VP as lexical projections, respectively as PP or VP. They share the same features: (1) moving the complement of VP or PP to the highest Spec position (Spec IP); (2) *bei* is base-generated either in PP or VP head position. According to Huang, Li and Li (2009), one of the issues with both accounts is that it is hard to explain what motivates the complement of different types to be raised to the Spec IP position.

¹¹ It is noteworthy that *bei*+VP was not explicitly labelled in Huang, Li and Li (2009) as a *vP*. It is only a natural conclusion that can be drawn from his proposal of *bei* as a light verb.

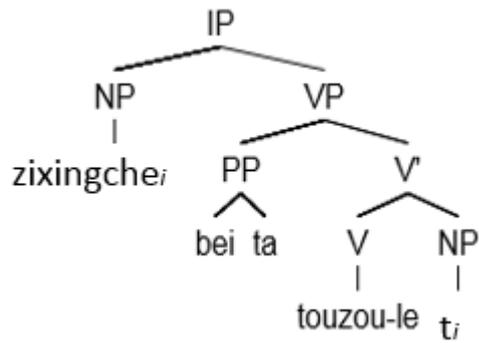


Figure 3.15 *bei* + NP

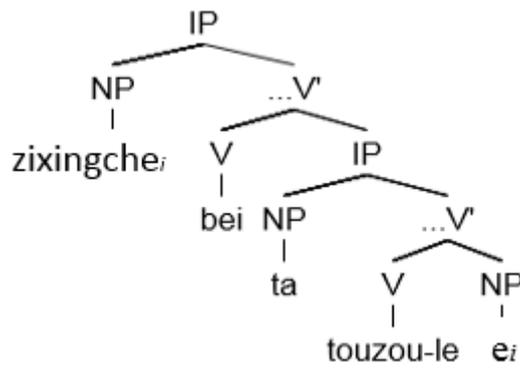


Figure 3.16 *bei* + IP

Following Feng (1995), Huang, Li and Li (2009) differentiate long *bei* and short *bei* constructions. Feng proposes the null operator (NOP) analysis for the long *bei* construction and NP movement for short *bei* construction. In Figure 3.17, A' movement occurs through the following steps:

- The complement of VP moves to the edge of IP, landing in the NOP (null operator) position;
- *Bei* is inserted;
- The moved complement is further raised to the highest Spec IP position.

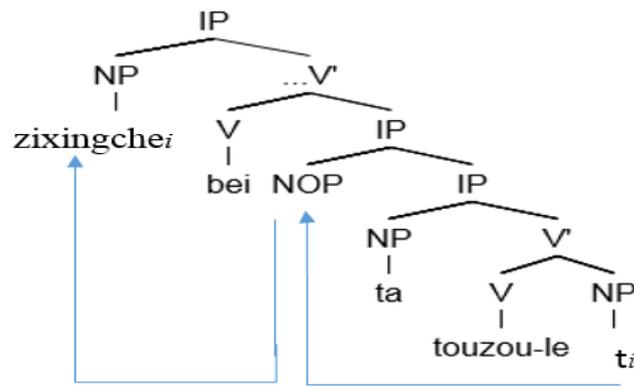


Figure 3.17 Derivation of the long *bei* construction

In the short *bei* construction, the post-*bei* construction is a PRO. The derivation of short *bei* is illustrated in Figure 3.18.

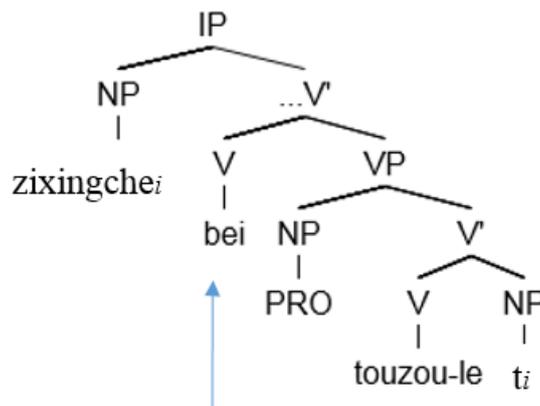


Figure 3.18 Derivation of the short *bei* construction¹²

Huang, Li and Li (2009) hold that the A or A' movement in the *bei* construction is owing to *bei* as a modal verb or a light verb, which seems to adequately explain why A or A' movement is motivated in the *bei* construction. According to the above analyses, *bei* is only one of the speltout forms of a V in VP (or an equivalent of a *v* in *vP*). In other words, there is no independent functional projection of *BeiP*. Compared with the other variants that denote passivity, *bei* is the sole functional element, and *bei* is a well-established structure in Mandarin, *BeiP*, spelt of *v* is assumed to be an independent functional projection. This thesis adopts the idea of an independent *BeiP* functional projection, which denotes passivity.

¹² It should be noted that the author of the thesis supplied the examples in Figures 3.17 and 3.18 to illustrate Feng's (1995) proposal of the derivation of the long and short *bei* constructions.

3.3.5 *NegP in Mandarin*

3.3.5.1 *bu and mei (you): negators in Mandarin*

bu and *mei(you)*¹³ are the major negators in Mandarin (Li and Thompson 1981). They generally occupy the second position of the clause, as can be seen in (3.18)-(3.20). Unless in an elliptical answer, neither can be clause-initial or clause-final (M. Li 2007). An existential sentence like (3.20)¹⁴ can be negated only by *mei*, while it is optional whether to negate a non-existential sentence like (3.19) or (3.20) with *bu* or *meiyou*. According to Li and Thompson (1981), *mei* can negate the completion of a past event¹⁵. Example (3.20) is of this type. It is also possible for *mei* to negate a future event under certain circumstances. In contrast, *bu* does not negate the completion of an event; instead, it is used to negate stative verbs and adjectives (Li and Thompson 1981: 421). This is illustrated by example (3.19). Consequently, the distribution of *bu* and *mei* is largely complementary, as revealed in Table 3. 3.

(3.18) *ta* *bu* *xihuan* *zhe-ben shu*.
 3SG NEG like this-CL book
 ‘S/he doesn’t like the book.’

(3.19) *wo* *mei - you* *ta* *de* *lianxi fangshi*.
 1SG NEG have 3SG POSS contact means
 ‘I don’t have his/her correspondence address.’

(3.20) *wo* *mei-(you)* *ting-dao* *na* *-ge* *hao* *xiaoxi*.
 1SG NEG have hear-arrive that -CL good news
 ‘I did not hear of that good news.’

¹³ Another negator is *bie* (Li and Thompson 1981), which is mainly used in imperative clauses. As it is not the focus of this research, it is not discussed here.

¹⁴ Following Li and Thompson (1981), the following sentence is called an existential sentence.

wo *mei* *you* *qian*.
 1SG NEG exist money
 ‘I don’t have money.’ (Li and Thompson 1981: 416)

¹⁵ When *bu* can also be used in connection with reference to a past event, the verbs in such sentences are stative verbs or adjectivals. Negation is used to falsify continuous state in the past.

Ta *Yiqian* *bu* *piaolian*.
 3SG before NOT beautiful
 ‘She was not beautiful before.’

Table 3.3 The distribution of *bu* and *mei*

	Present	Past	Future
<i>bu</i>	Stative and adjective 		
<i>mei</i>	'Existence', 'possession'	Completion of action	Existence/completion of action

3.3.5.2 *NegP* hypotheses and the postulation of *NegP* in Mandarin

Our next question concerns the syntactic position of negators in Mandarin. Following Pollock's (1989) examination of negation and verb movement in English and French, *NegP* (negative phrase) as a functional projection has been hypothesised in many languages. Nevertheless, there has been debate over whether *NegP* exists in all languages (see, e.g. Pollock 1989, Belletti 1990, Ouhalla 1991 vs Ernst 1992) and where it resides in the syntactic tree. This section reviews negation in English, but the focus is on the discussion of *NegP* in Mandarin.

Pollock (1989) and Belletti (1990) both hypothesised syntactic trees with a *NegP* projection for English. Some, e.g. Ernst (1995), have argued, on the contrary, that *NegP* does not exist in English due to licensing issues. Four points can be made of those studies: (1) both Pollock and Belletti argue for an independent *NegP* projection; (2) 'not' is proposed as the functional head in Pollock (1989) but in Bettelli (1990), *NegP* has a null head and 'not' is posited in the Spec *NegP*; (3) the syntactic position of *NegP* varies in the two proposals: for Pollock, *NegP* in English is projected below TP but above AgrP with the order at the IP layer as TP-*NegP*-AgrP-VP, while for Belletti, the order in English is AgrP -*NegP*- TP -VP.

For Mandarin, some researchers, like Wang (1965) and Cheng and Li (1991), propose *bu* as the head of *NegP*, while Chiu (1995) presents *mei* as the head of *NegP* and posits *bu* is in the Spec *NegP* position. Other scholars argue for the absence of a *NegP* projection in Mandarin. For instance, Huang (1988) argues that the negative morpheme *bu* forms an immediate constituent with the first V^o that follows. In other words, *bu* is cliticised to the verb (or auxiliary). He gives three reasons: (1) *bu* has the property of a clitic, as its tones change with the tone of the verb following it; (2) it cannot be used independently in answering questions; and (3) in imperative sentences, *bu* is often fused with auxiliaries. He concludes that *bu* and *mei* are cliticised to VP. Ernst (1995) also argues for *bu* as an adverb, functioning as a clitic. He maintains that it is located in Spec AuxP or Spec VP and that it "must be cliticised to the

sentence at S-structure” (p. 664). Yuan (2004) argues that *bu* can be attached to the head of a wide range of lexical projections like AP, AdvP and PP as well as VP. Yuan also argues that *bu* tends to negate the closest items in its c-command domain; namely, the head of the XP which *bu* is attached to. Like Huang (1988), Yuan (2004) gives phonological evidence in support of his analysis. Recently, some other proposals have been arguing against a NegP in Mandarin (M. Li 2007 and N. Li 2014).

M. Li (2007), in her extensive study of negation, argues that while negation applies to a wide range of languages, it does not empirically capture the complexity of Mandarin. She maintains that *bu* is an adverb and *mei* a prefix attached to the aspect marker *you*. She argues that a NegP account fails to capture: (1) the interaction between negators and different types of preverbal adjuncts; (2) the interaction between negation and post-verbal adjuncts; (3) the interaction between negation and aspect markers; (4) negation in SOV structures; (5) negative polarity items; (6) the licensing of negative quantifiers and (7) the co-occurrence restrictions on *bu* and *mei*. The following section will scrutinise M. Li’s first four arguments.

M. Li argues against Huang’s (1982) proposal that *bu* precedes the verb based on her categorisation of adjuncts into three types: Type I in sentence-initial position; Type II in post subject position and Type III immediately preverbal. In regard to the interaction between negation and different types of adjuncts, M. Li argues that Type II adjuncts follow the subject. This type of adjunct includes “sentential manner adjuncts, adjuncts of reasons, temporal adjuncts, [and] external locative adjuncts” (M. Li 2007: 90). Type III includes “manner adjuncts, adjuncts of sources, benefactive, instrument and reason, indefinite time adjuncts, [and] inner locative adjuncts” (M. Li 2007: 90). Moreover, Li maintains that Type II adjuncts are projected higher than Type III adjuncts in the tree. I argue that M. Li’s analysis against Huang’s (1982) account is insufficient for two reasons. On the one hand, M. Li’s classification of manner adjuncts is unclear. In other words, how adjuncts in Type II are distinct from those in Type III is not fully specified. As the boundaries are unclear, Li’s statement that *bu* is flexible so it can occur before Type II or Type III adverbs is also unclear. More specifically, M. Li categorises the manner adjunct *xiaosheng* as a Type III adjunct and concludes that the position of Type III adjuncts is interchangeable with negators and that the position of negators is more flexible. In other words, *bu* can be placed either before or after verbs. I hold that *xiaoxing* can be a Type II adjunct as in (3.21 a.), where *bu* is in the second position. Moreover, what M. Li

counts as the flexibility of *bu* in Type III does not hold water, as native speakers consulted regarded (3.21 b.) as ungrammatical.

- (3.21) a. *Lifan bu xiaosheng shuohua.*
 Lifan NEG low voice speak
 ‘Lifan does not speak in a low voice’.
- b. *Lifan xiaosheng bu shuohua.*
 Lifan low voice NEG speak
 ‘If he has to use a low voice, Lifan does not speak’ (Li 2007: 104)

It is worth noting that most examples that M. Li cites to show the incompatibility between negators and preverbal adjuncts are *de*-resultative clauses as in (3.22 a. and b.). Regarding b, Huang (1988) analyses the part after *de* as a clause with an empty subject, that is, [PRO *bu hen kuai*].¹⁶ Thereby, *bu* is still cliticised to VP. To sum up, manner adjuncts do not enjoy a flexible relationship with negation; rather, *bu* is placed in front of manner adjuncts.

- (3.22) a. *Ta bu pao de hen man.*
 3SG NEG run DE very slowly
 ‘He did not run slowly.’
- b. *ta pao de bu hen man.*
 3SG run DE NEG very slow
 ‘He runs not slowly.’

Examples (3.23)-(3.24) demonstrate that negator *bu* has scope over different elements. Thereby, based on her categorisation of adverbial types, Li’s statements do not account sufficiently for the syntactic relationships between negators *bu* and different types of adjuncts. Instead, it seems to be more appropriate to say negators can come before or after locatives (3.23) and temporal adjuncts (3.24) but are more restricted before other types of adjuncts and verbs.

- (3.23) a. *ta bu zai tushuguan xuexi.*
 3SG NOT in library study
 ‘S/He does not study in the library.’

¹⁶ Meaning: [he] is not very quick.

- b. *ta xuexi bu zai tushuguan*
 3SG study NOT in library
 ‘S/He does not study in the library.’
 (Implying s/he studies somewhere else.)
- (3.24) a. *ta bu jingchang huijia.*
 3SG NOT often go home
 ‘S/He does not often go home.’
- b. *ta jingchang bu huijia.*
 3SG often NOT go home
 ‘S/HE does not go home often’
 (Implying that he often stays in other places)

In regard to (4) negation in SOV structure, M. Li’s examples are restricted to the topicalisation of objects in front of the verb. This type of SOV is different from the general meaning of SOV, viz., the sentence patterns in the *ba* construction (NP1+*ba*+NP2+VP+XP) and *bei* construction (NP2+*bei*+NP1+VP+XP). SOV structure in example (3.25) has a left-peripheral structure, where the object appears immediately in the preverbal position. Such a structure is most likely to occur at the pragmatic/discourse level among native speakers, indicating contrastive or emphatic interpretation (Shyu 2014). Nonetheless, the incidence of such an instance is very low. As such, this type of structure is distinctive from the other established syntactic structures and should be addressed with other topicalised sentences at the discourse or pragmatic level.

- (3.25) *wo Beijing qu le¹⁷.*
 1SG Beijing go LE
 ‘I have been to Beijing.’

Thereby, I argue that even if M. Li’s arguments against the functional category NegP are plausible, issues remain that cannot be solved, even without the projection of NegP. Moreover, the proposed Principle M and Principle B do not provide a sufficient explanation (see 3.4.3 for the explanation of the principles). N. Li (2014) also argues against a NegP in Mandarin: negation markers, *meiyou* and *buhui* should not be posited to be under NegP; rather, they should head TP. Firstly, N. Li argues that NegP in many languages can occur in a non-finite construction, but since the Mandarin negative markers *meiyou* and *buhui* ‘not be able to’ do not occur in non-finite constructions, as revealed in Example (3.26), they cannot head a NegP.

¹⁷ The object has been interpreted from three perspectives: topic, focus or focus topic. For a brief review, see Shyu (2014).

- (3.26) *Zhangsan* *zhunbei* *chunjie* *bu* (**buhui*/**meiyou*)
 Zhangsan prepare Spring Festival NOT (not IR, will/not R¹⁸)
 hui *jia*.
 return home
 ‘Zhangsan plans not to go home during the Spring Festival.’

However, Li’s argument is conceptually problematic. First, negative markers in languages where NegP is postulated do not necessarily occur in a non-finite construction. For instance, in Finnish, negation is a head but cannot appear in non-finite clauses (Vainikka 1989; Holmberg, Nikanne *et al.* 1993). Second, N. Li has conceptualised *meiyou* and *buhui* in an unconventional way. That is, *hui* is a modal verb, whose syntactic position can be in three layers of Mandarin syntax, i.e. lexical layer, IP layer and CP layer and when *hui* has a future or generic meaning, it heads TP (See Tsai 2015: 16). Third, example (3.26) sounds ungrammatical according to two native Mandarin speakers. The recommended expression should be *Zhangsan bu zhunbei chunjie huijia*, where *bu* precedes the first verb *zhunbei* ‘prepare’. Hence, it can be concluded that no convincing evidence is provided in N. Li’s (2014) argument against a NegP functional projection in Mandarin.

3.3.5.3 NegP: A new proposal

In summary, the previous studies mainly focus on negation at SVO level. While the syntactic status of NegP has been approached from unique perspectives, the consensus seems to be that unlike English, there lacks a NegP¹⁹ functional projection in Mandarin. This thesis takes the same path at the SVO level and concurs with Yuan’s proposal (2001, 2004) that *bu* is an adverb, which is attached to the head of lexical projections of VP, as well as PP, AdvP and AP. But I agree that as *bu* and *mei* are in complementary distribution, and that the syntactic position of *mei* is always the same as that of *bu*, *mei* should also be assumed to be attached to the heads of various types of lexical projections. That is considered in this thesis as the specific Chinese linguistic feature.

Simultaneously, I argue that the above account at SVO level is insufficient in describing negation in SOV structure; for example, the negation in the *ba* and *bei* constructions. In other words, it does not provide answers to why the syntactic position of *mei* in example (3.27 a.) is

¹⁸ R: relis; IR: irrelis

¹⁹ A different account can be found in the Ernst (1995) and others.

ungrammatical, while the position of *mei* in example (3.27 b.) is grammatical. The same puzzle exists in examples (3.27 c.) and (3.27 d.) in relation to the *bei* construction.

- (3.27) a. **wo* *ba* *xiao* *zhu* *mei* *diu* *le*.
 1SG BA little pig MEI lose LE
 ‘I did not lose the piglet.’
- b. *wo* *mei* *ba* *xiao* *zhu* *diu* *le*.
 1SG NEG BA little pig lose LE
 ‘I did not lose the piglet.’
- c. **ta* *bei* *women* *mei* *dabai*.
 3SG BEI us MEI defeat
 ‘She was not defeated by us.’
- d. *ta* *mei* *bei* *women* *dabai*.
 3SG MEI BEI us defeat
 ‘She was not defeated by us.’

Therefore, negation in *ba* and *bei* constructions needs an independent functional projection, which resides above $AspP_m$ but below $AspP_h$. As can be seen from example (3.28), *mei* is located right before *you*, which is considered a middle aspect marker as *zai*. Here, this thesis leaves open whether NegP is moved to the head position or base-generated in the proposed location.

- (3.28) *ta* *meiyou* *ba* *shu* *diu* *le*.
 3SG MEIYOU BA book loose LE_t
 ‘He did not get his book lost.’

3.4 The Co-occurrences of Functional Heads

Given the above accounts of the possible functional projections in Mandarin, it must be stressed that some functional heads do co-occur in one sentence, while others do not. In the following sections, three types of co-occurrences, that is, different aspect markers, aspect markers with negators, and functional heads of *ba* and *bei* constructions, will be given a brief sketch.

3.3.6 The co-occurrences of aspect markers

The proposed three-layer structure in Figure 3.8 does not specify, however, the possible combinations of aspect markers in a clause. The co-occurrence patterns are summarised in Table 3.4. As can be seen from the table, some aspect markers can co-occur, such as *zai+zhe*, *guo+le_h*, *le_t+le_h*, *zhe+le_h*, *guo+le_h*, while others cannot. The broad patterns of the co-

occurrence of different AspPs are: AspP_l headed by three different morphemes can co-occur with AspP_h while AspP_m can only occur with AspP_l headed by *zhe*.

Table 3.4 The co-occurrences of aspect markers

<i>guo</i>	<i>le_l</i>	√ PFV + PFV
<i>zhe</i>	<i>le_l</i>	×
<i>zai</i>	<i>le_l</i>	×
<i>le_h</i>	<i>le_l</i>	×
<i>guo</i>	<i>zhe</i>	×
<i>le_h</i>	<i>zhe</i>	×
<i>le_h</i>	<i>zhe</i>	×
<i>zai</i>	<i>zhe</i>	√ IPFV + IPFV
<i>zhe</i>	<i>guo</i>	×
<i>le_l</i>	<i>guo</i>	×
<i>zai</i>	<i>guo</i>	×
<i>le_h</i>	<i>guo</i>	×
<i>le_l</i>	<i>zai</i>	×
<i>zhe</i>	<i>zai</i>	×
<i>guo</i>	<i>zai</i>	×
<i>le_h</i>	<i>zai</i>	×
<i>le_l</i>	<i>le_h</i>	√ PFV + PFV
<i>zhe (resultative)</i>	<i>le_h</i>	√ PFV + PFV
<i>guo</i>	<i>le_h</i>	√ PFV + PFV
<i>zai</i>	<i>le_h</i>	×

Notes: PFV=perfectivity; IPFV=imperfective

- (3.29) a. *Ta zhengzai he zhe pijiu.* [ZAI+ZHE]
 3SG ZHENGZAI drink ZHE beer.
 ‘He is drinking beer.’
- b. *wo ting guo na shou ge le.* [GUO+LE]
 1SG listen GUO that CL song LE
 ‘I have listened to that song.’
- c. *wo yijing kan le na bu dianying le.* [LE_l+LE_h]
 1SG already see LE that CL film LE
 ‘I have already seen that film.’
- d. *wo yijing na zhe na feng xin le.* [ZHE+LE_h]
 1SG already get ZHE that CL letter LE
 ‘I have already got the email.’

3.3.6.1 *The co-occurrences of negators and aspect markers*

The issue of co-occurrence of linguistic elements is not restricted to aspect markers; it also exists for aspect markers and negators. Regarding the interaction between negation and aspect markers, M. Li (2007) proposes Principle B and Principle M to account for the incompatibility between negators *bu* and *mei* and aspect markers.²⁰ Principle B holds that *bu* inherits [-telic], [-static], [-resultative] and [+ progressive] features and that it is compatible with similar aspectual features. Principle M holds that *mei* inherits the [+telic] feature and occurs in situations where the aspectual features are in line with this feature.

Table 3.5 presents empirical data to demonstrate the co-occurrence constraints between negators and aspect markers. In the table, *mei* and *bu* are in complementary distribution in relation to aspect makers. A test of Principle M against examples (30 a) and (33 a), however, indicates that the principle is not sufficiently applicable. For instance, *zai* and *du* 'read' both are [-telic], and *mei* is [+ telic] but still (3.30 a) is grammatical. In the same vein, while *le* is [+ telic] and *mei* is [+ telic] in (3.33 a), the clause is ungrammatical. According to the table, *mei* is compatible with *zhe*, *le_h*, *guo* and *zai*, but it is not compatible with *le*, whether it is a verbal *le* or a sentential *le*. Like *mei*, *bu* is compatible with sentential *le* but not with verbal *le*.

²⁰ Principle B is presented on p. 246 and Principle M on p.260 in M. Li (2007).

Table 3.5 Incompatibility of *bu* and *mei* with aspect markers

<i>Mei</i>	<i>Bu</i>
(3.30) a. * <i>ta mei zai du shu.</i> 3SG NOT ZAI read book 'S/He was not reading a book.'	(3.30) b. <i>ta bu zai du shu.</i> 3SG NOT ZAI read book 'S/He was not reading a book.'
(3.31) a. <i>ta mei kan zhe wo.</i> 3SG NOT look ZHE me 'S/He was not looking at me.'	(3.31) b. * <i>ta bu kan zhe wo.</i> 3SG NOT look ZHE me 'S/He was not looking at me.'
(3.32) a. <i>ta mei qu guo Beijing.</i> 3SG NOT go GUO Beijing. 'S/He had not been to Beijing.'	(3.32) b. * <i>ta bu qu guo Beijing.</i> 3SG NOT go GUO Beijing. 'S/He had not been to Beijing.'
(3.33) a. * <i>ta mei chi le wufan.</i> 3SG NOT eat LE lunch 'S/He does not eat lunch.'	(3.33) b. * <i>ta bu chi le wufan.</i> 3SG NOT eat LE lunch. 'S/He does not eat lunch.'
(3.34) a. * <i>ta mei chi wufan le.</i> 3SG NOT eat lunch LE. 'S/He does not eat lunch.'	(3.34) b. <i>ta bu chi wufan le.</i> 3SG NOT eat lunch LE. 'S/He does not eat lunch.'

3.3.6.2 The co-occurrences of functional elements with *ba* and *bei* constructions

Proposals have been made concerning NegP, which may be above or below AspP. As researchers take different stances regarding the existence of an independent functional projection like *BaP*, there is no agreement on how NegP is posited in a syntactic tree relative to *BaP* in Example (3.35 a). Likewise, how the three-layer AspPs interact with *BaP* in (4.3 b-d) has not yet been sufficiently investigated. The sentences in (3.35) illustrate some of the co-occurrence patterns.

- (3.35) a. *Lisi meiyou ba laohu da si.*
Lisi not-have BA tiger beat die
'Lisi didn't kill the tiger.'

(Huang, Li and Li 2009: 175)
[NEG + BA]

- b. *Linyi zai ba yifu bao-cheng yi-ge da bao.*
Linyi at BA clothes wrap-into one-CL big bundle.
'Linyi was wrapping the clothes into a big bundle.'

(Huang, Li and Li 2009: 175)
[ZAI+BA]

- c. *tá* *bǎ* *zǎng* *yīfu* *bào* *zhe*.
 3SG BA dirty clothes hold DUR
 ‘S/He was holding dirty laundry.’
(Li and Thompson 1981: 486)
 [BA+ZHE]
- d. *tǎ* *bǎ* *zhuózi* *dǎ* *le* *là*
 3SG BA table apply LE wax
 ‘S/He waxed the table.’
 (What s/he did to the table was to apply wax to it.)
(Li and Thompson 1981:471)
 [BA+LE]

It is worth recalling that exemplification has been given earlier where functional heads *bei* and *ba* co-occur in one same clause and that *bei* occupies a higher syntactical position than *ba*. In other words, *BeiP* is assumed to be generated above *BaP*. Such a proposal can be justified by Feng’s (1995) proposal of A’ movement for the long *bei* construction, while *ba* construction is supposed to be achieved via A movement. Example (3.36) illustrates an instance where the *ba* construction is embedded in the *bei* construction, which demonstrates that the syntactic position of *BeiP* is higher than that of *BaP*.

- (3.36) *zhangsan* *bei* *tufei* *ba* *fuqin* *sha* *le*.
 zhangman BEI bandit BA father kill LE
 ‘zhangsan’s father got killed by bandits.’
(Translated from Deng 2004: 294)

Therefore, the ordering of all the proposed functional projections in the clause structure of Mandarin must be specified. This should be such that the various co-occurrence patterns can be understood. The following section proposes the syntactic tree that incorporates these requirements.

3.4 A Working Model for Mandarin Clause Structure

Given all the previous discussion, I propose a Mandarin syntactic tree in Figure 3.19. This tree depicts the hierarchical relationship of all the different functional projections in Mandarin. As a standard analysis, there seems to be no argument about the order of $VP > AspP_t$. That is, the lexical categories are at the bottom, followed by aspectual categories directly above. The motivation for projecting *BeiP* above *BaP* is because though short *bei* only needs A movement, A’ movement is likely to be necessary for the derivation of the long *bei* construction (Feng 1995); simultaneously, movement of the argument in *BaP* takes place at the IP layer. This suggests that *BeiP* is projected higher than *BaP*.

The postulation of AspP_m above BeiP is based on evidence that AspP_m headed by *zai* precedes *bei* in linear surface order. Similarly, NegP is proposed to occupy a position above AspP_m . Again, this is based on the linear order, where negators precede aspect markers. That is in line with the existing studies discussed above. Finally, AspP_h is proposed at the top of the IP layer of functional projections, and it is also likely that AspP_h moves and lands in the CP domain.

The tree accords with Vainikka and Young-Scholten's (2011: 11) proposal that "[a]ll and only those projections occur in the Master Tree for which there is evidence in the language". Unlike work conducted by M. Li (2007) but similar to Vainikka and Young-Scholten, as little adjunction as possible is posited in hypothesising the syntactic tree. Instead, all the functional elements (denoting aspect, negation, tense, etc.) are represented as functional categories, in line with what is now standard practice in the generative literature. The explanatory power of the tree in interlanguage development will be further investigated through empirical data.

Furthermore, the tree proposed does not claim to be able to adequately account for the issues mentioned above, particularly those concerning the co-occurrence between aspect markers and negation and other functional elements. I argue that other mechanisms may be involved in learners' analysis of the input they receive.

The above analysis has not only enabled a basic description of English and Mandarin aspectual features, but has also laid a foundation upon which the forthcoming SLA data can be constructed. For instance, if there is a full transfer of functional categories from the L1 from the initial state of L2 acquisition onwards, as proposed by Schwartz and Sprouse (1994, 1996) and in feature reassembly by Lardiere (2008), *le_b*, *le_h* and *zai* should be acquired earlier than *guo* and *zhe*. That will be discussed in Chapters 6 and 7.

3.6 Conclusion

This chapter has reviewed the existing literature on the syntactic structure of Mandarin and also predicated L2 Mandarin development based on the postulated syntactic structure. The mental representation of Mandarin syntactic structure covers the lexical projection VP and a wide range of functional projections, which involve AspP, BaP, BeiP and NegP. Following OG, this chapter has predicted that L2 learners' mental representation of Mandarin clause structure is built from the bottom up, following the development stages (VP>lower IP>upper IP stages). With such a conceptual framework for L2 Mandarin acquisition, the next chapter reviews the significant findings and issues in the existing L2 Mandarin acquisition literature.

CHAPTER 4 PREVIOUS STUDIES OF THE L2 ACQUISITION OF MANDRIN MORPHO-SYNTAX

4.1 Introduction

If an acquisition order is internally driven, it is worth exploring the extent to which ideas on developmental sequences discussed in the research on the L2 acquisition of European languages can shed light on the acquisition of Mandarin. Following the discussion of the relevant acquisition theories and hypotheses emerging from the study of European languages, and an outline of the syntax of Mandarin Chinese in the previous two chapters, this chapter reviews how the existing literature has accounted for the L2 acquisition of Mandarin morpho-syntax in light of two questions:

- (1) Where the word order in the verb phrase is different in English and Mandarin, do the learners in this study use the order of their L1 English or that of Mandarin?
- (2) Do L2 Mandarin learners project functional elements in a stage-like manner that is, from bottom to top, in accordance with the route predicted for this based on a syntactic Mandarin tree?

Such an investigation is expected to yield three results: a comprehensive overview of L2 Mandarin morpho-syntax acquisition research, existing research vacuums, and the linking of L2 Mandarin acquisition to ideas based on the acquisition of European languages.

As highlighted in Chapter 1, only a very small number of L2 morpho-syntax acquisition studies have been conducted on Mandarin from the perspective of Generative Grammar: for instance, Zheng and Chang (2012), Yuan (2004) and Shi (1998). It has also been noted that the results, particularly those of Yuan, challenge L2 acquisition conclusions based on the study of European languages. However, the majority of studies on L2 Mandarin are rooted in structural grammar, featuring distributional analysis and the categorisation of linguistic phenomena. In recent years, an increasing number of studies have tested the Processability Theory (Pienemann 1998) and the Aspect Hypothesis (Shirai 1993). The theoretical basis for the former is lexical functional grammar while for the latter, it is the notion of lexical or inherent aspect. I will argue that while these two contributions are quite distinct from each other, they take a stance that I do not take—that L2 learning is primarily semantically, rather than syntactically, driven. From the brief account of the theoretical background of the existing literature on L2 Mandarin morpho-syntax acquisition, it is necessary to point out that, apart from Shi (1998), Zhang (2001), Gao (2009) and Wang (2011), there are few developmental studies that examine the

acquisition of a wide range of grammatical categories in Mandarin. In effect, the orientation of most acquisition studies on Mandarin is the acquisition of one particular subcategory/system of Mandarin grammar or even one linguistic phenomenon. This can be illustrated through the acquisition research on aspect markers, negation, *ba* and *bei* constructions as enclosed systems. In those studies, morphemes and syntax are kept discrete, and syntactic structures or morphemes are seldom linked to learners' mental representation, which may not be surprising when the non-generative perspective of the research is taken into account.

As it is the case in studies on the acquisition of European languages, learner variability in L2 Mandarin acquisition has been a prominent theme of the research, which can be seen from a high number of error analyses. The role of L1 in relation to the variability observed has also been examined, albeit with inconsistent results.

Another salient feature in L2 Mandarin acquisition studies is using learners' written corpora to seek acquisition patterns. This type of data is very likely to be more effective in presenting L2 learners' explicit knowledge rather than exposing L2 learners' unconscious underlying knowledge, which is the target of L2 acquisition from the generative perspective.

Given the rough account of the theoretical underpinnings of this body of research, and the general themes and practical issues pertinent to empirical data types, the following sections take a closer look at the topics of these L2 Mandarin developmental studies (Table 4.1), and the acquisition of sub-systems (Table 4.2). The remainder of this chapter is organised as follows: Section 4.2 describes and evaluates acquisition studies from the generative perspective. Sections 4.3 to 4.6 review and criticise acquisition studies that adopt non-generative perspectives, following the order of the acquisition of word order, aspect markers, *ba* and *bei* constructions, and negation. Section 4.7 examines and appraises developmental studies, while Section 4.8 concludes the chapter.

4.2 Studies on L2 Acquisition of Mandarin from the Generative Perspective

The existence of a natural acquisition order or hierarchy, the accessibility of UG and L1 transfer, are themes that have been observed from the generative perspective in Shi (1998) and Zheng and Chang (2012). Shi (1998) explores the existence of a natural acquisition order/hierarchy based on 22 sentence types, which cover both declarative and interrogative clauses. She hypothesises, based on the Language Acquisition Device, UG, the Creative Construction Hypothesis, that there is a natural acquisition order that is unaffected by a wide

range of factors, such as the learners' L1 background, gender, language proficiency, instruction, data collection methods and data analysis methods (see Hawkins 2001, who reaches a similar conclusion). Both cross-sectional and longitudinal data were collected in her empirical study. One part of the cross-sectional data involves corpus data from adult Mandarin learners with L1 Korean and L1 English backgrounds at six different proficiency levels. The results from these production data describe an acquisition order. The other part of her study involves data collected from tests and questionnaires. As with the cross-sectional data, the tests provide additional evidence for an acquisition order. The questionnaires invited the L2 learners to rate the degree of difficulty for the 22 sentence types to provide additional yet subjective information. These tests and questionnaires were administered to 162 adult overseas students and 95 L1 child Mandarin speakers at three different year groups (Year 3, Year 4 and Year 6). Moreover, longitudinal data were collected from one adult Korean-speaking learner who was recorded during the acquisition in free conversations every two weeks for seven months. Utterances were also recorded for that learner in the form of diary entries every other day. Shi's results reveal:

- One can observe an order in adult L2 learners' acquisition of 22 sentence types. It is consistent with what the learners perceived to be the acquisition order based on adult L2 learners' judgement of the degree of acquisition difficulties. Noticeably, the order is not affected by learners' L1 background, gender, language proficiency or instruction. This order is found in L1 children' acquisition, but for them, the order observed in their production is not consistent with their perceptions of difficulty. Children's order in their production is very similar to that of adult L2 learners, but what they perceive as difficult, namely, their so-called subjective order, is affected by their proficiency level but not by gender.
- There is an acquisition order in the L1 Korean speaker's data, and it is consistent with what is found in the corpus data of the adult L2 learners with Korean and English backgrounds.
- Apart from the acquisition order, there are also hierarchies (which are more or less the same as acquisition stages). The order of linguistic components within one hierarchy can be altered or missing; nonetheless, acquisition hierarchies cannot be escaped.

The hierarchies in Shi (1998) indicate an internally-driven interlanguage, irrespective of L1 background, language proficiency and gender. However, the order is based on the acquisition of 22 Mandarin sentence types, and Shi does not consider the Mandarin aspect system separately, thereby omitting the crucial characteristics of Mandarin. Assuming that the acquisition order is internally driven, it is worth exploring the extent to which notions of

developmental orders discussed in the research on the acquisition of European languages can shed light on the acquisition of Mandarin.

I argue that the acquisition order in Shi's study can be empirically challenged in two respects: the contribution of the longitudinal study to the generalised conclusions from the cross-sectional study and the implicational scale used. Firstly, longitudinal data (audio recorded data and diary data) was collected from one Korean learner. Unexpectedly, Shi does not reveal that learner's separate development of the 22 sentence types over the seven months of data collection. Instead, she pools the longitudinal data and uses it to generate her observed order and to contribute to the subjective order. Therefore, the claim that evidence from both longitudinal data and cross-sectional data demonstrates an acquisition order carries less weight.

Zheng and Chang (2012) investigate the L2 acquisition of syntactic and semantic properties of the Mandarin negative construction under the Minimalist Program framework with additional ideas from the Principles and Parameters approach. Following Ernst (1995), which is reconstructed in Figure 4.1, they argue that Mandarin negators are attached to the left of VP, modal verbs, attributive adjectives and adjuncts. Their participants were two advanced English learners of Mandarin. Data collection from one learner lasted more than three months, stretching over seven data collection sessions, while data from the other learner was collected once. Free conversations were recorded in the data collection sessions with no specific test tasks set up in the process. Their findings are as follows:

- Learners could successfully place *bu* and *mei* in the right syntactic positions; no misplacement occurred;
- The negators were appropriately placed in sentences without subjects, objects or adjuncts, indicating that learners have properly reset the null subject parameter, the null object parameter and the null adjunct parameter;
- Negators correctly co-occurred with aspect markers *le* and *guo*;
- L1 transfer of English right-branching syntax for adjuncts (modal +not +V) was not found in learners' production.

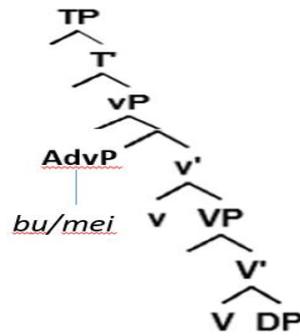


Figure 4.1 Syntactic analysis of negation constructed on Ernst (1995)

Zheng and Chang (2012) conclude that UG is accessible to L2 learners and that L2 parameters can be reset successfully. Moreover, in line with Herschensohn (2000), they argue that the primary tasks of L2 learners are to learn vocabulary and reset target language parameters, as general syntactic features come from UG and do not require particular learning apart from being triggered through input. Zheng and Chang’s findings, while not explicitly expressed, oppose theoretical models which argue for adult L2 learners’ persistent difficulty in acquiring the functional features of the target language due to their failure in accessing L1 influence and learning after a critical language period. Those models are Valueless Features Hypothesis (Eubank 1993/1994, 1994, 1996), the Failed Functional Feature Hypothesis (Hawkins and Chan 1997) and Local Impairment Hypothesis (Beck 1998).

Three aspects of Zheng and Chang’s arguments (2012) require attention, as they are pertinent to the present thesis. Firstly, the two participants are noticeably near-native L2 speakers, which may justify L2 learners’ acquisition of *bu* and *mei* and the complex coordination between negation and aspect markers. However, an alternative interpretation of the correct placement of *bu* and *mei*, for instance, is the narrow scope of the study. In other words, it is restricted only to learners’ acquisition of negation in SVO structure; the acquisition of negation in *ba* and *bei* construction was not included. The same question applies to *bu* and *mei* and negation coordination in the *ba* and *bei* constructions, which again, is not examined in Zheng and Chang. Furthermore, the results shed no light on the early stages of L2 Mandarin. Consequently, Zheng and Chang call for further research by homing in on results from L2 learners from different L1 backgrounds, alongside the outcomes of L2 Mandarin beginners.

Secondly, there is some scope for the exploration of Zheng and Chang's two conclusions: the first recognises the role of UG in line with the hypotheses concerning L2 initial state (Schwartz and Sprouse 1994, 1996 and Vainikka and Young-Scholten 1994, 1996a). However, as their participants are near-native learners, it is unclear whether and to what extent L1 transfer occurs in L2 learners' data. The second conclusion, proposing the easy acquisition of syntactic structure, is evidence against Slabakova's Bottleneck Hypothesis (2014), which specifies functional morphemes are the most challenging part compared with the acquisition of word order, semantics and pragmatics.

In light of the two studies, an interesting parallel can be drawn between the natural morpheme acquisition order studies of L2 English in the 1970s and the acquisition order study in Shi (1998), between the principles-and-parameters framework in the 1980s, and Zheng and Chang's UG access research. Suffice it to say that L2 Mandarin acquisition studies from the generative perspective have lagged several decades behind those studies based on Indo-European languages, but both of these studies have rendered support to the established theoretical perspective. Here, two points that are highly relevant to the following research must be highlighted. First, early stage L2 development with longitudinal data support is required to investigate L2 Mandarin development. Second, it is confirmed that the OG approach has not yet been applied to the acquisition of L2 Mandarin.

4.3 Acquisition of VP Head Directionality

Compared with the acquisition of L2 VP headedness or, more broadly, the word order of European languages and other morpho-syntax properties of L2 Mandarin, there is a dearth of acquisition studies on Mandarin VP headedness. Existing studies have taken three perspectives: there is the discourse perspective, as can be seen in the publications presented in Table 4.1. These are followed by recent studies based on Processability Theory/PT (e.g. Zhang 2001; Gao 2009; Wang 2011) which examine L2 grammatical development (Pienemann 1989). It has been hypothesised, and evidence brought to bear on the acquisition of an SVO word order at stage 2 of PT's hierarchy and acquisition of *ba* and *bei* construction with an SOV order at PT stage 5. This order supports PT's claim that acquisition is constrained by the processability of linguistic items. The order acquisition is approached through the error analysis (Lu 1994) and the most extensive study was conducted by Jiang (2009), who examined VP headedness errors based on a principle and sub-principle-based taxonomy of errors. Studies under these

perspectives offer no role for the L1, more specifically, the lack of transfer of L1 VP headedness, in their accounts. Thus, these accounts differ from both FT/FA and OG.

Table 4.1 Publications on the acquisition of Mandarin word order

Publication	Title
Yu (1986)	Word Order and Topic Prominence in the Interlanguage of an Australian Learner of Chinese ²¹
Xu (1998)	The Position of the Adverb in Chinese Foreign Language Development
Hu (1992)	Word order, Discourse and Language Learning
W. Li (1999)	Second Language Acquisition of Discourse- and Pragmatically-Governed Word Order in Mandarin Chinese

(Adapted from Jiang 2009: 200)

4.4 Acquisition of Aspect Markers

Acquisition of aspect markers has been one of the classical themes of L2 Mandarin acquisition studies. It has also been reported persistently as one of the most difficult linguistic components in L2 Mandarin acquisition (Duff and Li 2002). The review below addresses three aspects pertaining to the acquisition of aspect markers: the acquisition order of aspect markers, the explanatory power of the Aspect Hypothesis and the variability found in L2 acquisition studies.

4.4.1 Acquisition order studies

A wide range of acquisition orders has been presented to date, but the orders are not restricted to those presented below. I review these studies and discuss how different results can be interpreted.

- perfective *le*₁ > sentence-final *le*₂ (Wen 1995)
- *le*₂ > *le*₁ > double *les* (Teng 1999).
- *guo* > *le* > *zhe* (Yang, Huang and Cao 2000)

²¹ Chinese = Mandarin

- VF-*le*> VF/SF-*le*>*zai*>*zhe* (Jin and Hendrik 2005)
- *le*>*guo*>*zhe*>*zai* (Wang 2012)

After examining the acquisition of *le*₁, *le*₂, Wen (1995) and Teng (1999) appear to have drawn contrasting conclusions regarding their acquisition order; perfective *le*₁> sentence-final *le*₂ (Wen 1995) vs *le*₂>*le*₁> double *les* (Teng 1999). A closer look is necessary to examine how those acquisition orders were reached. Wen's (1995) data were oral production data collected from eight beginners who had been exposed to Mandarin for 14 months and six advanced learners with 26 months' exposure. They were all L1 English speakers. Three interviews with each learner were conducted through conversation-based and picture-based question and answer. Wen attributes her results to (1) the transfer of the L1-based English parameter value [+past tense] to the acquisition of perfective *le*; (2) the late acquisition of sentential *le* due to the semantics of sentential *le* is much less concrete or consistent than that of perfective *le*. She argues that her results support the Relevance Principle (Slobin 1985), One-Form-One Function (Andersen 1989) and that as proposed by Bailey (1989) and Ellis (1989), unmarked elements, namely perfective *le*, were acquired earlier than marked elements, i.e. sentential *le*. She attributes the variability in the learners' production to syntactic, semantic and pragmatic factors. Wen concludes that her results are consistent with Erbaugh's (1985) child L1 Mandarin acquisition results.

The data in Teng (1999) was collected from nine beginners' written production of single sentences and paragraphs. The learners had different L1 backgrounds and had received classroom instruction amounting to 20 hours per week.

Unlike Wen (1995), Teng (1999) argues the later acquisition of the learners is affected by the semantics of Mandarin, and that the change of state or new situation is more natural to master than the perfectivity of *le*₁. Teng (1999) maintains that his findings are consistent with those of Kong's (1993) study of L1 Mandarin children, aged between 12 months and five years old.

One central argument of the two studies is whether it is the proposed difficulty in learners' understanding of the semantics of *le*₁ and *le*₂ that lead to later acquisition. Moreover, it is noteworthy that our interpretation can easily ignore that Wen (1995) and Teng (1999) are conceptualising *le*₁ and *le*₂ differently in their studies, as revealed in Table 4.2.

Table 4.2 Conceptualisation of *le*1 and *le*2 in Wen (1995) and Teng (1999)

Wen (1995)	Teng (1999)
<p><i>le</i>1: V+<i>le</i>+O</p> <p><i>le</i>2: V+O+<i>le</i></p> <p>Under circumstances of V+<i>le</i>, it is decided by the pragmatic meaning of the context.</p>	<p>Lǚ (1981)</p> <p><i>le</i>1: V+<i>le</i>+O;</p> <p><i>le</i>2: V+O+<i>le</i>, n/quantifier/adj+<i>le</i>;</p> <p><i>Le</i>1 and <i>le</i>2: V+<i>le</i>+O+<i>le</i>2</p> <p>Underspecified <i>le</i> type: V+<i>le</i></p>

Yang, Huang and Cao (2000) also examine L2 learners' acquisition of *le* along with *zhe* and *guo* via corpus data from test tasks and written production in compositions. Learners were at four different levels: beginners, intermediate, advanced and post-advanced. Yang et al. find both over-marking and under-marking of these aspect markers in the data. The results from the test corpus indicate that (1) accuracy rate for *le* increases with learners' proficiency levels; (2) the accuracy of *guo* is consistently higher than that of *le* and *zhe*. An acquisition order according to accuracy can be inferred as *guo*>*le*>*zhe*. Similar results are found in the composition data which also show an overall accuracy rate for aspect markers higher than that in test tasks.

Jin and Hendrik (2003) also looked at the acquisition of these markers, i.e. what they term VF-*le*, VF/SF-*le* as well as *zai* and *zhe* by both L1 children, L2 children and L2 adults. Their participants comprised 30 L2 learners with at least six months' learning experience, and 30 five, seven and 10-year-old Mandarin native speakers along with ten adult native speakers. Oral production data was collected through the retelling of *The Cat Story* and *The Horse Story*. Their data analysis reveals:

- A VF-*le*> VF/SF-*le*>*zai*>*zhe* acquisition order;
- L1 speakers and L2 learners show the opposite order in their acquisition of VF/SF-*le* and VF-*le*. For L1 learners/speakers, it is VF/SF-*le*> VF-*le* and for L2 learners, it is VF-*le*> VF/SF-*le*;
- *Le* seemed to be persistently difficult for learners; at the initial stages, there were both overuse and underuse of *le*, and at advanced stages, there were mainly overuses of *le*;

- All the children had already passed through most stages of acquisition, and their acquisition greatly resembled that of Mandarin-speaking adults.

Wang (2012) conducted a cross-sectional study not of English L1 speakers but of adult Swedish speakers' acquisition of *zhe*, *le*, *guo* and *zai*, which set out to test the Aspect Hypothesis, the Distributional Bias Hypothesis and the Prototype Model. She adopted a wide range of test tasks: film retelling and picture retelling, filling in the blanks and comprehension tasks and also included longitudinal data collection of written Mandarin. Based on her analysis of the data from all tasks, she proposes the L2 acquisition order: *le*>*guo*>*zhe*>*zai*. Regarding whether the three hypotheses are supported, she states that the retelling tasks support all of them while filling in blanks and comprehension support only the Aspect Hypothesis.

Given the above, a complex picture emerges in researchers' exploration of the acquisition order of aspect markers. I argue that this is due to their different research agendas, heterogeneous learner groups, test tasks and data analysis methods used as well as the actual boundaries of *le*₁ and *le*₂ and the number of aspect markers involved. This picture demands a more thorough study of the acquisition of all these aspect markers.

4.4.2 Inherent semantics as the determining factor in L2 aspect acquisition

The most prominent hypothesis that has been applied in attempts to account for the acquisition of aspect markers is the Aspect Hypothesis (Andersen and Shirai 1994, 1996). The underlying assumption regarding acquisition underlying the Aspect Hypothesis is that aspect marking correlates with learners' inherited sensitivity to the lexical meaning of verbs, whose types are based on Vendler's (1967) classification with reference to lexical meanings (cf. Comrie's grammaticalised aspect categories in Section 3.3.1.1, Chapter 3). Vendler's inherent aspect categorisation is presented in Table 4.3.

Table 4.3 Vendler's categorisation of verbal aspect

Verb types	Lexical aspect			Examples
	stative	durative	telic	
States	+	+	-	hate, like, love
Activities	-	+	-	walk, run, swim
Achievements	-	-	+	break, hit
Accomplishments	-	+	+	cross [the river], sell [the house]

The part of the hypothesis that is relevant to Mandarin acquisition is as follows:

Perfective marking starts with achievement and accomplishment verbs and then is extended to activity and stative verbs.

Progressive marking starts with activity verbs, then is extended to accomplishment or achievement verbs but will not be incorrectly marked on stative verbs.

(Andersen and Shirai 1996: 533)

Duff and Li (2002), Bell and Wright (2015), Yang, Huang and Cao (2000) and Wang (2012) have all tested the hypothesis. Duff and Li examine nine English speakers' acquisition of perfective *le* with different Mandarin proficiency levels: beginners, intermediate (the majority) and advanced learners. Both oral and written production data were collected, from retelling *The Pear Story*, narrating the previous week's and other activities and editing written texts. A think-aloud task was also used to collect learners' meta-knowledge of *le* marking. Nine native speakers were involved as a control group.

Duff and Li find that the L2 learners failed to supply *le* to VQOs (verbs with quantified objects) or VRC (verbs with resultative complements) as native speakers. Learners, particularly those with low Mandarin proficiency, tended to undersupply *le* but over-produce *le* with certain stative and non-perfective activity verbs when narrating *The Pear Story* and personal travelling experiences of the previous week's activities. According to Duff and Li, the L2 learners had a smaller repertoire of inherently perfective verbs (V, VQO or RC). Thus they attached *le* to more generic and less prototypically perfective verbs. The native speakers marked *le* on a wide

range of perfective verbs, primarily ACC and ACH verbs. The patterns found in the L2 data are attributed to the following factors:

- the transfer of L1 English past tense category;
- cognitive factors or operating principles like “relative frequency, perceptual saliency, and transparency; and the possible “priming” role of certain adverbials”(p.445);
- input factors like “viewpoints, stylistic preferences, register, and variation across dialects” (p.445) and the form and function exposure frequency;
- the collocation of *le* with lexical items and constructions, particularly the inherent perfectivity with RCs;
- discourse features of tasks, which display actions and events and temporal meaning;
- instruction and text explanations.

Given the above, it seems that Duff and Li do not identify a strong correlation between their aspect marking and the L2 learners’ sensitivity to the inherent lexical aspect of verbs. As demonstrated previously, there is a sharp difference between the type of verbs that L2 learners marked and those marked by the native speakers. Certainly, there might be a weak correlation of *le* with lexical items or constructions that hint towards perfectivity. Supporting evidence for this emerges in Wang’s (2012) study of L1 Swedish speakers, even though she does not report universal support for the Aspect Hypothesis. Instead, she states that two of her test tasks (see 4.3.1) support the AH, namely, filling in blanks and comprehension. Jin and Fredrik (2003) make the claim of a correlation between lexical aspect and grammatical aspect marking in both the L1 and L2 acquisition of Mandarin.

Unlike the researchers noted above, Bell and Wright (2015) argue that the Sentential Aspect Hypothesis better predicts aspect marking in Mandarin than the Aspect Hypothesis. The Sentential Aspect Hypothesis (Sharma & Deo 2009) predicts a correlation between learners’ perfective marking and their sensitivity to aspect at the sentential level rather than at the lexical level, particularly with adverbs of duration and frequency. Thus, they are inclined to mark aspect by referring to adverbs than the inherent lexical aspect based on Vendler’s categorisation of verbs. Bell and Wright collected written production data from ten adult L1 English learners of Mandarin and eight native Mandarin speakers to test these two hypotheses. Four test tasks were administered in the corpus study: a planned talk about everyday activities; an unplanned

picture description task; a planned role-play in which Bell and Wright also used eight *ab initio* English learners' suppliance of aspect markers in a longitudinal study to further test these hypotheses. In a *le* insertion task durative adverbials and frequency adverbials were implemented in the experimental study. Bell and Wright observe that it was not the lexical but the sentential constraints that governed L2 learners' perfective marking and that the marking of perfectivity progressed from the initial reliance on quantified objects and then to dependence on verb types. The former can be accounted for as an L1 strategy and the latter as an L2 strategy. Bell and Wright (2015: 17) argue that the determining factor in perfective marking is a sentential aspect, which is relation to "cognitive and linguistic universals, including the cross-linguistic (semantic) equivalence of temporal adverbials". Moreover, they claim that L1 transfer contributes to perfectivity marking. Duff and Li (2002) contend that various other factors are also likely to have an impact on L2 learners' acquisition of aspect markers. Chen (2016) also argues, based on early L2 learners' data, against attributing L2 acquisition of aspect markers largely to learners' inherited sensitivity to the lexical aspect of verbs. Recently, Yang (2016) proposes the modification of the Aspect Hypothesis by introducing the Relevance Principle of Bybee (1985) to make it universally applicable for the acquisition of different languages.

4.4.3 Understanding variability in aspect marker acquisition studies

We have observed that learners exhibit variability in their marking of aspect. Their aspect marking has been described as errors, overuse, underuse, over marking and under-marking. These have been accounted for differently. According to Yang, Huang and Cao (2000), the results, i.e. acquisition or non-acquisition, are likely to be due to: (1) learners in one group being mostly advanced learners; (2) learners having chosen avoidance strategies in writing narrations; (3) the majority of errors in learners' data being more related to discourse and sentence patterns and much less to aspect markers. Their analyses revealed 23.5% of under-marking in very advanced learners' data. Learners in L2 Chinese acquisition studies are categorised into beginner, intermediate, advanced and very advanced groups in Yang, Huang and Cao (2000) and Yuan (1999). By very advanced learners, they are highly likely to refer to near-native speakers. It is noteworthy, however, that they do not specify the criteria for the differentiation of the different categories. Yang et al. argue that over-marking is due to constraints of the target language, and L1 transfer. Conversely, they argue that under-marking has no direct correlation with the L1. This differs from the predictions made by the universals under the Aspect Hypothesis, as discussed above. Universal aspect features predict under-

marking for stative and activity verbs while in the actual data, aspect *le* is under-marked on stative verbs with quantified action that shows the frequency and quantified objects. As such, under-marking is considered as a special interlanguage phenomenon originating from the interaction between the L1, the target language and L2 instruction. Thus, Yang et al. conclude that advanced learners show evidence of inherent aspect but not the properties of Mandarin from sentence patterns and discourse. Wen (1995) also argues that the variability observed is related to syntactic, semantic and pragmatic factors.

4.4.4 Aspect markers in *ba* construction acquisition

The L2 acquisition of *ba* is generally related to the complexity of this structure and learners' acquisition of the relevant rules. However, Huang and Yang (2004) approach acquisition from the additional perspective of the Aspect Hypothesis. That is, learners approach the rules of the *ba* construction according to their innate awareness of telicity and perfectiveness. They draw on the semantic categories proposed by Vendler (1967) and Smith (1991) where verbs are divided into the following types (see also Table 4.3 above):

- state verb (-stative, -temporary, -telicity): *ai* 'love', *you* 'have', *yunxu* 'permit';
- activity verb (+dynamic, -temporary, -telicity): *jiao* 'ask', *pao* 'run', *xuexi* 'learn';
- directive accomplishment verbs can be subdivided into
 - ✓ *creative* (+activity, -dynamic, +telicity (> result)): *build houses*, *make clothes*, *draw pictures*;
 - ✓ *destructive verbs* (+dynamics, -temporary, +telicity (> result)): *chaifangzi* 'demolish a house', *he* 'drink', *si* 'tear';
 - ✓ *resultative accomplishment verb*: (+dynamics, temporary, +telicity (> result)): 'beat to death', *zhata* 'make flat by explosion', *xing* 'wake', *wang* 'forget'.

(Adapted from Huang, Yang and Cao 2000)

Huang and Yang (2004) studied L1 English speakers' acquisition of the *ba* construction with truth value judgments, a sentence pattern transformation task, and a making-up sentence task. Their results reveal that: (1) in accordance with Aspect Hypothesis, learners are aware of the semantic meaning of telicity and perfectiveness; (2) overgeneralisation of the *ba* construction may be related to the learner's L1 or the type of testing. Bell and Wright (2015) argue that the semantic aspects of verbs and predicates are conflated in Vendler's categorisation of the aspect

of verbal elements, which may become problematic when the aspect of a verb does not agree with that of a predicate, as discussed above in relation to their study. That potentially makes the counting of the instances of activity verbs and accomplishment phrases difficult. For instance, *shuo* ‘speak’ is an activity verb, while *shuo-wan* ‘finish speaking’ as resultative complement phrase is an accomplishment. Different ways of counting items in the data will generate different empirical results. If Bell and Wright (2015) are correct, this will mean that Huang and Yang’s (2004) categorisation of verbs based only on Vendler’s criteria shares the same categorisation problem of that of Vendler. It is further argued in the present thesis that there are other concerns in these studies: (1) some criteria are likely to be intuitive when mapped to a particular type of category; (2) there is the possibility that learners avoided using *ba* in written tests; (3) *ba* itself has a degree of acceptance (Huang, Li and Li 2009).

4.5 Acquisition of *Ba* Construction

As a particular syntactic structure in Mandarin, the *ba* construction has long been held to be difficult for L2 learners to acquire (Jin 1993; Wen 1995: 39-43). This section reviews L2 *ba* construction studies with a focus on the following questions:

- (1) What is the characterisation of L2 *ba* construction acquisition studies?
- (2) What have the acquisition results been?
- (3) How have acquisition, acquisition stages and sequences been accounted for?
- (4) How has variability been accounted for in the existing studies?
- (5) What kind of research design has been applied?

4.5.1 The characterisation of L2 *ba* construction acquisition studies

Two clear patterns have been identified in L2 *ba* construction acquisition research. First, I will demonstrate how *ba* is conceptualised as an independent sub-system of Mandarin syntax composed of complex structural sub-types. The acquisition of the *ba* construction means to acquire those fundamental types. The preliminary step for a *ba* construction acquisition study is to obtain an inventory of native speaker *ba* construction types against which L2 interlanguage can be gauged, and acquisition results can be derived. Prior to the research, the general practice for the great majority of studies has been to decide on native speakers’ knowledge of *ba* construction types through the analysis of corpora composed mainly of novels, textbooks or syllabuses. For instance, Cui (1995) analyses *ba* in a corpus composed of two Chinese novels:

The *Dream of Red Mansion* and *Half of a Man is a Woman*. According to the frequency of occurrence, Cui (1995) summarises examples of the *ba* construction into core *ba* structure and peripheral structures. As presented below, each category is further divided into several sub-types.

Core	Peripheral
VP=VR or VP=AD+VR (result)	VP= (AD) +yi (one) +V
VP=VR or VP=AD+VR (tendency)	VP= (AD) +V +yi (one) +V
VP=VR or VP=AD+VR (verb qualifier)	VP=O or idiom
VP=VR (R is prepositional phrase)	VP= (AD) +V

Liu (2005) and others compare L2 *ba* types in L2 learners' corpora with Cui's (1995) proposed native types, finding that most L2 learners use the core *ba* constructions and that they use fewer AD+VRs (tendency) and VRs than native speakers. Xiong (1996) analyses 199 examples of *ba* constructions in textbooks with 107,000 words for intermediate and advanced learners and categorises structural types of *ba* constructions into four types:

- I. relevant party+ *ba*+ agent+ new position
 - II. Relevant party +*ba*+ agent+ new possessor (abstract or concrete)
 - III. Relevant party +*ba* + agent+ new understanding or form
 - IV. Relevant party+ *ba* + agent+ new property
- (4.1) *Liecheyuan kan -le kan, you ba piao huangeile*
 Conductor look LE look again BA ticket return LE
taken.
 taken
 'The conductor looked at the ticket and then returned it to them.' (Textbook 2: 44)
- (4.2) *Bu ba kecheng xuewan bu jiehun.*
 Not BA courses complete not marry
 'If he/I did not complete the courses, he/I would not get married.' (Type IV)

Xiong (1996) examines 1, 321 *ba* constructions in written data of the Chinese Interlanguage Corpus collected from 507 L2 Chinese learners from 70 countries with 1,44 million words to identify learners' error types, aiming to make suggestions for language teaching adjustment.

4.5.2 *The acquisition stages*

In response to my second question above regarding the above results, a significant number of *ba* construction acquisition studies examine the acquisition of the sub-types of the *ba* construction based on the native *ba* construction types. That means the acquisition of *ba* is to

acquire those different types of sub-structure in sequence or stages. Liu (2005) analysed compositions of intermediate and advanced L2 learners' in the Chinese Interlanguage Corpus and also data from beginning learners just starting to acquire the five types of *ba* construction. Liu proposes five stages of development for *ba*.

Stage I	Overgeneralisation: arbitrary <i>ba</i> position;
Stage II	Correct <i>ba</i> position, bare V;
Stage III	Correct <i>ba</i> position, incomplete V forms;
Stage IV	Correct <i>ba</i> position, over-complicated V forms;
Stage V	Acquisition

Jin (1993) collects data from 46 L1 English speakers using grammaticality judgments, translation and narration of stories, and, instead, proposes three stages: stage I learners differentiate post-BA nouns and their semantic meanings; II learners recognise the strength of the verb after the post-*ba* nouns; III the complexity of the *ba* construction itself occurs. A comparison of Jin (1993) and Liu's (2005) study reveals that Liu's stages stress that *ba* acquisition is the acquisition of the *ba* position and VP after post-*ba* NP, while Jin emphasises the addition of components to *ba* constructions in a linear manner. I can conclude that studies converge on the idea that L2 learners undergo stage-like interlanguage development regarding the different types of *ba* construction, as categorised in the earlier noted studies sub-*ba* construction, but learners differ in specific stages that they go through.

4.5.3 Variability in the existing studies

With regard to question 4, there is general agreement that the following are the major error types: over-generalisation of *ba* (54%) by using *ba* to replace other prepositions or adding *ba* when it is inappropriate, thereby making over-suppliance. These errors are attributed to the following reasons:

- Typological differences: the more typologically distant one language is from the target language, the more erroneous learners can be; however, it is also likely that they can disguise their production to be less erroneous. For instance, compared with L1 Japanese and Korean learners, L1 English speakers use more avoidance strategies and have higher accuracy rates (Jin 1993; Xiong 1996);
- Proficiency level: the accuracy level correlates with the proficiency level (Jin 1993; Xiong 1996);

- Incomplete mastery of L2 Chinese structural rules (Liu 2005).

While the existing studies contribute to our understanding of L2 acquisition of the *ba* construction, gaps remain that need to be filled. In other words, further studies must be conducted regarding how L2 learners switch from SVO to the *ba* construction with different word order, how the acquisition of other functional elements, such as aspect markers, *bei* and negators, interacts with the acquisition of different core and peripheral types for the *ba* construction.

4.6 Acquisition of the *Bei* Construction

Studies of the acquisition of the *bei* construction share similar features with acquisition studies of the *ba* construction.

4.6.1 Methodology

Firstly, the methodology is the same: first setting up *bei* construction categories based on native speaker data, then gauging interlanguage production against them and identifying an acquisition order and non-acquisition features (Chen 2006; Zhou and Xiao 2009). For instance, Chen (2006) searched a corpus of modern and contemporary novels with 600,000 words and identified nine patterns in native speaker *bei* types based on the frequency of use and order of use as P1>P4>P9>P3>P5>P2>P8>P6>P7. The analysis of interlanguage data display an acquisition order as P1>P4>P3>P5>P6>P7> P2> P9>P8 and the following patterns, with examples also given below.

Pattern 1: NP1+*bei*+NP2+V+other element;

Pattern 2: NP1+*bei*+ (NP2) +V+NP3;

Pattern 3: NP1+*bei*+V+other element;

Pattern 4: NP1+*bei*+ (NP2) +V+ other element;

Pattern 5: NP1+*bei*+ (+NP2)+V+*de*+other element;

Pattern 6: NP1+*bei*+NP2+*suo*+V;

Pattern 7: NP1+*bei*+NP2+BA+NP3+VC;

Pattern 8: NP1+*bei*+NP2+*gei*+VC;

Pattern 9: *bei* as a constituent in sentences.

- (4.3) *wo* *diyī* *ci* *cháng* *dao* *bei* *zhūnzhōng* *de* *gǎnqùe*.
 ISG first time taste come BEI respect DE feeling
 ‘It is the first time for me to taste the feeling of being respected.’ (Pattern 9a)
- (4.4) *tāmen* *yǐjīng* *xìguān* *bei* *jìdù* *le*.
 They already adapt BEI envy LE.
 ‘They have been used to being envied.’ (Pattern 9b)
- (4.5) *bei* *mòshì* *bei* *hùshì* *shì* *duōme* *yóushì* *zhūnyáng*
 BEI neglect BEI ignore be how lose dignity
de *shìqìng*.
 DE matter
 ‘To be neglected or ignored is such of a matter of losing dignity.’ (Pattern 9c)

4.6.2 Acquisition of the *bei* construction

Similar to the acquisition of *ba* construction, the Aspect Hypothesis is also applied to the L2 acquisition of the *bei* construction. Crucially, Huang, Yang *et al.* (2007) argue that unlike the English passive construction, the *bei* construction in Mandarin is constrained in three respects: the predicate of a clause should have the telic feature, the patient should be definite, and the clause should bear ‘unfortunate’ meaning (p.80 translated). According to Huang, Yang *et al.* (2007), grammaticalisation of telicity is not a unique feature of Mandarin; rather, the feature is universal. In accordance with Hopper and Thompson’s transitivity theory (1980), Huang, Yang, *et al.* (2007) argue that telicity in Mandarin is realised by *de*-construction, resultative complements, tendency verbs and verbal quantifiers and that objects are affected in the sense of being definite. Based on the above framework, they report their investigation of Mandarin *bei* construction used by L1 English speakers. Their data is composed of three parts: 109 *bei* sentences from the two-million-word Overseas L2 Chinese Interlanguage Corpus; *bei* sentences produced by 20 L2 Chinese learners in Beijing and results from grammaticality judgements of *bei* by 13 L1 English speakers. The data drawn from the corpus was produced by L1 English speakers. Among the 109 sentences, 18 were from beginners, 44 from students with low middle level, 47 from the intermediate and advanced level of learners. The last two datasets were from controlled production and comprehension of *bei* construction under different conditions. The learners in the second type of data had studied the language for two or three years and had an intermediate level of Chinese proficiency, while those in the third data types were learning Chinese in Beijing and had an intermediate level of Chinese proficiency.

Huang, Yang *et al.* (2007) find that: in natural data, the accuracy rate of the *bei* construction suppliance increases with learners’ language proficiency; learners follow three constraints on

the *bei* construction, and error types are incomplete use of complements, missing aspect marker *le*; incorrect use of intransitive verbs in passive sentences and overgeneralisation due to L1 transfer. In the sentence-making exercise, learners have higher accuracy in using directive accomplishment verbs and destructive accomplishment verbs in the *bei* construction. Additionally, no significant difference was found in the grammaticality judgement task between native and non-native speakers in five types of aspects, non-definite patient, and pejorative passive. The significant difference was only found in L2 Mandarin learners' use of intransitive verbs in passive sentences. They summarise that learners have a high level of awareness of telicity, delimiting elements, the definite feature of the patient and that this awareness reflects universal language acquisition features. Finally, three suggestions are made.

- Telicity, rather than an abstract disposal meaning, should be employed in explaining the *bei* construction to L2 learners.
- The grammaticality judgement exercises in relation to the three constraints should be reinforced to promote L2 learners' understanding at the intermediate and advanced levels.
- Teaching materials should have more exercises targeting at unpleasant verbs and resultative complements, etc.

Although Huang, Yang *et al.* (2007) made a useful exploration, their results may have been influenced by the proficiency levels of their participants. The study is not helpful in understanding how those learners seem to acquire telicity. Moreover, two studies do not allow us to conclude that learners' language performance is universally constrained by the Aspect Hypothesis.

Yang (2012) approaches the acquisition of *bei* construction by L1 Japanese speakers from an error analysis perspective. The dataset comes from Japanese participants' written assignments, test papers and oral answers in class. Yang finds that errors occur at different levels of the construction: redundancy (4.6), errors in predicate verbs (4.7-4.8), errors in complements (4.9 a-b) errors in negative adverbs, modal verbs and errors in agent and patient (4.10).

- (4.6) *zhuozi shang bei fang zhe shu.* (p.18)²²
 table on BEI place ZHE book
 (Target: *shu bei fang zai zhuozi shang.*)
 ‘A book was placed on the table.’
- (4.7) *riben de hua bei yinghua daibiao.* (p.19)
 Japan DE flower BEI cherry blossom represent.
 (Target: *yinghua daibiao zhe ribenhua.*)
 ‘Japanese flowers are represented by cherry blossom.’
- (4.8) *shantian bei shu ban dao.*
 Shantian BEI tree stumble fall
 ‘Shantian was stumbled by a tree and fell down.’
- (4.9) a *boshidun bangqiu dui bei mei taotai le.* (p.21)
 Boston baseball team BEI **not** beat LE
 ‘Boston baseball team was not beaten.’
- b *na jian shi bei ta hui zhidao de.* (p.21)
 that CL affair BEI 3SG can know DE
 (Target: *najianshi hui bei ta zhidao de.*)
 ‘That affair can be known to him.’
- (4.10) *bao kan jiaocai bei tongxue*
 Newspapers journal teaching material BEI classmate
na dao le classroom
 take arrive LE *jiaoshi.*
 ‘Newspapers and teaching material were taken to the classroom by [my] classmates.’

Taking a Full Transfer position, Yang (2012) concludes that most errors were due to negative transfer of Japanese and that this would persist:

At the early stage of BEI construction learning by Japanese students, the way of thinking, experience of learning a language and their knowledge of Chinese all come from their mother language-Japanese. The Japanese grammatical rules and language and thinking have produced great influences on their acquisition of Chinese and even when the learners move to an advanced level, the impact is still great. (Yang 2012: 23)

According to Yang (2012), other errors are caused by limited and incomplete knowledge of Mandarin, which includes sentence order, grammar and semantics. The influence of the L1 on L2 Chinese rules has led to overgeneralisation.

²² The annotations, alongside translation, were added to the examples (4.6-4.10) by the author of the thesis.

(4.11) *wo* *changchang* *bei* *laoshi* *biaoyang.*
 ISG often BEI teacher praise
 ‘I am often praised by my teacher.’

(4.12) *banjihui* *xingqi'er* *bei* *juxing.* (Yang 2012: 24)
 class meeting Tuesday BEI hold
 (Target: *banhui xingqi'er zhaokai.*)
 ‘The class meeting will be held on Tuesday.’

Unfortunately, Yang’s study suffers from lack of a theoretical base, inadequate description of the sample size and language background of the learners and lack of application of statistics to the data.

4.7 Negation

4.7.1 Findings from L2 negation acquisition²³

Wang (1997) analyses 914 clauses in a written interlanguage corpus with 1.04 million characters to investigate patterns in Mandarin negation acquisition. The data is from L1 English speakers who were classified into six groups according to their term of study of Mandarin. *Bu* is divided into ten subtypes while *mei* into four. Wang’s analysis divides their L2 acquisition into three periods emergence period > up-surfing period > stable/mature period. He also demonstrates correlations between the word order and the level of structural complexity. The results are summarised in Table 4.4.

²³ Zheng and Chang’s (2012) acquisition study was reviewed earlier in this chapter while Yuan’s (2004) will be discussed in Chapter 7.

Table 4.4 A summary of negation development adapted from Wang (1997)

Levels of structural complexity		Proficiency level (based on terms of study)					
Levels	Negative structure	1	2	3	4	5	6
Level 1	<i>bu(tai)+V</i> not (too)+V 'not (too)+V'	emergence	up surging	stable			
	<i>bu(tai)+adj</i> not (too)+adj' 'not (too) +adj'	emergence	up surging	stable			
Level 2	<i>bu (hui, neng)+V/adj</i> not (can, be able to)+V/adj' cannot/ be unable to V/adj	emergence		up surging	stable		
	<i>mei+V</i> not+V 'not +V'	emergence			up surging		
Level 3	<i>bu shi+N/V</i> not be+N/V 'not be +N/V'	emergence					
	<i>gen bu yiyang</i> with not same 'not the same as...'	/	emergence				
	<i>bu (wan, le)</i> not (aspect marking perfectivity)	/	emergence				

Wang (1997) further analyses the error types and proposes four transitional periods in negation acquisition: the single negator period, the miscellaneous use of *bu* and *mei*, overgeneralising *mei*, and differentiating and integrating *bu* and *mei* (1997: 99). It is not until the 5th period that L2 learners reach the native-like production.

Li (2004) narrows her scope to the study of *bu+V* and *mei+V*, finding that: (1) there is random use of *bu/mei +V*, but no overuse of *mei* at the miscellaneous stage; (2) learners' mastery of *bu*

and *mei* is positively related to their Mandarin proficiency; (3) the acquisition of *bu* and *mei* are attributed to several significant factors. Apart from cross-sectional data, Li also collects longitudinal data at four different points over three months. The longitudinal data were collected from 17 students with above zero language knowledge and unspecified L1 backgrounds and involved grammar tests, compositions and oral question and written answers. The cross-sectional data came from different class groups in test forms. Li yields four important findings:

- The dominant way for L2 learners to mark negation was using *bu* instead of *mei*; *mei* was not overgeneralised in negation marking.
- Learners at all proficiency levels used *bu* and *mei* miscellaneously in grammar tests.
- There was no strong correlation between L2 learners' acquisition of *negation* and their language proficiency.
- Learners' familiarity with adverbials of time and chunks affected L2 learners' use of *negators*.
- Language teaching had an impact on learners' acquisition of negation.

4.7.2 Summary of negation acquisition research

To date, negation acquisition studies have produced inconsistent results. Nonetheless, these studies have two essential features. Firstly, negation acquisition studies rely on distributional analyses which they share with *ba* and *bei* construction acquisition studies. *bu* and *mei* in the reviewed studies are commonly assumed to be adverbs cliticised to the VP, adjectives and *ba* and *bei* construction. They do not head independent negation phrases.

Another salient feature of the *bu* and *mei* acquisition studies is that claims are all based on written corpus data, which, I argue, draws on L2 learners' metalinguistic knowledge rather than their linguistic competence. Instead, oral data is desirable to indicate unconscious underlying linguistic knowledge in relation to negation.

Literature has also shown that L2 learners' acquisition of negation has been used as a medium to observe L2 learners' acquisition of other linguistic features. For instance, Liu (2009) investigates L2 learners' acquisition of Mandarin aspects and modals through his observation of learners' acquisition of negation. Chen (2015) studies the learners' judgement of negation in *ba* and *bei* construction to gain insight into the functional categories of *ba* and *bei*.

4.8 Developmental Studies

Reviewed above is part of the growing body of L2 Mandarin morpho-syntax acquisition studies, which are limited to the acquisition of certain grammatical constructions or items (Mai 2016; Zhao 2011). One issue with the research scope is that it offers little insight into how the acquisition of particular sets/sub-systems of structures or linguistic items is inter-linked to form a comprehensive picture of learners' morpho-syntactic knowledge. Zhang (2001, 2008), Gao (2009) and Wang (2011) extend the research scope and involve more grammatical items based on PT (Pienemann 1998) to investigate the hierarchical development of Mandarin linguistic structures and morphemes. A close examination of these studies will help show why it is still necessary to approach L2 Mandarin acquisition from the theoretical perspective of the present thesis.

We can divide the structures, and morphemes examined in Zhang (2001, 2008), Gao (2009) and Zhao (2011) into those belonging to the NP domain and those in the VP domain and focus on the latter. Wang (2011) has made the most recent efforts in applying PT (Pieneman 1998, 2005 and 2008) to the analysis of L2 Mandarin morpho-syntax.

Wang (2011) adopts a longitudinal and cross-sectional design involving oral data collected over one academic year through semi-structured interviews from two Year 1 and six Year 2 university students²⁴. They were enrolled on the Mandarin programme at Newcastle University and had various L1 backgrounds. In line with research based on the PT, she adopts emergence criteria in dealing with her data, that is, production of a relevant morpheme or construction when it occurs minimally in four lexically different contexts indicates acquisition. The emergence criteria and the distributional analyses were used to locate various linguistic features in PT-driven stages. It is worth noting that Wang's analytical framework is based on her general adoption of Zhang's (2001) and Gao's (2009) categorisation of the Mandarin grammatical system. Wang's revised stages are presented in Table 4.5.

²⁴ There were altogether nine data collection sessions, which were conducted on a monthly basis.

Table 4.5 Wang's revised development stages based on PT

Stages	Processing procedures	Information exchange	Morpheme	Syntax
5	Subordinate clause procedure	Main and sub-clause	/	<u>bei construction</u> ba construction
4	S-procedure	Inter-clausal information	Relative clause marker <i>-de</i>	Topicalisation: T(=O)SV(Comp) T(=O)(S)V(Comp)
3	Phrasal procedure	Phrasal Information	Classifier V-COMP marker <i>-de</i>	Topicalisation: T(=Adjunct)SV(O) Subordinate clause adverbial clause coordinate clause
2	Category procedure	Lexical morphology	Possessive <i>-de</i> Adjective <i>-de</i> Attributive <i>-de</i> Progressive (<i>zheng</i>) <i>zai</i> Experiential <i>-guo</i>	Canonical SV(O): declaratives interrogatives (y/n, <i>wh-</i> , intonation) Topicalisation T(=S)VO
1	Word/lemma access	No exchange	Single words and constituents	Formulaic expressions

(Source: Wang 2011: 153)

In Table 4.5, Wang, based on the results of her empirical study, added the bold items. The remaining ones in the table were established by Zhang (2001, 2008) and Gao (2009). Therefore, Wang's table is the most comprehensive representative for L2 Mandarin of hypotheses based on the PT. The following section focuses on Wang's study. Meanwhile, Zhang (2001) will be mentioned when necessary. Gao's (2009) syntactic development and coverage of aspect markers are integrated into Wang's study, and her research is therefore not further mentioned.

Wang's data analysis indicates:

- “Relatively identical development patterns” to the PT-driven stages predicted based on the Processability Theory (Wang 2011, 1993) or strong eligibility of PT to be applied to L2 Mandarin development studies;
- Considerable differences are not observed in the actual production patterns and those in the teaching syllabus; in other words, the observed universal development hierarchy is not affected by classroom instruction;
- Similarities in the individual development hierarchy but differences in development speed;
- The ineffectiveness of eliciting particular sentence structures through collecting natural speech.

As noted previously, the present thesis is focused on the acquisition of morpho-syntactic properties in the VP domain, but not the acquisition of NP domain-oriented items. Thus, a filtered table is generated below.

Table 4.6 Developmental hierarchy with linguistic items in NP domain excluded

Stages	Processing procedures	Information exchange	Morpho-Syntax
5	Subordinate clause procedure	Inter-clausal Main and sub-clause	<i>bei</i> construction <i>ba</i> construction
4	S-procedure	Inter-clausal	Topicalisation: T(=O)SV(Comp) T(=O)(S)V(Comp)
3	Phrasal procedure	Phrasal information	Topicalization: T(=Adjunct)SV(O) subordinate clause coordinate clause
2	Category procedure	Lexical morphology	Canonical SV(O): declaratives interrogatives (<i>y/n</i> , <i>wh</i> - intonation) T(=S)VO Progressive (<i>zheng</i>) <i>zai</i> Experiential - <i>guo</i>
1	Word/lemma access	No exchange	Formulaic expressions

Scrutiny of the table raises concerns regarding the following aspects of Wang's findings (2011):

- The conceptualising of *guo* and *zheng(zai)* to be acquired at an early stage, i.e. stage 2 in both declarative and interrogative questions, including both yes and no or *wh*-questions;
- The emergence of subordinate and coordinate clauses at the phrasal procedure, i.e. stage 3;
- The single production of V in T(=O)(S)V(Comp) at S procedure, i.e. stage 4;
- *ba* and *bei* construction at stage 5.

Firstly, I argue that conceptualising *guo* and *zhengzai* as lexical items with equal syntactic status is problematic. Mai (2016) explains that *guo* and *zhengzai* should be captured as functional heads in line with the Lexical Functional Grammar that PT is based on and that their syntactic status should be differentiated. I further argue that assuming *guo* and *zai* are acquired in the same procedure as the acquisition of both declarative and interrogative clauses makes it risky to claim that *zhengzai* and *guo* can be flexibly used in those clauses. Evidence from Wang's (2011) data or evidence from previous studies is lacking here. I also argue that compared with Wang's proposition of early acquisition of *guo* and *zhengzai*, another part of the acquisition story is that based on some other studies, i.e. *guo* and *zhengzai* are acquired at different stages or even not acquired.

Secondly, Wang's proposal of subordinate and coordinate clauses occurring at stage 3 has challenged PT's proposed stage-like development, where subordinate clause structure is supposed to emerge at the highest layer of the proposed grammatical architecture. Meanwhile, she proposed *ba* and *bei* constructions are not justified from a Lexical Functional Grammar perspective or information processing perspective to be appropriately posited at the highest stage. Furthermore, for V to be counted as topicalization, T (=O) (S) V (Comp) generated at stage 4 require serious explanation. Again, Wang does not provide examples of such production.

Thirdly, there are missing links between PT and the emergence stages in Wang's study. Wang pays more attention to describing L2 Mandarin development stages within the framework provided by PT than to explaining how PT constrains emergence. In other words, it is unclear how learners are constrained by processing procedures and how information is exchanged between different stages observed.

Fourthly, according to Wang (2011), it is unclear whether or to what extent the different L1s that her participants speak have affected the proposed L2 development. Pienemann offers that L1-modulated transfer occurs when a particular structure is established in the L2, and there is a similarity between L1 and L2 syntactic structure (note: this is compatible with Hawkins' (2001) Modulated Structure Building Approach; see Chapter 2). Mai (2016) further argues that Wang has left open the question of how processability interacts with well-established factors like the role of the L1 and L2 input.

Fifthly, Wang's data presentation is problematic in two respects. On the one hand, very few learner utterances are provided as examples to convince readers of those conclusions can be drawn. Conversely, when the data from one of the participants, Rachel, is missing, Wang claims that "[e]vidence can be found in the data analysis and she was posited at the highest level of the processing hierarchy at week 12" (Wang 2011: 189).

Sixthly, Wang's learners have multi-learning experiences and multi-L1 backgrounds. Some of the learners both visited and studied in China; others only managed a short visit to China. The L1 German speaker was counted as having no previous exposure to Chinese. The language background of those learners is mostly L1 English with the L1 German as an exception. Wang acknowledges that the internal and external multi-factors might have affected the learners' rate of acquisition, but not their acquisition order. However, when the nature of learning is unclear, the multi-factors in Wang's research design are not helpful in gaining an insightful and focused view of how the L2 was learned.

Finally, although Wang (2011) claims that the developmental trajectory of L2 Mandarin supports PT, a few aspects remain unclear in her study. For instance, she does not explain precisely how the processing capacity of the learners constrained procedural progress, how learners built up their L2 morpho-syntax as proposed by PT and whether and how learners' L1 transfers in L2 Chinese development. Mai (2016: 123) also argues that Wang has made too strong a proposal concerning the acquisition sequences and these need to be revised. Furthermore, Mai calls for "a more fine-grained approach to L2 Chinese structures and their processability".

4.9 Summary

This chapter has reviewed L2 acquisition studies conducted both from the generative and non-generative perspectives, developmental studies of L2 grammatical systems and sub-items, that is, the acquisition of word order, aspect markers, negation and *ba* and *bei* constructions. Overall, research on L2 Mandarin acquisition is progressing from being heavily descriptive to being theory-oriented. The major theories adopted are PT and the AH. The former has been applied to the development of morpho-syntax, while the latter is dedicated to the exploration of aspect marking and learners' sensitivity to the inherent lexical aspect of verbs and predicates.

Moreover, the review has highlighted the lack of clarity and consistency regarding L2 learners' acquisition of morpho-syntax in the verbal domain particularly with respect to aspect marking,

the *ba* and the *bei* constructions. OG's prediction of a stage-like development provides a model that links the discrete aspects of the Mandarin grammatical system into a comprehensive understanding of the developmental features of L2 learners. The next chapter will describe how OG can be fruitfully applied to oral production data from a longitudinal design. Furthermore, a report of the results in the subsequent chapter will also lay the foundation for future discussion of the nature of the L2 acquisition of Mandarin clause structure.

CHAPTER 5 METHODOLOGY

5.1 Introduction

The previous chapters have identified both conceptual and empirical issues in the acquisition of L2 morpho-syntax of both European languages and Mandarin. The main problems are summarised in Table 5.1.

Table 5.1 Conceptual and empirical issues in previous studies

Conceptual issues

- The FT/FA Hypothesis is facing challenges from Organic Grammar;
- Processability Theory's predictions about the development of Mandarin are not upheld.

Empirical issues

- Organic Grammar has only been applied to the acquisition of European languages;
 - Theoretical approaches that highlight lexically driven L2 acquisition, like Processability Theory and the Aspect Hypothesis, have been empirically challenged;
 - There is a shortage of early stage L2 acquisition studies, particularly of *ab initio* learners;
 - There are many cross-sectional studies and much fewer longitudinal studies;
 - There is an increasing amount of written rather than oral corpus data in L2 Chinese acquisition studies;
 - The acquisition of Mandarin by learners with diverse L1 backgrounds has shed little light on the role of the L1 in L2 Mandarin acquisition;
 - Variability in the L2 production of Mandarin aspect markers can be partially attributed to the nature of the test tasks adopted.
-

In light of these issues, we can test OG to assess whether it provides a better account of L2 Mandarin acquisition from the very early stages. A clause structure proposal for Mandarin, based on Organic Syntax (Vainikka and Young-Scholten 2011), was introduced in Chapter 3, and the following research questions can now be asked to examine L2 Mandarin development:

Q1: Where the word order in the verb phrase is different in English and Mandarin, do the learners in this study use the order of their L1 English or the order of Mandarin?

Q2: Do L2 Mandarin learners posit functional projections in a stage-like manner, that is, from bottom to top, in accordance with the route predicted in Chapter 3?

Given the above questions, this chapter presents and justifies the empirical methods of studying L2 Mandarin morpho-syntax acquisition employed in the current thesis. It is organised into eight further sections. Section 5.2 outlines the overall research design, while Section 5.3 introduces the early stage adult learners in the current research. Section 5.4 specifies the study's test design and a battery of tasks used in this research. Section 5.5 describes how data is transcribed and how the accuracy of the transcription is ensured. Section 5.6 explains the acquisition criteria, while section 5.7 provides an account of how data is processed in the study. Section 5.8 discusses issues pertaining to the validity and reliability of the current research and, finally, 5.9 provides a summary of the chapter.

5.2 A Mixed Research Design

The present study has two characteristics: a mixed design and homogeneous sampling. The mixed design involves the collection of both longitudinal and cross-sectional L2 data. Two considerations motivate the adoption of this design. Firstly, a discrete design has its inherent advantages and disadvantages as a research method. The latter includes failure to provide a comprehensive profile of L2 development. Secondly, current L2 Mandarin research requires more compelling evidence from longitudinal data. A close examination of the two designs, longitudinal and cross-sectional, is as offered below:

Longitudinal data collection in language development studies can cover a period of anything from two or three months up to several years or decades (Ellis 1994; see, e.g. Lardiere 2008 for a perhaps the lengthiest longitudinal study of L2 acquisition). Such studies are conducted to track the development by individuals of the variables under scrutiny and collect data for further quantitative and qualitative analysis. A longitudinal method adheres to the conventions of SLA developmental studies and has long been recognised as suitable for L2 developmental studies within both naturalistic and classroom environments (see, e.g. Hakuta 1975; Wong-Fillmore 1976; Burt and Dulay 1980; Clahsen and Muysken 1986; Schwartz and Sprouse 1994; Vainikka and Young-Scholten 1994, 1996 a, 2011; Myles, Hooper and Mitchell 1998; Myles,

Mitchell and Hooper 1999; Zhang 2001 and Wang 2011). The importance of a longitudinal study is owing to the following opportunities:

- it can provide empirical evidence for developmental patterns and order of acquisition (Ellis 1994: 75; Bardovi-Harlig 2000: 94). That is, researchers can trace the changes in the learner language of individuals at regular intervals over a period (Gao 2009: 60), so that “transitions between states” (Rose and Sullivan 1982: 211) can be recorded and a comprehensive picture of learners’ interlanguage development over stages can be highlighted by the collected rich datasets (Gao 2009).
- it can help provide interpretations or reasons for development, as it allows for the inference of causal relationships between variables, which are revealed through the acquisition order of a particular individual (Bryman 2012; Dörnyei 2007);
- it can reduce problems due to the absence of a control group (Mackey and Gass 2005: 155; 2012);
- it can help overcome typical SLA issues, like small numbers of participants and non-comparability of individuals at the very beginning of the acquisition process.

Conversely, longitudinal research can be problematic in terms of representativeness and reliability, the length of the testing periods and cost. Firstly, compared with a cross-sectional study, it typically has a much smaller sampling size. Such a feature makes some researchers question the extent to which the results can be generalised over a larger population (Larsen-Freeman and Long 1991). Indeed, some studies are only of a single individual; for example, Haznedar (2003) and Lardiere (2008). Secondly, longitudinal research requires repeated testing over a long period, which demands participants’ commitment in terms of time and effort. For example, it is not uncommon for participants to withdraw at different points in a study. Moreover, even within the existing well-known datasets, there is often an issue of missing data due to the participants’ circumstances, such as illness or absence for a holiday (Hakuta 1974; Wong-Fillmore 1976; Vainikka and Young-Scholten 2011). Participants’ absence may potentially threaten both the validity and reliability of a longitudinal study (Pica 1997; Zhang 2001). Thirdly, a longitudinal study may also be constrained by the length of the research period agreed-upon between learners and researchers prior to the start of the research. In other words, the study might not be sufficiently long to capture what the researcher has set out to capture. If it is realised that further data is required, an extension of the research period may be difficult due to ethical issues or learners’ availability (Pica 1997), or funding. That is, collecting longitudinal datasets can be time-consuming and costly (Myles 2008: 59). Therefore, two parallel longitudinal studies, of learners at two distinct levels, were conducted rather than a

two-year longitudinal study. Out of the above considerations, the present study is both longitudinal and cross-sectional.

Similar to longitudinal studies, a cross-sectional design has both negative and positive sides. On the positive side, it is valuable for the description of acquisition patterns at a single data collection point (Dörnyei 2007). It also has the advantage of enabling a researcher to identify stage-like differences between different levels of learners (Larsen-Freeman and Long 1991; Dörnyei 2007; Vainikka and Young-Scholten 1994). Furthermore, a cross-sectional study with group data or large sample size is thought to be more convincing when the results need to be generalised over a larger population (Gao 2008). Nonetheless, a cross-sectional design has also been observed to have constraints. For instance, Larsen-Freeman and Long (1991) argue that a cross-sectional study is not very helpful in revealing language acquisition processes, particularly the transition points in language learning, as it is generally conducted at one shot and at one specific time.

A mixed design, using longitudinal as well as cross-sectional datasets, has been well established in language development studies (Schwartz 1995; Clahsen and Muysken 1996; Vainikka and Young-Scholten 1994, 1996a). Zhao (2011) argues that a longitudinal design should be adopted to complement cross-sectional studies in L2 Mandarin acquisition studies, as the dominant design has been cross-sectional and both are indispensable in understanding the processes of L2 acquisition. However, apart from Shi (1998), Gao (2009) and Wang (2011), a longitudinal-plus-cross-sectional mixed design has seldom been used in L2 Mandarin development research. Specifically, it has never been used to study the acquisition of L2 functional projections.

Given the advantages and disadvantages of both designs and current research practice, the present study adopted a longitudinal-and-cross-sectional mixed design to avoid the weaknesses of either method and try to make them complementary. The research design was operationalised in the present study as follows: utterances of eight adult L2 learners in a Mandarin undergraduate degree programme were audio-recorded on a monthly basis over one academic year (October 2014-June 2015). When the study began, three of the eight participants were at a beginning level (Year 1 at university) and five at an intermediate level (Year 2 at university). Longitudinal data is used to capture the individual interlanguage development of two groups of L2 learners where the cross-sectional design comes about from the data from these two groups of learners at two proficiency levels. Such a design extends the observation

period to two years, thereby enabling a good understanding of further post-beginner development in the acquisition of the functional projections of Mandarin. The data collection information presented in Table 5.2 provides access to the longitudinal and cross-sectional design of the present study.

Table 5.2 The longitudinal and cross-sectional data collection schedule

Participants	Dataset 1	Dataset 2	Dataset 3	Dataset 4	Dataset 5	Dataset 6	Dataset 7	Dataset 8	Dataset 9
Alice (Y1)	31/10/2014	24/11/2015	09/12/2014	-	24/02/2015	11/03/2015	15/04/2015	29/05/2015	10/06/2015
Beth (Y1)	30/10/2014	25/11/2014	10/12/2014	30/01/2015	23/02/2015	12/03/2015	13/04/2015	15/05/2015	-
Charles (Y1)	23/10/2014	21/11/2014	12/12/2014	19 /01/2015	18/02/2015	-	15/04/2015	15/05/2015	01/06/2015
Daisy (Y2)	24/10/2014	21/11/2014	12/12/2014	26/01/2015	18 /02/2015	10/03/2015	14/04/2015	05/05/2015	08/06/2015
Emily (Y2)	24/10/2014	25/11/2014	11/12/2014	20/01/2015	-	20/03/2015	14/04/2015	-	-
Fiona (Y2)	24/10/2014	28/11/2014	12/12/2014	30/01/ 2015	27/02/2015	13/03/2015	-	01/05/2015	18/06/2015
Grace (Y2)	24/10/2014	21/11/2014	08/12/2014	30/01/2015	17/02/2015	09/03/2015	14/04/2015	08/05/2015	01/06/2015
Harry (Y2)	27&28/10 /2014 ²⁵	25/11/2014	09/12/2014	30/01/2015	-	12/03/2015	17/04/2015	06/05/2015	03/06/2015

Note: ‘-’ marks a learner’s absence from the data collection session.

²⁵ For practical reasons, the session was completed over two time slots.

5.3 Participants

The population in this study was adult English-speaking learners of Mandarin who were then under classroom instruction. The rationale for focusing on instructed, rather than uninstructed, naturalistic learners rests primarily upon practicality, for it is much more difficult to access a good number of naturalistic beginners. Importantly, Ellis (1994), Hawkins (2001) and others have argued that the same L2 acquisition order can be observed regardless of whether the learning context takes place in or outside the classroom; universals that drive development should be available to all learners²⁶. Therefore, the results from an instructed population can test the explanatory power of OG.

5.3.1 Sampling

Obtaining representative participants of a particular population requires a specific subgroup and the targeted population to share some common features (Dörnyei 2007). To obtain instructed early stage L2 Mandarin learners, the researcher of the present study adopted two sub-types of non-probability sampling: convenience sampling and homogeneity sampling. The advantage of convenience sampling is in its “practical criteria”, namely “geographical proximity, availability at a certain time, easy accessibility, or the willingness to volunteer” (Dörnyei 2007: 99). The disadvantage is that this sampling method has some inherent biases.²⁷ Consequently, a sample may not indeed represent a population, leading to difficulties in making generalisations. However, Dörnyei (2007) notes that it would be incorrect to say that research based on a convenience sample cannot offer any generalisations; rather, generalisations may be limited in scope, as it is effectively a compromise between convenience and research-oriented sampling of the population. Therefore, convenience sampling is best combined with homogeneous sampling when the research question to be addressed is particularly relevant to the characteristics of a particular interest group²⁸.

Given the above, the participants of this study were selected for convenience, but they also met the homogeneity criteria. Specifically, the L2 participants were English-speaking students in their first or second year of university study (= Year 1 and Year 2) who were recruited on a

²⁶ The possible influence of instruction on the learners in the present study will be touched upon in Chapters 6 and 7.

²⁷ e.g. <http://dissertation.laerd.com/convenience-sampling.php> accessed on 19/01/2016

²⁸ <http://dissertation.laerd.com/purposive-sampling.php> accessed on 19/01/2016

voluntary basis from the same British university. When the participants in this study were recruited, attention was paid to ensure they met the following criteria for a homogeneous sample:

- their first language had to be English;
- they should not have had substantial exposure to another East Asian language
- they should have received no classroom instruction prior to their then Mandarin programme;
- all Year 2 students should have completed Year 1 at the same university;
- they should have had no previous experience of living in China or a Mandarin-speaking community.

These conditions were motivated by my efforts to guarantee that the learners were (Year 1) or had been (Year 2) *ab initio* Mandarin learners. The decision to include beginners as well as intermediate learners was motivated by White's (2000) argument, which goes against conducting developmental studies with data collected solely from intermediate learners.

Although convenience and homogeneous sampling are thought to be prone to bias, the combined sampling methods improve the validity of this study, when the features of a longitudinal study and the research purposes of this study are taken into account. As noted earlier, the combination ensures: (1) a good number of participants are accessible and (2) they are representative of instructed L2 Mandarin learners in their first and second years with an L1 English background.

The recruitment of participants as well as the subsequent data collection, storage and usage were in line with the ethical requirements of the researcher's affiliated institution. The recruitment of the participants can be taken as an example. The participants entered the present study by three means:

- face-to-face invitations: the researcher went to the Mandarin lessons, introduced the language development project and called for L2 Mandarin learners in Year 1 and Year 2 to volunteer as participants;
- indirect recruitment: L2 learners responded to the call for participation which was handed out at the start of the project;
- the help of gatekeepers: the Mandarin instructors on the programme encouraged students to participate.

Accompanying the call, all volunteers received further detailed information on their right to withdraw from the research at any point. Before the data collection commenced, they all signed a consent form for their participation, which was followed by filling in the learners' biographical information questionnaire. Appendix I contains the consent form for this study and Appendix II the bio-information survey.

5.3.2 *Participant information*

All participants in the present study were students in a four-year modern language degree programme of a British university, and their mean age was 22 years old. Students first receive two years of instruction and then are required to pursue one year of overseas study in a country that speaks the particular language before completing their final year at the university. Some students on the programme are encouraged to follow a Combined/Joint Honours Degree by picking up additional languages.

There were eight participants in the present study: Alice, Beth, Charles, Daisy, Emily, Fiona, Grace and Harry (all pseudonyms). The first three were Year 1 learners, while the remainder were Year 2 learners. They all studied Mandarin, but also European languages for their combined degree. Emily was the exception, for the other field of her study was business. It is worth noting that five more participants were recruited initially but they withdrew after two or three sessions and their data were not analysed in this study. Their withdrawal did not reduce the validity of the research data, since having four to six participants is generally held to be representative to a reasonable extent in case study research (Duff 2008). Detailed participant information was collected through questionnaires. The results are presented in Table 5.3 for Year 1 learners and Table 5.4 for Year 2 learners.

Table 5.3 presents the bio-information of the three Year 1 participants Alice, Beth and Charles. They all appeared to be *ab initio* learners: none of them self-reported visiting China or living in a Mandarin-speaking community nor did they report receiving classroom instruction prior to their Mandarin programme. Two participants, Beth and Charles, acknowledged meeting their Mandarin 'tandem partners'. See below for a description after their Mandarin programme had started. Additionally, they reported that their proficiency in Mandarin was at a low or beginning level. Alice proclaimed herself to be an absolute beginner with zero exposure to any Mandarin or Mandarin-speaking community prior to university. Compared with the other Year 1 learners, Alice could be rated as the one who received the least native-like input, for the other two Year 1 learners had either a native Mandarin-speaking roommate or a native Mandarin-

speaking tandem partner with whom they had occasional or regular contact. Alice had none of these contacts and relied totally on the Mandarin instruction and course materials. Once data collection commenced, it became clear that the status of Charles as an *ab initio* learner was incorrect, as he had been engaged in self-study of Mandarin prior to starting university. His case will be discussed later in Chapter 6. Learners' self-reported extra-curriculum study hours ranged from two to ten hours. Apart from Mandarin, the participants also reported studying German, French or Spanish, in which their proficiency was noted to be at least intermediate.

Table 5.3 Participant information of Year 1 learners

Name	Sex	Age	Self-evaluated Mandarin level	Other languages and related proficiency	Ever visited China	Mandarin roommate	Ever lived in a Chinese community	Extra-curriculum hours for Mandarin (per week)	Other regular Mandarin activities
Alice	F	18	Absolute beginner	French: A level-B German: A level-A	No	No	No	6	Noi
Beth	F	19	Basic	French: GCSE level German: University	No	Yes	No	10	Meet a tandem partner once a week
Charles	M	24	Very low	Spanish: advanced	No	No	No	5-10	Skype a Chinese friend from time to time

Table 5.4 provides bio-information of the five Year 2 participants. The mean age of the group was 27 years old, and the eldest learner was Fiona, who was 34 years old when the data collection began. Moreover, only one student out of the five was male. As with the Year 1 participants, none of the Year 2s had ever visited China or lived in a Mandarin-speaking community. Two of them reported having a Mandarin roommate, and three acknowledged regular contact with their tandem partners. Their self-reported Mandarin proficiency was at intermediate or low-intermediate levels; however, Daisy rated herself at the beginner level, and Emily made no response to this question. Again, like Year 1 participants, the Year 2 learners were multilingual. Aside from Mandarin, they were also learning various European languages, such as French, German and Spanish, and they rated themselves as advanced or intermediate learners of these languages. Daisy and Fiona were learning one more language than the rest of the Year 2 participants, namely Italian or Catalan; they considered themselves as beginners in these languages. The reported self-study time for Year 2 varied from two to 15 hours per week.

Table 5.4 Participant information of Year 2 students

Name	Sex	Age	Self-evaluated Mandarin level	Other languages and related proficiency	Mandarin roommates	Living in a Chinese community	Ever visited China	Extracurricular hours for Mandarin	Other regular Mandarin activities
Daisy	F	20	Beginner	French: advanced/fluent German: advanced/fluent Italian: beginner	No	No	No	4	No
Emily	F	20	(Not reported)	French, German : able to understand conversations, signs and written texts	Yes	No	No	6-8	Meet a tandem partner once a week
Fiona	F	34	Between beginner and intermediate	Spanish and French: between intermediate and advanced Catalan: beginner	No	No	No	2-5	No

Grace	F	20	Low intermediate	French: intermediate German: intermediate	Yes	No	No	2	Meet a tandem partner once a week
Harry	M	20	Low intermediate	French: A level	No	No	No	10-15	Meet a tandem partner once a week

5.3.3 *Mandarin input*

There were three primary sources of L2 Mandarin input for these learners: classroom instruction, teaching resources and informal social events or extra-curriculum activities. The primary source of input came from the programme instructors, who were all native speakers of Mandarin and taught both the Year 1 and Year 2 groups. Learners in the two-year groups received the same amount of classroom instruction, i.e. six hours per week, which included a one-hour listening session. In this session, students were required to either do a self-monitored listening session or have an interactive listening class, based on teachers' assessment of their needs. The remaining five classroom hours were used for an intensive study, which included speaking, reading and writing. During the classroom teaching, sentence pattern drills and translation played a significant role. Learners were encouraged to undertake paired work in the form of translating sentences, dialogues and essays in the textbooks into the target language forms orally from English to Chinese or vice versa. Due to the pressure from limited teaching hours, a free conversation was mostly expected to be conducted outside the classroom. Table 5.5 provides a rough account of the learners' cumulative classroom instruction hours at each data collection point.

The source of written input for the programme was the textbook *Integrated Chinese (Zhongwen tingshuo duxie)* (Yao, Liu *et al.* 2005), which was designed as a two-year introductory course for university and college learners worldwide. Its accompanying written and audio materials are workbooks, character workbooks, audio CDs, CD-ROM and DVDs, aiming to develop the four skills, listening, speaking, reading and writing. Each volume contains ten lessons, which typically involve the following sections: vocabulary and texts (two dialogues), functional expressions, grammar and pattern drills, *pinyin* (Roman orthography) texts and English texts. Grammatical structures are introduced in simple language without resorting to linguistic terminology. The textbooks used by the Year 1 and Year 2 learners adopt simplified Chinese characters. Apart from the classroom instruction hours, Year 1 participants also reported five to 10 hours of self-study time per week, while Year 2 learners' extracurricular study time varied from two to 15 hours per week.

Another source of Mandarin input for the participants of the study came from the learners' 'tandem partners'. The term derives from an exchange of languages and emphasises cultural integration to facilitate language learning. Tandem partners typically want to learn the language of the other person, and they make free decisions on whether to communicate with each other

face-to-face, via email, Blackboard (the virtual learning platform) or other social media and (Kabata and Edasawa 2011). Participants in this study met their tandem partners face-to-face for two hours per week, spending one hour on practising Mandarin and the other on learning English. The Mandarin practice took the form of either free conversations or revising homework together.

Table 5.5 Number of instruction hours that L2 learners had received by the time of each data collection session

Sessions	Year 1 learners			Year 2 learners				
	Alice	Beth	Charles	Daisy	Emily	Fiona	Grace	Harry
T1	18-24 hours			138-144 hours				
T2	36-42 hours			156-162 hours				
T3	48-54 hours			168-174 hours				
T4	66-82 hours			196-202 hours				
T5	90-106 hours			214-230 hours				
T6	102-118 hours			226-318 hours				
T7	126-142 hours			244 -348 hours				
T8	144-166 hours			280-384 hours				
T9	162-184 hours			308-418 hours				

5.3.4 *The examination of the textbook input order*

A proclamation of L2 acquisition owing to the interaction between UG and target-language input requires a consistent review of the systematic input that is received by L2 learners. As noted previously, the L2 learners in the present study were all under classroom instruction. The most systematic linguistic input could be nothing but the teaching syllabus revealed in the learners' textbooks. Textbook input, as reviewed above, is a primary stable channel for the access to standard Mandarin language material, i.e. observable functional elements.

Thus, apart from the test tasks, an examination of the textbook input order is also essential for two other reasons. One the one hand, the generative perspective of language acquisition considers language input, as the primary linguistic data, plays a non-determinant but necessary

role. Conversely, a comparison of the textbook input order and L2 learners' production order will be valuable in providing a comprehensive account of the factors, which underpin the hierarchical relationship of the functional projections.

5.4 Test Design

It has been established that an appropriate investigation of all aspects of linguistic competence needs a wide range of tasks (White 2003). Thus, section 5.4.1 presents the various types of test tasks adopted in this study and explains how the acquisition of functional projections was approached through each task.

5.4.1 Test tasks

A wide range of tasks was used to collect oral data and provide more comprehensive insight into L2 acquisition than a single job could. Table 5.6 presents an overview of all the test tasks in the study. The leftmost column displays, from bottom to the top, the predicted stage-like development of functional projections. The second leftmost column demonstrates the overt marking forms for the test items. The middle column displays all test tasks. Each of the four sets of tasks includes one or two sub-tasks involving picture descriptions. The last three tasks for negation (NegP, *BaP* and *BeiP*) takes in an additional task, an acceptability judgement task, and the *BaP* exclusively has a translation component. The right column specifies the exact elements examined in the present study, i.e. the grammatical morphemes and structures that are considered to mirror participants' mental representation of the functional projections of different types. These test materials were administered to both Year 1 and Year 2 students through PPT slides, where Mandarin characters and *pinyin* were supplied. Where appropriate, English equivalents were provided.

The present study also adopted repeated testing to increase the validity of the research. The following sections provide a much closer look at the test tasks that examine the development of the functional projections.

Table 5.6 An overview of the test design

Targeted functional projections	Items being focused on	Test task	Test materials
NegP (headed by <i>bu</i> and <i>mei</i>)	The interaction with the other test items; Word order; Negators <i>bu</i> and <i>mei</i> ;	Acceptability judgement task	Slides of sentences with both <i>pinyin</i> and simplified Mandarin characters
		Semi-structured interviews	Slides with activities and cross or tick signs
		Semi-structured interviews	A slide with an image of <i>Qianzhao Li</i> , a historical figure
BeiP (headed by <i>bei</i>)	The interaction with the other test items; Word order; <i>Bei</i> construction	Acceptability judgement	Slides of sentences with both <i>pinyin</i> and simplified Mandarin characters
		Transforming clauses with VO order into <i>bei</i> constructions	Slides with four pictures, where clauses are given in <i>pinyin</i> , Chinese characters and their English equivalents
BaP (headed by <i>ba</i>)	The interaction with the other test items Word order; <i>Ba</i> construction;	Acceptability judgement task	Slides of sentences with both <i>pinyin</i> and simplified Mandarin characters
		Transforming clauses with VO order into <i>ba</i> constructions	Slides of four pictures, where clauses are given in <i>pinyin</i> , characters and their English equivalents
		Oral translation of <i>ba</i> clauses	Two slides of 12 targeted English sentences
AspP (headed by Aspect makers <i>zhe</i> , verbal <i>le_v</i> , <i>guo</i> , <i>zai</i>) and sentential <i>le_s</i>)	The interaction with the other test items Word order; Aspect markers	Acceptability judgement task	Aspect markers are tested in NegP, BaP and BeiP test tasks.
		Describing pictures	20 PPT slides of pictures which are provided with English key words and arranged in SVO order
		The narration of two film clips	The film clips of <i>the Pear Story</i> and the <i>Wise Little Hen</i>

Notes: Some examples of the test tasks are given in the appendices.

5.4.1.1 Testing VP word order

Three particular sets of tests are related to the acquisition of VP word order. They are the picture description task and the transformation tasks involving the *ba* and *bei* constructions. In the picture description task, all prompts are given in SOV order, as depicted in the pictures in Figure 5.1. The L2 learners are expected to produce clauses with SVO order in this task.



Figure 5.1 The picture description task

In the *ba* and *bei* transformation test tasks, the subjects of the clauses were given. The nature of the prompts was meant to induce speakers to complete the sentences providing OV structures with the support of *ba* and *bei*. A prompt is illustrated in Figure 5.2.

- (5.1) *Renmen* *ba* *zi* *xie* *zai* *guijia* *shang*.
 People BA characters write at tortoise on
 “People wrote characters on tortoise shells.”



1. 人们在龟甲上写字。
 ren men zai gui jia shang xie zi.
 (Folks wrote characters on tortoise shells.)
 人们_____。



2. 李时珍记录了草药的功能。
 li shi zhen ji lu le cao yao de gong neng.
 (Li Shizhen recorded the function of herbs.)
 李时珍_____。

Figure 5.2 The *ba* transformation task

5.4.1.2 Testing the development of AspP

As noted in Chapter 4, a right amount of variability exists in L2 learners' production of aspect markers. In the original design, controlled, semi-controlled and broad elicitation tasks were combined to elicit L2 learners' knowledge of AspPs. They are, respectively, picture description, negation tasks and story narration. The picture description task involved 20 pictures with a 5×4 design. That is, each of the five aspect markers was repeated four times in the task. Additionally, the tested items were arranged in a *zhe-le_r-guo-zai-le_n* order. The design of testing one type of aspect marker by using four sentences was based on the research designs of Yuan (1999) and Zhao (2014).

Specifically, the picture description task involved 20 slides with prompts; namely, picture images and English keywords. It was anticipated that Year 2 and Year 1 participants would behave differently in a significant way at the beginning of the data collection. In other words, even with the help of the prompts, Year 1 participants would be unable to utter clauses with aspect markers *zhe*, *le*, *guo* or *zai*, while Year 2 participants would be able to utter at least some of them.

The negation task includes interviews about the historical figure *Qingzhao Li* and about students' daily life with questions on the elicitation slides, where ticks or crosses were given as prompts for the production of negative or positive clauses. The story narration tasks were intended to evoke natural output without much interference. Huang and Yang have argued that learners are sensitive to the boundedness of the *ba* construction. Thus, in the data analysis, the counting of the instances of aspect markers produced was restricted to the test tasks set up correctly for the AspP functional projection. However, we will see that the counting was increased to include all the tasks. It confirms that the decision was appropriate for early-stage L2 learners; all of whom were learning under classroom instruction. When the data collection started, participants of the lower of the two levels had learned Mandarin for only three weeks or, the higher level one year and three weeks. When the Mandarin equivalents of the English prompts were outside their grasp in the data collection, they could use any Mandarin words accessible to them. Moreover, if participants did not have any appropriate Mandarin words, they were told to feel free to use English. The purpose of these instructions was to reduce the stress or anxiety of the participants, particularly the Year 1 participants whose Mandarin was so limited initially that they were barely able to produce anything at all.

Obtaining data on the development of AspP_i, for instance, was achieved by constructing possible contexts where aspect markers were seemingly obligatory. The point can be illustrated by the two images in Figure 5.1 above. Possible nativelike utterances that match Picture I and Picture II are given in Example (5.2) and Example (5.3) respectively:

- (5.2) *jiejie* *na* *zhe* *xuduo* *liwu.*
elder sister hold ZHE many gift
‘The elder sister is holding many gifts.’
- (5.3) a. *baba* *dasui* *le* *na* *ge* *beizi.*
Daddy break-finish LE that CL mug
‘Daddy broke the cup.’
- b. *baba* *ba* *na* *ge* *beizi* *dasui* *-le.*
Daddy BA that CL mug break LE
‘Daddy got the cup broken.’
- c. *na* *ge* *beizi* *bei* *baba* *dasui* *le.*
That CL mug BEI daddy break LE
‘The cup was broken by Daddy.’

Note that the compulsory elements in (5.1) and (5.2) are respectively *zhe* and *le* while *xuduo* ‘many’ and *nage* ‘that one’ may be omitted in all three options. In relation to picture I, beginning learners were predicted not to provide a VP bearing the aspect marker *zhe* and Year 2 learners might or might not supply *zhe*. Likewise, in picture II, beginning learners were predicted not to include the perfective aspect marker *le*₁, while intermediate learners were predicted to be more likely to utter *le*₁ in a target-like manners like (5.3 a) in VO clause structure or even be able to use *le*₁ in a native-like way in an OV structure like example (5.3b) or (5.3 c). This design can help the researcher to elicit participants’ language knowledge, particularly that of Year 2 students regarding AspP and their acquisition of *ba* and *bei* constructions.

Similarly, prompts were employed in the remaining 18 pictures to create possible contexts where aspect markers were expected. Consistent non-production of aspect markers over several sessions was considered to reflect the absence of the IP functional projection in participants’ mental representations. Appendix I provides the scenarios for the aspect marker test. It should be noted that task I also probed whether L2 learners, particularly Year 1 beginners, produced SOV or SVO word order. That explains why all the prompt words on the test slides for Task I were given in SOV patterns rather than SVO.

5.4.1.3 Testing the development of BaP

L2 learners' development of *BaP* was examined through three tasks. They were (1) transforming sentences with SVO order into *ba* clauses, (2) online oral translation and (3) acceptability judgements. The transformation tasks included four pictures depicting historical facts, as stated in Section 5.3.2.2.

The first *BaP* task contained four clauses. In this task, participants were asked to orally reconstruct four clauses by starting sentences with given subjects. The clauses presented in Mandarin characters were annotated with *pinyin* and their English equivalents to ensure failure in producing something would not be due to learners' limited access to the meaning of the sentences. Example (5.4 a) was the first sentence given to the learners. It had the correct VO word order. Additionally, the subject of (5.4 b) was also provided, and learners were supposed to complete the rest of the sentence. In this way, obligatory contexts were created where learners would have to move O in front of V with(out) base-generated or inserted *ba*. In other words, L2 learners would have to adjust the syntactic structure of the original sentence by putting the object in the post-*ba* position. Example (5.4 b) is the sentence which L2 learners were expected to produce. The same rationale applies to the other three clauses.

- (5.4) a. *renmen* *zai* *gui* *jia* *shang* *xie* *zi*.
People at tortoise shell top write characters
'People wrote characters on tortoise shells.'
- b. *renmen* *ba* *zi* *xie* *zai* *gui* *jia*
People BA characters write at tortoise shell
shang.
on
'People got characters written on tortoise shells.'

As with the first negation test task, this task was used as a pre-test to see if the learners had any knowledge of the *ba* construction. Different from the criterion for the negation task 1, participants of this task were allowed to proceed to the acceptability judgement and translation tasks with a 25% accuracy rate. The reason for this requirement was that *ba* is generally held to be acquired late by L2 learners (and by L1 Mandarin children). Thus, as long as the learners were able to produce one *ba* clause out of the presented four, they were then asked to take the acceptability judgement and translation tests. Failure to provide any *BA* sentence in this first test in effect indicates that the learner would be completely unable to complete the more

difficult further tests, so there was no point in asking them to do these. Appendix III provides all the *BaP* related tasks.

The second *BaP* task was an acceptability judgement task, which included 32 test clauses, as presented in Table 5.7. This relatively large number of clauses is due to the interaction between grammatical elements that was targeted in the different test items. Specifically, 31% of the clauses were correct, and the remainder were distractors in various forms. Moreover, 38% of the total (12 out of 32) tested the relationship between *BaP* and AspP introduced by *le*, 12.5% the relationship between *BaP* and AspP introduced by *zai*, and 12.5% the relation between *BaP* and AspP introduced by *guo*. Another 38% tested the relationship between *ba* and negators (*bu* and *bei*), among which eight, i.e. 25% were with *bu*, and four (12.5%) were with *mei*.

Table 5.7 Test design for the *ba* construction

		<i>Properties of the sentences</i>	
<i>ba</i> (32)	with aspect markers (20)		<i>le</i> (12)
			<i>zai</i> (4)
			<i>guo</i> (4)
	with negators (12)		<i>bu</i> (8)
			<i>mei</i> (4)

The third and final *ba* construction task was a translation task, which included 12 sentences in English. The task was online in that participants were asked to translate these orally into Mandarin, using *ba*. They were told that *ba* could be used in any place where they thought it was appropriate. In this task, there were target clauses with a wide range of *ba* construction types with different internal structures. However, the purpose was not to see the extent to which learners had grasped these sub-types but to test whether they produced the *ba* constructions unconsciously.

5.4.1.4 Testing the development of *BeiP*

The *BeiP* test comprised two tasks, as can be seen from Appendix VI. The first task was to construct *bei* clauses and the second an acceptability judgement task. Similar to the first *ba* construction task, the *bei* construction task required learners, who were shown a picture, to make *bei* clauses after hearing questions in English, such as; “What has happened to/is

happening to ... (the object/ the person) in the picture?” Learners were asked to produce complete clauses. In addition to the pictures provided, suitable verbs were placed beneath each picture, written in both *pinyin* and characters. Nevertheless, in case of lack of vocabulary, learners were allowed to use whatever they could manage. For instance, in response to a picture showing a demolished house, ideally, participants were supposed to answer the question: “what has happened to the house?” by replying in Mandarin:

- (5.6) *fangzi bei chai le.*
house BEI demolish LE
‘The house has been demolished

Table 5.8 Test design for *bei* constructions

<i>bei</i> (24)	<i>Properties of the sentences</i>
	<i>Bei</i> with distracting word order (8)
	<i>le</i> (8)
	Correct <i>bei</i> constructions (8)

Similar to the first *ba* test, as long as participants were able to use one *bei* in any of their clauses (25%), they were asked also to complete task 2, which was an acceptability judgement task comprising 25 test items. Among the test items, 1/3 were correct clauses and the remaining 2/3 distractors, among which half had ungrammatical word order and the other half ungrammatical uses of IP due to the inappropriate use of *le*.

5.4.1.5 Testing the development of NegP

The development of NegP was tested through three tasks: a semi-structured interview about a Song Dynasty (1085-1155) female Chinese poet, another semi-structured interview about daily life in modern society and an acceptability judgement task that tested the interaction between NegP and other functional projections. The two interview tasks are supplementary to each other. In the former task, learners were asked at least six questions which were centered upon the poet, *Qingzhao Li*. The purpose of adopting the image of the poet was to create an information gap for the elicitation of negation. For instance, one of the questions in the interview was: have you ever read her poems? As the participants had no idea about this poet and neither could they read any ancient Chinese poems, there was little likelihood that they

could give a positive answer to the question. As the question demanded an answer in relation to the experience, the answer should ideally be as example (5.7). To keep participants from simply providing yes or no answers, they were instructed explicitly to provide answers in complete sentences and the instruction was consistent throughout the tests.

(5.7) *wo mei du guo ta de shi.*
 1SG MEI read GUO 3SG DE poem
 ‘I did not read her poems.’

The six questions regarding *Qingzhao Li* were designed initially as a progression test for the participants. In other words, the first test was administered to test whether L2 participants had sufficient knowledge of negation in order to proceed to the second negation question task and the following acceptability judgement task. The criterion for progression was appropriate responses to four questions in this task. Following the third data collection session, this test was incorporated into the rest of the test materials for negation. It is worth noting that to minimise the researcher’s impact, I conducted the two semi-structured interviews in English while learners were asked to respond in complete Mandarin sentences, if possible.

As was the case in the first negation task, participants in the second task were also asked to answer questions based on a set of pictures. The difference between the two tasks lay in the fact that in the first task, all questions centered upon a historical figure, while in the second task questions were asked about 12 pictures of daily experiences. According to the prompt symbols (\times and \surd), participants were asked to answer negatively or affirmatively, among which 75% were designed to elicit negative answers and the remaining 25% positive distractors. The first eight pictures elicited negation of a habitual state and the last four elicited negation related to an experience in the past. Similar to the first negation test, the questions in this task were asked orally in English and participants were asked to give replies in complete Mandarin sentences. Figure 5.3 is given as an illustration, where learners could easily spot the image of the Great Wall of China and a cross on its right for picture a. Another example can be seen in picture b, which shows a running girl. When asked: “Did the girl swim yesterday?” the participants were expected to produce an utterance like (5.8 a) but not like (5.8 b).

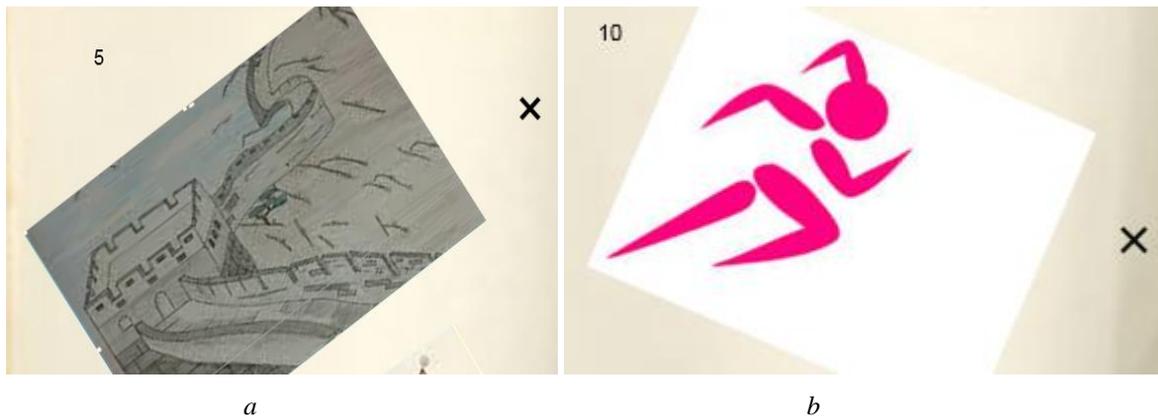


Figure 5.3 Test material for the semi-structured negation interviews

- (5.8) a. *zuotian* *ta* *mei* *youyong*; *ta* *baopu* *le*.
 yesterday 3SG MEI swim 3SG *paobu* *le*
 ‘Yesterday, she did not go swimming but did some running.’
- b. *zuotian* *ta* *bu* *youyong*; *ta* *paobu*.
 yesterday 3SG BU swim 3SG run
 ‘Yesterday, she did not go swimming but did some running.’

The third negation task, the acceptability judgement task, contained 16 clauses. These involve the interaction between negators and aspect markers. Details are given in Table 5.9, where the number of instances of *mei* (=12), which was used to test the interaction between negation with the aspect markers, is greater than that of *bu* (=4). This is due to the complementary distribution between the two negators and the fact that *bu* is more widely used than *mei*. Thus, the number of *bu* is smaller in this part of the test because *bu* cannot co-occur with *guo* or *zai*, while *mei* can. Examples of all three tasks are given in Appendix II.

Table 5.9 Test design of the development of NegP

Negation with aspect markers (16)	<i>bu</i> (4)	<i>le</i> (4)
	<i>mei</i> (12)	<i>guo</i> (4)
		<i>le</i> (4)
		<i>zai</i> (4)

5.4.2 *Uncontrolled tests for functional projections*

The tasks described above were intended to elicit controlled production, where participants were expected to provide example of particular language structure seemingly obligatory for certain contexts. This type of production can reveal participants' morphosyntactic competence, albeit only to some extent, as it is unclear whether language not produced for the obligatory contexts means that certain structure has not been acquired. Potentially, this could lead to the acquisition of a less comprehensive picture of the participants' competence. Thus, uncontrolled production tasks were introduced alongside the controlled ones. In the uncontrolled tasks learners were asked to narrate stories after they had viewed two video clips, *the Pear Film* and *the Wise Little Hen*.³⁰ The purpose was to examine the overall morpho-syntactic development of L2 learners in comparatively less controlled contexts and capture their implicit knowledge.

The Pear Story is a silent film made by Chafe (1980) and his colleagues, aiming to examine "the origin of grammaticalisation in verbalisation of experience" in any language (Croft 2010: 1). Duff and Li (2002) use the same story in their testing of L2 learners' acquisition of perfective *le*. The film is less than six minutes' duration and contains a series of simultaneous and sequential events: a pear picker is picking pears from trees when three groups of people pass his pear baskets: a man with a goat, a boy on a bicycle and three boys with pears. The film ends with the pear-picker wondering where one of his baskets has gone and whether the missing basket has anything to do with the three boys who are seen passing his pear baskets. In this task, participants were asked first to view the film and then narrate the story in Mandarin as it developed.

The Wise Little Hen is a seven-minute-long cartoon with music and singing. It tells how a hen and her children sow corn seeds and have a good harvest, while Peter the Pig and Donald Duck idle all the time and harvest nothing in the end. Similarly, participants were asked to narrate the story as they viewed it. This removes differences caused by cognitive factors; for example, storing and recalling information from memory about the film clips.

5.4.3 *Repeated tests*

According to Mackey and Gass (2013), repeated tests can remove randomness from learners' performances and capture the characteristics of L2 interlanguage that are not due to chance. Therefore, the aforementioned test tasks were administered to the L2 participants of the present

³⁰ <https://www.youtube.com/watch?v=bRNSTxTpG7U> and <https://www.youtube.com/watch?v=A5dowCyaP7I>

study on a monthly basis over one academic year with some exceptions. The Little Wise Hen and the *ba* translation task were implemented in the second data collection session, and thus it was only after the third data collection that all the test tasks were equally administered to all the L2 learners. However, it could be objected that repeated tests can lead to acquisition. Nonetheless, this concern is untenable. Firstly, apart from the suggested optional use of *ba* in the *ba* translation test task, learners generally had no clue about linguistic purposes underlying the tasks; rather, it seemed that the requirement was for them to describe various types of pictures with the vocabulary that they had accumulated. Secondly, the production results of the study from not only the Year 1 learners and the Year 2 learners reveal almost no learning effect from the repeated tests. Vainikka and Young-Scholten (2011) also used repeated tests to elicit L2 German oral production by three American English speakers. They did not find that the learners became test-wise due to the repeated use of the same tests; instead, the learners became less and less interested in the possible aims of the tests and then seemed to supply utterances that reflected their real linguistic knowledge as they were not consciously monitoring their output.

5.5 Data Collection

As is clear from the above descriptions of the tasks, the present study used various types of elicitation techniques to ensure the collection of valid data.

5.5.1 Elicitation techniques

White (2003) once noted that only results converging from multiple test tasks and different types of L2 learner could help to shed light on “the nature of the underlying linguistic competence” (p. 17). In response to the call, this study used a wide range of test tasks to collect data to probe L2 learners’ linguistic competence.

5.5.1.1 Picture elicitation

Eliciting data with pictures is an established method of collecting data in language acquisition studies. Harper (2002) proposes that use of images and pictures can be superior to the exclusive use of linguistic material. According to Harper, “exchanges based on words alone utilize less of the brain capacity than do exchanges in which the brain is processing images and as well as words”, and moreover, pictures can remove participants' fatigue compared to merely using words (p.13). Among Mandarin L2 researchers, Yuan (1999) used pictures to elicit L2 Chinese utterances for the production of unergative and unaccusative verbs by L1 English speakers.

Recent studies of L2 Mandarin grammatical development used pictures to elicit data (Zhang 2001; Gao 2009; Wang 2011).

As is clear from the above descriptions, there were three types of picture elicitation tasks in this study: (1) elicitation with pictures annotated with *pinyin*; (2) elicitation with film clips; and (3) elicitation with pictures followed by semi-structured interviews. (1) applies to the picture description task, (2) to the task requiring the narration of two film clips (described in 5.3.2.6) and (3) to negation tasks I, II, *BaP* task I and *BeiP* task I.

5.5.1.2 *Elicitation through acceptability judgement task*

Different from developmental studies from a Processability Perspective which rely solely on production data, the present study also involved the collection of data from acceptability judgment tasks to triangulate the results from learners' production. Three points justified the adoption of the acceptability judgement task in this study. Firstly, acceptability judgement is a type of grammaticality judgment (GJ), which is a standard measurement in theoretical and empirical studies from the generative perspective (Wright 2009; Poole 2011; Whong and Wright 2013; Wu and Wang 2014, etc.). Compared with grammaticality judgements, acceptability judgements can yield more nuanced data, for GJ tasks generally use a 2-scale (right or wrong) or 3-scale (right, wrong or I don't know) measurement, while a 5-scale measurement is often adopted in acceptability judgements. This means compared with a grammaticality judgement task, an acceptability judgement allows L2 learners to reveal their development or stages of acquisition of certain linguistic phenomena. It can also help researchers to treat L2 interlanguage as a rule-based and dynamic system.

Secondly, compared with production data, data from acceptability judgement tasks can uncover not only what learners know about certain properties of a certain linguistic phenomena but also what they do not know. Thirdly, acceptability and grammaticality judgement tasks provide a means of establishing whether learners know that certain forms are impossible or ungrammatical in the L2. Thus, such tasks can be used to discover whether sentences which discarded by principles of UG can be disallowed in the learners' interlanguage grammar (White 2003).

Finally, the production is generally assumed to lag behind their comprehension. As stated by Swain, Dumas and Naiman (1974), a speaker's language comprehension ability surpasses his spoken ability. The term 'silent period' has been adopted to describe the period of sparse

production in the L2 acquisition, although it occurs more prominently in L2 children (Ellis 1997). An acceptability judgement task can be used to elicit data when production data are still not forthcoming.

In contrast, some researchers (e.g. Sorace 2003; Bialystok 1994, 2002) have challenged the use of GJ (presumably including acceptability judgement) as a valid means of measuring learners' implicit knowledge. They argue that GJ demands L2 learners' manipulation of their knowledge in the judgment process. In other words, grammaticality judgement tasks encourage learners to use metalinguistic knowledge to deal with the test items. However, it should be noted that this method has continued to be used independently or combined with other tasks to generate a more valid portrayal of L2 learners' linguistic knowledge (Wright 2009).

In light of the information above, acceptability judgement tasks were adopted in this study to supplement the other elicitation tasks. Their purpose was to obtain a more comprehensive picture of learners' implicit knowledge of negation, aspect markers and *ba* and *bei* constructions. 5-point Likert scales were used in the acceptability judgement tasks for the present study, where 5 represented completely acceptable, 4 possibly acceptable, 3 I don't know, 2 possibly unacceptable and 1 completely unacceptable.

5.5.1.3 Elicitation through oral translation

An oral translation task is another established elicitation technique used to measure second language competence. L2 learners are asked to utter a sentence in the target language after being given the sentence in their native language. Swain, Dumas and Naiman (1974) highlight that translation involves two operations: comprehension and production. Comprehension is the decoding of the native language information and production is the encoding of this information into the target language. Furthermore, they demonstrate that previous research does not exhibit significant differences between oral translation and other tasks. Nevertheless, they emphasise that participants' performance may be affected by whether learners can understand the supplied sentences.

Vainikka and Young-Scholten (1996: 148) use what they refer to as "online translation", that is "translating orally into German English sentences of increasing difficulty given orally". A similar oral test was used by Beck (1998) to test head movement proposed by Vainikka and Young-Scholten, where learners were played an audio-recording and were asked to translate what they heard into sentences. The task was controlled at a moderate speed. The study

examined S-V inversion and inflectional morphology. One result was that L1 English-speaking learners of German with low language proficiency used more bare VPs.

Based on the argument that elicited oral translation is a good index of second-language competence and the limitations of presenting test material in oral form, the present study adopted translation in the testing instrument but instead provided L2 learners with written sentences in English to reduce the cognitive demands of sentences presented in audio form.

5.5.2 Data collection processes

Data was collected from both year groups over one academic year between October 2014 and June 2015. A detailed schedule is given at the beginning of the chapter. The schedule was established primarily in line with learners' availability. As indicated in the table, there were missing sessions for some learners. Of all the learners, Emily had the most missing data due to her absence from 1/3 of the data collection sessions.

During the data collection sessions, each participant stayed from 1.5 to 2 hours with the researcher and completed all the test tasks. The data were collected largely in Venue A, an enclosed room at the British university where the research was carried out. When Venue A was unavailable, the data collection was conducted in Venue B, which had similar characteristics as Venue A.

The researcher (myself) in the data collection process acted as a friendly facilitator and audience. My role involved helping with the turn of the test slides, conducting the semi-interviews in the negation tasks, being an attentive audience and ensuring that each session was audio-recorded.

5.6 Data Transcription

For all of the 10 tasks described above, audio data collected from the eight participants at nine data collection points (at a roughly one-month interval) were transcribed manually by the researcher. That was done mostly orthographically or in CHAT format for the story narration. The forms of transcriptions can be seen more clearly from Table 5.10, where the transcription that used only Chinese characters, and both characters and romanised *pinyin* are marked out.

Table 5.10 Data types and the transcription

Test tasks	Orthographic transcription	Scripts of learners' production
Picture description	√	
Semi-structured interviews	√	
Negation 1	√	<u>Mandarin characters</u>
Negation 2	√	
<i>Ba</i> transformation	√	
<i>Ba</i> translation	√	
<i>Bei</i> transformation	√	
Narrating the <i>Pear Story</i>	√+ CHILDES' CHAT format	Mandarin characters + <i>pinyin</i>
<u>Narrating the <i>Wise Little Hen</i></u>	√+ CHILDES' CHAT format	
Acceptability judgement	√	Mandarin characters

It is worth noting that some students, like Fiona, hesitated when answering and also made comments about the sentences. Such utterances were also transcribed. In case of hesitations some tasks, the first uttered judgement, for example, in the acceptability judgement was counted.

5.6.1 Orthographic and CHAT transcriptions

Of the two broad types of transcription, i.e. phonetic and orthographic transcription, the latter was adopted in the present study due to the research focus (morphosyntax) and the theoretical and analytical framework, generative syntax. Given this purpose, phonetic transcription was not relevant, and orthographic transcription is both relevant and appropriate. It is noteworthy that places where L2 learners demonstrate distinctive interlanguage tones were marked according to phonetic conventions in the transcription. This is in line with Mackey and Gass'

(2005) remarks that there are cases where researchers choose to transcribe only the part of the utterances relevant to the research purposes of the current investigation

As noted previously, most oral data was transcribed by the researcher into Chinese characters. Transcription was faster and more accurate in terms of interpreting the contents, as it can reduce the processing time that romanised *pinyin* transcription demands. This is because one *pinyin* word can stand for different characters and meanings, and identifying the exact meaning requires retrieval of the context where an utterance occurs. However, *pinyin* along with its translation and annotation are required for contributing data to CHILDES and thus useful for others who do not know Mandarin. Transcribing data in both characters + romanised *pinyin* is time consuming but as Gao (2009) notes, it can help researchers to maintain accuracy.

Nevertheless, not all data was transcribed in both. First, Révész (2012) argues that how much data should be transcribed depends on the specific research questions and theoretical framework. In this study, the analysis varied across tasks. The picture description and story-(re)telling aimed at interval statistics, while the acceptability judgements aimed at ordinal data. However, the outcomes of the first and the last task of the test battery, namely picture description and story narration, were transcribed into CHAT while the remaining tasks were transcribed only orthographically. Second, due to the study's time constraints, transcribing all the data into CHAT format was impractical. The practice is compatible with previous SLA studies where researchers can select modes of transcription relevant to their research purposes. Moreover, perception data, as from the acceptability judgement task, were not appropriate for *pinyin* transcription, as the answers were numbers. Furthermore, the transcription of part of the production data was most manageable when it came to the time framework of the current PhD project and the transcription into *pinyin* took into consideration the data contribution to the CHILDES database.

5.6.2 *Orthographic transcription symbols*

The following are the conventional transcription symbols mentioned in Mackey and Gass (2005) and Wang (2011).

- [...] learners' intended expressions/target forms
- (...) elaborations by the researcher
- boldface words or sentences uttered in English
- "...” the test sentences spoken by the L2 learners
- XXX material that could not be transcribed due to unintelligibility

- 0word omitted word
- (.) short pause (i.e. a period of silence between words)
- (..) longer pause
- (...) very long pause
- (0.15) exact length of a pause
- [/] repetition
- [x N] times of repetition

They were tagged to the characters and English words when transcribed in this study. The symbols of transcription are provided in the list of symbols. To illustrate, we can consider Alice's third negation task. In this task, Alice first repeated the original sentence and then gave her judgement. The quotation markers indicate Alice's reading of the tested clauses.

In addition to the conventional symbols, the study also marked learners' misuse of tones with Arabic numerals 1, 2, 3 and 4, which stand respectively for high-level tone, rising tone, falling-rising tone and falling tone better. The purpose of the tone marking was to reflect the participants' state of acquisition. In case of erroneous production, Vainikka and Young-Scholten's (2011) 4-line presentation style was used, i.e. the original erroneous sentence---gloss—target sentence ---translation.

In summary, while the researcher transcribed data in both characters and *pinyin*, the presented samples indicate that transcriptions served well the overall research purposes and the time frame of the present research.

5.6.3 The accuracy of the transcription, coding and recording of the data

As the accuracy of original data has a potentially significant impact on the research results, two measures were taken to ensure the accuracy of the transcription, coding and the recording of data into the Excel forms. First, I transcribed the oral data and checked the transcription of each individual learner and over each session at least three times against the audio recording. In regard to the oral production data, the utterances with the functional items were extracted from the text and put into different categories labelled by functional item, and target-like and non-target-like production were differentiated in the Excel forms. With regard to the grammaticality judgement data, the five-point Likert scale results were further coded according to Mackey and Gass (2005). The coding and audio recordings of both the production data and the grammaticality judgement data were further checked by the researcher. Further to the researcher's checks, one L1 English-speaking PhD student majoring in Chinese syntax was invited to be an assistant coder, performing a systematic check of the transcription and the

coding and recordings of data on 24th May, 7th June and 9th June, 2016. For each check, the assistant coder called out at random a session number, a test task of the session, and the name of a learner, before proceeding to check that material. This overall random checking of the production data covered close to half of the data sessions (2nd, 4th, 6th and 9th), half of the Year 1 and Year 2 participants; at least 33% of the test tasks (notably 33% for the negation and *ba* tasks) and within each sampled test task, all test items were checked against the recording. The assistant coder also checked 1/3 of the coding of the grammaticality judgement task. According to Ortega (2000), a sampled coding check, which surpasses the threshold of 10% of the sampling, is thought to be reliable and valid. The spot-checking yielded no problems in either transcription or coding (Orwin 1994).

5.7 Measurement of Acquisition

5.7.1 Acquisition criteria

Acquisition criteria play a crucial role in SLA, since they determine an important part of the interpretation of the results obtained and the conclusions drawn from them. In the generative approach to L2 acquisition studies, a criterion should be set to measure L2 learners' linguistic competence. A close look at existing acquisition criteria, both generative and non-generative, reveals a wide range of measurement standards, thus prompting the question: which criterion can most validly and consistently gauge learners' L2 grammatical knowledge? This section examines several existing acquisition criteria and clarifies the criteria used for the present study.

5.7.1.1 Accuracy and emergence criteria

The criteria for acquisition have been hotly debated. Roughly speaking, there have been three criteria: (percentage of) accuracy, emergence criteria and a combination of accuracy and emergence. Ideally, in a longitudinal study, one would adopt Brown's (1973) criteria of 90% over three successive data collection sessions. For various reasons which will become clear in the discussion below, this has not been adopted in L2 acquisition studies. Pallotti (2007) argues that simple accuracy as an acquisition criterion has three limitations. Firstly, all the acquisition percentages are arbitrary and different studies have adopted percentages ranging from 60% to 90%, as presented in Table 5.11. Importantly, none of them has provided any theoretical argument to the effect that one criterion is more valid than the others are. Secondly, as some accuracy criteria are exceedingly high, e.g. 90% of accuracy, they are not measuring learners' knowledge; rather, they are thought to only examine "mastery" of a particular language.

Thirdly, researchers are inclined to falling into the pit of the “comparative fallacy,” where accuracy is gauged against native norms in researchers’ judgement of L2 production. Likewise, it has argued that most existing criteria are more applicable to the measurement of language performance rather than language competence, which ideally should be consistently revealed in language production (White 1991). In other words, learners’ high accuracy of use is not the same as acquisition, per se (White 2003).

Table 5.11 Criteria based on accuracy

Accuracy rate	SLA studies
60%	Vainikka and Young-Scholten (1994)
75%	Ellis (1998)
80%	Andersen (1978)
90%	Dulay and Burt (1974)

While Pallotti’s arguments against accuracy criteria are insightful, it is worth taking a closer look at what underpins the proposed percentages. For instance, Vainikka and Young-Scholten’s account of their acquisition criterion is as follows:

A cut-off point of 60 percent was used as a general criterion for acquisition, i.e. we judged a construction to have been acquired if it was used in at least 60 percent of the obligatory contexts.

(Vainikka and Young-Scholten 1994: 308-309)

Regardless of the specific criteria, I argue that Vainikka and Young-Scholten’s account has laid out two shared grounds for all the accuracy criteria, i.e. the cut-off point and obligatory contexts. The former is where acquisition patterns can be best observed in a study and the cut-off points per se are based on the counting of instances of language production against obligatory contexts. I hold that both points are not difficult to argue against if L2 studies have

to have a benchmark to measure L2 acquisition. Nevertheless, I further argue that either of the points encounters difficulty when it comes to the measurement of L2 acquisition at the very early stages of a language, like Mandarin (Duff and Li 2002 and Gao 2009), which often lacks strict obligatory contexts for the aspect morphology examined in the present thesis.

Emergence criteria, instead, have been argued to be valid in capturing the point when “the first systematic and productive use of a structure” occurs (Palloti 2007: 366). If Palloti is right, the criteria adopted in this study can reduce the effect of the comparative fallacy, and is also more consistent and less arbitrary than accuracy criteria. The criteria represent the restructuring of the interlanguage and are suitable for longitudinal data. It should be noted, nonetheless, that like the accuracy criteria, emergence criteria vary across studies. Some researchers specify that systematic productive use is signalled by three correct occurrences of one token, others opt for four (Zhang 2001, 2005; Wang 2011) or five. Still, others accept two correct utterances in obligatory contexts (Tracy-Ventura and Myles 2015). As can be seen from the above, different criteria actually measure different aspects of the acquisition processes. Bardovi-Harlig (1994, 2000) therefore argues for a combined criterion based on emergence (across different tokens; see Pienemann 1998, as discussed earlier), as well as accuracy in SLA research.

5.7.1.2 Acquisition criteria of the current study

I take the last stance, namely, valuing the role of both emergence and accuracy percentages in measuring L2 competence. The emerging criteria for this study are: (1) three target-like productions in one single session; or (2) at least one correct production over each of three consecutive sessions. Both of these criteria put emphasis on learners’ consistent production over time. The accuracy criterion continues to be used, but no specific developmental percentage is set, as the purpose of the study is to unearth the interlanguage development of early-stage L2 learners’ functional projections.

5.7.2 Measurement of the acceptability judgement tasks

What can be categorised as perception data were collected from acceptability judgement tasks with a five-point Likert scale. As noted previously, acceptability judgement tasks are used widely in generative work on SLA. Nevertheless, there are different accounts of how the scale should be presented and what the scoring scheme should be. Zhao (2014) and Yuan (1999) also used five-point Likert scales in their L2 Mandarin acquisition studies, using -2, -1, 0, 1 and 2 to represent degree of acceptability from the most unacceptable to the most acceptable. Zhao

(2014) notes that 0 indicates indeterminacy. The present study used 1-5 scaling due to Juff's (2001) argument that zero is ambiguous, as it is not helpful in differentiating 'don't know' from a midpoint.

5.7.2.1 Computing the scores for the five-point Likert scale

There are three main ways of scoring acceptability judgement results, as discussed in Yuan (1999), Zhao (2014), and Mackey and Gass (2005). Yuan (1999) used the original -2 to 2 scores of acceptability judgement as they were; Zhao (2014) however, recoded ≤ -1 as -1, meaning rejection and ≥ 1 with 1 meaning acceptance. This worked well with their research design, where tested structure was clearly set up and also importantly, their participants included native speakers, whose scores could offer a benchmark for the comparison between native speakers and non-native speakers. However, the present study did not involve native speakers. Therefore, I needed to differentiate learners' knowledge of what was a correct and incorrect judgement. Mackey and Gass' model (2005) provided the right scoring framework, as shown in Table 5.12. The issue with this type of analysis was that the scoring should be handled with care, as it was much more complicated than Yuan and Zhao's scoring. The present study adopted Mackey and Gass' recommended scoring schemes. Therefore, this study simplified the coding in Table 5.13. Subsequently, scores were uploaded to SPSS and analysed with SPSS General Linear Model.

Table 5.12 Scoring system of Mackey and Gass (2005: 55)

Grammatical sentences	Ungrammatical sentences
Definitely correct=4	Definitely incorrect=4
Probably correct=3	Probably incorrect=3
Don't know =2	Don't know=2
Probably incorrect=1	Probably correct=1
Definitely incorrect=0	Definitely correct=0

Table 5.13 Scoring system of the present study

Grammatical sentences	Ungrammatical sentences
Definitely correct=2	Definitely incorrect=2
Probably correct=2	Probably incorrect=2
Don't know =1	Don't know=1
Probably incorrect=1	Probably correct=1
Definitely incorrect=0	Definitely correct=0

5.7.2.2 Repeated measures with General Linear Model (GLM) in SPSS

This study adopted the repeated measure analysis of the General Linear Model (GLM) in SPSS to gauge L2 Mandarin development.³¹ In this method, the same measurement was made several times in each subject or case.³² The repeated measures can provide statistical analyses on whether language acquisition was related to within-subject factors (e.g. timeline in this study and syntactic structures introduced by functional heads), between-subject factors (e.g. year group in this study, length of study, gender, age, etc.), and interaction between factors. The choice of GLM repeated measures is in conformity with the research design of the study where participants engaged in the same tests nine times over one academic year. It is also in accordance with the nature of longitudinal studies, for “repeated measures (RM) assessment is integral to longitudinal studies of foreign language improvement” (Rees and Klapper 2008: 101). Mackey and Gass (2012) suggested when they discussed the measurement of the acceptability judgement task data that if the same participants were multiply measured, a repeated-measures ANOVA was applicable to quantified production data. Counter-linear development arguments are discussed in Long (2007), Yuan (1999) and others.

Two -sampled t-tests were used in this study to compare the means of accurate occurrences from the learners’ production of functional elements. According to Field (2013), a two-sampled t-test is applicable to participants who are assigned to two different conditions of an

³¹ For more information on the functions of GLM repeated measures, see, e.g. <http://dissertation.laerd.com/convenience-sampling.php> (accessed on 12th April 2016).

³² <http://dissertation.laerd.com/purposive-sampling.php> (accessed on 12th April 2016).

experiment. In regard to this study, two -sample t-tests were used to test the significant mean differences in different learners' production of functional elements.

5.7.2.3 *Missing data and missing value analysis*

Missing data is one of the challenges for longitudinal data analyses and the interpretation of the results (Zhang 2001; Dörnyei 2007). The notion has been conceptualised in two different ways. In the first sense, missing data means missing values in datasets or zero acquisition due to the absence of the target forms. The missing data is likely due to: (1) the absence of participants on the research site; (2) no answers provided for the attending participants; or (3) researchers' neglect in inputting data into databases. For the present study, missing data are due to (1) the absence of participants under such circumstances as examinations, coursework, holidays and family obligations. Rees and Klapper (2008: 102) note missing data as an 'inherent' issue in L2 longitudinal studies and call for a solution to the problem. However, Dörnyei (2007) cautions against solving the problem by simply excluding missing data, for this might result in missing 50% of the sample. Alternatively, Dörnyei suggests analysing first the data with sufficient statistic information and treating the missing values separately afterwards.

Missing data have been treated in various ways in L2 Mandarin acquisition studies. Zhang's practice (2001) is in line with Dörnyei's suggestions. She recorded missing data from one data collection session and analysed the rest of the participants' data. Wang (2011) seems to have followed the same process. Nevertheless, while she did not specify the extent of the missing data of her participants, and at the same time the two participants with missing data were mentioned frequently. It is unclear how much of her data was missing, and to what extent the exclusion of the missing data affected her results. In contrast to Dörnyei's (2007) "reserved" recommendation, Long (2012: 90) suggested assigning values to the missing data to help construct "a complete dataset; whereby every intended response [was] realized" by looking into neighbouring performance.

Although the proposals of Dörnyei (2007) and Long (2012) were both valuable for the treatment of the missing data, the latter was more useful for the present study. As with other developmental studies, the present study demanded a complete picture of the developmental process. Fortunately, the missing data analysis in the SPSS package provides technical and statistical support that equips a researcher to obtain values assigned to the missing data through the calculation of the mean score between two adjacent sessions.

Missing data in the second sense touches upon one key argument in L2 acquisition studies. That is, how should the absence of responses to test items be counted? Does it suggest a deficiency in the mental representation of morphemes or syntactic structure? Alternatively, does it mean that mental representations exist but just have not been captured during data collection? In line with OG, the stance of the present study was that zero values were missing evidence for mental representations. Due to personal circumstances, participants in this longitudinal study were recorded to be absent from data collection sessions and their data were assigned values by assuming ‘a complete dataset, in which every intended response [was] realized’ by exploring the neighbouring performances (Long 2012: 90). The process is realised by ‘missing value analyses’ in SPSS.

5.8 The Validity and Reliability of the Present Study

Following the above accounts of the test design, this section reflects on how validity and reliability, two key indices in measuring the quality of a research study (Kimberlin and Winterstein 2008) were maintained in this study. The validity of research means the test materials of a study can measure what the research intends to measure, while the reliability refers to consistency in the results even when there are different conditions.

All the elicitation tasks described above aim at measuring learners’ morphosyntactic competence, or learners’ underlying knowledge of Mandarin syntax, which is largely what Ellis (2005: 151) termed as implicit knowledge. He proposed seven psychometric measurement criteria for tacit knowledge: response according to feel, time pressure, and primary focus on meaning not form, metalinguistic knowledge, early learning, systematicity and certainty in response. Among the seven criteria, systematicity and certainty are related to the outcome of the production and early learning is not relevant to the current study.

An analysis of the picture elicitation types was performed against the other four criteria provided by Ellis (2005) to check whether the picture elicitation tasks of various types were likely to reveal L2 learners’ underlying unconscious knowledge of the mental representation of syntactic structure introduced by the functional elements. The results presented in Table 5.14 reveal how the elicitation types are related to Ellis’ (2005) psychometric measurements in this study. For instance, in the video task, participants were asked to tell two stories online. The task put the participants under time pressure. They needed to tell the stories as the film developed, which drove them to focus on meaning rather than on grammatical forms and therefore not to rely on their metalinguistic knowledge. On those occasions, they would

generally come up with sentences based on their intuition, as there was no time for them to pause and retrieve their metalinguistic knowledge in the process. They may be sure of some of the responses but not others.

Table 5.14 The validity of the elicitation tasks tested against Ellis' (2005) psychometric measurement

	Response according to feel	Time pressure	Primary focus on meaning, not form	Metalinguistic knowledge not required
Picture with <i>pinyin</i>	√	√	√	×
Video	√	√	√	×
Pictures followed by interrogative questions	√	√	√	×

The validity and reliability of the test tasks were tested in the pilot studies, which were conducted on three groups of people between June 2014 and December 2014. The first pilot group involved four PhD students in linguistics, of whom three were native Mandarin speakers and one L1 English speaker who specialised in a Chinese dialect and had learned Mandarin and spent time in China. They all supplied a high amount of the functional elements, as expected in the tasks but their performance varied, as expected with morphemes, which are not obligatory. For example, one native Mandarin speaker failed to supply *ba* in the highly controlled *ba* transformation task, and the L1 English speaker of Mandarin oversupplied *le* in his picture description and the story narration tasks. As it is likely that linguistics students may use their metalinguistic knowledge consciously, the test tasks were then administered on five–native Mandarin speaking students majoring in business in a British university. Similarly, they were native-like and highly productive with the expected functional elements. Finally, the tests were performed on one Year 1 and one Year 4 student on the same Mandarin programme from which participants were later recruited. Overall, they produced few functional elements and struggled with some vocabulary. The pilot testing was recorded, and story narration was transcribed just for reference. Trial tests on a good range of learners helped me make changes to the vocabulary with which the two students most struggled, and replace some pictures and clauses in the test materials.

5.9 Summary

This chapter has described and justified the overall design of the empirical study of the research. Specifically, it has detailed the operationalisation process, which includes the sampling, the recruiting of participants, the test battery used, the methods by which data were

collected, transcribed and coded, and the method of analysis. Moreover, the chapter has demonstrated how each method, design and procedures has been validly and reliably controlled. The next chapter presents the results of the data analyses.

With all the data analysis-related issues tackled, the present study examined the extent to which L2 Chinese development proceeds along the proposed stage-like development lines pertinent to functional projections. As the Year 1 participants were early stage L2 learners, it was likely that they would at the start still be at the bare VP stage, or at a stage “where a VP grammar competes with an IP” (Vainikka and Young-Scholten 1996: 13). In the next chapter, the results will be presented in accordance with the following four principles:

- the overall organisation of the next chapter follows the order of the research questions;
- results are laid out in chronological order;
- group scores are reported before individual scores;
- divergences are reported and explained.

CHAPTER 6 RESEARCH RESULTS

6.1 Introduction

Following the presentation of the methodological framework in Chapter 5, this chapter presents the results to answer the following two research questions:

Q1: Where the word order in the verb phrase is different in English and Mandarin, do the learners in this study use the order of their L1 English or the order of Mandarin?

Q2: Do L2 Mandarin learners project functional elements in a stage-like manner, that is, from bottom to top, in accordance with the route, predicted based on the syntactic tree for Mandarin, as proposed in Chapter 3?

Based on these research questions and OG, the following hypotheses have been formulated:

1. *ab initio* L2 learners will start their Mandarin acquisition with bare VP;
2. *ab initio* L2 learners' initial VP headedness will be identical to that of their L1, i.e. head-initial;
3. *ab initio* L2 learners will adopt English VP word order when Mandarin and English differ in locative adverbial and object-fronting and then switch to L2 word order;
4. L2 learners will develop L2 Mandarin by successively acquiring higher elements of clause structure, in the following order: AspP_l>BaP>BeiP>AspP_u>NegP>AspP_h.

The first three predictions are related to research Q1 and the last to Q2.

This chapter is structured into four further sections. Section 6.2 addresses the first research question, namely, the transfer issue of L1 English VP word order by tracing language production of Year 1 learners from the very first data collection session, but also probing into VP headedness changes by Year 2 learners. The two subsequent sections investigate the second research question, namely, the hierarchical building of functional projections from bare VP to NegP in a stage-like manner. Specifically, section 6.3 reports the results from learners' development of aspect markers, negators, *ba* and *bei* constructions in production data, while section 6.4 further explores to what extent the learners can coordinate the co-occurrences of different functional items in the acceptability judgement to assess whether this mirrors the acquisition route evidenced in the production data. Section 6.5 summarises the results.

In terms of the data used to test these predictions, the total transcribed dataset contains around 222,000 words, a transcribed mixture of Mandarin characters/*pinyin* and English words. The breakdown of the transcription for each session for Year 1 is presented in the following table:

Table 6.1 The size of the transcribed datasets based on data collection sessions

1 st	21,822 words
2 nd	21,827 words
3 rd	35,021 words
4 th	31,486 words
5 th	25,377 words
7 th	28,341 words
8 th	27,095 words
9 th	30,856 words

After removing incomplete production and clauses with English verbs, the entire dataset comprises 7,418 utterances containing at least a subject and verb.

6.2 Acquisition of L2 Mandarin by Year 1 Learners in the Production Data

As discussed in Chapter 2, Mandarin has not only a dominant head-initial VP directionality but also a different pattern in the subdomain of VP phrase; ie, XV. In this thesis, XV refers to AdvV denoting the relative syntactic positions of the verb with locative and temporal adverbials, and OV in *ba/ bei* constructions. The labels OV (a preverbal object without *ba/ bei*) and VAdv (a post verbal adverbial), therefore, describe non-target word orders. In other words, in contrast to English, Mandarin requires locative and temporal adverbials to be placed in front of verbs; an object can appear before verbs in when used with *ba* and *bei* (Huang 1982; Huang, Li and Li 2009; A. Li 1990; Yuan 2004; Zheng and Chang 2012). Otherwise, VAdv (locative/temporal adverbs) or OV without *ba* or *bei* is ungrammatical/non-target in Mandarin. Examples (6.1) and (6.2) are good illustrations of ungrammatical word order types. It is worth noting there are cases where locatives are posited after the verb in the target language. This

occurs with stative verbs that allow a locative complement, as shown in (6.3), where *zai Beijing* ‘in Beijing’ follows *zhu* ‘live’.

(6.1) **Ta xuexi zai tushuguan.*
 3SG study in library
 (Target: *ta zai tushuguan xuexi.*)
 ‘He studies in the Library.’

(6.2) **wo shuxue xihuan.*
 1SG maths like
 (Target: *wo xihuan shuxue.*)
 I like maths.

(6.3) *ta zhu zai Beijing.*
 3SG live in Beijing.
 ‘He lives in Beijing.’

6.2.1 Year 1 learners’ acquisition of Mandarin VP headedness

Table 6.2 provides an overview of the total number of utterances made by the three Year 1 learners across seven test tasks and over eight data collection sessions. In this context, ‘utterance’ is identified as anything that contains a VP and can, therefore, be considered the main clause (with possibly one or more subordinate clauses inside it – though most of these early learners’ utterances are simple clauses). As seen from the table, the total number of utterances produced varies across test tasks and L2 learners. Alice, Beth and Charles produced utterances with 554, 635 and 722 VPs, respectively, by the end of the data collection period. While Charles produced more VPs than the other two Year 1 learners, paired two-sample and two-tailed independent t-tests reveal no statistically significant difference in terms of total production across learners ($p > 0.05$, specifically Alice vs Beth: $p = 0.68$, Beth vs Charles: $p = 0.68$, Alice vs Charles: $p = 0.46$). However, it should be borne in mind here and in what follows that Charles, who supplied the most utterances across the tasks, received not only classroom instruction but was also self-taught and obtained his own naturalistic input (see Chapter 7), which may have contributed to the qualitative differences between him and Alice and Beth, as will be discussed below.

Table 6.2 Learner utterances across test tasks for all sessions

Year 1 learners	Test tasks							Total
	<i>Pear Story</i>	<i>Wise Little Hen</i>	Picture description	Negation 1	Negation 2	<i>Ba</i> translation	<i>Bei</i> construction	
Alice	66	73	65	101	193	42	14	554
Beth	82	142	117	55	150	58	31	635
Charles	107	152	137	65	190	56	15	722

6.2.1.1 The acquisition of head-initial VPs

Table 6.3 shows the three Year 1 learners' target-like production of head-initial VPs against total VPs across the test tasks and over the data collection sessions. The percentage of the learners' target-like production ranges between 85%-94% (M score= 91%). In other words, non-target production in word order accounts for only 9% of the learners' total production. The figures suggest that the learners mainly use V(O) order to construct L2 Mandarin utterances. This is unsurprising since the VP headedness of the target language accords with the VO order in learners' L1 English. Examples (6.4) and (6.5) from Alice and Beth illustrate the learners' predominant use of VO order in their Mandarin production.

Table 6.3 VP word order in utterances of three Year 1 learners

Year 1 learners	Total VPs	Head-initial VPs	Proportion of target-like head-initial VPs
Alice	554	471	0.85
Beth	635	595	0.94
Charles	722	678	0.94

(6.4) *nanhaizi* *he* *er* *chi* *li.*
 boy drink er eat pear
 'The boy drinks, er eats pears.'
(Alice: T1_Pear Story)

(6.5) *nanhaizi* *da* *qiu.*
 boy play ball.
 'The boy plays balls.'
(Beth: T1_Pear Story)

It is apparent that *he chi li* ‘eat pears’, *daqiu* ‘play balls’, and their English equivalents have VO order, thus sharing the same VP headedness. The evidence that Year 1 learners mostly produced head-initial VPs in structures where L1 English and L2 Mandarin VP headedness is identical confirms Hypothesis 1. Table 6.3 presents the distribution of the learner utterances across test tasks. According to the table, the negation task 2 elicited the most utterances.

6.2.1.2 The acquisition of XV word order

This section examines the remaining 9% of the non-target production in the three Year 1 learners’ data. The non-target like production involves utterances with *VAdv and *OV structures as well as other erroneous types,³³ which do not belong to either of the two mentioned.

Examples (6.6) and (6.7) are instances of *VAdv production, whereby Alice and Beth respectively placed the time adverbial *wushi* before an English phrase ‘fifty years ago’ and locative *zai bangong* ‘in the office’ after the verbs *shi* ‘be’ and *xue* ‘study’. (6.8) and (6.9) are Alice’s production of *OV where object *ta* ‘her’ is placed in front of the verb *bangzhu* ‘help’. It should be noted, however, that Alice’s use of OV order was restricted to the verb *bangzhu* ‘help’.

- (6.6) *wo baba wo lao baba was a soldier wushi (X2) years ago.*
 1SG dad 1SG old dad was a soldier fifty years ago
 (Target: *wo yeye wushi nian qian shi junren.*)
 ‘My granddad served as a soldier 50 years ago.’ (Alice_T3_Picture description)
- (6.7) *wo bu xue zai bangong[shi].*
 1SG NEG study at office
 (Target: *wo bu zai bangongshi xuexi.*)
 ‘I do not study in the library.’ (Beth_T2: Negation 2)
- (6.8) *san ge nanhaizi shi tamen ta help.*
 Three CL boy be they 3SG help
 (Target: *shi san ge nanhaizi bang ta.*)
 ‘It was three boys who helped him.’ (Alice_T2: Pear Story)
- (6.9) *ta asks Peter Pig ta bangzhu.*
 3SG asks Peter Pig 3SG help
 (Target: *ta qing Peter Pig bang ta.*)
 ‘She asked Peter Pig to help her.’ (Alice_T6: Wise Little Hen)

Figures 6.1 and 6.2 illustrate the distribution of Alice and Beth’s different types of non-target VP word order production. As demonstrated in the figures, the primary type of non-target VP

³³ Notes: the other types are shortened as others in the subsequent pie charts and figures.

for both Alice and Beth is *VX, i.e. V adv. More than 1/2 of Alice's and over 3/4 of Beth's errors have *VAdv order. Conversely, Alice and Beth committed far fewer *OV errors. In other words, there were only 1/3 of *OV errors for Alice and only 8% for Beth. The results indicate that Alice and Beth's VP word order patterned with the VP word order of L1 English, which confirms the second hypothesis that the two *ab initio* learners maintain their English VP word order when Mandarin and English VPs differ. It is hard to tell whether learners' production is the transfer or L2 acquisition; nonetheless, the results serve as evidence that *ab initio* learners' VP word order is consistent with that of their L1.

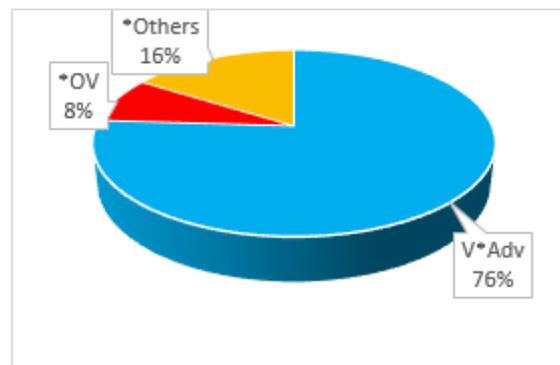
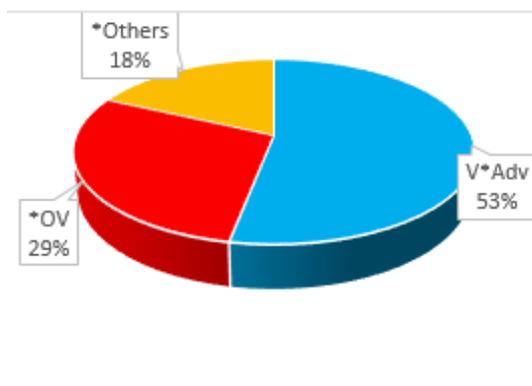


Figure 6.1 Alice's non-target-like production Figure 6.2 Beth's non-target-like VP production

Figure 6.3 presents the distribution of Charles' non-target VP types. In his data, the *VAdv type of errors only represents 20% of the total error production, *OV 7% while the other type of errors rises to 73%. Attention is drawn to the fact that the number of Charles' OV errors is on a par with the error level of Beth, but his errors in *VAdv type are much less comparable with those of the other two Year 1 learners, Alice and Beth. The error rate is likely to indicate that unlike Alice and Beth, Charles has established a mental representation of the Mandarin VP with AdvV word order.

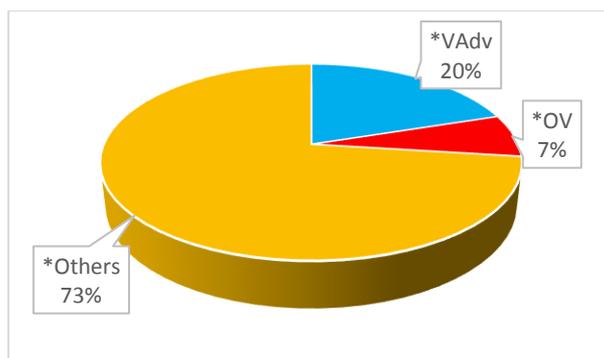


Figure 6.3 Charles' non-target-like production of VP word order

In summary, this section has provided an overview of Year 1 learners' use of target-like VP word order and non-target-like VP word order. Alice and Beth's non-target use of *VAdv, along with *OV indicates that they adopted L1 VP word order in places where L1 English and L2 Mandarin VP word order differ. Such transfer can also explain the high numbers of VO tokens that they produce in places where headedness of the two languages is the same. The outcome confirms OG's prediction concerning the transfer of L1 VP word order. Charles' results, particularly his reduced production of *VAdv, reveal that although there is no significant difference in the total number of utterances by the three Year 1 learners, Charles is at a more advanced development stage than Alice and Beth.

6.2.1.3 The development of Alice and Beth's VP word order

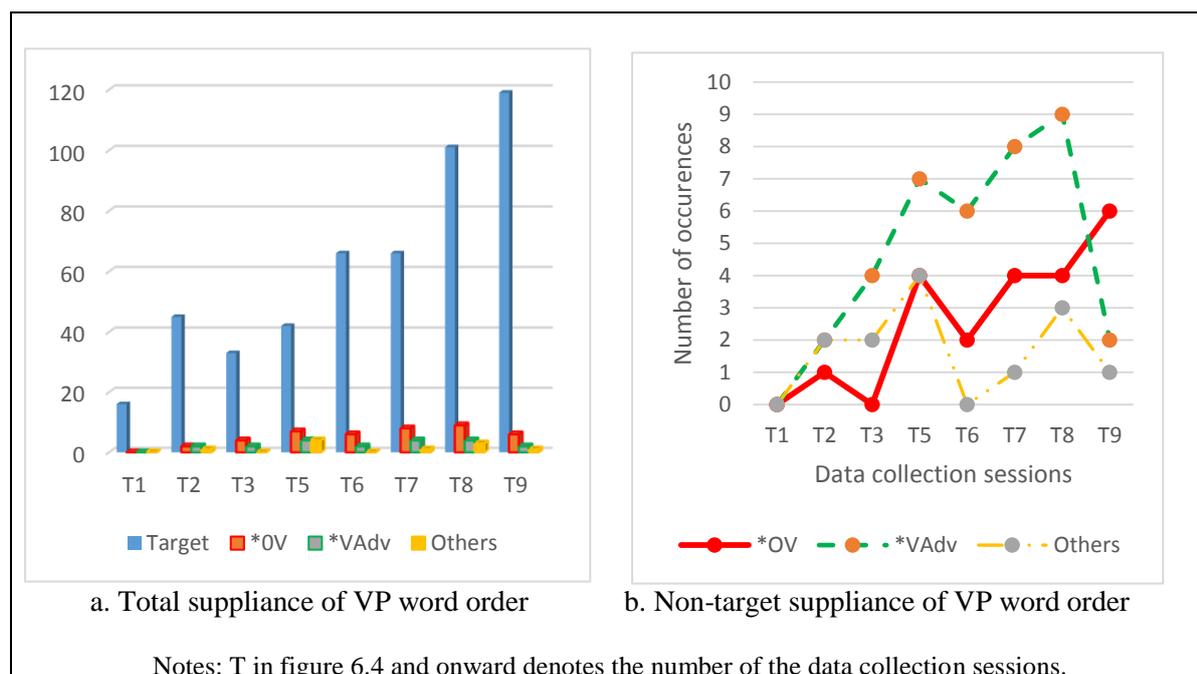


Figure 6.4 The development of Alice's VP word order

Figures 6.4a and 6.4b³⁴ display Alice's development of VP word order. Figure 6.4a presents a panoramic view of VP word order changes over time, while figure 6.4b reports a zoomed-in view of changes in the interlanguage VP word order types over time. Figure 6.4a reveals that: (1) there is a significant difference between Alice's head-initial VP production and her non-target VP word order production; (2) the overall VP headedness production increases with her overall production. Figure 6.4b illustrates that her use of *OV type of VP word order increases over time but her VAdv type of erroneous VP word order drops. Moreover, Alice's made more *VAdv type errors than any other error type. Between T2 and T8, *VAdv type of errors shows a general rising tendency but the total number of errors drops sharply at T9. *OV, Alice's second type of word order error, only started to emerge from T2 and showed an overall rising trend. Between T5 and T8, it fluctuated slightly between two and four errors but rose again at T9.

Figure 6.5 demonstrates the development of Beth's VP headedness. Like that of Alice, there is a significant difference between Beth's VP target-like head-initial production and her production with non-target VP headedness. Moreover, there is an overall increasing tendency in the number of VPs that she produced within the data collection period. The zoomed-in view of the non-target VP word order in Figure 6.5 b shows a rising and falling tendency of *VX errors and the rise in *OV type of errors. The other error types in Beth's data resemble those of Alice.

³⁴ The horizontal axis shows the data collection sessions while the vertical axis presents the number of non-nativelike occurrences. This applies to Figures 6.5-6.6.

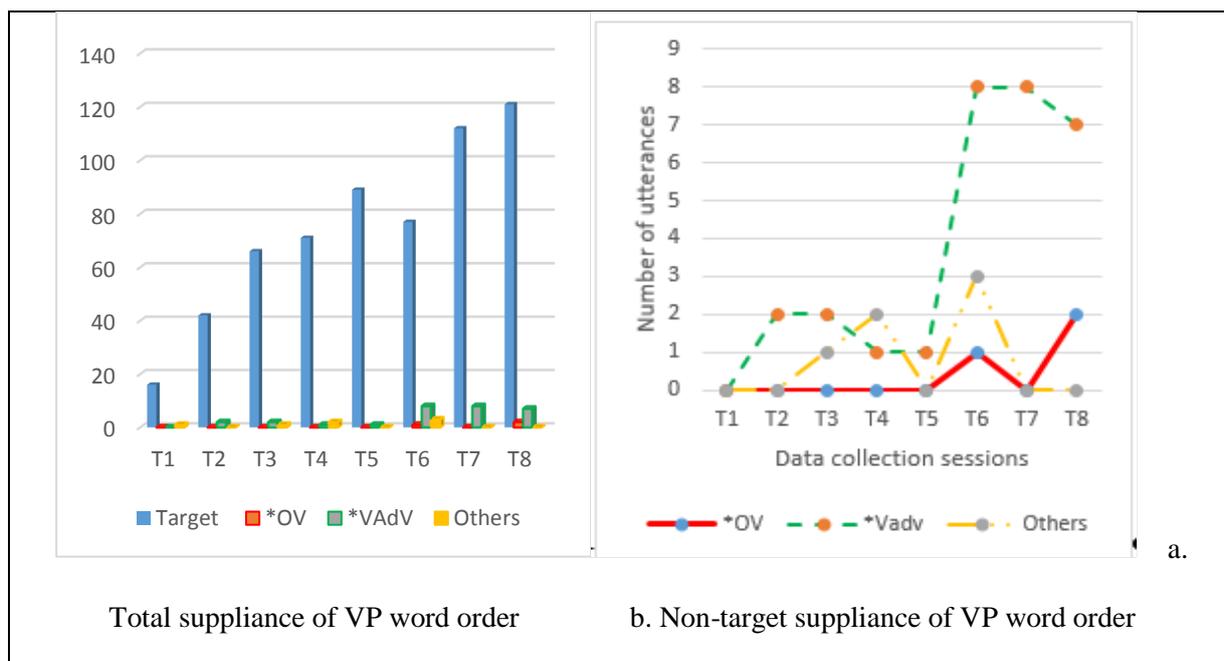


Figure 6.5 The development of Beth's VP word order

Specifically, the *VX type of word order error obviously dominated in Beth's production. It first occurred at T2 and became particularly salient after T5. In-between, there was a slight fluctuation. It rose sharply at T6, remained stable until T7 and fell slightly at T8. The *OV type of error occurred only once at T6 and twice at T8. Given the above, Alice and Beth shared great similarities in the development of their VP headedness, as summarised below:

- dominant VP headedness: head-initial;
- erroneous VP head-initial errors: *V Adv type over the data collection sessions with a drop by the end of the data collection;
- erroneous head-final VPs: the occurrence of *OV by the end of the data collection.

6.2.1.4 The development of Charles' VP headedness

As presented in Figure 6.6-a, there is no salient difference between Charles and Alice and Beth's production of head-initial VP. Their overall developmental tendency is the same. Nevertheless, Charles differed from Alice and Beth in his dominant VP erroneous type, as it is not V*Adv type but *OV that gradually becomes the more erroneous type. More specifically, as shown in Figure 6.6-b, all Charles' VP headedness was target-like in the first data collection session. It was from the second session onwards that the 'other' types of errors emerged. Moreover, the clear majority of Charles' 'other' types were distinct from the 'other' types produced by Alice and Beth. Where the latter produced all kinds of non-target patterns not

classifiable as *OV, *VAdv, *VXO and others, Charles' 'other' types of word order included a good number of errors resulting from his production of *ba* constructions. An illustration is shown in Charles's non-target use of a *ba* construction in example (6.10), where *ba* is not followed by an NP but a VP.

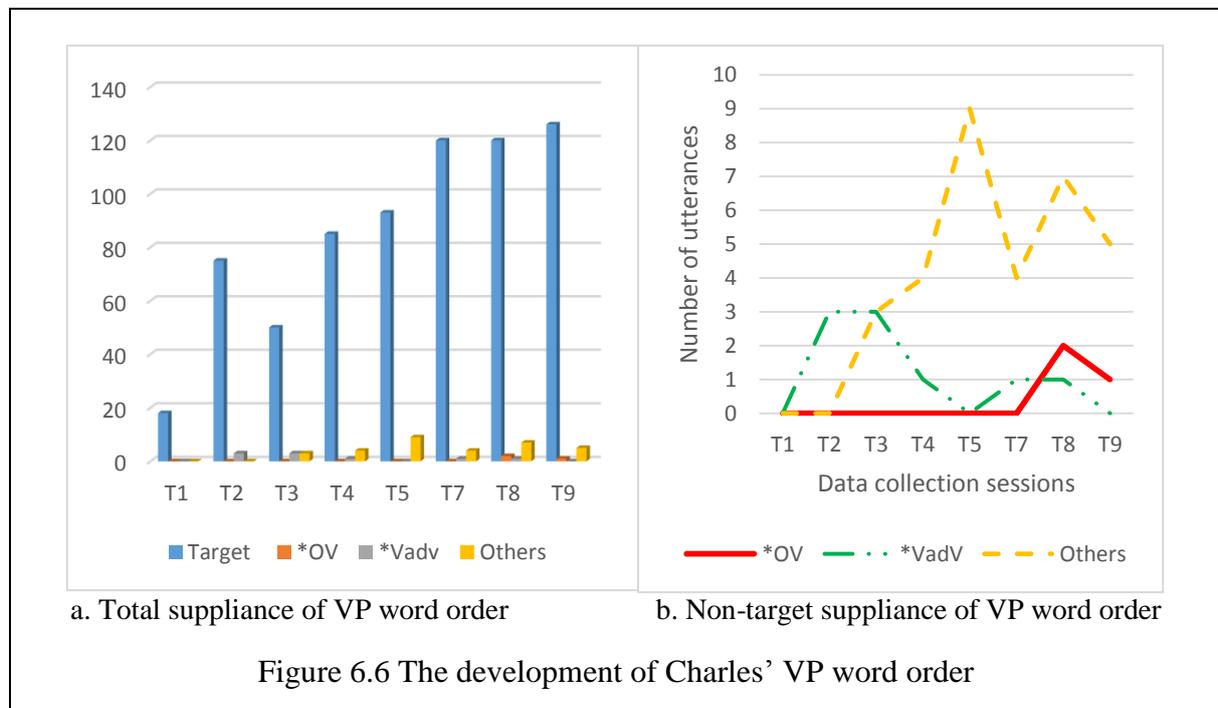


Figure 6.6 The development of Charles' VP word order

(6.10) *qing ni ba wen ta na ben shu.*
 please 2SG BA ask 3SG that CL book
 (Target: *qing ta ba na ben shu huan le.*)
 'Please ask him about the book.' (Charles: T5_Ba translation)³⁵

In summary, the above results reveal that the majority of L2 utterances by the stage 1 learners have head-initial VPs, which is in line with both English and Mandarin VP headedness. Meanwhile, learners were found to transfer their L1 English VX word order to structures where this was not grammatical in Mandarin. A handful of Mandarin utterances with *OV order was found in the learners' data, but only by the end of the data collection, after they had received 132 hours of instruction. This can be considered an interlanguage stage where learners began to experiment with Mandarin word order. This will be further elaborated in the discussion

³⁵ Charles' attempts to use the *ba* construction started at T4 and examples like (6.10) show that he struggled with it; however, his performance here was markedly different from that of Alice and Beth, who never attempted to use *ba* over the entire data collection period. We can thus say that, although there was no salient difference between Charles and the other two Year 1 learners in the total number of utterances produced (see Table 6.2), Charles was much more advanced in terms of what he was attempting to produce. Again, this is the result indicating that he was actually not an *ab initio* learner at the start of data collection. I will return to this later on.

chapter where OG is considered as an explanation for these patterns. At this juncture, it is sufficient to postulate that the production data provides no counter-evidence against the possible transfer of L1 English VP headedness in the L2 data or acquisition of L2 VP headedness.

The next section examines whether there is a stage-like acquisition in L2 Mandarin from the bare VP stage to the first AspP stage and, subsequently, to the *BaP*, *BeiP* and *NegP* stages.

6.2.2 *The development of Alice and Beth's aspect markers*

Table 6.4 provides an overview of Alice's aspect marker production across all the test tasks and over nine data collections sessions. By the end of the ninth data collection session and across the test tasks, there were 219 contexts where Alice could have supplied aspect markers; she provided only 10% (22/219) of them, among which only 6% (13/219) were marked with target forms. That occurred after the three learners had received 132 hours of classroom instruction.

Table 6.4 Alice's development of aspect markers across the data collection sessions and test tasks

Data collection sessions	<i>The Pear Story</i>			<i>Wise Little Hen</i>			Picture description			Negation 1			Negation 2			<i>Ba</i> construction			<i>Bei</i> construction		
	Utterances	Possible contexts	Actual production	Utterances	Possible contexts	Actual production	Utterances	Possible contexts	Actual production	Utterances	Possible contexts	Actual production	Utterances	Possible contexts	Actual production	Utterances	Possible contexts	Actual production	Utterances	Possible contexts	Actual production
T1	5	5	0	-	-	-	5	2	0	6	1	0	-	-	-	-	-	-	-	-	-
T2	7	6	0	9	2	0	10	5	0/1	5	2	0	12	1	0	4	0	0	1	1	1
T3	4	4	0	6	4	0	6	6	0	7	2	0	12	1	0	3	0	1	1	1	1
T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5	5	4	1	7	4	0	7	6	0	11	3	0	14	0	0	8	0	0	1	1	0
T6	10	9	0	11	4	0	6	5	0	12	2	0	24	3	0	8	4	0	3	3	0
T7	12	8	0	12	5	0	10	8	0	13	3	0/1	27	6	0	3	2	0/1	2	2	0
T8	7	6	0	10	7	0	11	10	0	29	4	0	51	13	6/8	7	1	1/3	2	2	0
T9	16	8	0	18	7	0	10	8	0	18	6	1/2	53	14	1/2	9	4	0	4	4	0
Total	66	50	1/1	73	33	0	65	50	0/1	101	23	1/3	193	38	7/10	42	11	2/5	14	14	2/2

Notes: no aspect markers were supplied in Alice's narration of *The Wise Little Hen*.

Total utterances	Possible contexts for aspect markers production	Actual production of aspect markers
554	219	22

Figure 6.7 displays the distribution of the aspect markers over the data collection period for Alice. It reveals that: (1) not all aspect markers were produced in Alice’s data: *le_l*, *zai* and *le_h* were supplied, but *zhe* and *guo* were not; (2) there occurred a peak production of *le_l* at T8, i.e. 11 occurrences but no single case that reached three (correct) instances of correct production at one session or one correct production at three consecutive sessions before T8; however, in session 9, there were three instances of *le_l* and one instance of *le_h* production.

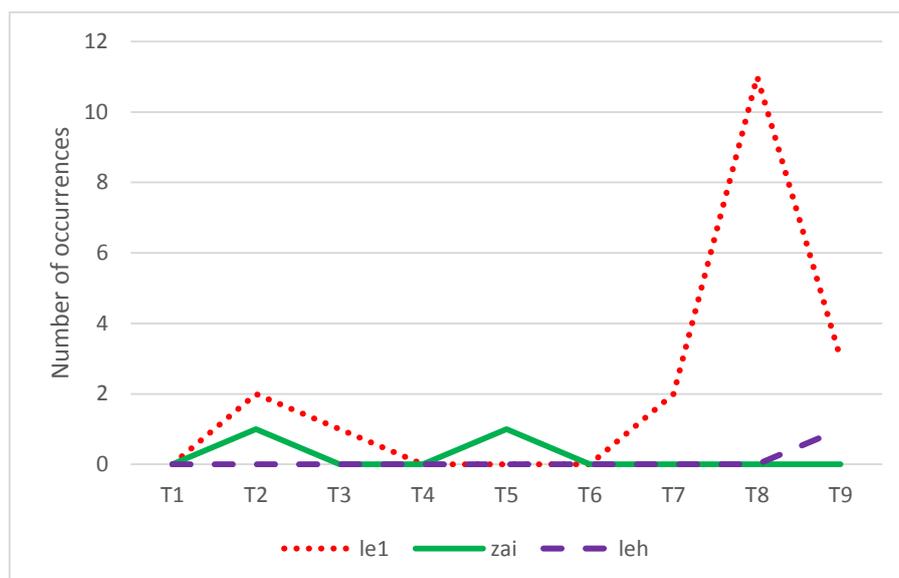


Figure 6.7 Development of Alice’s aspect markers over all data collection sessions and across test tasks

A closer look at Table 6.5 reveals that Alice’s target-like production of aspect markers is very limited and sporadic. In the table, x/y stands for target-like production (x) compared with total production (y). Among *zai*, *le_l* and *le_h*, Alice supplied the largest number of *le_l* with an accuracy rate of 61% (11 out of 18) but there was no single correct suppliance of any aspect marker at T1, T3 or T6. It was only until the last two data collections (T8 and T9) that there were more than three instances of correctly supplied *le_l*. The total production of *zai* or *le_h* did not reach three instances. *zai* was produced once at T2 and once at T5; the only instance of *le_h* occurred at the last data collection session. Examples (6.11 a-d) are Alice’s production.

Table 6.7 Beth's development of aspect markers across the test tasks and over the data collection sessions

Data collection session	<i>The Pear Story</i>			<i>The Wise Little Hen</i>			Picture description			Negation1			Negation 2			<i>Ba</i> construction			<i>Bei</i> construction		
	Utterances	Possible contexts	Actual production	Utterances	Possible contexts	Actual production	Utterances	Possible contexts	Actual production	Utterances	Possible contexts	Actual production	Utterances	Possible contexts	Actual production	Utterances	Possible contexts	Actual production	Utterances	Possible contexts	Actual production
T1	1	1	0	-	-	-	15	4	0	1	0	0	-	-	-	-	-	-	0	0	0
T2	2	1	0	10	5	0	13	9	0	2	1	0	11	4	0	3	1	0	3	0	0
T3	11	5	0	17	7	0	15	8	0	4	2	0	12	4	0	7	3	0	3	0	0
T4	12	3	0	20	10	0	9	7	0	7	2	0	14	4	0	8	2	0	4	0	0
T5	8	4	0	22	12	0	16	10	0	5	2	0	23	3	0	9	2	0	7	0	0
T6	14	9	0	14	6	0	14	10	1	8	2	0	24	2	0	11	3	0	4	0	0
T7	12	10	0	29	14	0	17	10	0	11	2	0	38	7	1	9	2	1	4	0	0
T8	22	13	1	30	17	0	18	12	0	17	3	1	28	8	0	11	2	0	6	0	0
Total	82	46	1	142	71	0	117	70	1	55	32	1	150	32	1	58	15	1	31	0	0

As presented in Table 6.7, Beth produced no aspect markers during the first five data collection sessions. It was only from T6 that she started to provide one instance of *zai* and one instance of *le_h*. Noticeably, neither of them was appropriate for its context. The only target instances of a *le_l* and a *guo* were respectively produced at T7 and at T8, and one non-target *le_h* at T9. According to the acquisition criteria noted earlier, Beth showed no evidence of having acquired any aspect marker after a year with at least 110 hours of Mandarin exposure.

- (6.12) a. **ta wushi nian shi solider le.*
 3SG fifty year be solider LE_h
 (*ta wushi nian qian dang guo bing.*)
 ‘He has been a solider for 50 years.’ (Beth: T6_PD)
- b. *wo kan er tamen zai kan dianying.*
 1SG see er 3PL ZAI see film
 ‘I saw er them seeing a film.’ (Beth: T7_Negation 2)
- c. *jintian wanshang wo you le yi ping shui.*
 Today night 1SG have LE_l one CL water
 ‘Tonight I had a bottle of water.’ (Beth: T7_Ba translation)
- d. *tamen zuo [zou] guo zhe ge xiansheng.*
 3PL do [walk] GUO this CL gentleman
 ‘They walked past the gentleman.’ (Beth: T8_the Pear Story)
- e. *yinwei zhe shi henda [duo] nian le.*
 because this be many year LE_h
 ‘Because this has been for many years.’ (Beth: T8_Negation 1)

To summarise, the results of Alice and Beth’s aspect marking suggest that there is an early stage in L2 Mandarin acquisition, when learners project only a bare VP. The results also suggest that learners remain at this stage even after over 100 hours of classroom instruction. Chapter 7 will revisit whether it can be argued that no production (or very sparse production of (non-) target-like aspect markers is due to learners’ lack of the phonological forms of the aspect markers or the absence of functional projections in their mental grammar.

6.2.3 Charles’ development of aspect markers

Charles’ aspect marking was markedly different from that of Alice and Beth in two respects. As can be seen from Table 6.8, 54% (192 out of 358) of possible contexts in Charles’s data

were supplied with aspect markers (192 instances in total), in stark contrast to Alice's 10% and Beth's 2% marking of their possible aspect contexts. Charles' total production greatly surpassed that of Alice and Beth, suggesting that he was able to move beyond the bare VP stage with his additional exposure to Mandarin.

Table 6.8 Charles' development of aspect markers across the test tasks and over the data collection sessions

Data collection session	<i>The Pear Story</i>			<i>The Wise Little Hen</i>			Picture description			Negation1			Negation 2			<i>Ba</i> construction			<i>Bei</i> construction		
	Utterances	Possible Context	Actual production	Utterances	Possible Context	Actual production	Utterances	Possible Context	Actual production	Utterances	Possible Context	Actual production	Utterances	Possible Context	Actual production	Utterances	Possible Context	Actual production	Utterances	Possible Context	Actual production
T1	2	0	0	-	-	-	15	2	4	1	0	0	-	-	-	-	-	-	-	0	0
T2	12	11	2/5	14	6	1/2	16	6	0/1	5	2	0/2	9	1	0/1	1	0	0	0	0	0
T3	10	6	0/0	14	11	5/5	15	8	2/2	4	2	0/0	15	5	2/4	-	-	-	-	-	-
T4	17	14	2/2	24	17	5/7	17	9	2/3	5	2	1/2	16	4	2/4	9	2	0/1	1	0	0
T5	16	15	1/1	26	16	4/4	19	10	3/3	6	3	1/2	23	9	0/5	11	4	0/4	1	0	0
T6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T7	17	12	3/3	32	20	3/3	19	14	4/10	11	6	2/4	33	11	8/9	11	6	2/3	5	3	0
T8	16	11	1/2	10	9	7/7	18	11	7/8	19	5	2/3	53	9	3/5	10	6	1/3	3	1	1/1
T9	17	11	4	32	19	7	18	12	7	14	6	6	41	10	4	14	8	6	5	3	3
Total	107	80	23	152	98	40	137	72	48	65	26	23	190	49	34	56	26	17	15	7	7

Total utterances	Possible contexts	Actual production
722	358	192

The other striking difference is the range of aspect markers that emerged in Charles' production. While Alice acquired only *le_l* and Beth none over the data collection period, based on his production, it can be concluded that Charles acquired all the aspect markers except *zhe*. Figure 6.8 illustrates Charles' aspect marking across the tasks and over the data collection sessions.

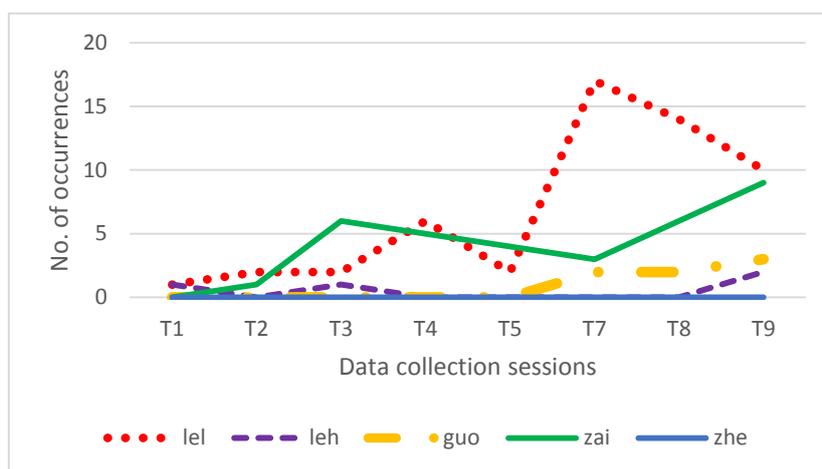


Figure 6.8 Charles' target-like production of aspect markers over time

An indication that Charles was not an *ab initio* learner is the fact that he used *le_l*, *zhe* and *le_h* at the very first session, as seen in examples (6.13 a-b). Before providing a detailed account of Charles' production in Chapter 7, it should be noted that the two target-like productions certainly evidenced that Charles had been exposed to at least several weeks of basic instruction and had already acquired the phonetic forms of those three markers data collection started.

- (6.13) a. *yeye* *zuo* *le* *gongzuo*, *zou* *zhe*.
 grandpa do LE work do ZHE
 'Grandpa did some work and is (still) doing some.'
- b. *yeye* *chi* *le* *fan* *le*.
 grandpa eat LE food LE
 'Grandpa has had his food.'

Charles' production of *le_l* surpassed his total production of all the other aspect markers in his data and moreover, the production of *le_l* was consecutive over data collections. As noted previously, Charles' first target-like *le_l* was supplied at T1 and four other instances at T2, from which it may be concluded that Charles acquired *le_l*. Though the number of instances fell slightly at T5, there was a general rise with a subsequent peak production of 22 instances at T7, 11 instances at T8 and 13 at T9.

Charles' production of *zai* was consistent from the second data collection onwards. The general trend of production is upward. The initial production at T2 displayed suppliance in mixed syntactic positions. In other words, *zai* was marked both before and after the verb, as shown in the example (6.14 a-b).

(6.14) a. little hen *zai* *gongzuo.*
 little hen ZAI work
 'Little hen is working.'
(Wise Little Hen_T2)

b. *na* *ge* *nanren* *kan* *zai.*
 that CL man look ZAI
 'That man is looking.'
(Pear Story_T2)

The subsequent instances were all used in the correct syntactic positions, as can be seen from examples (6.15-18). We might conclude that *zai* was acquired at T3 due to the production in six target instances in one session; in subsequent sessions, *zai* was supplied between four and nine times. Note that two instances at T8 and three instances at T9 were excluded from analysis since they were not aspect markers but the homophonic Mandarin word, meaning 'again'. This is illustrated in the three examples in (6.18).³⁶

(6.15) *na* *ge* *nanren* *kan* *zai* looking things through.
 that CL man look ZAI looking things through
 'That man is looking things through.'

(6.16) *Xianzai* little wise hen *zai* Peter Pig's *de* *jia* *zai.*
 now little wise hen at Peter Pig's DE home ZAI
 'Now the wise little hen is at Peter Pig's home.'

(6.17) little hen *de* *haizi* *gongzuo* *he* *little* hen *zai*
 little hen POSS child work and little hen ZAI
 gongzuo.
 work
 'The little hen's children work, and the little hen is working.'

³⁶ Finally, it should also be pointed out that from the second data collection session, Charles supplied a large number of *xianzai* 'now'.

**Xianzai* little wise hen *he* *ta* *de* *jia* Donald Duck *de* *jia* *zai.*
 Now little wise hen and she POSS family Donald Duck POSS family ZAI
 (Target: *xianzai congming de xiaoji zai Donald Duck de jia li.*)
 'Now the wise little hen and her family are at Donald duck's home.'

- (6.18) a. little wise hen *zai* *wen* *tamen* *bang* *ta*.
 little wise hen again ask 3PL help 3SG
 ‘The wise little hen asks him again to help her.’
- b. *tamen* *zai* *bu* *xihuan* *bang* *ta*.
 3PL again NEG like help 3SG
 ‘Again, they don’t want to help her.’
- c. *tamen* *zai* *gaosu* *ta* *juede* *bu* *a* *hao*.
 3PL again tell 3SG feel NEG a good
 ‘Again, they tell her ‘Not feeling well’.’

In contrast, Charles’ production of *le_h* and *guo* was much less consistent. As *le_h* was supplied in the first three consecutive sessions, *le_h* was considered to have been acquired at the third data collection session. There was a *le_h* production gap between T4 and T8, but, three target instances of *le_h* emerged again at the last data collection session.

Guo appeared much later than *le_l* and *le_h* in Charles’ data, i.e. at T8. For the first five sessions, Charles did not supply any *guo*. It was only at T7 that the first two target instances of *guo* were observed. Another two target instances were supplied at T9. No target-like production was found due to his placement of *guo*. Three target instances of *guo* at T9 are given in examples (6.19 a-c).

- (6.19) a. *mama* *de* *mama* *qu* *guo* *the* *Great* *Wall* *liang* *ge* *ci*.
 mum POSS mum go EXP the Great Wall two CL time
 ‘My grandma has been to the Great Wall twice.’
- b. *wo* *bu* *zhidao* *ta* *qu* *guo* *yingguo*.
 1SG NEG know 3SG go EXP Britain
 ‘I don’t know that she has been to Britain.’
- c. *mei* *qu* *guo*, *mei* *qu* *guo*.
 NEG go GUO NEG go GUO
 ‘[I] have not been there.’

Zhe is the least produced aspect marker, not only by Alice and Beth but also by Charles. Indeed, Charles supplied only one (non-target) instance of *zhe* throughout the data collection sessions, which is presented in (6.20). Here, *zhe* is in the appropriate syntactic position following the main verb but because the contexts demand the expression of perfectivity instead of durative meaning, the production is non-target.

(6.20) *yeye* *zuo* *le* *gongzuo*, *zuo* *zhe*.
 grandpa do LE work do ZHE
 ‘Grandpa worked, is working.’

Thus, the acquisition order for Charles’ aspect markers production is *le_l/zai* > *guo* > *le_h/zhe*. Table 6.9 provides details for Charles’ production of aspect markers over the data collection sessions with a focus on *le_h* and *le_l* production. As can be seen from the table, *le_l* was further sub-categorised into three different types: V+*le*+O, V+*le*+S, V+*le*, where according to (see Chapter 3) V+*le*+O were unarguably *le_l* types. Two-tailed paired t-test results revealed that significant statistical differences in the acquisition of *le* at various syntactic positions: *le_l* (i.e. V+*le_l*+O) vs *le_h* (i.e. V+O+*le_h*): $p=0.00<0.05$, which confirms Charles’ acquisition of *le_l* ahead of *le_h*. The t-tests also show that *guo* vs *zai*: $p=0.01(<0.05)$; *zai* vs *zhe*: $p=0.00 (<0.05)$. *le_l* (=V+*le*+O) vs *guo*: $p=0.00 (<0.05)$ and *le_l* vs *zai*: $p=0.07 (>0.05)$ with a result that is close to significant. The t-tests show that there is only very small probability that the acquisition order in Charles’ data is due to chance.³⁷

Table 6.9 Charles’ aspect markers in the production tasks

	<i>le_l</i>			<i>le_h</i>	<i>guo</i>	<i>zai</i>	<i>zhe</i>
	V+ <i>le</i> +O	*V+ <i>le</i> +S ¹	V+ <i>le</i>	V+O+ <i>le</i>			
T1	1/2	0/0	0/0	1/1	0/0	0	0/1
T2	0/3	0/0	2/2	0/0	0/0	1/4	0/0
T3	2/2	0/0	0/2	1/1	0/0	6/6	0/0
T4	3/7	0/3	3/3	0/0	0/0	5/5	0/0
T5	2/9	0/0	0/2	0/0	0/0	4/4	0/0
T7	7/15	0/0	10/12	0/0	2/2	3/3	0/0
T8	11/17	0/0	3/4	0/0	2/2	6/6	0/0
T9	6/12	0/0	4/4	2/2	3/3	9/9	0/0
Total	31/70	0/3	22/29	4/4	7/7	34/37	0/1

Notes: 1/2 means one target-like instance out of two occurrences. V+*le*+S 0/3 means zero correct instances out of three occurrences. This pattern also applies to the other instances of the table.

³⁷ Note that whilst *zai* and *le_h* both reached the acquisition point at T3, due to the significant difference that showed up in the T-test, *zai* was ranked ahead of *le_h*.

An independent test reveals a significant difference between Year 1 learners' total target-like and non-target production of negation, with $p=0.00$ (<0.05). However, no significant difference is found across the learners ($p>0.05$). Table 6.11 further reports individual learners' production of *bu* and *mei* against their year group's total production. Not much difference is noted in the three learners' production of negator *bu*, but Charles was found to be significantly better than the other two Year 1 learners in the total production and target-like production of *mei*. Charles also produced much fewer instances of non-target *mei* than Beth.

Table 6.11 Individual Year 1 learners' production of negation

	% of <i>bu</i> suppliance	% of target-like <i>bu</i> suppliance	% of non-target <i>bu</i> suppliance	% of <i>mei</i> suppliance	% of target-like <i>mei</i> suppliance	% of non-target <i>mei</i> suppliance
Alice	0.36 (166/449) ³⁸	0.35 (123/342)	0.40 (43/107)	0.04 (2/45)	0.03 (1/40)	0.25 (1/4)
Beth	0.30 (138/449)	0.30 (104/342)	0.34 (34/107)	0.35 (16/45)	0.33 (13/40)	0.75 (3/4)
Charles	0.32 (145/449)	0.33 (115/342)	0.28 (17/107)	0.60 (27/45)	0.65 (26/40)	0.25 (1/4)

Table 6.12 presents Alice's production of *bu* (166 instances) and her sparse production of *mei* (two instances) over the data collection period and across the tasks. There is a striking similarity between Alice's total production and target-like production of *bu* within a session and across-sessions, as demonstrated in the second and third columns of the table. In other words, there was close to zero production at the first data collection session. Only two instances of *bu* were supplied at the first data collection with one target-like. The production quickly increased to 13 target-like instances (out of 18 production) at T2, and there was only a small fluctuation in Alice's production until T6. Nonetheless, a noticeable rise occurred at T7. According to the within-session data, the proportion of target-like utterances ranged between 50% to 81% from T1 to T9 with an average target-like rate of 74%. Examples of target-like and non-target production of *bu* are given in examples (6. 22 a. and b.) respectively.

³⁸ % of *bu* suppliance=individual learners' suppliance/year group suppliance. The purpose of such a calculation is to see to what extent Charles is different from the other Year 1 learners.

- (6.23) a. *keshi ta mei-you feiji.*
 yet 3SG NEG-have plane
 ‘Yet, she did not have a plane.’ (Alice: T6_Negation 1)
- b. *Haishi ni mei neng bu neng he cha zai tushuguan.*
 yet 2SG MEI can BU can drink tea at library
 ‘Yet, you cannot drink tea in the library.’ (Alice: T8_Negation 2)

An independent sample T-test (n=8) further confirms that the target-like *bu*+VP suppliance, unlike *mei*+VP, is statistically significant and not subject to chance.

Target-like <i>bu</i> vs non-target-like <i>bu</i>	$p^*=0.01<0.05$;
Target-like <i>bu</i> vs target-like <i>mei</i>	$p^*=0.00<0.05$;
Non -target like <i>bu</i> vs non-target <i>mei</i>	$p^*=0.01<0.05$;
Target-like <i>mei</i> vs non-target <i>mei</i>	$p=0.52>0.05$.

According to the emergence criteria adopted for this study, *bu* emerged at T2 owing to Beth’s production of 13 correct instances at one session. Notably, *bu* is almost always placed in front of VP, which is in line with the surface order of Mandarin negative clauses. Illustrations can be found in examples (6.24-25).

Table 6.13 displays Beth’s across-the-board production of negators over the data collection sessions. Beth’s production of *bu* in both total production and sessional production surpasses that of *mei*. In total, Beth supplied 138 instances of *bu* and 16 instances of *mei*, among which 78% for *bu* and 63% for *mei* are target-like. At T1, there was a target-like instance of *bu* but zero instances of *mei*; the ensuing target-like production of *bu* and *mei* +VP fluctuated across sessions, respectively, between 1% and 22%, and between 0% and 23%. It should be noted that based on the current acquisition criteria, the *bu*+VP structure is considered to have emerged at T2 due to the use of 11 target-like instances. The negator *mei* emerged at T5, where it fulfilled the criteria of three target-like productions at one data collection session. Compared with Alice, Beth produced fewer instances of *bu* but far more instances of *mei* over the data collection period.

Table 6.13 Distribution of negators in Beth's production data

Data collection (N=8)	<i>bu</i>			<i>mei</i>		
	% of suppliance: sessional vs cross-sessional	% of target-like suppliance: sessional vs cross-sessional	% of target-like suppliance: within session	% of suppliance: sessional vs cross-sessional	% of target-like suppliance: sessional vs cross-sessional	% of target-like suppliance: within session
T1	0 (1/138)	0.01(1/104)	1.00 (1/1)	0 (0/16)	0 (0/0)	0 (0/0)
T2	0.09 (12/138)	0.11 (11/104)	0.92 (11/12)	0.06 (1/16)	0.08 (1/13)	1.00 (1/1)
T3	0.10 (14/138)	0.10 (10/104)	0.71 (10/14)	0.19 (3/16)	0.15 (2/13)	0.67 (2/3)
T4	0.12 (16/138)	0.10 (10/104)	0.63 (10/16)	0 (0/16)	0 (0/0)	0 (0/0)
T5	0.18 (25/138)	0.20 (21/104)	0.84 (21/25)	0.19 (3/16)	0.23 (3/13)	1.00 (3/3)
T6	0.14 (20/138)	0.13 (13/104)	0.65 (13/20)	0.13 (2/16)	0.15 (2/13)	1.00 (2/2)
T7	0.17 (23/138)	0.14 (15/104)	0.65 (15/23)	0.25 (4/16)	0.23 (3/13)	0.75 (3/4)
T8	0.20 (27/138)	0.22 (23/104)	0.85 (23/27)	0.19 (3/16)	0.15 (2/13)	0.67 (2/3)
Average	0.13	0.13	0.78	0.13	0.14	0.63

A two-tailed independent T-test was performed on *bu* and *mei* production in Table 6.13. Crucially, it demonstrates the significance value of Beth's suppliance ratio of negators:

<i>bu vs mei</i>	$p^*=0.00<0.05$;
target-like <i>bu</i> vs target-like <i>mei</i>	$p^*=0.00<0.05$;
non-target <i>bu</i> vs non-target-like <i>mei</i>	$p^*=0.00<0.05$;
target vs non-target <i>bu</i>	$p^*=0.00<0.05$;
target vs non-target <i>mei</i>	$p^*=0.02<0.05$.

The statistics indicate that Beth's production of target-like production across *bu* and *mei* and within the production of *bu* and *mei* all show significant differences and these differences are not due to chance.

Table 6.14 presents the mean score of Beth's negation production. In other words, a mean score of 13 vs 4.2 for the target-like and non-target production of *bu* and a mean score of 1.25 vs 0.88 for target/non-target production of *mei*. Beth's target-like production of *bu* surpasses her non-target production of *bu* ($p^*=0.01<0.05$), and her target-like production of *bu* significantly exceeds her target-like production of *mei* ($p^*=0.00<0.05$). The test also indicates that Beth's target-like production of *mei* is not significantly different from her non-target production of *mei* ($p=0.52>0.05$).

Table 6.14 Mean scores for Beth's *bu* and *mei* production

Total production		Target-like production		Non-target production	
<i>bu</i>	<i>mei</i>	<i>bu</i>	<i>mei</i>	<i>bu</i>	<i>mei</i>
17.25	2	13	1.63	4.25	0.38

The following examples are taken from Beth's negation task 1 to illustrate her target-like and non-target suppliance of *bu* and *mei*. The position of *bu* in example (6.24 a) should be in front of the verb. *Bushi* 'not be' in (6.24 b) should be *mei(you) bing* and (6.24 c) is not a context where a [+telicity] feature is needed; therefore, *bu* should be used instead of *meiyou*. Errors as in (6.24 b, c) are few; the majority of errors are related to the inappropriate use of *bu* where *mei* is required.

- (6.24) a. *zhe shi bu hao.*
 This be NEG good
 (Target: *ta buhao.*)
 'This is not good.' (Beth: T3_Ba translation)
- b. *ta bu shi ill.*
 3SG NEG be ill
 (Target: *ta mei(you) bing.*)
 'He is not ill.' (Beth: T4_ Wise Little Hen)
- c. **ta meiyou shenme wo wo gei ta wo de dianhua.*
 3SG NEG what 1SG 1SG give 3SG 1SG POSS telephone
 (Target: *wo bu hui ba dianhua haoma gei ta.*)
 'I won't give him my telephone number.' (Beth: T7_Ba translation)

However, it is noteworthy that while Beth produced more negation phrases than Alice, Beth's production of *mei* is restricted to one thematic verb *you* 'have'. She did not use *mei* in front of other verbs. Therefore, it is very likely that Beth first acquires *bu*+VP and then moves on to *mei*+*you*+VP.

Table 6.15 presents Charles' production of negators. Overall, Charles supplied 145 instances of *bu* and 27 instances of *mei*, with 69% of the instances of *bu* and 83% of *mei* being target-like. There is a clear upward target-like development of *bu* over the sessions, and peak production is 21% of the target-like suppliance; only a slight fluctuation was found between sessions. The final two sessions witnessed the largest number of target-like productions. Regarding *mei*, Charles did not supply any *mei* at the first data collection. Then, there was a

wave-like production with ups and downs between T2 and T7. A sudden increase in the production of *mei(you)+VP* occurred at T8 with 13 target-like cases and then the suppliance dropped to five target-like instances.

Table 6.15 Distribution of negators in Charles' production data

Data collection (N=8)	<i>Bu</i> +VP			<i>Mei</i> +VP		
	Total production: sessional vs across - sessions	Target-like production: sessional vs across - sessions	Target-like production: within session	Total production: sessional vs across - sessions	Target-like production: sessional vs across - sessions	Target-like production: within a session
T1	0 (0/0)	0 (0/0)	0 (0/0)	0 (0/0)	0 (0/0)	0 (0/0)
T2	0.08 (11/145)	0.07(8/115)	0.72(8/11)	0.04(1/27)	0.04(1/26)	1.00(1/1)
T3	0.09 (13/145)	0.10(11/115)	0.85(11/13)	0.11(3/27)	0.08(2/26)	0.67(2/3)
T4	0.17 (24/145)	0.15(17/115)	0.71(17/24)	0.04(1/27)	0.04(1/26)	1.00(1/1)
T5	0.15 (22/145)	0.14(16/115)	0.73(16/22)	0.11(3/27)	0.12(3/26)	1.00(3/3)
T7	0.15(22/145)	0.14(16/115)	0.73(16/22)	0.04(1/27)	0.04(1/26)	1.00(1/1)
T8	0.19 (27/145)	0.21(24/115)	0.89(24/27)	0.48(13/27)	0.50(13/26)	1.00(13/13)
T9	0.18 (26/145)	0.2 (23/115)	0.88(23/26)	0.19 (5/27)	0.20 (5/26)	1.00 (5/5)
Mean score	0.13	0.13	0.69	0.13	0.13	0.83

An independent sample T-test reveals that, similar to Alice and Beth's suppliance of negators, there are statistically significant differences between Charles' total target-like production of *bu* and *mei*, target-like and non-target production of *bu*, target-like *bu* and target-like *mei* and non-target production of *bu* and non-target *mei* ($p^*=0.00<0.05$). Nonetheless, unlike Alice and Beth's suppliance of target and non-target-like *mei*, the difference between those two items in Charles' data is not statistically significant, or just close to significant $p=0.06 (>0.05)$, which will be discussed in Chapter 7.

Table 6.16 presents Charles' mean scores for the *bu* and *mei* production in the production data. Again, according to the emergence acquisition criteria of this study, *bu* is considered to be acquired at T2 in reference to eight target-like productions. Moreover, due to the consecutiveness criterion of this study, *mei* is thought to be acquired at T4. Nonetheless, it should be noted that two-thirds of *meis* at that session were combined with the verb *you* 'have', which suggests that Charles had not reached the productive stage of *mei* production. At T8, although Charles still used *meiyou* with *qu* 'go', he uses *mei* in front of other verbs, *kan* 'see',

shou ‘receive’, and *qu* ‘go’, as seen in examples (6.25 a-c). Hence, Charles was considered to have appropriately established the representation of *mei* +VP at this session.

Table 6.16 Mean scores for Charles’ *bu* and *mei* production

Total production		Target-like production		Non-target production	
<i>bu</i>	<i>mei</i>	<i>bu</i>	<i>mei</i>	<i>bu</i>	<i>mei</i>
18.13	3.37	14.38	3.25	3.75	0.13

- (6.25) a. *wo mei kan zhongguo wen.*
 1st NEG see China language
 ‘I don’t read Mandarin.’
- b. *ta mei shou a schoolbag.*
 3SG NEG receive a schoolbag
 ‘She has not received a schoolbag.’
- c. *ta mei qu swimming.*
 3SG NEG go swimming
 ‘She did not go swimming’ (Charles: T8_ Negation 2)

A closer examination of Charles’ production of negator + VP suggests an acquisition route, as follows: *bu* + VP > a period unspecified for *bu/meiyou* +VP > *mei* +VP. The unspecified period mainly occurred between T2 and T7, when he was struggling to make appropriate choices between *bu* and *mei*. As examples (6.26 a-d) reveal, Charles sometimes used *mei* but then self-corrected it to *bu*. Charles negates NP with *meiyou* ‘not exist’ or ‘not possess’ and *you* as a thematic verb at T5.

- (6.26) a. *mei -you, wo bu kan, wo mei-you, wo bu kan*
 NEG -have 1SG NEG read 1SG NEG-have 1SG NEG read
ta de shu.
 3SG POSS book
 ‘No, I did not read her book.’ (Charles: T3_ Negation 1)
- b. *mei -you, wo bu kan le ta de shu.*
 NEG- have 1SG NEG read LE 3SG POSS book
 ‘No, I did not read her book.’ (Charles: T5_ Negation 1)
- c. *ta jintian zaoshang mei bu swimming le.*
 3SG today morning NEG NEG swimming PFV/CRS
 ‘She did not swim this morning.’ (Charles: T5_ Negation 2)
- d. *ta mei qu, oh ta mei(.) bu swim bu swim.*
 3SG NEG go oh 3SG NEG NEG swim NEG swim
 ‘She did not go swimming.’ (Charles: T7_ Negation 2)

The instances of *mei* at T8 and T9 were all appropriate. However, a full picture of the *mei*+VP production should also consider the fact that the target-like production with an accuracy rate of 88-89% at the last two sessions actually meant that 11-12% of the negation should have been supplied in the form of *mei* +VP.

To summarise, this section has reported on three Year 1 learners' production of negation. The following acquisition route was found: early acquisition of *bu*+VP, followed by production underspecified *mei*+VP and eventually specified *mei*+VP. Charles is the only learner who was able to productively use *mei*+VP. The emergence order for *bu* and *mei* are: *bu*+VP>the occurrences of *bu/mei* +VP> *mei*+VP. Additionally, *ab initio* learners are also found to have acquired the syntactic positions of *bu* and *mei* in clauses with SVO order. Following this report on Year 1 learners' acquisition of negation, the following section investigates the three learners' production of the *ba* and *bei* constructions.

6.2.5 Year 1 learners' acquisition of *ba* and *bei* constructions

Apart from Charles' production of nine utterances with *ba*, Year 1 learners did not manage to supply any token of the *ba* construction or *bei* construction by the end of the data collection. Seven of Charles' utterances with *ba* occurred at T5 in the *ba* translation task and the other two at T9 in the *bei* transformation task.

Charles' nine utterances with *ba* can be categorised into three types: Type I—*ba* + NP, Type II— *ba* + VP and Type III— *ba* + NP₁ +NP₂. Examples (6.27 a, b) and (6.29 a, b) belong to Type I *ba* utterances, where *ba* was used a main verb, thus being non-target. Examples (6.28 a-d) are Type II *ba* utterances, where *ba* was followed by another verb phrase. Example (6.27 b) belongs to the last type of utterances with *ba*, which was followed by double objects.

- (6.27) a. *wo* *ba* *yi* *ping* *shui*, *sorry*, *zhe* *ge* *xia*
 1SG BA/grasp? one CL water sorry this CL after
hao, oh sorry *xia* *xiawu*.
 good oh sorry after afternoon
 (Target: *wo jintian xia wu mai le yiping shui*.)
 'I grasped one bottle of water this afternoon.'
- b. *wo* *ba* *zhe* *ge* *xiawu*, I can say about the
 1SG BA this CL afternoon 1SG can say about the
 water *yi* *-ping* *shui*, I said *shou*(X2), *shuo* *mai*[4]
 water one CL water I said hand say sell
bu *shuo* *mai* [3]
 NEG say buy

(Target: *wo jintian xiawu mai yiping shui de shihou, wo shuo mai4 bu shuo mai3.*)
 ‘When I bought a bottle of water this afternoon, I said ‘sell’ instead of ‘buy’.

- c. *qing ni ba zhe ge drawing a careful look yi*
 please 2SG BA this CL drawing a careful look one
kan careful.
 look careful
 (Target: *qing ba zhefuhua zixi kanyixia.*)
 ‘Please give this drawing a careful look.’ (Charles: T4_ *ba* translation)
- (6.28) a. *wo qing ni ba gei carefully look at ta*
 1SG please 2SG BA give carefully look at 3SG
de zuowei.
 POSS seat
 (Target: *qing ba zhefuhua zixi kanyixia.*)
 ‘Please give the drawing a careful look.’
- b. *qing ni ba gei qing ni kan carefully ta*
 please 2SG BA give please 2SG look carefully 3SG
de zuowei.
 POSS seat
 (Target: *qing ba zhefuhua zixi kanyixia.*)
 ‘Please give his seat a careful look.’ (Charles: T5_ *ba* translation)
- c. *wo ba wen ta na ben shu.*
 1SG BA ask 3SG that CL book
 (Target: *qing ta ba shu huanshang.*)
 ‘Ask him to return the book.’
- d. *ni ba shut the window.*
 2SG BA shut the window
 (Target: *ba chuanghu guanshang.*)
 ‘Shut the window.’ (Charles: T5_ *ba* translation)
- (6.29) a. The police is *ba,* the police *ba* grasp *na* *ge*
 the police is grasp the police BA grasp that CL man
nanren.
 man
 (Target: *ba ge nanren bei jingcha daipu le/ jingcha ba na ge nanren daipu le.*)
 ‘The police is grasping the man.’
- b. *tamen ba na ge fangzi.*
 3PL grasp that CL house
 (Target: *nage fangzi bei ren chaile/ renmen ba nage fangzi chaile.*)
 ‘They were pulling down the house.’ (Charles: T9_ *bei* transformation)

From the above examples, we can conclude that all Charles’ production of *ba* was non-target and that Charles was placing *ba* randomly in his utterances. This suggests that by the end of data collection, he remains unclear about the syntactic structure and the semantics of the *ba* construction.

6.2.6 A Summary of Year 1 learners' Mandarin development

In summary, section 6.2 has provided data for three Year 1 learners' production of aspect markers, *ba* and *bei* constructions, and negation across test tasks and data collection sessions. It concludes that:

- (1) Year 1 learners transferred L1 VP word order;
- (2) Among the test items, negator *bu* emerged the earliest, followed by the emergence of the aspect marker *le*; no single target-like case of *ba* or *bei* construction occurred in the three Year 1 learners' production data;
- (3) Aspect markers were absent from the production data of Alice and Beth, the two *ab initio* learners but they did occur in Charles' data from the first data collection session indicating that he was not actually an *ab initio* learner.

Thus, the results from Year 1 learners' production largely support the predictions established at the beginning of the chapter. We now turn to the results from Year 2 learners' production data, to see whether their data also supports the predictions.

6.3 Mandarin Development of Year 2 Learners

This section presents Year 2 learners' word order use in the production data. The presentation begins by providing data for their total production, followed by data for Year 2 learners' development in word order and use of functional elements over time.

6.3.1 Year 2 learners' development of L2 Mandarin VP headedness

Table 6.17 presents Year 2 learners' total utterances in eight test tasks across the data collection sessions. As seen from the table, the total utterances of the learners added up to 5060 ones. Daisy supplied the largest number of utterances while Emily, due to her absences, supplied the fewest. The average number of utterances for the five Year 2 learners is 1012, which is much higher than the mean utterance production of Year 1 learners, i.e. 637.

Table 6.17 Year 2 learner utterances across tests over all the sessions

Year 2 learners	PS	WLH	PD	Neg1	Neg2	<i>Ba</i> translation	<i>Bei</i> construction	Total
Daisy	268	316	152	122	263	96	37	1254
Emily	190	236	112	56	113	62	24	793
Fiona	189	218	159	96	192	112	27	993
Grace	161	186	153	82	243	78	14	917
Harry	204	229	222	93	229	90	36	1103

Among the Year 2 learners' utterances, errors in word order are rare in the story narration data. That is, the clear majority of the production is VO order in their narration, which is in line with the learners' L1 English VP. Figures 6.9-13 report learners' inappropriate use of word order in other test tasks. Unlike Year 1 learners, the examination of Year 2 learners' data reveals four orders: *VO, along with *VX, *OV and *XV. *VX represents V+*Adv/O while *XV stands for *O/Adv V.

Figure 6.9 illustrates that among Daisy's four types of non-target word order production, *VX, the L1 transfer type of non-target use plays a dominant role while the *OV type, where objects are in preverbal position, is less frequent than the other types. In contrast, Fiona, Harry and Grace in Figures 6.9-12 supplied mostly the same numbers of non-target use of *VX and *OV. Due to the non-target use of OV by Fiona, Grace's and Harry's production should be counted as the most salient type of non-target-use (close to 1/3 of the non-target like word order use).

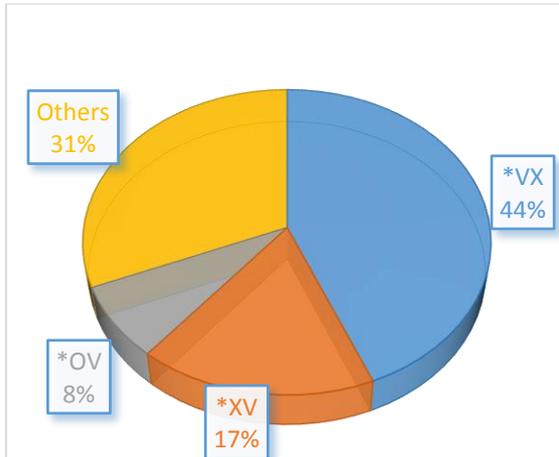


Figure 6.9 Daisy's non-target use of VPs

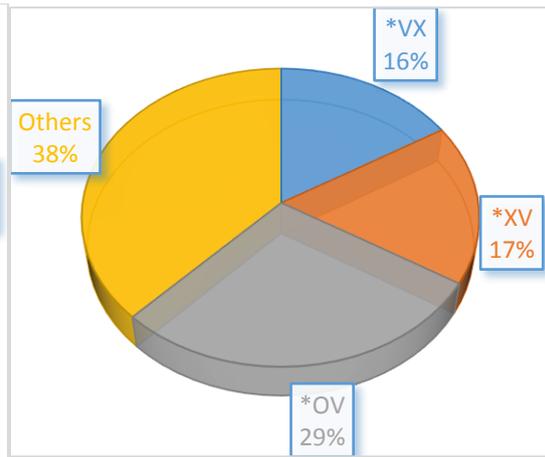


Figure 6.10 Fiona's non-target use of VPs

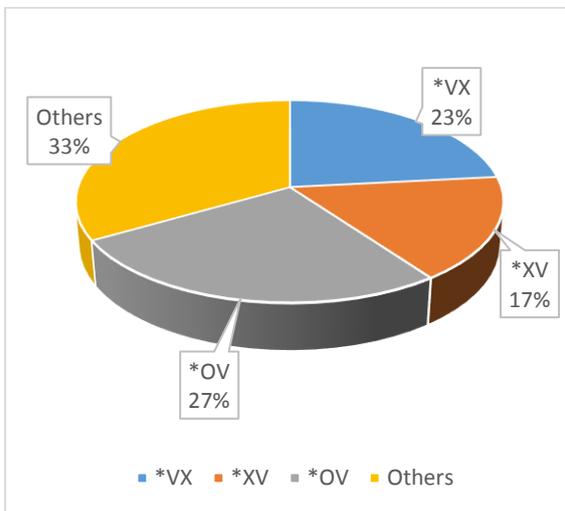


Figure 6.11 Grace's non-target use

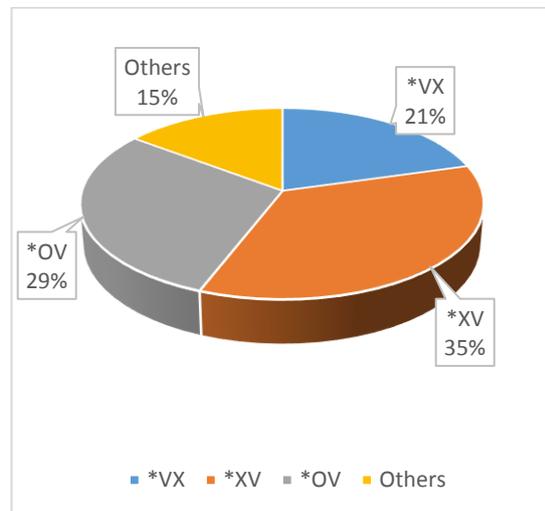


Figure 6.12 Harry's non-target use

In summary, placing the object in front of the verb makes Year 2 learners distinctively different from Year 1 learners; however, *VX type of non-target use still lingered in Year 2 learners' production. Moreover, the inappropriate fronting relates specifically to the learners' non-target use of *ba* and *bei* constructions. The finding also explains Daisy's least non-target production of OV in *ba* construction over the data collection sessions. That is, O was fronted ahead of V, but it was not motivated by *ba*.

Figure 6.13 depicts the distribution of non-target word order types in Emily's six data collection sessions. The data shows that, unlike the other Year 2 learners, Emily's non-target word order type is overwhelmingly the *OV type, followed by the *XV type. This may suggest that Emily tends to put both adverbials and objects in front of verbs.

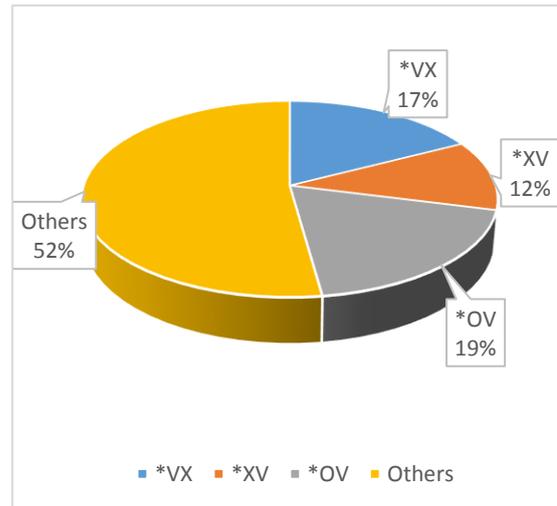


Figure 6.13 Distribution of Harry's non-target use

Following the description of Year 2 learners' overall use of non-target word orders, Figures 6.14-18 chart the use of non-target-like word orders over data collection sessions. As observed in the figures, Year 2 learners' non-target word order change is much more complicated compared with that of Year 1 learners, with more interaction between different non-target types. Nevertheless, the seemingly asystematic production reveals one striking similarity across the L2 learners' production: there is a U-shaped development profile for the non-target suppliance of OV word order, which features high production at two ends and no output for a period of two to three sessions.

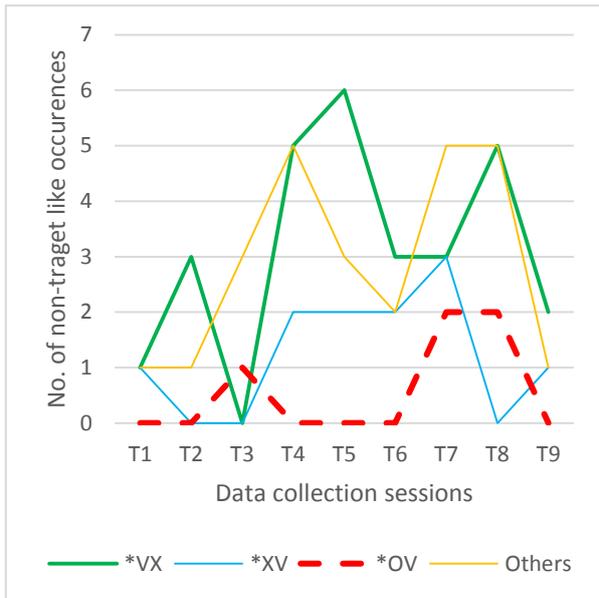


Figure 6.14 Daisy's non-target word order

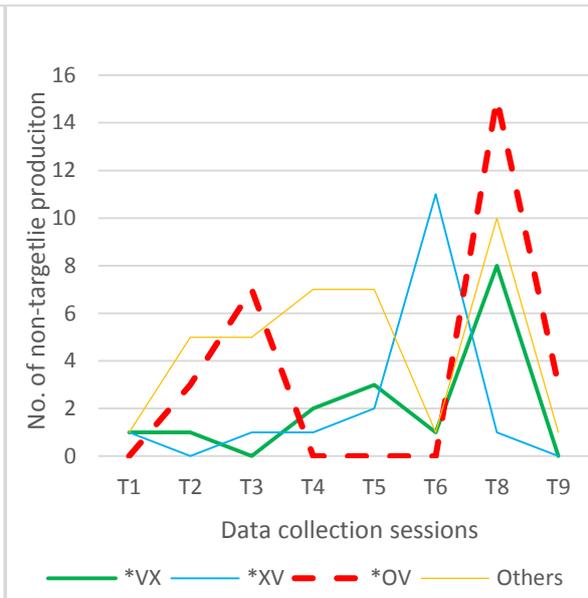


Figure 6.15 Fiona's non-target use

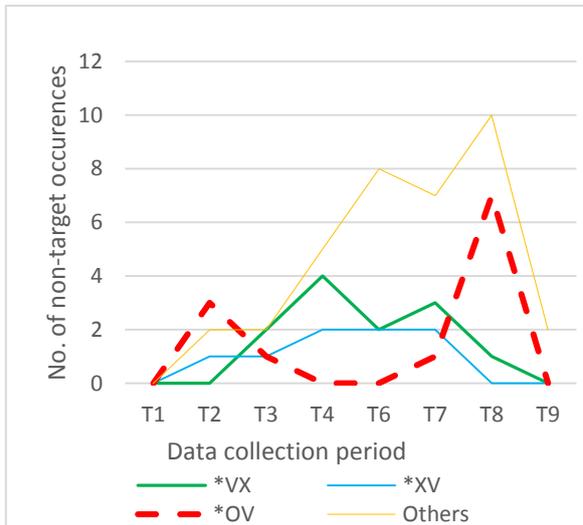


Figure 6.16 Harry's non-target word order

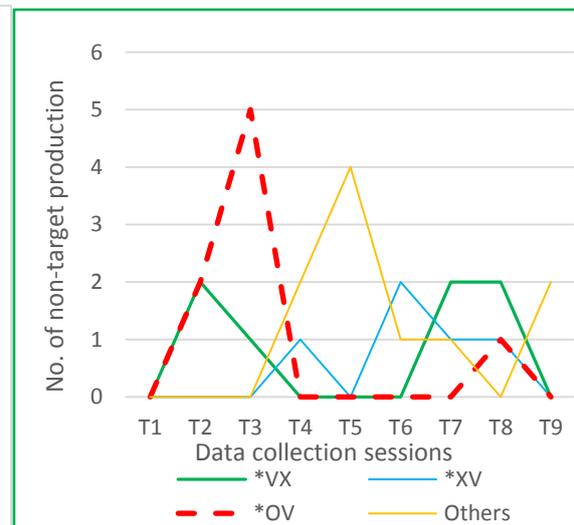


Figure 6.17 Grace's non-target use

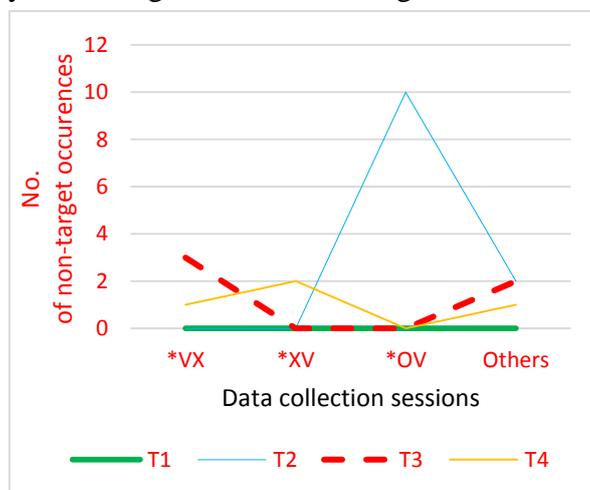


Figure 6.18 Emily's non-target use

6.3.2 Year 2 learners' development of aspect markers

Over nine data collection sessions and a wide range of tasks, Year 2 learners produced 562 instances of aspect makers altogether, of which close to one-third (28%) were non-target. Figures 6.19-20 reveal their target-like and non-target production respectively. One same characteristic for both figures is that for each learner, the red line representing *lei* is above all the other lines, which means that the total production of target-like/ non-target *lei* surpasses the total target-like/non-target-like production of any other aspect marker. Moreover, for most of the Year 2 learners, the line for target *zhe* almost overlaps with the horizontal line in Figure 6.19, and the same line in Figure 6.20 shows minimal changes; thereby suggesting that for all Year 2 learners, except Emily, for whom the target production was none, non-target production for all Year 2 learners was minimal.

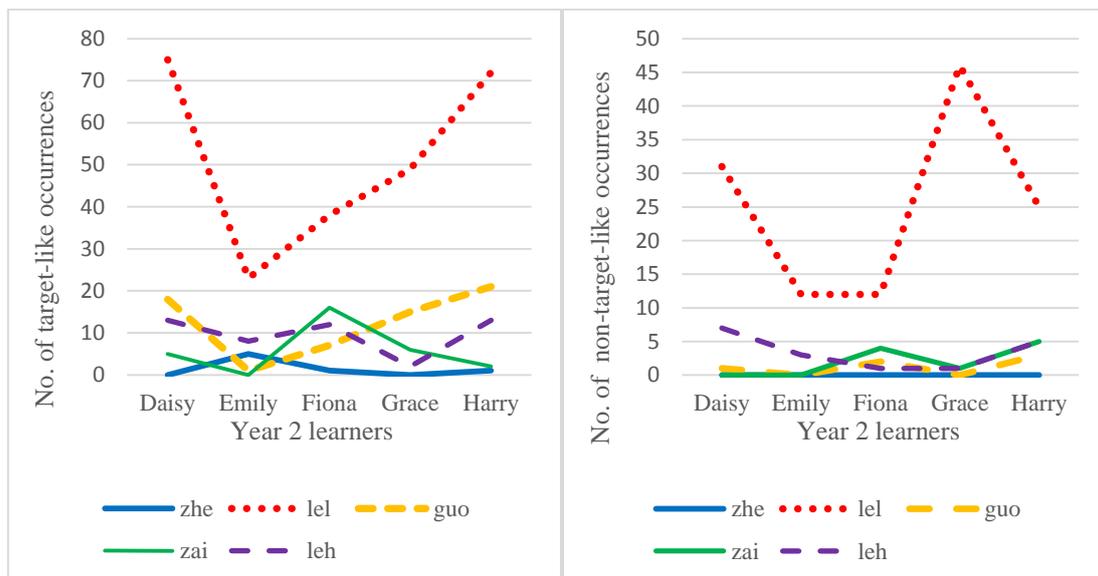


Figure 6.19 Year 2 learners' target production Figure 6.20 Year 2 learners' non-target Production

In what follows, we will first discuss the acquisition of aspect markers by the learners who had no or only one missing data collection session and then give a brief account of the acquisition characteristics of the learner with the most missing data collection sessions. In other words, we will first analyse Daisy, Fiona, Grace and Harry's data and then that of Emily who missed three data collection sessions.

Figures 6.21-24 illustrate Daisy, Fiona, Grace and Harry's production of aspect markers across all the test tasks. In each figure, the vertical axis displays the number of target-like occurrences,

while the vertical axis displays the data collection sessions. The red dotted line shows *le_l*, the blue *zhe*, the yellow *zai*, green *le_n* and the blue dotted *guo*.

Three consistently shared patterns emerge in Year 2 learners' production of *le_l*. Firstly, the line for the target *le_l* is above all the other lines, which means that the total production of *le_l* surpassed the total production of any other aspect marker. Secondly, *le_l* is the first among the aspect markers that emerged in L2 learners' production. It occurred in Harry's first data collection session and Daisy, Grace and Daisy's second data collection session. Finally, while there are some fluctuations in Daisy, Grace and Fiona's total production of *le_l* in some sessions and Harry's output of *le_l* decreased at his last data collection session. Overall, there was an upward development tendency in the production of *le_l* by all the learners.

In contrast, *zhe* is the least productive aspect marker for the four Year 2 learners, as seen from the figures, where the blue line overlapped with the horizontal line in Daisy, Emily, Fiona's figures. Indeed, only two instances of *zhe* were supplied across a wide range of test tasks in the datasets of four Year 2 learners. The only target-like instance, given in (6.30a), was provided by Harry at T7 and the other, a non-target -like one, given in (6.30b), by Fiona at T8.

- (6.30) a. *ta* *chuan* *zhe* *yi* *jian* (X2) *lansede* *chenyi* *he* *yi*
 3SG wear DUR one CL blue shirt and one
 tiao *heisede* *kuzi*.
 CL black trousers
 'He wears a blue shirt and a pair of black trousers.' (Harry: T7_ *Pear Story*)
- b. **li shizheng* *ba* *zao* *yao* *de* *gongneng* *jilu*
 Li shizhen BA herb medicine POSS function record
 zhe.
 DUR
 (Target: *Li Shizhen jilu le caoyao de gongneng*.)
 'Li Shizhen recorded the functions of the herbs.' (Fiona: T8_ *Ba* transformation)

Although both instances of *zhe* occurred after verbs, *zhe* in (6.30 b) was non-target as the context demands production of an aspect maker which expresses perfectivity, so not *zhe*. *Guo*, referred to by the blue dotted line in the figures, seems to be the second aspect marker acquired by the Year 2 learners. There were three consecutive productions of *guo* in Harry's first three data collection sessions, and three occurrences at T4 for Daisy and at T6 for Grace. Fiona's output of *guo* is different, as the emergence of four instances of *guo* initially occurred at T4, right after three occurrences of *zai* at T3. Note that *guo* was not used very productively and

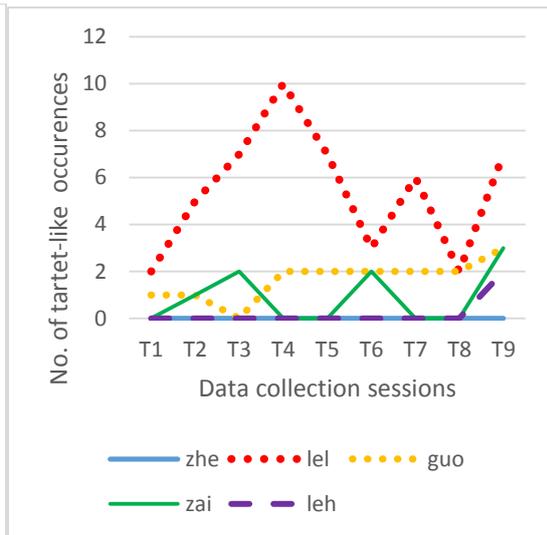
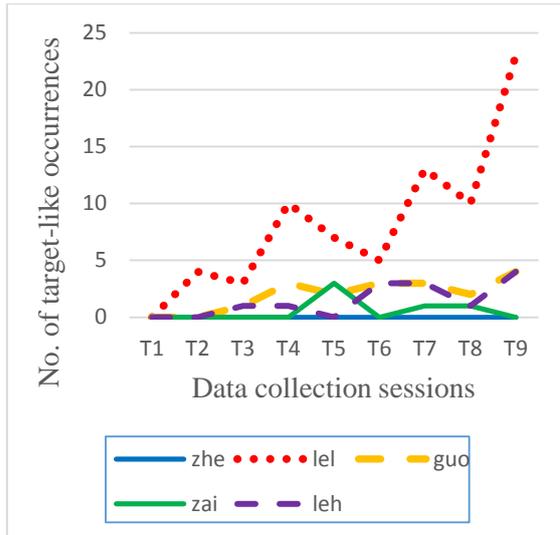


Figure 6.21 Daisy's target-like production

Figure 6.22 Grace's target-like production

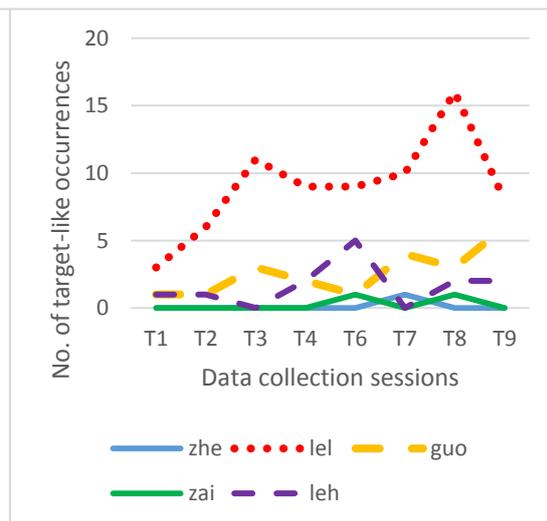
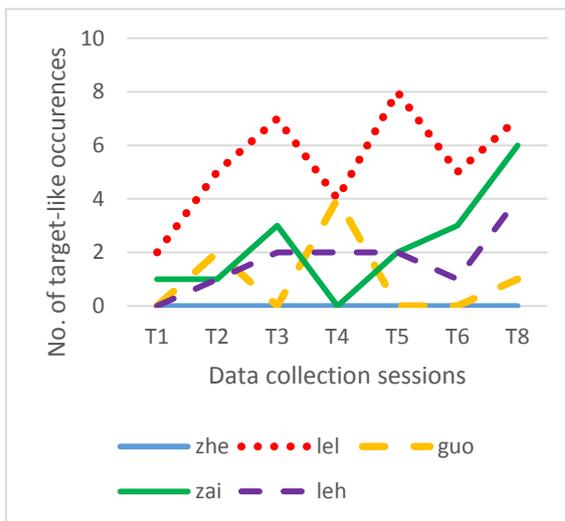


Figure 6.23 Fiona's target-like production

Figure 6.24 Harry's target-like production

Figure 6.25 reveals Emily acquisition of aspect markers across six data collection sessions. Like all the other learners, le_l was supplied ahead of le_h . Like Harry, Emily provided three target instances of le_l at the very first data collection session, while four target instances of le_h occurred at T6. Emily's acquisition of le_l preceding le_h is in line with the other four Year 2 learners. The difference between Emily and the other four Year 2 learners lies in Emily's target-like production of four instances of zhe at T1. Emily supplied another zhe at T6. Moreover, no guo or zai was provided over the six data collection sessions.

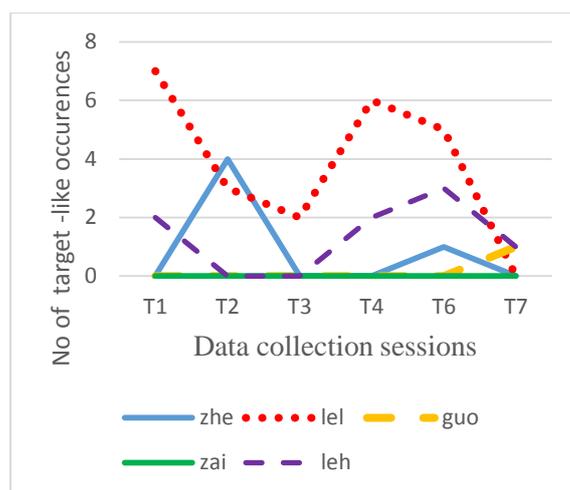


Figure 6.25 Emily's target-like production of aspect markers

In summary, Year 2 learners' acquisition of aspect markers shares some characteristics of Year 1 learners. Firstly, as predicted by OG, *lei* was acquired ahead of *lei_n* by all Year 2 learners. The acquisition of *zhe* may be considered a distinctive characteristic of Emily, as she was the only learner who was observed to have acquired *zhe*. The following section examines Year 2 learners' production of *ba* and *bei* constructions.

6.3.3 Year 2 learners' development of *ba* and *bei* constructions

Figure 6.26 presents Year 2 learners' target and non-target production of *ba* and *bei* constructions over nine data collection sessions across all the test tasks. The green lines stand for the production of the *bei* construction while the red line stands for the the production of *ba* construction. In total, Year 2 learners produced 199 utterances of *ba* and 47 utterances of *bei*. Across test tasks, there were more target productions of *ba* constructions, i.e. 57 than target-like productions of *bei*, as can be seen from the figure where the red dotted line and the red solid line are posited above the green lines except for in cases of Emily and Harry. The former did not supply any *bei* or target *ba* constructions and the latter produced fewer target *ba* utterances than *bei* utterances, as the red solid line is below the green solid line. The overall rate of target-like production was 29% for the *ba* construction and 68% for the *bei* construction.

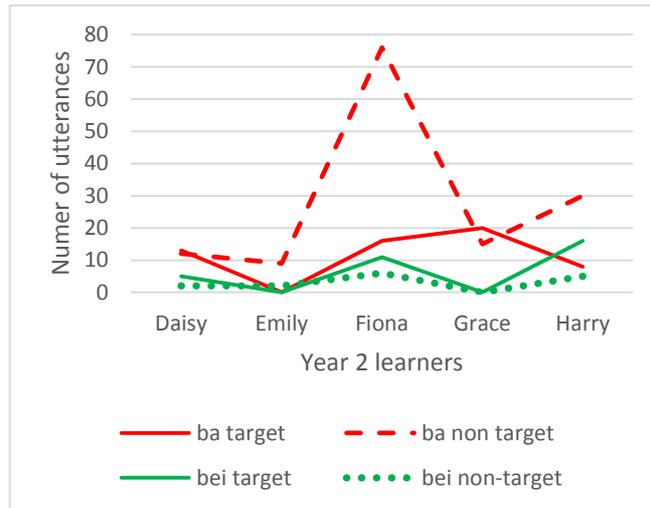


Figure 6.26 Year 2 learners' *ba* and *bei* production

In addition to the overall production of Year 2 learners' *ba* and *bei* construction, each learner's first acquisition of *ba* and *bei* constructions and their overall development over time was also investigated. Figure 6.27 illustrates Daisy's target-like use of the *ba* and *bei* constructions across the test tasks and over the data collection sessions. The red line in the figure represents the production of the *ba* construction, and the green the production of the *bei* construction. The red line first reached three target occurrences at T6, followed by the green line at T8. Daisy's acquisition of *ba* preceded that of *bei*. The instances in examples (6.32 a-c) are the total production of Daisy at T6. The structure of examples a. and b. can be summarised as *ba*+NP+PP while c and d have *ba*+NP+VP. Though the first two are non-target due to the absence of a verb, the others have target-like *ba* constructions. It should be pointed out that (d) is still non-target like, as the negator *bu* is placed in front of the VP headed by *yuanyi* 'want' instead of in front of the *ba* phrase.

- (6.32) a. *Wo ba zhe ben shu shang zhuozi.*
 1SG BA this CL book on table
 (Target: *wo ba zhe ben shu fang shang zhuozi.*)
 'I put the book on the table.'
- b. *Qing ni ba ta de zhaopian yi kan.*
 please 2SG BA 3SG POSS photo one look
 (Target: *ni ba ta de zhaopian kan yi kan.*)
 'Please give his photo a look.'

- c. *Mama ba zhe jian shi wang le.*
 mum BA this CL thing forget LE
 ‘Mum forgot this thing.’
- d. *Wo ba zhe bu yuanyi zai xie.*
 1SG BA this NEG want again write
 (Target: *wo bu yuanyi ba zhe zai xie yibian.*)
 ‘I don’t want to rewrite this.’

(Daisy: T6_Ba translation)

Another three target-like *ba* constructions were supplied at T7. Then, the production dropped to two occurrences but bounced back to three at T9. The figure also reveals that the first target-like production of *bei* constructions appeared later than that of *ba* constructions and that the real acquisition of *bei* construction occurred at T8 with a total production of three occurrences.

A two-tailed, two sample equal variance T-test analyses of Daisy’s *ba* and *bei* construction production did not demonstrate any considerable difference during the first four data collection sessions; however, the analysis after the ensuing session did show a significant difference in Daisy’s target-like production of *ba* and *bei* constructions with $p=0.02 < 0.05$. The discovery means that Daisy’s acquisition of *ba* ahead of *bei* was above chance level.

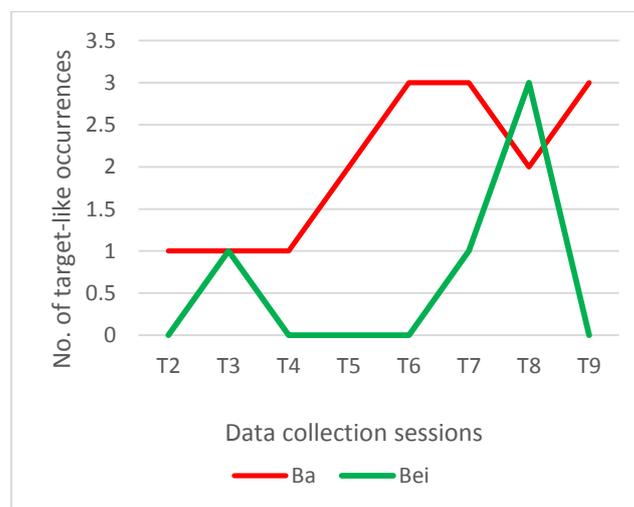


Figure 6.27 Daisy’s target-like production of *ba* and *bei* across the test tasks

Figure 6.28 illustrates Fiona’s target-like production of *ba* and *bei* constructions across test tasks. The profile of the *ba* production is wave-shaped across the data collection sessions. No *ba* construction is detected at the first data collection session. Nevertheless, T3 witnesses three target-like instances of *ba* construction. The number remains stable at T4, and then falls

gradually to zero output at T5. It rises again to three target-like productions at T8 but drops to zero still at T9. The production of *bei* shows more fluctuating features than that of *ba* construction. The first target-like utterance occurs at T3 and then drops to zero at T6. Nonetheless, the suppliance rises again to three target-like instances at T8 but drops to zero again at T9. Importantly, despite the fluctuation, Fiona’s acquisition of the *bei* constructions emerged at T8, according to our criteria.

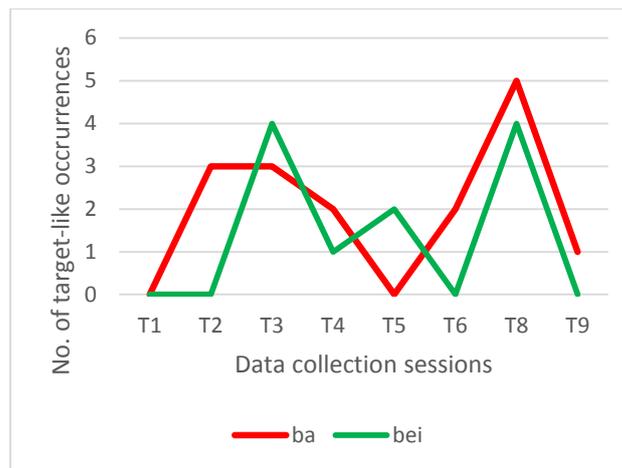


Figure 6.28 Fiona’s target-like production of *ba* and *bei* across the test tasks

As can be seen from the table below, the total number of occurrences and the emergence time for the target-like *ba* and *bei* construction production vary. However, a two-tailed, two sample T-Test with equal variance did not show significant difference between Fiona’s production of *ba* and *bei* constructions. The mean score is 1.44 and 0.56 respectively for the *ba* and *bei* constructions with $p=0.11 > 0.05$. Nonetheless, a t-test with scores excluded from the first four sessions, most of which are zero productions, reveals a difference between the mean scores of *ba* and *bei* (2.6 vs 0.8) constructions, and that the difference is statistically significant with $p=0.03 < 0.05$. In summary, Fiona acquired the *ba* construction at T3 and the *bei* construction at T8.

Table 6.18 Fiona’s target-like production over time

	<i>Ba construction</i>	<i>Bei construction</i>
T1	0	0
T2	0	0
T3	0	1
T4	0	0
T5	2	0
T6	3	0
T7	3	1
T8	2	3
T9	3	0

Figure 6.29 reveals Grace’s target-like production of *ba* and *bei* across test tasks. Grace did not produce a single *bei* construction. However, she provided 27 target-like *ba* constructions; the first three target-like *ba* constructions first occurred at T3. The production fluctuates a bit at T4 but rises to six and seven instances at T5 and T9. There is an overall upward development for *ba* constructions.

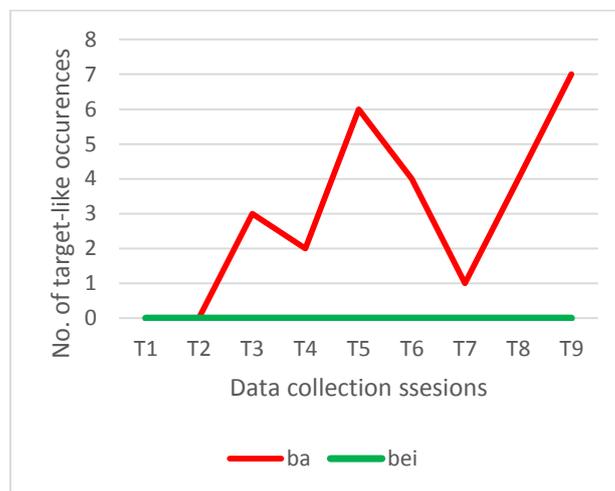


Figure 6.29 Grace’s target-like production of *ba* and *bei* constructions across the test tasks

Table 6.19 shows Grace’s supplience of *ba* construction over time: Grace produced a high percentage of target-like *ba* constructions (80%-100%) after the first three data collection sessions. A two-tailed t-test also confirms that a significant difference exists between Grace’s

production of *ba* and *bei* constructions with $p=0.00<0.05$, which indicates that the difference is above chance.

Table 6.19 Accuracy rate of Grace’s *ba* construction across test tasks

Data collection sessions	T1	T2	T3	T4	T5	T6	T7	T8	T9
Percentage of target <i>ba</i> constructions against total production	-	0 (0/2)	0.43 (3/7)	1.00 (2/2)	1.00 (6/6)	0.80 (4/5)	1.00 (1/1)	0.80 (4/5)	1.00 (7/7)

Notes: - means that there were zero instances of *ba* construction production

Figure 6.30 shows Harry’s production of *ba* and *bei* construction across the test tasks. No *ba* or *bei* production is found at the first two data collection sessions; nevertheless, the first batch of *ba* and *bei* constructions occurs at T3 and T4 respectively. The productions were four *ba* constructions at T3 and three *bei* constructions at T4. The production of both *ba* and *bei* drops to zero at the next data collection session and then rises up again. The *ba* construction output further drops slightly at the last data collection session, but the production of *bei* construction keeps on increasing. Interestingly, however, the mean production scores of *ba* and *bei* constructions do not differ significantly from each other over the data collection sessions, with *ba* and *bei* mean scores 1 vs 2, $p=0.29$, implicating that the differences in Harry’s *ba* and *bei* production simply occur due to chance.

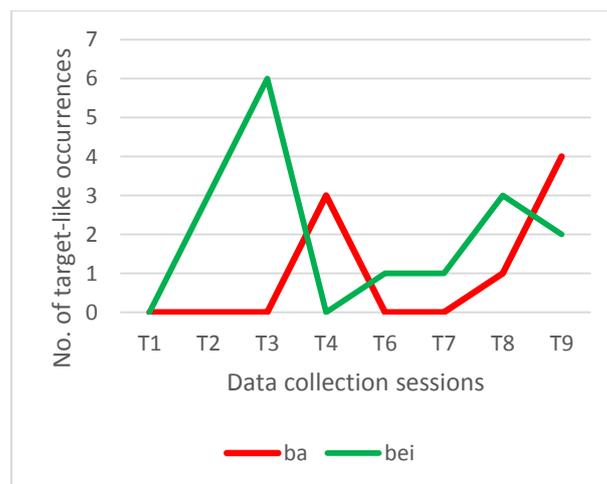


Figure 6.30 Harry’s target-like production of *ba* and *bei* across the test tasks

It should also be noted that over the data collection sessions, five *rang* ‘let’ utterances were also supplied, two target-like and one non-target production at T8, another two target-like at T9. *Rang*, along with *gei* and *jiao*, are the variants of *bei*, and they express the same ‘passivity’ ideas as *bei* in Mandarin. The difference between *bei* and the variant passive forms is that *bei* is a purely functional word, while the others can be thematic verbs; thereby bearing independent meanings.

Emily did not supply either target-like *ba* or *bei* constructions across the data collection period. In total, she supplied nine non-target-like *ba* constructions and two non-target *bei* constructions. One non-target *ba* construction was supplied at T2 in the picture description task and the rest at the same session in the *ba* construction task. Conversely, for the first *bei* construction, the non-target-like were supplied at T6 in the *ba* construction task and one non-target *bei* in the *bei* construction task. The finding implies that by the end of the data collection, Emily was unable to assign appropriate syntactic functions to the *ba* and *bei* constructions.

A further close comparison of the *ba* and *bei* production of the L2 learners shows a close to the significant difference between Grace and Harry’s production in *ba* ($p=0.06$) but not in *bei* ($p=0.52$). Close to the significant difference is found between Fiona’s production of *ba* and that of Harry ($p=0.06$) but not in the production of *ba* and *bei* constructions between the other Year 2

learners ($p>0.05$). The results shed some light on the different developmental patterns across the learners, which are assumed not just to be based on chance.

6.3.4 L2 learners’ development of negation

The production data for Year 2 learners (Daisy, Fiona, Harry, Grace and Emily) in Figure 6.31 shows that all the Year 2 learners behaved consistently in supplying both *bu* and *mei*. Although the target-like production of *bu* falls behind the target-like production of *mei*, the total production of *bu* surpasses that of *mei*. More specifically, over the data collection sessions and the test tasks, Year 2 learners supplied 905 instances of negative utterances with 725 instances of *bu* and 180 instances of *mei*, and target-like suppliance of *bu* falls behind with 86% of target-like *bu* and 94% of *mei*. However, it should be noted that the total production of *mei* is limited. The next chapter will discuss whether this suggests that the acquisition of *mei* occurs before *bu*. Figure 6.31 illustrates the different cases of *bu* and *mei* production, which not only confirms the early-noted points but also provides a closer view of the non-target production.

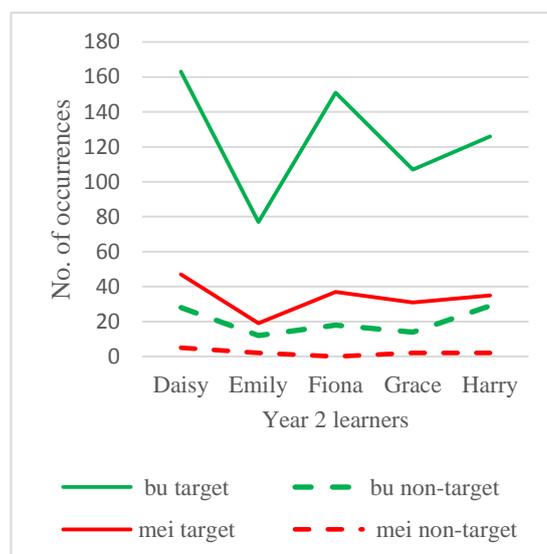


Figure 6.31 Year 2 learners' production of negators

A two-tailed T-test with unequal variance demonstrates that the target *bu* vs target *mei*, non-target *bu* vs non-target *mei*, target *bu* and non-target *bu*, target *mei* and non-target *mei* have respective *p*-values of 0.00, 0.01, 0.00 and 0.00, which means, the difference between each production pair is statistically significant.

Based on the overview, Figures (6.32-6.36) display the development of negators across the test tasks and over the data collection sessions. In the same vein, as it was in the data analysis of aspect markers, Daisy, Fiona, Grace and Harry's data were first presented, followed by that of Emily. There were two salient features for the four learners' production of target-like negation structures.

The first striking feature about the development route of target-like productions of *bu* and *mei* was that the development profiles of *bu* and *mei* were much similar to each other, as can be seen in Figures 6.32-36. Secondly, the number of *bu* occurrences surpasses that of *mei*. The figures also show that *bu* occurred at the first data collection session of all the four learners. When the first data collection started, Daisy, Fiona and Harry had acquired *bu*, as there were respectively eight utterances, ten utterances and nine utterances at the first data collection session. The exception was Grace, who supplied only one *bu* during the first data collection session. Conversely, just Harry was observed to have acquired *mei* with four target-like productions in the very first data collection session. Meanwhile, Grace supplied one *mei*, but the other two did not supply any *mei*.

Regarding L2 learners' production of non-target negators, the four figures reveal that the learners' non-target like the production of *bu* was strikingly similar to the profiles of the target-like development of *bu*, while there were no remarkable similarities between the target-like and non-target development of *mei* across the four Year 2 learners. Furthermore, the errors committed in non-target use of *bu* consistently surpassed that the non-target use of *mei* by L2 learners. In other words, while the total production of *mei* was limited, utterances with overtly marked *mei* were more likely to be produced in a target-like way.

Figure 6.36 displays Emily's production of negators across test tasks. Like the production of aspect markers, Emily's production of negators also showed distinctive features from the other four learners. In other words, Emily's target-like output of *mei* reveals a steady upward tendency.

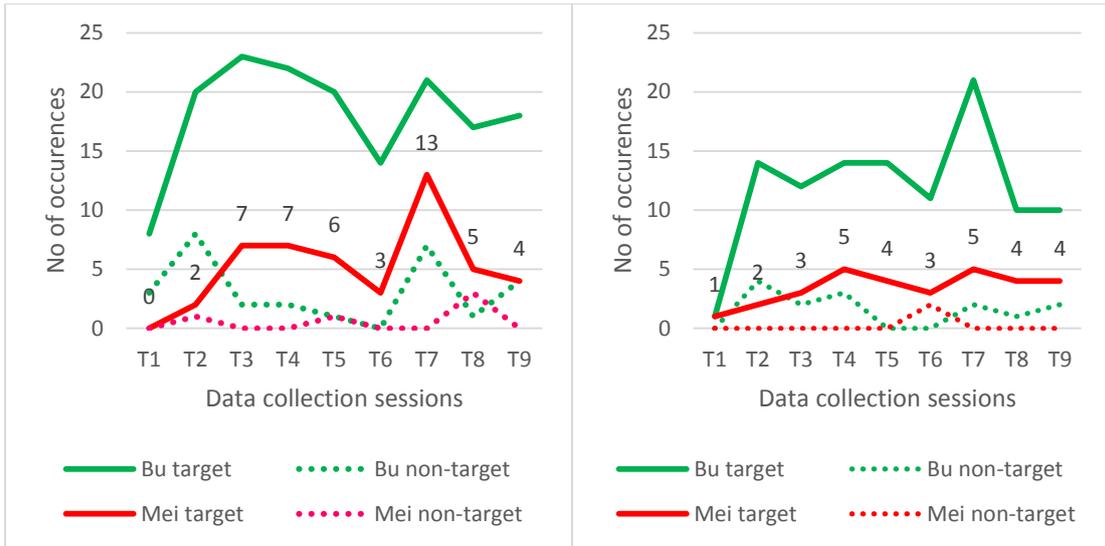


Figure 6.32 Daisy's production across test tasks Figure 6.33 Grace's production

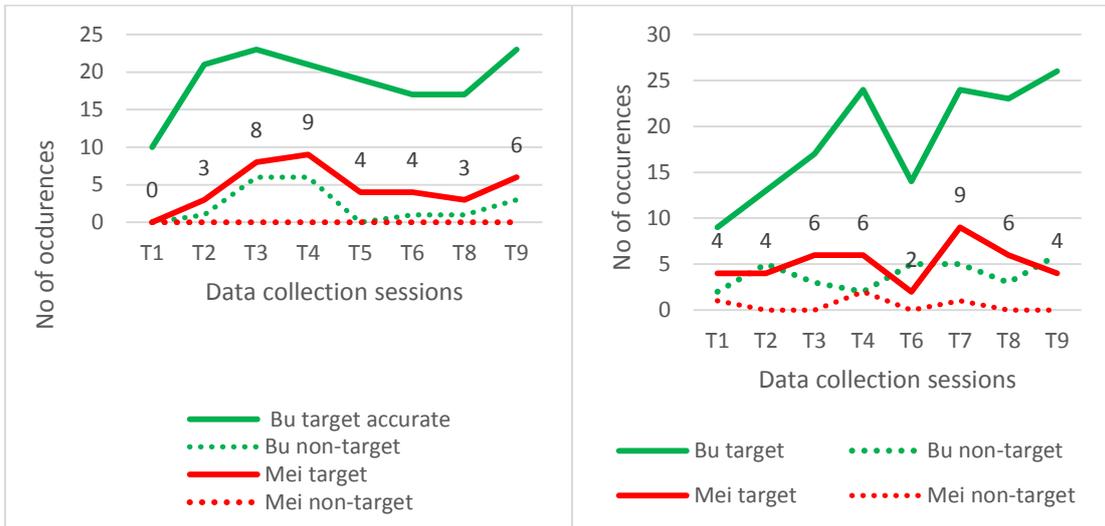


Figure 6.34 Fiona's production across test tasks Figure 6.35 Harry's production

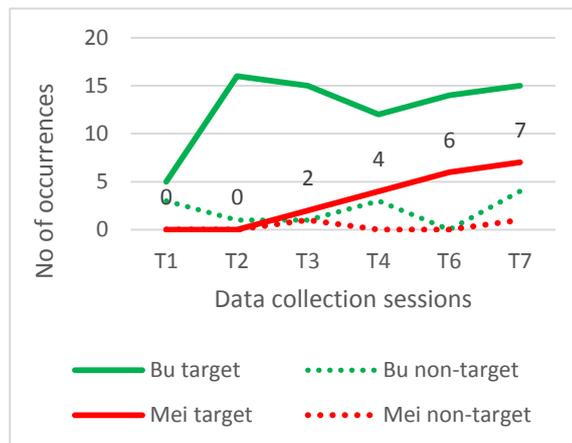


Figure 6.36 Emily's production of negators across test tasks

Two-tailed, unequal variance T-test analyses reveal statistically significant differences in Year 2 learners' target production of negators *bu* in Table 6.20. However, no significant difference is found between individual learners in the production of *mei*. This means that the cross-learner discrepancies in *mei + VP* were due to chance.

Table 6.20 T-test on the negation production results across Year 2 learners

	Mean score for <i>bu</i>	<i>P</i> value for <i>bu</i>	Mean score for <i>mei</i>	<i>P</i> value for <i>mei</i>
Daisy vs Emily	18.11 vs 12.83	$p=0.039^* < 0.05$;	5.22 vs 3.17	$p=0.26 > 0.05$
Daisy vs Fiona	18.11 vs 18.88	$p=0.73 > 0.05$;	5.22 vs 4.62	$p=0.71 > 0.05$
Daisy vs Grace	18.11 vs 11.89	$p=0.02^* < 0.05$;	5.22 vs 4.44	$p=0.20 > 0.05$
Daisy vs Harry	18.11 vs 18.75	$p=0.8 > 0.05$	5.22 vs 5.12	$p=0.95 > 0.05$
Emily vs Fiona	12.83 vs 18.88	$p=0.02^* < 0.05$	3.17 vs 4.62	$p=0.38 > 0.05$
Emily vs Grace	12.83 vs 11.89	$p=0.70 > 0.05$	3.17 vs 4.44	$p=0.84 > 0.05$
Emily vs Harry	12.83 vs 18.75	$p=0.06 > 0.05$	3.17 vs 5.12	$p=0.21 > 0.05$
Fiona vs Grace	18.88 vs 11.89	$p=0.01^* < 0.05$	4.62 vs 4.44	$p=0.32 > 0.05$
Fiona vs Harry	18.88 vs 18.75	$p=0.96 > 0.05$	4.62 vs 4.44	$p=0.70 > 0.05$
Grace vs Harry	11.89 vs 18.75	$p=0.03^* < 0.05$	4.44 vs 5.12	$p=0.08 > 0.05$

6.3.5 L2 Mandarin development in the production data: a summary

Tables 6.21-6.28 summarise the morpho-syntactic development of L2 Mandarin by each L1 English speaker over the test tasks and across the data collection sessions based on the emergence criteria, i.e. three target-like productions within one data collection session or three consecutive productions of one target-like item. At the bottom of each table are the linguistic items whose acquisition has been examined in this study; the leftmost column displays the different data collection sessions. The highlighted green areas denote the sessions where the mental representation of the lexical projections is formed, while the yellow areas indicate the establishment of the mental representations of the functional projections. Furthermore, the first yellow cell represents the session where the functional projection emerges. Meanwhile, ‘-’ stands for a learner’s absence.

Table 6.21 Alice’s L2 morpho-syntactic development

T9									
T8									
T7									
T6									
T5									
T4	-	-	-	-	-	-	-	-	-
T3									
T2									
T1									
	<i>bu</i>	<i>mei</i>	<i>zhe</i>	<i>le_l</i>	<i>guo</i>	<i>zai</i>	<i>le_h</i>	<i>ba</i>	<i>bei</i>

Table 6.22 Beth’s L2 morpho-syntactic development

T8									
T7									
T6									
T5									
T4									
T3									
T2									
T1									
	<i>bu</i>	<i>mei</i>	<i>zhe</i>	<i>le_l</i>	<i>guo</i>	<i>zai</i>	<i>le_h</i>	<i>ba</i>	<i>bei</i>

Table 6.23 Charles’ morpho-syntactic development

T9									
T8									
T7									
T6	-	-	-	-	-	-	-	-	-
T5									
T4									
T3									
T2									
T1									
	<i>bu</i>	<i>mei</i>	<i>zhe</i>	<i>le_l</i>	<i>guo</i>	<i>zai</i>	<i>le_h</i>	<i>ba</i>	<i>bei</i>

Overall, Year 2 learners’ acquisition demonstrates progress over Year 1 learners. Grace and Daisy were largely the same in the acquisition, while Fiona and Harry shared the same developmental route. As presented in Table 6.24, Grace acquired *le_l*, *bu* and *ba* construction at the same time, *mei* and *guo* later. Similarly, Daisy in Table 6.25 acquired *le_l*, *bu*, followed by *mei* and *ba phrases*, then *guo* and further on *zai*; nonetheless, at the end of the data collection session, Grace’s suppliance of *le_h* did not reach the acquisition criteria of the study, i.e. three target-like productions and one target-like production over three consecutive data collection sessions. However, unlike Grace, Daisy managed to acquire the *bei* constructions.

Table 6.24 Grace's morpho-syntactic development

T9									
T8									
T7									
T6									
T5									
T4									
T3									
T2									
T1									
	<i>bu</i>	<i>mei</i>	<i>zhe</i>	<i>le_l</i>	<i>guo</i>	<i>zai</i>	<i>le_h</i>	<i>ba</i>	<i>bei</i>

Table 6.25 Daisy's L2 morpho-syntactic development

T9									
T8									
T7									
T6									
T5									
T4									
T3									
T2									
T1									
	<i>bu</i>	<i>mei</i>	<i>zhe</i>	<i>le_l</i>	<i>guo</i>	<i>zai</i>	<i>le_h</i>	<i>ba</i>	<i>bei</i>

Tables 6.26-27 present Harry's and Fiona's L2 Mandarin production. As shown in Table 6.26, Harry acquired *le_l*, *bu* and *mei* right from the first data collection session. Then acquisition of *guo* and *bei* followed at T3 and *ba* construction at T4 and *le_h* at T6, but *zai* and *zhe* were not acquired. Fiona instead acquired all the linguistic items apart from *zhe*.

Table 6.26 Harry's L2 morpho-syntactic development

T9									
T8									
T7									
T6									
T5	-	-	-	-	-	-	-	-	-
T4									
T3									
T2									
T1									
	<i>bu</i>	<i>mei</i>	<i>zhe</i>	<i>le_l</i>	<i>guo</i>	<i>zai</i>	<i>le_h</i>	<i>ba</i>	<i>bei</i>

Table 6.27 Fiona's L2 morpho-syntactic development

T9									
T8									
T7	-	-	-	-	-	-	-	-	-
T6									
T5									
T4									
T3									
T2									
T1									
	<i>bu</i>	<i>mei</i>	<i>zhe</i>	<i>le_l</i>	<i>guo</i>	<i>zai</i>	<i>le_h</i>	<i>ba</i>	<i>bei</i>

Although Fiona produced three negative utterances at T2, it is concluded that she acquired negation at T3. As revealed in the following instances, her negative production at T2 was realised as *meiyou*; thereby indicating that Fiona had not acquired the rule of negation with *mei*.

Table 6.28 presents Emily's development of L2 Mandarin. It is worth noting that, unlike all the other learners in this study, Emily is the only person who acquired *zhe*. Apart from *zhe* at T2, she acquired both negators and only aspect markers *le_l* and *le_h*.

Table 6.28 Emily's L2 morpho-syntactic development

T9	-	-	-	-	-	-	-	-	-
T8	-	-	-	-	-	-	-	-	-
T7									
T6									
T5	-	-	-	-	-	-	-	-	-
T4									
T3									
T2									
T1									
	<i>bu</i>	<i>mei</i>	<i>zhe</i>	<i>le_l</i>	<i>guo</i>	<i>zai</i>	<i>le_h</i>	<i>ba</i>	<i>bei</i>

A synthesised view of the morph-syntactic development of all the eight learners is presented in Table 6.29. Developmental features based on the acquisition results will be discussed further in Chapter 7.

Table 6.29 L2 learners' emergence points for different functional elements

	<i>bu</i>	<i>mei</i>	<i>zhe</i>	<i>le_l</i>	<i>guo</i>	<i>zai</i>	<i>le_h</i>	<i>ba</i>	<i>bei</i>
Alice	T2	-	-	T8	-	-	-	-	-
Beth	T2	T3		-	-	-	-	-	-
Charles	T2	T5		T2	T8	T2	T3	-	-
Daisy	T1	T3	-	T2	T4	T5	T6	T6	T8
Fiona	T1	T2	-	T2	T4	T3	T4	T2	T3
Grace	T2	T3	-	T2	T6	T9	-	T3	-
Harry	T1	T3	-	T1	T3	-	T6	T8	T2
Emily	T1	T4	T2	T1	-	-	T6	-	-

In summary, the above tables chart the eight L2 learners' acquisition order of the functional items. Year 1 learners' data reveals that it took time for L2 learners to be able to form mental representations of the test items. The lack of acquisition of functional items by the *ab initio* learners confirms OG's prediction that language acquisition starts with a bare VP and that learners then slowly build up functional syntax. The later acquisition of *ba* and *bei* also indicates stage-like development features; that will be discussed in Chapter 7.

So far, we have carefully examined Year 2 learners' production of both functional (aspect markers, *ba* and *bei*) and lexical items (*bu* and *mei*) and left untouched more insightful understanding of how learners linked those items in relation to each other. Thus, the following section reports the results from both Year 1 and Year 2 learners' grammaticality judgement data, where learners' knowledge was probed for the interaction between negators and aspect markers, the interaction between negators and aspect markers in the *ba* and *bei* constructions.

6.4 L2 Mandarin Development in the Acceptability Judgement Data

Following the investigation of individual morpho-syntactic structure elements in the production data, the grammaticality judgement tests were undertaken to examine the extent to which learners accepted the co-occurrences of morpho-syntactic items, i.e. negators, aspect markers, *ba* and *bei* constructions in utterances and how their acceptance changed over time. Specifically, the grammaticality judgement tests investigate whether there are significant changes in learners' judgement scores due to variables like time, morpho-syntactic items, year groups or the interactions between them. Two-way repeated measure analyses (ANOVA) were undertaken. The General Linear Model (GLM) revealed no statistically significant differences in learners' acceptance judgements of the co-occurrences of aspect markers and negation, aspect markers and *bei* constructions; some significant differences, however, were found for L2 learners' acquisition of aspect markers and negation in the *ba* construction. As the learners in the present study are early stage learners and the Likert scale with a middle point is arguable, the test results in the grammaticality judgement tests are not reported in the thesis apart from a brief account of both Year 1 and Year 2 learners' recognition of the negation in *ba* construction. Both Year 1 and Year 2 learners initially accepted that the positing of *bu* 'not' in front of *huangei* 'return' as the appropriate syntactic position of negation. Among all the learners, only Grace recognised this was ungrammatical during the final few sessions of data collection. This provides firm evidence that the majority of the Year 1 and Year 2 learners had not established the functional projection of NegP, which is postulated to reside between AspP_m and AspP_h.

- (6.33) a. **ta* *ba* *wo* *de* *shu* *bu* *huangei* *wo.*
 3SG BA 1SG DE book BU return 1SG
 ‘She didn’t get my book returned to me.’
- b. *ta* *bu* *ba* *wo* *de* *shu* *huangei* *wo.*
 3SG BU BA 1SG DE BU return 1SG
 ‘She didn’t get my book returned to me.’

6.5 Conclusion

This chapter has reported the results of tasks undertaken by L2 learners and the indications of the results on learners’ acquisition of different linguistic items over the data collection sessions and across the test tasks. Each learner’s development of the task results has been discussed, and the emergence points (i.e. the point of acquisition) for each session have also been charted. In addition, grammaticality judgement data have been examined, and co-occurrences of functional items with the *ba* construction have shown significance. By probing into L2 learners’ production and comprehension data, this chapter has examined two research questions, recaptured as below:

- Q1: Where the word order in the verb phrase is different in English and Mandarin, do the learners in this study use the order of their L1 English or the order of Mandarin?
- Q2: Do L2 Mandarin learners project functional elements in a stage-like manner, that is, from bottom to top, in accordance with the route, predicted for this by OG?

The analyses of longitudinal and cross-sectional production data across a range of tasks have confirmed hypotheses that when L1 and L2 VP head directionality is the same, L2 learners use head-initial VPs. When the word order in VP is different in English and Mandarin, the learners in the study still use the order of their L1 English. Such results conform to the hypotheses of OG and its earlier studies (Vainikka and Young-Scholten 1994, 1996a). Additionally, L2 learners were found to use bare VP forms.

Reports were also made in this chapter regarding the development of discrete functional projections, that learners were predicted to use to build clause structure in a stage-like manner incrementally. Whether there was stage-like development and why will be elaborated on in Chapter 7.

CHAPTER 7 DISCUSSION

7.1 Introduction

Chapter 6 presented the results from L2 learners' acquisition of VP word order, aspect markers, negators, *ba* and *bei* constructions over time. As noted previously, the results were approached from the perspectives of both individual learners and the two-year groups, covering the analyses of both the production and the acceptance judgement data. Nonetheless, as they are merely discretely described, it remains unclear how those distinct functional elements, when combined, demonstrate the predicted development based on the Mandarin tree (see Chapter 3). In addition, the extent to which OG can provide interpretations for the acquisition results is yet to be clarified (Vainikka and Young-Scholten 2015).

This chapter discusses how the results from Chapter 6 shed light on the following two assumptions of OG:

Assumption 3: Universal Grammar provides the tools for acquiring the Master Tree, based on input.

(Vainikka and Young-Scholten 2011: 12)

Assumption 4: The master tree is acquired from the bottom up.

(Vainikka and Young-Scholten 2011: 13)

Specifically, the chapter examines the following four aspects. Firstly, it investigates whether English speakers start Mandarin acquisition from the bottom of the tree, that is, the bare VP or lexical projections. Secondly, it explores whether L2 learners build up functional projections along the predicted acquisition stages [Assumption 4]. Thirdly, it looks into whether the textbook input order affects learners' acquisition results. Finally, it elaborates on whether Mandarin acquisition results from the interaction between UG, here X' theory and the target language input [Assumption 3]. Therefore, the discussion in this chapter will be OG-centred and, where necessary, it will also be linked to a broader context of second language acquisition and syntax theories.

Prior to the discussion, four points are worth noting: the relationship between functional morpheme and syntactic structure, the acquisition criterion for a functional projection in case of multi-morphemes and a full picture of L2 learners' development of functional elements. Firstly, it is necessary to restate Bakers' Mirror Principle (1985) and Vainikka and Young-Scholten's (2011) assumption of tight coupling between the development of grammatical morphemes and the development of syntactic structures (Vainikka and Young-Scholten 1994,

2011, 2013). These are the fundamental assumptions underlying the predictions made in the present thesis. These assumptions provide the basis on which it has been proposed that functional morphemes' upward development from *bu/mei*>*le_l*>*ba*>*bei*>>*zai*>*mei/bu*>*le_h* in the target-like syntactic positions corresponds to the development of functional projections from $AspP_l > BaP > BeiP > AspP_m > NegP > AspP_h$.

Secondly, the present thesis holds that multi-morphemes can be accommodated in a functional projection and occupy the same functional head. That is, *zhe*, *le_l* and *guo* may all belong to one functional projection $AspP_l$. However, the relevant sections will also explore the possibility of each functional morpheme belonging to a functional projection.

Thirdly, Year 2 learners' acquisition results are more or less the continuity of those of Year 1 learners due to the homogeneous characteristics of Year 1 and Year 2 learners in this study. In other words, they all came from an L1 English background and had received no Mandarin instruction before their Mandarin programme (apart from Charles, who is discussed below). Furthermore, they used the same teaching material and were taught by the same group of native-speaking Mandarin instructors.

Fourthly, Table 7.1, as recorded in Chapter 6, highlights the emergence points of all the tested functional elements of all learners to provide a full account of the development of functional projections over the data collection period and over the test tasks. The table presents clear evidence of early acquisition of *le_l* and *bu* by most L2 learners. Due to the debated nature of negation and variability in learners' acquisition of *zhe*, *le* and *guo*, an inclusive picture of those functional elements in the acquisition table will hinder discussion of the general development stages in L2 learners' data. Thus, the ensuing discussion must first establish a good understanding of learners' acquisition of $AspP_l$, BaP , $AspP_m$, $AspP_h$ and $BeiP$ before it addresses the acquisition of negation, here *bu* and *mei*, and internal functional elements of $AspP_l$, that is, *zhe*, *le* and *guo*. Given the above, Table 7.2 presents the results from Table 7.1 but with the acquisition of negation temporarily removed, as Section 7.6 is dedicated to a more detailed account of its acquisition. As can be seen from the table, much clearer development stages are exposed after setting aside the acquisition.

Table 7.1 L2 learners' emergence points for different functional projections

	<i>bu</i>	<i>mei</i>	<i>zhe</i>	<i>le_l</i>	<i>guo</i>	<i>zai</i>	<i>le_h</i>	<i>ba</i>	<i>bei</i>
Alice	T2	-	-	T8	-	-	-	-	-
Beth	T2	T3		-	-	-	-	-	-
Charles	T2	T5		T2	T8	T2	T3	-	-
Daisy	T1	T3	-	T2	T4	T5	T6	T6	T8
Fiona	T1	T2	-	T2	T4	T3	T4	T2	T3
Grace	T2	T3	-	T2	T6	T9	-	T3	-
Harry	T1	T3	-	T1	T3	-	T6	T8	T2
Emily	T1	T4	T2	T1	-	-	T6	-	-

Table 7.2 The emergence order of functional morphemes in L2 learners' data

Year 1 learners	
Alice: <i>le_l</i>	(Notes: <i>zai</i> , <i>ba</i> and <i>bei</i> were not acquired)
Beth: /	
Charles: <i>le_l *zai > le_h</i>	(Notes: <i>ba</i> and <i>bei</i> were not acquired)

Year 2 learners	
Daisy: <i>le_l > ba > zai > le_h > bei</i>	
Fiona: <i>le_l & ba > zai & bei > le_h</i>	
Grace: <i>le_l > ba > zai</i>	(Notes: <i>le_h</i> and <i>bei</i> were not acquired)
Harry: <i>le_l > bei > le_h > ba</i>	(Notes: <i>zai</i> was not acquired)
Emily: <i>le_l > le_h</i>	

Note that with previous justification (Baker 1985; Vainikka and Young-Scholten 1994, 2011), the acquisition sequence of functional morphemes along with their appropriate syntactic position in Table 7.2 is translated into learners' acquisition sequence of functional projections in Table 7.3. As mentioned previously, while Charles' total production did not reveal significant differences from those of the other Year 1 learners, there were qualitative differences in his production of functional elements. Thus, Year 1 learners will be further categorised into *ab initio* learners (Alice and Beth) and Charles.

Table 7.3 The emergence of functional projections in L2 learners' data

<p>Year 1 learners Alice: AspP_l Beth: / Charles: AspP_l & AspP_m > AspP_h</p> <p>*****</p> <p>Year 2 learners Daisy: AspP_l > BaP > AspP_m > AspP_h > BeiP Fiona: AspP_l & BaP > AspP_m & BeiP > AspP_h Grace: AspP_l > BaP > AspP_m (Notes: AspP_h or BeiP was not acquired³⁹.) Harry: AspP_l > BeiP > BaP > AspP_h (Notes: AspP_m was not acquired.) Emily: AspP_l > AspP_h</p>	
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Given the above, this chapter is structured into nine sections. Section 7.2 synthesises evidence from different test tasks and further justifies a bare VP stage for the *ab initio* learners. More importantly, it examines the implications of a bare VP stage. Section 7.3 verifies learners' two stages at the IP layer, i.e. the lower and upper stages. Following discussion of the production data in Sections 7.2 and 7.3, Section 7.4 addresses the results of the acceptability judgement tasks, focusing on whether the findings reinforce or contradict the results yielded from the production data. Section 7.5 particularly addresses variability in Year 2 learners' development and addresses whether OG can accommodate the variation. Section 7.6 explores several aspects regarding L2 learners' acquisition of negation and the internal acquisition feature of AspP_l. Section 7.7 discusses the source of L2 Mandarin development and 7.8 reflects on OG's predictive power and explanatory strengths regarding L2 Mandarin acquisition. Section 7.9 concludes the chapter. Bare VP Stage

Figure 7.1 presents a vP that dominates a minimal lexical projection VP. As noted previously, the VP part of the syntactic tree displays the hierarchical relations within VP, i.e. between V, its complement and its specifier rather than the surface word order of VP. OG (Vainikka and Young-Scholten 1994, 1996a, 1998, 2013) argues that as illustrated in Figure 7.1, the beginning of L2 acquisition features as a lexical projection stage and L2 learners can only project the minimal VP structure. The figure demonstrates that the Mandarin VP word order, identical to learners' L1, was adopted by L2 learners. Meanwhile, as predicted, genuine L2 beginners did

³⁹ The acquisition of AspP_m is to be discussed in Section 7.5.

not have a fully-fledged mental representation of the functional projections due to the lack of suppliance of functional projections like *AspP_m*, *AspP_h*, *BaP* or *BeiP*.

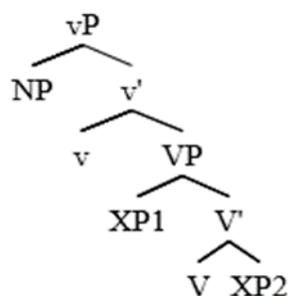


Figure 7.1 VP lexical projection

7.2 The acquisition of L2 VP word order

There has been a consensus within the generative approach to L2 acquisition regarding L2 learners' acquisition of VP head directionality at the initial stage, as recalled briefly below. The Minimal Trees Hypothesis argues that L2 learners transfer their L1 VP head-directionality, based on learners' acquisition of L2 German (Vainikka and Young-Scholten 1994, 1996; Hawkins 2001). Likewise, Schwartz and Sprouse (1994) recognise L1 transfer and note that learners instantly re-set L1 VP headedness according to L2 head-directionality parameter. Thus, across the generative literature, the transfer of L1 VP headedness is counted as an important indicator of direct access to UG for L2 learners.

Regarding the results of the present study, it needs stressing that VP headedness which contradicts the learners' L1 English at VO level is not displayed; nonetheless, it should be highlighted that, at XV level, i.e. the subdomain of L2 VP, interlanguage word order is compatible with English L1 VP and can be illustrated in two aspects.

On the one hand, the *ab initio* learners' acquisition of VP word order demonstrates that there is consistent suppliance of a great majority of VPs with VO word order and a limited number of peripheral *VX and *OV word order. That is, *ab initio* learners used VO order in 91% of their L2 VPs and among the remaining 9% of VPs with non-target word order, 82% of Alice's and 84% of Beth's errors were respectively attributed to the *VAdv and *OV types. Errors account for 53% of Alice's and 76% of Beth's total non-target production. The non-target production did not occur at the first data collection but increased in total production over time. The peak production occurred at T7 (Alice) or T8 (Beth) but dropped at the last data collection.

VP word order at XV level can be considered evidence of L2 learners' transfer of L1 VP word order.

Here, it is worthwhile recalling that VP headedness transfer in OG studies (Vainikka and Young-Scholten's 1994, 1996a, 2011). That is, those studies find that Korean and Turkish learners, whose L1 VP headedness is head-final, straightforwardly acquired L2 German head-final VP. Nonetheless, the English, Italian and Spanish learners of German experienced an adaptation period due to the differences in VP headedness. They first adopted head-initial VPs corresponding to their L1s, before switching to L2 German VP headedness. It has been argued that compelling evidence of L1 transfer should come from two languages with distinctive VP headedness features.

So far, the current study has endeavoured to demonstrate that the interweaving of stable suppliance of head-initial VP by L2 learners with persistent non-target-like suppliance of word order XV level projects a more reliable picture of L2 Mandarin word order acquisition reality. In other words, the dominant VP headedness word order can be acquired straightforwardly, while the acquisition of sub-domain of VP word order seems to be an extended task. As learners' L1 and L2 VP headedness is the same in this study, there are two ways to interpret the VP headedness in L2 learner data. One way is to take the head-initial VP as the transfer of L1 English VP headedness. In that case, L2 learners of Mandarin seem to have direct access to UG word order parameter, and the value of VP headedness seems to be set instantly, right at the start of L2 acquisition. By contrast, the acquisition of VP word order at XV level is an extended task, and it is more highly likely that it will take much longer to achieve. Such an account is compatible with Schwartz and Sprouse's observation of the acquisition of the L2 grammatical system, as quoted below:

L1 parameter values serve as part of the INITIAL STATE (Schwartz 1987; White 1985, 1989b); the system of L2 knowledge changes as more and more PLD⁴⁰ are perceived to be in need of accommodation, forcing the parameter values revised (and perhaps re-revised) along the way.

(Schwartz and Sprouse 1994: 319)

⁴⁰ Primary linguistic data

Therefore, it is summarised that the two *ab initio* learners consistently supplied L1 head-initial VPs, confirming the L2 Mandarin head-initial VP and meanwhile demonstrating interlanguage characteristics, which is contradictory primarily to Mandarin's specific XV order in peripheral VP domain. Thus, this section concludes that the two L2 learners indeed persistently adopted their L1 English VP headedness straightforwardly from the start, not contradictory to what has been observed by Vainikka and Young-Scholten (1994), Schwartz and Sprouse (1996)⁴¹ and Hawkins (2001, 2006). Simultaneously, due to the linguistic features of Mandarin, L2 learners' persistently adopted L1 VP word order when Mandarin offers no other options at XV level, suggesting that the resetting of VP word order parameters was a challenging task and it had not been achieved by the end of the data collection by the two *ab initio* learners. They managed to realise only that VP headedness differs in certain constructions, i.e. VAdv.

One further point pertinent to learners' acquisition of VP word order is Alice's occasional production of head-final VPs. Regarding her non-target production of head-final VPs, it is worth mentioning that the position of O before V was restricted to only the verb in the data *bangzhu* 'help' in 'pronoun + *bangzhu* (help), resulting in a non-target utterance. This production is unlikely to result from the L2 Mandarin input that Alice received because all the Mandarin instructors of the programme spoke standard Mandarin in both phonological and syntactic terms. Nor was it possible to presume that the position of O was due to Alice's incomplete production of *ba*+NP+VP because she did not produce any *ba* constructions in the *ba* phrase translation task. Furthermore, it was not due to her production of any *bei* constructions, where O can be raised to be the head of V. Thus, the most likely explanation for her non-target production is her on-going German acquisition; thereby resulting in the transfer of German head-final VP.

The above interprets the results relevant to the first research question of the present study. The following two sections discuss the bare VP account of OG by referring to L2 data of *ab initio* learners in the present study. However, it is worth recalling that a series of OG works (Vainikka and Young-Scholten 1994, 1996a, 1996b, 1998, 2011, 2013) proposed, based on research findings in child L1 and adult L2 acquisition of German, a language with a rich system of inflectional morphemes, that language develops universally from a bare VP. In other words, a VP without inflectional morphology that, for example, marks tense, modality, agreement or

⁴¹ Note that Schwartz and Sprouse (1996) contend for the transfer of not only the lexical phrase but also functional phrases at the initial stage of L2 acquisition.

complementiser status. As noted earlier, a bare VP syntax in Mandarin lacks the functional projections $AspPs^{42}$, $NegP$, BaP and $BeiP$. Based on Tables 7.1-7.3, I argue that there is a bare VP stage in L2 learners' initial L2 Mandarin development. For Beth, this stage lasted until the data collection ended, while for Alice, it extended until she acquired $AspP_l$ at the eighth data collection session.

7.2.1 *The emergence of $AspP_l$ in ab initio learners' mental representation*

To operationalise learners' acquisition of functional projections in empirical data, we need to take another look at the acquisition criteria adopted in Section 5.6.1, Chapter 5, namely, three target-like productions in one session or one production over three consecutive sessions. Although highly applicable, the criteria did not take into account the cases where the same functional projection is represented by different functional morphemes. As discussed in the introductory section, three aspect morphemes, *le*, *zhe* and *guo* in post-verbal position serve the same functional projection $AspP_l$. This case is similar to $AgrP$ in German, where four morphemes are posited in the head position of $AgrP$. On such an occasion, Vainikka and Young-Scholten (1994: 279) hold that acquisition of "at least two correct instances of four different agreement suffixes" as the acquisition of $AgrP$. As the case for $AspP$ is different from German $AgrP$, there can be two possibilities that account for the acquisition of $AspP_l$: a broad criterion and a narrow criterion. The former counts the acquisition of one morpheme as the acquisition of $AspP_l$ and the latter the acquisition of two out of three as the acquisition of $AspP_l$. In Chapter 6, Beth is reported as not having acquired any of aspect markers, and Alice only *le* at T8. If a broad criterion is applied, Alice is considered to have acquired the functional projection of $AspP_l$ at the eighth data collection session, which is after eight months' Mandarin instruction. Conversely, Alice could be thought not to have projected $AspP_l$ headed by *le*; thereby remaining at the bare VP stage like Beth. As Alice and Beth are *ab initio* learners. I consider the emergence of one target-like post-verbal aspect morpheme as evidence the learner has posited an $AspP_l$ and conclude that Alice has indeed done so. Meanwhile, it is noteworthy that when narrower criteria are implemented, neither of the *ab initio* learners is considered to have posited $AspP_l$ and both of them would remain at the bare VP stage.

Whether broad or narrow, two points can be confirmed. On the one hand, there is a long period of absence of aspect markers in the L2 acquisition of one *ab initio* learner (Alice), that is, a

⁴² Collectively called after $AspP_l$, $AspP_m$ and $AspP_h$.

long period of no evidence for projections above VP in her data. There is also no evidence during this time for transferred functional projections. Conversely, Beth, the other *ab initio* learner, never supplied any aspect markers or produced other morphemes that might indicate the transfer of an L1 projection.

To summarise, among the three Year 1 learners, Charles displayed evidence of positing functional projection. The real *ab initio* started with their L1-based head-initial bare VP, and after around 132 hours of classroom instruction, one learner demonstrated early signs of positing a functional projection⁴³. The acquisition stages of the two *ab initio* learners are illustrated in Figure 7.2.

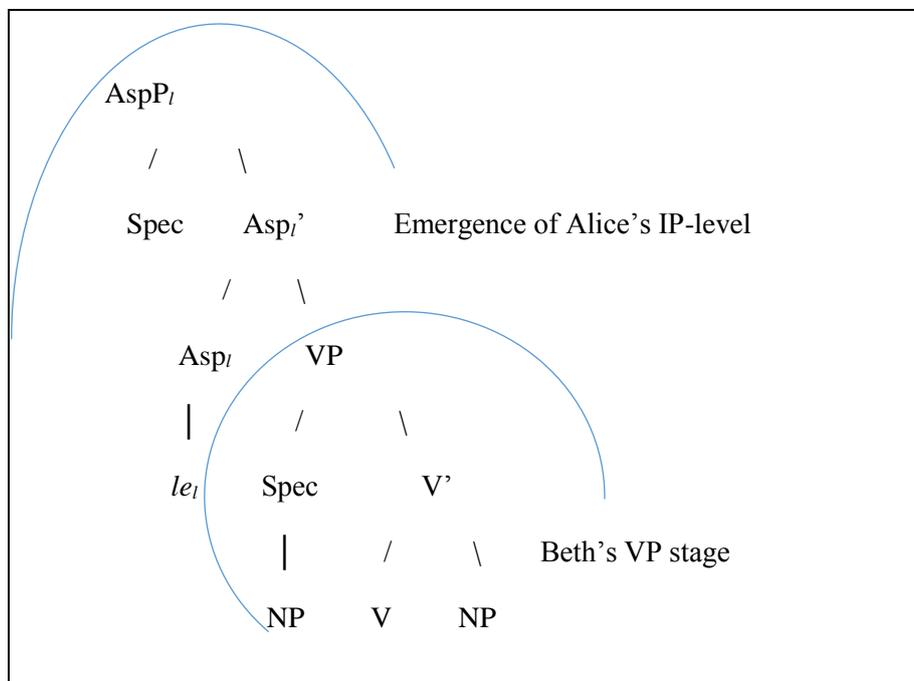


Figure 7.2 *Ab initio* learners' at different acquisition stages by the end of data collection

Ab initio learners' sparse production of aspect markers prompts several questions:

- (1) Is the sparse production of the aspect markers due to learners' lack of acquisition of their phonetic forms (PFs)?
- (2) Is the absence of aspect marking due to L2 learners' avoidance strategies?
- (3) Are missing aspect markers evidence of deficit syntactic representation?

⁴³ Note that this does not mean that Alice and Beth have made almost no progress in their L2 Mandarin acquisition. Rather, the learners made progress in Mandarin phonology and the writing system. Importantly, they were successful in stringing the phonetic forms based on VP headedness into utterances to communicate meaning in Mandarin.

The answer to the first question is probably no. An analysis of the textbook used in the learners' Mandarin classes shows that by the end of the data collection, L2 learners had been instructed in the order of *le_l-le_h-zai*. Moreover, Alice did not lack the PFs of *le_l* and *zai*, as can be seen from her production of the two aspect markers at T2 in examples (7.3) and (7.4). Further, her production of aspect markers was in appropriate syntactic positions, i.e. *le* after V and *zai* before V. These examples from her production seem to suggest these were from the classroom input that Alice had received by T2 regarding aspect markers. Alice's production of those aspect markers occurs much earlier than that of Beth, whose first production of *le_h* (V+O+*le_h*) occurred at T6, as shown in the examples (7.5) and (7.6). Nonetheless, Alice and Beth's subsequent production of aspect markers remains sporadic.

(7.3) *jia* demolished *le*.
house demolish LE
(Target: *fangzi zhengzai bei ren chaichu*.)
'The house is being demolished.' (Alice: T2_Picture description)

(7.4) *mama zai* *chi fan*.
Mum PROG eat food
'My mum is having some food.' (Alice: T2_Picture description)

(7.5) *ta wushi nian shi solider le*.
3SG fifty year besolider PFV/CRS
(Target: *ta wushinianqian dang guo bing*.)
'She was a solider fifty years ago.' (Beth: T6_Picture description)

(7.6) *ta hen da nian le*.
3SG very old year PFV/CRS
(Target: *ta nianling hen da le*.)
'She is very old.' (Beth: T6_Negation1)

Given that repeated tests were conducted monthly over nine data collection sessions for this study, it is untenable to claim that absence of a functional projection is due to the lack of phonetic forms at the IP layer. In contrast, the absence means that L2 learners have not posited the functional projections relating to aspect with these aspect markers as the functional heads. The L1 could be playing a role here in terms of learners' expectations in the light of the weak features of Mandarin verbs, which do not require agreement or tense checking as in English.

For the second question, arguing either against or for the use of avoidance strategies in L2 learners' production highlights learners' consistent and complete lack of functional projections for aspect. Here, an avoidance strategy refers to learners' non-production of functional

elements due to their concerns over committing errors (see, e.g. Schachter 1974, 1987, 1988). Again, we recall that the data extended over one academic year in nine sessions. Long-term absence of functional elements is less likely to be due to either intended or unconscious avoidance than to non-existence of functional projections in L2 learners' mental representations. In other words, L2 learners had not posited projections in response to the L2 input that they were receiving.

The third question is of the type posed by the Full Transfer/Full Access Hypothesis (Schwartz and Sprouse 1996) and Missing Surface Inflection Hypothesis (Lardiere 2010). The former claims a full syntactic tree in L2 learners' mental presentation but argues for the de-linking of inflectional morphemes with their corresponding functional projection in syntactic structure. In other words, the absence of evidence of inflectional morphology does not signify the absence of corresponding functional projection in syntactic structure. The answers to the first and the second questions have already illuminated the third question. Further light can be shed by the absence of *zai* in both Alice and Beth's production, thereby indicating the lack of transfer of progressive aspects from English and the associated IP-level projection acquisition. See, also, studies on the early acquisition of progressive aspect in English in both child L1 and adult L2 learners of English, e.g. Brown (1973) and Bailey, Maiden and Krashen (1974).

7.2.2 The emergence of BaP and BeiP in ab initio learners' mental representation

Based on the results reported in Chapter 6, apart from lacking the lowest level of functional projection, neither of the *ab initio* learners had posited *BaP* and *BeiP* by the end of the data collection. The acquisition results of *ba* construction are consistent with the findings from an earlier longitudinal study of L2 Mandarin grammatical development (Wang 2011). Two out of eight of the participants in Wang's study, H and M, were Year 1 learners. They shared some similarities with the *ab initio* learners in this study in that they were studying other languages alongside Mandarin, and used the textbook *Integrated Chinese* as course material. The difference between them was that H and M had some contact with Mandarin before they started their university Mandarin programme. For instance, H had stayed in mainland China for close to three months as an English teacher before he started his Mandarin programme while M had visited China for a week for a sports event. Moreover, though M's English was almost native-like, her first language was German and not English.

An examination of their data displays that M supplied two *ba* utterances over one academic year, that is, also over nine monthly data collection points (Wang 2011: 135), but neither was

target-like. In contrast, H managed to supply two target-like *ba* utterances (out of five produced). Hence, according to the emergence criteria of this study, neither M nor H should be considered to have displayed early signs of positing *BaP*. Unfortunately, it was unclear whether the two learners managed to supply *bei* construction, as this was not specified in Wang's report. The absence of *BaP* and *BeiP* data from the present study implies that acquisition of functional projections at an upper node does not occur until both learners have acquired lower nodes of the syntactic tree, a crucial assumption under OG.

7.2.3 Summary

Alice's acquisition of *AspP_l* occurred at T8, and Alice and Beth were *ab initio* learners with no previous contact with Mandarin. In other words, they had not previously learned Mandarin at secondary school; nor did they live in Mandarin communities or visit China before they started their Mandarin programmes. The acquisition results of Alice and Beth collected through multiple oral production tasks and over nine data collection sessions confirm that their Mandarin syntax was represented as a bare VP.

The absence of *AspP_l*, which is right above VP, along with the absence of *BaP*, *BeiP* and the other aspect phrases, higher in the IP layer, confirms a bare VP stage in L2 learners' development. Such a claim, as can be seen in Chapter 6, considers the cases where the absence of aspect markers⁴⁴ are not the absence of phonetic forms but the mental representation. Therefore, it can be concluded that L2 learners' acquisition of Mandarin VP headedness supports the OG hypothesis that L2 acquisition starts with a lexical verbal projection or bare VP, with transferred VP headedness.

7.3 Stages at the IP Layer

As discussed in Chapter 3 on Mandarin syntax, functional projections at the IP layer of Mandarin clauses involve *AspP_l*, *BaP*, *AspP_m*, *AspP_h* and *BeiP*. The data collected from the Year 2 learners show: i) a clear emergence pattern in Daisy, Fiona and Grace's data, i.e. *AspP_l* > *BaP* > *AspP_m*; ii) statistically significantly different patterns in Harry's emergence order and iii) a division into two further stages for Daisy, Fiona and Grace. The cut-off point of lower

⁴⁴ Note that there are cases where aspect markers are absent but are still pragmatically acceptable in relation to the contexts it is embedded.

IP and the upper IP stage falls between *BaP* and *AspP_m*. Their building of functional projections in Mandarin has the following characteristics:

The lower stage features the emergence of *AspP_l* and *BaP*, as can be seen from the consistency in Daisy, Fiona and Grace’s production of *AspP_l* > *BaP*.

- i.) The underspecified middle stage involves L2 learners’ acquisition of *AspP_m*, *AspP_h* and *BeiP* and as shown in Table 7.4.
- ii.) There is incremental and consistent evidence for positing of functional projections, as shown in *AspP_l* > *AspP_m* > *AspP_h* and *BaP* > *BeiP* in Daisy, Fiona and Grace’s data, which needs to be explained by both the predicted order and the textbook input order.
- iii.) Variability has three characteristics: Year 2 learners’ functional projection at the IP layer, Harry’s production of *BeiP* earlier than expected and ‘stage seepage’ in both Year 1 and Year 2 learners’ data.
- iv.) There is early acquisition of *bu* and *mei* in SVO structure.

The conclusion must be that, at end of the data collection, a great majority of the learners had gone through the lower IP stage and had reached the upper IP stage, as presented in Table 7.4.

Table 7.4 L2 learners’ acquisition at the IP layer

Daisy: $AspP_l > BaP \underline{\underline{}} > AspP_m > AspP_h > BeiP$	
Fiona: $AspP_l \ \& \ BaP \underline{\underline{}} > AspP_m \ \& \ BeiP > AspP_h$	
Harry: $AspP_l > BeiP \underline{\underline{}} > AspP_h > BaP$	【Notes: <i>AspP_m</i> was not acquired】
Notes: $\underline{\underline{}}$ marks two different stages, the lower IP stage and the upper IP stage.	

7.3.1 The lower IP stages in Year 2 learners’ Mandarin acquisition

The functional projections at the lower IP stage have two salient characteristics in learners’ development. Firstly, there was the unanimous projection of *AspP_l* by all Year 2 learners and, as illustrated in Table 7.4, three out of four Year 2 learners projected *AspP_l* > *BaP*. Note that there is evidence that *AspP_l* is projected above VP by all Year 2 learners, here with Emily included.

Table 7.4 also presents three salient features in Fiona’s functional projections at the lower IP stage. Firstly, unlike Daisy and Grace, there was no clear-cut emergence order in Fiona’s production owing to her production of target-like *ba* phrases at T2. Her full awareness of the uses of the *ba* phrases is revealed through a wide range of tasks, covering the picture description

task, the *ba* transformation task, and the *ba* translation task. Her target-like production indicates that she had a good knowledge of the syntactic structure of *BaP* early on in Year 2.

One piece of evidence is Fiona's suppliance of *ba* phrases at T2, illustrated in examples in (7.7). The first two were supplied in the picture description task and the other three in the *ba* transformation task. In the latter task, subjects were fixed and learners were supposed to reconstruct clauses by rearranging the word order of the given sentences.

- (7.7) a. *Baba ba bei (X2) international he ba bei baba*
 Dad BA cup international drink BA cup
he wan.
 drink up
 'Dad had the cup drunk up.' (Fiona_T2: Picture description)
- b. *Li Shizhen ba caoyao de gongneng jilu le.*
 Li Shizhen BA herbal medicine DE function record LE
 'Li Shizhen got the functions of herbal medicine recorded.'
 (Fiona_T2: *Ba* transformation)
- c. *Dayu ba hongshui zhili le.*
 Dayu BA flood govern PFV/CRS
 'Dayu had the flood governed.'
 (Fiona_T2: *Ba* transformation)
- d. *Qinshihuang ba zhongguo tongyi le.*
 Qinshihuang BA China unite PFV/CRS
 'Qinshihuang had China united.'
 (Fiona_T2: *Ba* transformation)

As shown in the examples at T2, all of Fiona's productions, except one clause (*ba bei baba he wan*) in (7.7 a), reflect the appropriate projection of *ba* as the head of *BaP* in *ba*+NP+VP. The exceptional clause is linked to another salient feature in Fiona's production, i.e. the fronting of the *ba*+NP to the top of clauses, generating interlanguage production.

- (7.8) a. **ba dianshi mama wang le.*
 BA TV mum forget LE
 (*Mama ba dianshi wang le.*)
 'Mum forgot about the TV.'
- b. **ba xiezi ni chuan le.*
 BA shoe you wear LE
 (*ni ba xiezi chuanshang le.*)
 'You have worn the shoes'
 (Fiona_T5: *Ba* transformation)

Those were not exceptions that occurred only in Fiona’s second data collection session; rather, a good many of such productions occurred in her ensuing data collection sessions. It should be pointed out that it is controversial whether positing *ba*+NP to the top of clauses is native Mandarin. Zhou (1995) counts it as unacceptable while Huang, Li and Li (2009) assume it as acceptable in ‘casual informal speech’ or imperative clauses where disposal meaning is most obvious (2009: 166-167). The examples in Huang, Li and Li are quoted as follows:

- (7.9) a. *ni xian ba zhe kuai rou qie -qie ba.*
 You first BA this-CL meat cut-cut SFP
 ‘First cut the meat.’
- b. [*ba zhe-kuai rou*], *ni xian qie-qie ba!*
 BA this-CL meat you first cut-cut SFP
 ‘First cut the meat.’

(Source: Huang, Li and Li 2009: 167)

To decide the status of fronting *ba*+NP, I conducted a small-scale survey. A total of 10 university students were involved, comprising five male and five female students. Among them were five Northerners and five Southerners, including one from Hong Kong. They were asked to judge three interpretative pairs of sentences composed of three clauses with *ba* +NP fronted to the beginning of the clause and the other three without such fronting. The results revealed that all the participants unanimously and strongly rejected the clauses where *ba*+NP was fronted. This small-scale survey confirms Zhou’s stance that *ba*+NP cannot be fronted in native adult Mandarin. Thus, Fiona’s fronting of *ba*+NP must be considered as an interlanguage phenomenon.

One possible account for the pattern Fiona produced could be the influence of instruction. However, this explanation can be dismissed as this is not an option in the Mandarin spoken by all the instructors and in my classroom observation undertaken between October 2014 and June 2015 where I did not witness the instructors speaking in a non-native-like manner. Thus, it is reasonable to conclude that the *ba*+NP fronting was due to Fiona’s overgeneralisation of the topic-comment instruction in the textbook. As can be found in the textbook analysis, the teaching syllabus *ba*+NP+VP, or fronting argument (O) to the start of a clause fell in the period

between the end of Year 1 and the start of Year 2. Fronting/Topicalising O may have created a syntactic position for the *ba*+NP to move into.

A third salient feature of Fiona's production is the co-occurrence of $AspP_l$ and *BaP* at the lower IP stage. I argue that this does not mean necessarily that $AspP_l$ and *BaP* were projected at T2. It is possible that the emergence of *BaP* in Fiona's data falls at the predicted time, while her $AspP_l$ was posited earlier, probably as Alice and Charles did, in other words, at Year 1 and Fiona provided evidence for it only at T2.

7.3.1.1 The upper IP stage in Year 2 learners' Mandarin acquisition

This section maps Year 2 learners' actual development stages onto the predicted route and explains the L2 learners' detected acquisition stages. Based on the reported results in Chapter 6, I argue that while Year 2 learners' production data presents a mixed acquisition picture due to overlapping of stages or 'stage seepage', the overall development is viewed as supporting the predicted developmental route, i.e. $AspP_l > BaP > BeiP > AspP_m > AspP_h$, the route based on the proposed Mandarin syntactic tree. In other words, by the end of the data collection, all Year 2 learners are at an underspecified upper IP stage.

At the upper IP stage, two developing features need to be mentioned. In the first place, $AspP_m$ was unanimously projected right above *BaP* by Year 2 learners (and also by Charles). Secondly, there were general tendencies for $AspP_l > AspP_u > AspP_h$ and *BaP* > *BeiP* routes in three out of four Year 2 learners' acquisition data. The following sections will address them individually.

7.3.1.2 Consistent projection of $AspP_m$

The projection of $AspP_m$ right after *BaP* is consistent for the majority of Year 2 learners' data. It is also considered as the borderline of lower IP and upper IP stages. Recall that $AspP_m$ is predicted to be projected after *BeiP* and *NegP*. Learners' interlanguage suggests that $AspP_m$ needs to be posited above *BeiP* in their data. The early production of $AspP_m$ is related to the input received by L2 learners.

*7.3.1.3 *BaP* > *BeiP**

According to the acquisition results presented in Figure 7.3, *BaP* is very likely to have been projected between T2 and T4, ahead of *BeiP* in learners' mental representation based on emergence evidence. As mentioned previously, the criteria for emergence are three target-like productions of one linguistic item or one target-like production over three consecutive sessions.

Given that, *BaP* and *BeiP* can be viewed as emerging at three different places in Year 2 learners' data: (1) *ba-bei* acquisition order by Daisy, Grace and Fiona, (2) *bei-ba* by Harry and (3) no acquisition of either *ba* or *bei* by Emily. Note that Grace is placed into the *ba-bei* category due to her acquisition of *BaP* by the end of the data collection and predicted acquisition of *BeiP* after the data collection. The development of the five Year 2 learners' production of *ba* and *bei* phrases over nine data collection points is mapped into Figure 7.3.

(1) *Ba-bei*

Daisy: *ba* (T4)---*jiao*⁴⁵ (T6)---*bei* (T8)

Grace: *ba* (T3)

Fiona: *ba* (T2)---*bei* (T3)

(2) *Bei-ba*⁴⁶

Harry: *bei* (T2)---*ba* (T8)

(3) No *ba* or *bei*: Emily

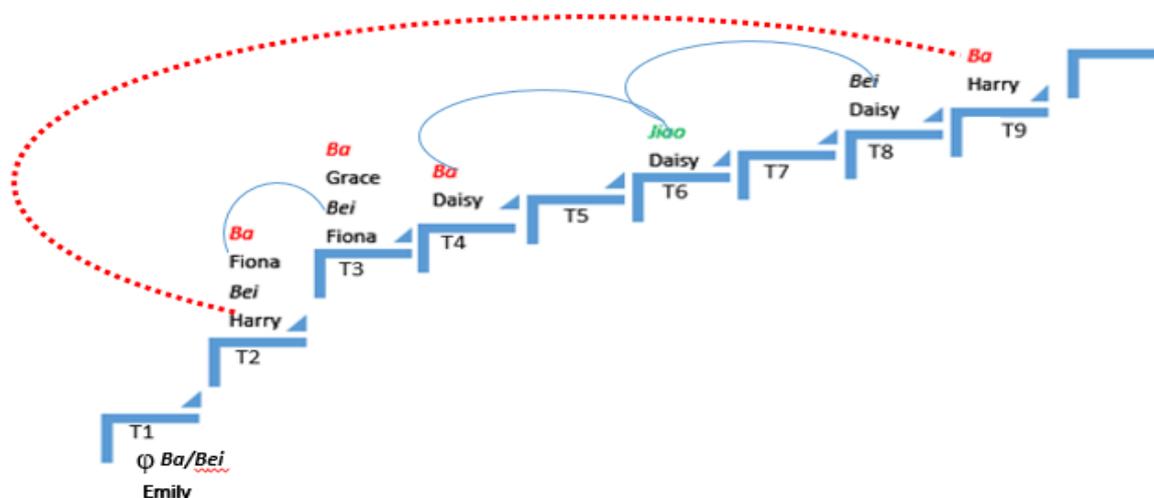


Figure 7.3 The emergence of *BaP* and *BeiP* over data collection sessions (Year 2)

The acquisition results of *BaP*>*BeiP* were consistent with the findings of Shi (1998), who examined 22 types of Mandarin clauses through cross-sectional and longitudinal data. Based on high and consistent accuracy rates, Shi (1998) established three acquisition intervals: firstly, the (semi)complete acquisition interval, the dynamic acquisition interval with overall upward developing tendency, and the un-activated acquisition interval with a low acquisition rate. The

⁴⁵ Refer to Section 3.3.4, Chapter 3.

⁴⁶ Harry's data will be discussed later.

three intervals are consecutive acquisition periods. Shi (1998) found that learners' acquisition of *ba* phrase fell into the second interval, while that of *bei* ended up in the third. The finding of the study, thereby, demonstrates evidence of learners' acquisition of *ba* construction ahead of that of *bei*.⁴⁷

Gao's (2009) longitudinal study of topic development in L2 Mandarin, which provides another glimpse of *ba* construction acquisition by five L1 Japanese and five L1 German learners of Mandarin at an intermediate or above level, shows that one L1 Japanese learner and three L1 German learners altogether produced 22 *ba* utterances. Unfortunately, it was unclear whether the participants of Gao (2009), like those of Wang (2011), supplied any *bei* constructions, and the assumption is that it is very likely that there was very sparse production, if any.

Ba phrases with raised O bear distinctive features not found in European languages. A consistent *BaP*>*BeiP* acquisition order for Year 2 learners provides important evidence for the theoretical debate between the OG and the Full Transfer/Full Access Hypothesis. The latter would predict a *BeiP*>*BaP* order due to the absence of equivalent *BaP* and the existing *PassP* (though not in the same syntactic position: *S+bei+VP+XP* vs *S+VP+by+NP*) in learners' L1 English. However, this prediction is not supported in the present study. Rather, the results support OG's prediction that functional projections are built up from a lower syntactic position to a higher one based on the interaction between X' theory and Mandarin input. It should be noted that while *bei* construction may be more freshly taught to Year 2 learners, the observed acquisition results did not provide strong evidence for the better acquisition of the *bei* construction than the *ba* construction.

Meanwhile, a *BaP*>*BeiP* acquisition order is also consistent with the typological distance proposal by Kellerman (1979, 1983), who holds that the greater distance a learner can perceive between his L1 and the target language, the less likely he or she is to transfer L1 features to the second language. The *BaP*>*BeiP* acquisition results in this study indicate the lack of L1 functional projection transfer in most Year 2 learners' production, Mandarin development thus supporting Kellerman (1979, 1983); whereby the further a distance exists between L1 and L2 learners' mental representation of functional categories, the more difficult it is to acquire L2 linguistic items, displayed in Figure 7.3. It is worth noting that passive phrases headed by *jiao*

⁴⁷ Note that the *bei* is input in the first term of Year 2 learners' study. It is possibly that *bei* was taught recently; nonetheless, a good acquisition result did not show up in learners' *bei* construction acquisition. This may suggest that memorisation sometimes do not strongly affect learners' acquisition order of functional projections.

or *rang* (S+*jiao/rang*+NP+VP+XP) were also observed in Year 2 learners' data. However, as production was limited, it did not affect the results presented in Chapter 6.⁴⁸ Unlike the majority of Year 2 learners, *BeiP* occurred ahead of *BaP* to Harry, which will be discussed in section 7.5.2.3.

7.3.2 Cross-stage consistency in $AspP_l > AspP_m > AspP_h$

A cross-stage emergence pattern, i.e. $AspP_l > AspP_m > AspP_h$, is found in Year 2 learners' data as well as in Charles' production. Such an acquisition order provides clear evidence of functional development from the lower to upper and then to the projection of high aspect markers based on learners' acquisition of functional morphemes $le_l > zai > le_h$ in appropriate syntactic positions. The acquisition order of $V+le_l+O > zai+VP > V+O+le_h$ demonstrates an acquisition stage development from $AspP_l > AspP_m > AspP_h$.

Such results are largely consistent with two important previous studies (Wen 1995; Wang 2012), discussed in Chapter 4. Wen (1995) studied L1 English speakers' acquisition of le_1 and le_2 , finding that le_1 is acquired ahead of le_2 ⁴⁹ (see section 3.3.1.2. for the classification of the scope of le_1 and le_2). Wang (2012) investigated L1 Swedish speakers' acquisition of L2 Mandarin aspect markers, finding that L2 learners acquired them in order of $le > guo > zhe > zai$. Wang notes that learners mainly struggle with their acquisition of *zai*. It is a pity that L2 learners' acquisition of sentential *le* falls outside of Wang's research. Nonetheless, these two studies each contributed important insights into our more complete understanding of the acquisition of $AspP_l$, $AspP_m$ and $AspP_h$. Crucially, however, the acquisition orders in these studies were not contradictory to the emergence order in this study.⁵⁰

7.3.3 A summary: mapping learners' actual development to the predicted route

The above sections have mapped Year 2 learners' development of function projections against the predicted route. In the process, a two-stage development of functional projections at the IP layer has been identified and characteristics relevant to learners' functional projections described. So far, the development route from bare VP > lower IP > upper IP confirms part of Vainikka and Young-Scholten's (1994, 1996) hypotheses of VP > IP > CP acquisition, which

⁴⁸ The interval between *BaP* and *BeiP* acquisition varies greatly between learners.

⁴⁹ Note that *le* in Wen (1995) is further divided in clauses ended with verbs into le_1 and le_2 based on pragmatic meanings. Here, based on syntactic position, they were classified into le_l .

⁵⁰ Such an acquisition result will be in contrast to an acquisition predication based on Full Access and Full Transfer Hypothesis.

was based on their studies of L1 Korean and Turkish adult learners of L2 German. Vainikka and Young-Scholten find that L2 German develops from VP>TP [AgrP] >CP and in their 1994 publication, they proposed an underspecified FP (finite phrase) stage. Young-Scholten and Strom (2006) also find similar development stages, i.e. [VP stage] --- [TP or AgrP stage] --- [CP stage] in L1 Somali and Vietnamese-speaking immigrants' L2 English development. Examples of acquisition data are cited as follows:

(7.10)

- a. You my car hit here teacher. This is car.
- b. The women is cry.
- c. Because too bad.
- d. Someone's die because we have accident.
- e. Car hit the kid that's lie down on the street.
- f. When you reverse, you have to see anybody behind.

(Vainikka and Young-Scholten 2013: 599)

According to Young-Scholten and Strom, examples (7.10 a. and b.) indicate learners' bare VP stage, c-d their IP stage and e-g their CP stage development.

7.4 Acquisition Results Revealed in the Acceptability Judgement Tasks

Further to the analyses of L2 learners' acquisition results, this section discusses the results of the acceptability judgement tasks; specifically, whether the results from learners, both Year 1 and Year 2, fit into the predicted order *baP>beiP>NegP*. This is achieved by scrutinising L2 learners' acceptability judgement of whether different functional items can co-occur with each other. Recall the findings in Chapter 6, which are that: (1) no significant differences were found in regard to the co-occurrences of aspect markers and negators, aspect markers and *bei*;

The acquisition stages seem to be:

- (1) *ba > bei*>negation;
- (2) *ba+NP+VP+le_l* is better acquired than *zai+ba+NP+VP*;
- (3) *mei+ba+NP+VP* is better acquired than *bu+ba+NP+VP*;

- (4) No significant are found between learners' acceptance of aspect markers and negation, between the acceptances of *bei* constructions, negation and aspect markers, which are attributed to factors like test items, year group and the interaction between those two.

The production data focuses on learners' acquisition of individual functional projection, and sheds no light on to what the extent to which extent L2 learners know about the co-occurrences of different functional items. Chapter 6 reported the underlying knowledge of both Year 1 and Year 2 students in terms of the co-occurrence of functional categories. The General Linear Model suggests there is no significant difference between negative items, time and interaction of time and effort.

Finding (1) indicates that the acquisition for L2 learners are $BaP > BeiP > NegP$, which is in line with the general predicted projection route that *BeiP* and *NegP* are projected above *BaP*. Findings (2) and (3) found functional categories of aspect makers and negators within the *ba* construction, where *mei* is supplied more than *bu* and *le_h* more than *zai*. That *le_l* is acquired better than *zai* is consistently what we have already found in production data. As *mei* is more related to, though not restricted, to a past event, the fact that it is better acquired than *bu* is likely due to learners' awareness of the boundedness of the event. With regard to negation and aspect markers, there is significant year group difference and item differences, which means that Year 2 learners performed significantly better than Year 1 students. Moreover, significant differences were found in the interaction between item and year group. So far, there have been many such issues.

7.5 Variability in L2 Mandarin Development from the Initial Stage

While the overall development of L2 learners' functional projections corresponds to the predicted development route, there are also characteristics of learners' production that do not clearly fit into the predictions, for example, the high level of production of aspect markers in Charles' (Year 1) data, and stage seepage in Year 2 learners' production. These aspects will be examined respectively in the following sections.

7.5.1 Charles's acquisition of functional projection

7.5.1.1 Charles' projection of *AspPs*

Unlike the two *ab initio* learners, Charles displayed evidence of having posited not only *le_l*, but also *zai* and *le_h* by the end of the last data collection. Based on the acquisition criteria of this

study, Charles is considered to have posited AspP_l, AspP_m and AspP_h by the end of the data collection session with a functional projection emergence order of AspP_l & AspP_m > AspP_h.

Charles' projection of functional AspPs shows i) an abundant production of aspect markers at an early stage and ii) the occurrence of *le* and *zai*. This poses challenges to the predicted development route in the following respects:

- (1) Is there proposed universal learning route starting with VP (Vainikka and Young-Scholten 2011), as VP development stage was absent from Charles' data?
- (2) Is language development incremental as proposed by Vainikka and Young-Scholten (2011), as AspP_l and AspP_m seemed to be overlapping in Charles' data?
- (3) How are the results related to the L2 acquisition literature?

Before answering these questions, it is necessary to compare Charles' and the rest of the learners' acquisition of aspect markers. Firstly, note that three aspect markers occurred at Charles' first data collection session. Moreover, only one of the two learners, whom we know were *ab initio* learners, had acquired one AspP by the end of the data collection. The above facts are sufficient to conclude that Charles' positing of functional projections was qualitatively different from the other two and ask what sort of exposure he had experienced prior to starting classroom instruction. Secondly, note that among AspP_l, AspP_m and AspP_h, Grace failed to acquire AspP_h, Harry AspP_m and Emily AspP_m (note: Emily was absent from three data collection sessions). Indeed, it seems that not only was Charles not an *ab initio* learner, but he also appears to have had proficiency surpassing at least two of the Year 2 learners.

Therefore, regarding Q1, if the present thesis takes Charles' additional exposure to Mandarin into account, the presence of aspect markers in his data is not evidenced against OG; he is simply much more advanced at the start of data collection than was assumed. Unlike the two *ab initio* learners who relied almost 100% on the classroom instruction along with their outside homework, Charles also chatted online with a native-speaking Mandarin friend, which he did not count as a way of "learning" Mandarin in the proper sense. His Mandarin contact was revealed in two respects: his production of three aspect markers at the first data collection session and the recorded conversation following the test tasks at the first data collection. During the conversation, Charles was invited to recall any Mandarin he could remember from his memory. One of Charles' utterances was *ni chi le fan le ma?* 'Have you had your meals?' which is a common conversation opener when people meet in China. The English equivalent is 'How are you?' It verifies that Charles has been exposed to Mandarin expressions and memorised

some routines prior to his Mandarin programme. Charles' production provided solid evidence of existing aspect markers at least in the form of phonetic form when language teaching was still at the basic stage. Memorised and retrieved linguistic forms are categorised as formulaic language or formulaic sequence (Clark 1974; Myles, Hooper and Mitchell 1998; Wray 2002). These often surface as over-representing L2 learners' language competence (Myles 2004). It has been argued that formulaic language facilitates children's L2 acquisition by first memorising language chunks, gradually breaking them down, and generating new rules (Wong-Fillmore 1976; Myles, Hooper and Mitchell 1998). While I will not further analyse the data in this respect, Charles was indeed identified as producing memorised chunks with aspect markers involved before he was able to produce individual aspect markers. It is possible that he was using those formulaic chunks and further analysing them to build his production in L2 Mandarin.

Given the above, there are sufficient reasons to argue against the seeming absence of a bare VP stage in Charles' data and shed some light on the co-occurrence of AspP_l and AspP_m. Alternatively, the co-occurrences meant that it is possible that the monthly data collection interval skipped the time when those two were developing at different times.

While Charles acquired AspP_l and AspP_m simultaneously, the data also revealed that Charles' structure building process still followed the development patterns, as displayed in other Year 2 learners' data, i.e. AspP_l > AspP_m > AspP_h and the first acquisition of AspP_l before higher functional projections BaP, BeiP and NegP.

7.5.1.2 Ungrammatical ba production and the absence of bei construction

Like the two *ab initio* learners, neither the functional projection of BaP nor BeiP emerged in Charles' acquisition agenda, although he did attempt to use *ba* in his production (see Chapter 6). The lack of BaP can be reinforced by the fact that in the *ba* transformation task, Charles did not make changes to the VO word order and instead, responded that the given SVO was fine and that there was no need to make any changes. Moving O out of VP in a VO clause had not occurred in Charles' data by the end of the data collection sessions.

7.5.2 Stage seepage in Year 2 learners' acquisition of functional projections

'Stage seepage' is a term used to refer to the blurry transitions between stages during development, and is considered a common phenomenon in development studies (Vainikka and Young-Scholten 2011). The seepage types involved in this study are the 'submarining' of

functional projections or the co-occurrences of two stages. The absence of Harry’s *BeiP* and *AspP_m*, as noted earlier, can serve as good examples for the former, while Fiona’s simultaneous production of *AspP_l* & *BaP* at the lower IP layer and *AspP_m* and *BeiP* at the upper IP layer are good illustrations of co-occurrences of projections.

7.5.3 Optional functional projections at the upper IP stage

As illustrated below, optional functional projections occurred at the upper IP stage. Firstly, *AspP_m* resides at the lowest position of the upper IP layer, and the functional head needs to move upwards to be above *AspP* and *BeiP* in subsequent development.

Harry:	<i>BeiP</i> > <i>BaP</i> > <i>AspP_h</i>	(Notes: <i>AspP_m</i> was not acquired)
Daisy:	} <i>>AspP_h</i> > <i>BeiP</i> & <i>BeiP</i> > <i>AspP_h</i>	
Fiona:		
Grace:		(Note: <i>AspP_h</i> and <i>BeiP</i> were not acquired)

Unlike Daisy, Fiona or Grace, the emergence of Harry’s functional projections has two distinctive features: *AspP_m* did not emerge in his data over the data collection period, and *BeiP* is acquired much earlier than expected. The idiosyncratic acquisition characteristics appear to challenge the incremental development proposal of OG.

7.5.3.1 The absence of *AspP_m* in Harry’s data

The absence of *AspP_m* from Harry’s data does not mean zero production of progressive aspect marker (*zheng*)*zai*. Indeed, both *zai* and *zhengzai* were produced by Harry. They were in different syntactic positions, as illustrated in examples (7.10-7.11). Nonetheless, he seemed to be unaware that *zhengzai* and *zai* share the same syntactic position and possess the same semantic meanings. Thus, it is necessary to take a closer look at *zai* and *zhengzai* to shed some light on Harry’s mental representation of the syntax involving *zai* or *zhengzai*.

Harry’s production in examples (7.11 a-f) over the data collection sessions did not indicate that he acquired *AspP_m* headed by *zai*. There are three types of *zai*+VP, that is, *zai* attached to the head of VP (e.g. a. and b.) with verbs expressing durability, to activity verbs (e.g. d) and *xihuan* ‘like’ +*zai*+VP (e.g. c, e and f). A, b, d and f are target-like but not the others. *xihuan zai xiayu/xia xue* is non-target production. *zai* is placed before the VP phrase *xiayu* ‘rain’ or *xiaxue* ‘snow’ and after *xihuan* ‘like’. This translates into IP [*womeimei* VP [V’ [*xihuan* *ApsP* [*AspP*’ [(**zai*) VP [V’ [*xiayu/xiaxue*]]]]]]]. Note also that target-like *zai* has a dispersed distribution at

different data collection sessions and the frequency of production did not achieve the emergence criteria applied to the present study.

- (7.11) a. *suoyi ta zai chi fan zuo dangao zuo fan.*
 so 3SG PROG eat food make cake cook food
 ‘Thus, she is cooking food, making cakes.’ (Harry: T2_ *Wise Little Hen*)
- b. *ta zai shang [correction] zuo gongzuo.*
 3SG PROG on do job
 ‘She is working.’ (Harry: T6_ *Pear Story*)
- c. *wo meimei hen xihuan zai xiaxue, *zai xiaxue wan.*
 My younger sister very like PROG snow PROG snow play
 (Target: *wo meimei hen xihuan xiaxue. ta xihuan zaixiaxue tian wan.*)
 ‘My sister likes snowing. She likes to play when it snows.’
 (Harry: T8_ *Pear Story*)
- d. *ta zai qu kan Peter Pig and Donald Duck.*
 3SG PROG go see Peter Pig and Donald Duck
 ‘She is going to see Peter Pig and Donald Duck.’
 (Harry: T8_ *Wise Little Hen*)
- e. *ta hen xihuan zai xiayu, haowan.*
 3SG very like PROG rain fun
 (Target: *ta hen xihuan xiayu, haowan.*)
 ‘She likes raining. It is fun.’ (Harry: T9_ *Picture description*)
- f. *mama ji de haizi zai hao wan.*
 Mum hen DE child PROG good play
 (Target: *mama ji de haizi zai haohao de wan.*)
 ‘The mother hen’s children are enjoying playing.’ (Harry: T9: *Pear Story*)⁵¹

Examples (7.12 a.-d.) demonstrate Harry’s misplacement of *zhengzai*. Instead of attaching *zai* to the head of VP, Harry placed all the instances of *zhengzai* ahead of the subjects of clauses. Harry’s production is very likely to be affected by his preference of fronting the adjunct particularly *xianzai* ‘now’ or ‘present’ to the specifier position of the IP. As demonstrated in examples b and c, Harry struggled to differentiate between *xianzai* and *zhengzai*. Note that the great majority of the instances of *xianzai* in his data were fronted to the heads of clauses and

⁵¹ *Zai women mama ye dai ta haizi.*
 ZAI 1PL mum also take her child
 ‘The mother hen is also taking her children.’ (Harry: T2_ *Picture description*)

only a small amount in front of VP. For *xianzai*, both positions are appropriate; nevertheless, *zhengzai* can only be posited pre-verbally.

- (7.12) a. *zhengzai ta feiji xia.*
 PROG 3SG plane off
 (Target: *ta zhengzai xia feiji.*)
 ‘Now he is getting off the plane.’ (Harry: T4_Picture description)
- b. *keshi xianzai keshi zhengzai (X2) mamaji wen tamen bang*
 Yet now yet PROG mum hen ask them help
ta chi fan.
 3SG eat food
 (Target: *mamaji zhengzai wen tamen bang ta chi fan.*)
 ‘Yet now, yet mum hen is asking him to help her to eat food.’
 (Harry: T4_Wise Little Hen)
- c. *xian buguo (X2) zheng (X2)zai ta (X2) tai lao le.*
 Now yet PROG 3SG er too old PFV/CRS
 (Target: *buguo ta xianzai tai lao le.*)
 ‘Now he is too old.’ (Harry: T4_Picture description)
- d. *zhengzai mama ji zhidao tamen bu shi bing.*
 PROG mother chicken know 3PL BU be ill
 (Target: *xianzai jimama zhidao tamen mei bing.*)
 ‘Now mummy hen knows that he is not ill.’ (Harry: T4_Wise Little Hen)

7.5.3.2 The earlier presentation of *BeiP* than *BaP* in Harry’s data

According to the acquisition criteria applied to the present study, *BeiP* was posited at T2, as exemplified in (7.13) but *BaP* had not been posited by the end of the data collection.⁵² This reaffirms the previous account that the emergence of Harry’s *BeiP* is much earlier than the textbook input order and far ahead of the future *BaP* acquisition.

- (7.13) a. *zhe ge fangzi bei jiya huai le.*
 this CL house BE press broken LE
 ‘The house was torn down by pressure.’ (Harry: T2_Bei transformation)
- b. *zhe ge rabbit bei na-ge tuzi paobu.*
 this CL rabbit BEI that-CL rabbit run
 ‘The rabbit is chased by that rabbit.’ (Harry: T2_Bei transformation)
- c. *zhe ge li bei zhe ge nanhaizi na zou.*
 this CL pear BEI this CL boy take away
 ‘The pears were taken away by that boy.’ (Harry: T2_Bei transformation)

⁵² The production in line with the given picture should be ‘*zhe ge tuzhi zhengzai bei na ge rabbit zhuigan*’.
 (7.14) [The rabbit is being chased by the rabbit].

in Fiona's simultaneous production of AspP_l & BaP at the lower IP layer and AspP_m & BeiP at the upper IP layer.

7.5.4 A summary: an appropriate understanding of 'stages' in L2 development

In sections 7.2-7.4, cases of stage-like development and cases that are seemingly counter-arguments against nice and neat interpretations of stage-like development are discussed. The above sections (7.5.1 and 7.5.2) have taken Charles and Harry's variation data not only to illustrate the variability in learners' production but also to demonstrate how language input and syntactic constraints like movement have diverged acquisition stages. This is in line with OG's stance on language acquisition:

If acquisition is not solely dictated by a single vast tree provided by UG (as under Strong Continuity), but instead involves the interaction of primary linguistic data with X' theory and the mechanism of OG, it is unsurprising that stage seepage occurred.

(Vainikka and Young-Scholten 2011: 238)

In noting learners' missing stages, Sharwood Smith and Truscott (2006: 25) remark that skipping of stages is one characteristic of interlanguage grammar and those optional periods with co-occurrences of both preceding and following stages are expected in learners' development. Similarly, Vainikka and Young-Scholten (2013) argue against a rigid interpretation of interlanguage stages by quoting Piaget and Inhelder who remarked that "a stage of cognitive development should not be seen as static or neatly or separated as from what precedes or follows it" (1969: 584). Rather, they hold that missing stages are not problematic in sequential development.

7.6 Acquisition of Negation in L2 Mandarin

This section interprets L2 learners' acquisition of negation results, which has so far been set apart to answer whether NegP in L2 learners' data is projected above AspP_m and below AspP_h in L2 learners' data and why (not) the acquisition results are as they were. The results in Chapter 6 have demonstrated four points:

- i) all L2 learners in this study can consistently produce *bu*+VP in the first few data collection sessions;
- ii) there are clear instances of interfaced use of *bu* and *mei*;
- iii) the production of *mei* +VP consistently falls after *bu*+VP over the data collection sessions;
- iv) L2 learners have difficulties in raising *bu* and *mei* to the front of *ba* or *bei* phrases. The following discussion proceeds from the analysis of ab initio learners' production to that of Charles and then to that of Year 2 learners.

7.6.1 L2 learners' acquisition of Mandarin negation

7.6.1.1 bu +VP in L2 learners' early production

The finding of early emergence of *bu* +VP in the present study is consistent with the results of Yuan (2004) and Zheng and Chang (2012). Yuan investigates L2 Mandarin negation acquisition by L1 English, French and German learners with a hypothesis that learners with a more typologically distant L1s will have more difficulties than those with a typological closer language in acquiring the syntactic position of negation in L2 Mandarin. He finds that L2 learners acquired negation in a standard way irrespective of their L1 backgrounds and across different proficiency levels and that, unlike L2 acquisition of European languages, the verb is not raised out of the VP.

Following Huang (1982), Yuan argues that negation in Mandarin (here *bu* again), has no independent projection of its own; conversely, it bears the characteristics of clitics, as revealed in its tone changes in response to the tones of some ensuing lexical words. He claims that negation *bu* is criticised to the head of AP, PP, AdvP or VP (Yuan 2004: 193). The early acquisition of *bu* is due to learners' early awareness of the weak inflectional features of Mandarin verbs.

Such an interpretation is indeed applicable to the findings in the present study that *bu*+VP is acquired ahead of other functional projections. It is worth noting, however, that such a proposal runs into difficulties on two occasions. Firstly, Yuan's proposals only address the acquisition of syntactic position of *bu*+VP. As Yuan does not shed light on the functional negator *mei* +VP, it is unclear whether his account of *bu* acquisition applies to L2 learners' acquisition of

mei. Secondly, proposing the cliticising of *bu* to the head of AP, PP, AdvP and VP gives no adequate explanation to the syntactic position of negators, here *bu* and *mei* in *ba* or *bei* phrases. In those phrases, *bu* and *mei* are posited ahead of *ba* and *bei* construction (*bu/mei+ba/bei+NP+VP*), rather than be cliticised to the head of VP (*ba/bei+ NP+ bu/mei+VP*). Explanations are also needed for what drives L2 learners to raise *bu* and *mei* to the front of *ba* and *bei* phrases.

Apart from Yuan's findings for the negation marking, Vainikka and Young-Scholten (2011) also find that L1 English speakers of L2 German acquire German *nicht* at an early stage. Though NegP has a much more established syntactic functional projection status in German, they argue that phrase introduced by *nicht* might be counted as a lexical phrase in learners' interlanguage. If Vainikka and Young-Scholten's proposal is correct, it would also be possible for the early *bu/mei+VP* to have lexical phrase features. In that line of thought, the argument against the hierarchical development of functional projections based on *bu* is alleviated. Nevertheless, it is necessary to explain why *mei+VP* is acquired later than *bu+VP*, not the other way around.

While each of the above analyses on the acquisition of negation sounds plausible in some aspects, I have argued that the interpretations have not been adequate. To summarise, Yuan's research focuses on the Mandarin syntactic feature of negation at SVO level, and negation at SOV level has been left open. The acquisition of *mei* as the functional head of NegP has even been under-explored by other researchers. In other words, negator *mei* is not attached to the head of VP, AdvP, AP or PP or the head of a *ba* phrase or *bei* phrase but provides independent projections. Conversely, a proposal of negation being more of a lexical phrase needs more explanatory power when applied to the two negators with complementary semantic meanings and acquired at different times.

7.6.1.2 *The later emergence of mei+VP after bu+VP*

The later appearance of *mei+VP* than that of *bu+VP* in L2 learners' data at different levels is highly likely to be attributed to both syntactic and semantic reasons. Here, examples from three Year 1 learners' data are used to illustrate the developmental feature. *Ab initio*, learners' development of negation, as presented in Table 7.5, shows that *mei +VP* occurred in Beth's third data collection, but not in Alice's data over the data collection period. Alice's total *mei+VP* production is illustrated in examples (7.15 a.-b.), while examples (7.16 a.-c.) demonstrate the total production of Beth's first three utterances at T3.

Table 7.5 *Ab initio* learners' production of negators

	<i>Bu</i>	<i>mei</i>
Alice	T2	-
Beth	T2	T3/T8

Examples (7.15 a.-b.) clearly show that Alice's negation production features *bu/mei* +V/auxiliary and that she struggled in making appropriate choices between *bu* and *mei*. In (7.15 a), Alice managed to provide *meiyou* which is both an appropriate collocation and fit into the required background concerning the historical figure *Qinzhao Li*. In (7.15 b), Alice managed to switch from the *meineng* 'not be able to' which showed a capacity, in the past, to *buneng* with reference to the capacity in the present. Unfortunately, after this section, Alice did not supply *mei* in her later data collection sessions.

- (7.15) a. *Yinwei ta bu you feiji, yinwei ta mei*
 Because 3SG NEG have plane because 3SG NEG
-you feiji.
-have plane
 'Because she does not have a plane. Yet she did not have a plane.'
 (T6: Alice: Negation 1)

- b. *Haishi ni mei neng bu neng he cha zai tushuguan.*
 Yet 2SG NEG can NEG can drink tea at library
 'Yet, you could not, cannot drink tea in the library.'
 (T8:Alice_Negation)

Beth's production cannot be considered as being productive, as can be seen from examples (7.16 a.-c.), where *mei* is restrictively combined with the content verb *you* 'have', 'possess'. At the last data collection (T8), Beth was still unable to generalise negation over content verbs beyond *you*, 'have' or 'possess'. The result implies that the semantics of the completed action, which is linked primarily to the previous temporal concept, has not been conceptualised in Beth or Alice's mental presentation.

- (7.16) a. *wo baba mei -you yi bei.*
 1SG dad NE have one cup
 'My dad does not have a cup.' (Beth: T3_ Picture description)
- b. *ta mei -you em [clear throat] schoolbag.*
 3SG NEG- have em schoolbag
 'She does not have a school bag.' (Beth: T3_Negation 2)
- c. *ta mei -you er bellyache.*
 3SG NEG have er bellyache.
 'She does not have a bellyache.' (Beth: T3_ Wise Little Hen)

Bu+VP emerged earlier than *mei*+VP (T2 vs T5) in Charles' data. The first *mei* negation stated with *meiyou* and tended towards being overgeneralised to some extent. Given the above acquisition results, it is sound for one to argue that the early emergence of *bu* and *mei* in appropriate syntactic positions severely challenges the predicted acquisition route. In essence, it challenges OG's incremental development of functional categories from the bottom to the top. The following aspects can be cited as counter-evidence: the emergence of Beth's *mei*+VP ahead of AspP, the spontaneous emergence of Charles' negation with a good range of AspP prior to his acquisition of *BaP* and *BeiP*.

This thesis argues that such interpretations have taken too simplistic a view. In the proposed syntactic tree, the functional status of NegP is proposed to be generated higher on the tree, just below the AspP_h. The following section will approach the negation with *bu* from two perspectives. In the first instance, there is no independent NegP as argued by Yuan (2004), N. Li (2014) and M. Li (2007). In the second instance, there is a NegP headed by *bu* or *mei* in the proposed syntactic position.

In view of the first perspective, Beth and Charles' development could be described as proceeding from VP to AspP_l, which renders support for the predicted route; thereby maintaining consistency with OG's incremental development assumption. Yuan's (2004) study approaches L2 Mandarin negation acquisition by L1 English, French and German learners right from this perspective. Yuan reports that regardless of their different L1 backgrounds and development stages, L2 learners acquire Mandarin negation (here *bu*) in a native-like manner and that, unlike L2 acquisition of European languages, the verb is not found to be raised out of VP.

In relation to the L2 Mandarin development, this study claims that *ab initio* learners start with bare VP and proceed by gradually projecting ApsP_l--AspP_i...NegP (headed by *bu/mei*)-ApsP_h. Due to the late input of *ba* and *bei* construction, *BaP* and *BeiP* need to be inserted below NegP but above AspP_h. *Ba* and *bei*, if Huang, Li and Li (2009) are correct in proposing them as auxiliaries, specifically modal verbs, as the right reason for not being raised out of VP to the head of *BaP* and *BeiP*. In this sense, the existing results are not in great conflict with the predicted route.

7.6.1.3 Charles' acquisition of NegP

As with the *ab initio* learners, *bu* emerged early (T2) in Charles' data; by contrast, *mei*+VP emerged at T5. The first *mei* negation stated with *meiyou* and tended to be fossilised to some extent. It is after the learners' acquisition of AspP_m and AspP_h that *mei*+VP came into being. The development data reveals that Charles has a faster learning pace than others and his biographic data highlights that he was likely receiving much more input than his classmates. The syntactic operation is much later than clause construction at the VP level.

Charles' higher-level performance is similar to George, one of Vainikka and Young-Scholten's (2011) participants, an L1 American English learner of L2 German, who was more advanced than the two other learners, Paul and Joan, due to greater self-study. Vainikka and Young-Scholten proposed that rather than accelerating his linguistic competence, George's production demonstrates the characteristics of what they term 'Grammar Lite', which means "a set of communicative tools that does not indicate a linguistic system" (2011: 344). Grammar Lite is conceived to involve three strategies: 'use of metalinguistic skills', 'memorisation' and 'reflexification', which can be further unpacked as the use of linguistic analysis skills, cognitive mechanism and the use of L2 lexical functions. All of these are thought to eventually bootstrap the UG-governed syntactic rules: "[a]t the early stages of development, the three strategies of Grammar Lite would normally be expected to occur in a classroom context" (Vainikka and Young-Scholten 2011: 345). Additionally, Vainikka and Young-Scholten hold that the Grammar Lite stopped George from operating UG and prevented him from developing to the more advanced stages the other two learners reached, particularly in switching the headedness of AgrP.

I argue that, while Charles is learning Mandarin rather than German, he, like George, is showing similar strategies and possible characteristics of Grammar Lite. This is particularly the case regarding his memorisation strategies and application of metalinguistic skills. Regarding memorisation, the early production of three aspect markers *le_l*, *le_h* and *zhe* are good evidence. The difficulties of acquiring aspect markers have been laid bare in the acquisition results of Alice and Beth: over eight to nine monthly data collection sessions, Alice only acquired one aspect marker *le_l* while Beth acquired zero. However, Charles acquired *le_l*, *zai*, *guo* and *le_h*, all the aspect markers except *zhe*.

To gain a better understanding of such a great acquisition contrast, Charles' production of aspect markers *le_l*, *le_h* and *zhe* at the first data collection session should be taken into account.

As noted previously, Charles supplied three aspect markers at the first data collection session when no Year 2 learners supply any aspect markers. Moreover, it should be pointed out that there were only a couple of co-occurrence instances of *le_l* and *le_h* in L2 learners' data. So was the production of *zhe* for Year 2 learners. The comparison suggests that Charles' production of aspect markers has surpassed not only that of Year 1 learners, but also Year 2 learners. This is very likely to indicate that Charles' production was based on memorisation of a language sequence *ni chi le fan le* or individual words. The aspect production at the very first data collection, when most of his production in story-narration task was English, indicates that Charles employed memorisation as an important strategy early in his study of Mandarin.

7.6.1.4 *The role of input in ab initio learners' negation acquisition*

OG (2011) holds that target language input plays an important role in learners' L2 acquisition and that L2 acquisition results from the interaction between UG and target language input. A brief visit to the teaching material used by L2 learners should shed some light on the early acquisition of the Mandarin negation by L1 English speakers.

The textbook input for negation has two characteristics. Firstly, *bu* and *mei* were introduced respectively in Lesson 1 and Lesson 2, *Integrated Chinese* (Level 1) at the beginning of L2 exposure, soon after a brief introduction to Mandarin sounds, the writing system and some formulaic routine expressions. *Bu* was introduced as a negative adverb in dialogues and explanatory remarks in the Grammar section are illustrated below:

(7.17) *Li You bu shi zhongguo ren.*
(Li You is not Mandarin.)

(7.18) *Laoshi bu xing wang.*
(The teacher's surname is not Wang)

(Yao, Liu et al. 2005: 42)

The section is reinforced by an exercise in Pattern Drills in the form of answering questions. As can be observed in the following example, both Mandarin *pinyin* and the characters are provided in the textbook. Moreover, negator *bu* is underlined to highlight the syntactic position of the negator right after subject and before verb.

(7.19) *Ni shi laoshi ma? → Wo bu shi laoshi.*
你是老师吗? 我不是老师。

(Yao, Liu et al. 2005: 47)

The introduction to *mei* is much simpler. It is annotated as “adv not” in the vocabulary section (Yao et al. 2005: 52) and further annotated that *mei* is always used to negate *you*, with the meanings of “to have”, “to possess” or “to exist” (pp.61-62). Thus, it is concluded that the earlier emergence of *bu* than *mei* in learners’ data is clearly consistent with the textbook lesson order and that learners’ persistent production of *mei* with *you* might well be due to learners’ acquisition of *meiyou* as lexical entry and used in an fossilised manner in front of VP to express negation.

7.6.1.5 *NegP in Year 2 learners’ acquisition of bu+VP and mei+VP*

Following the early emergence of *bu* in Year 1 learners’ data, the appearance of *bu* at T1-T2 in Year 2 learners’ data is unsurprising, which can be considered the continuity of Year 1 learners’ L2 acquisition. Consistently, as Year 1 learners’ data, *mei* emerged later than *bu*. However, it should be noted that *bu* and *mei* at this time is still attached to head of VP. By contrast, the emergence of NegP is considered to have taken place only when it is raised above *BeiP*.

Table 7.6 L2 learners’ acquisition of negators

	<i>bu</i>	<i>mei</i>
Daisy	T1	T3
Fiona	T1	T2
Grace	T2	T3
Harry	T1	T3
Emily	T1	T4

7.6.2 *Acquisition order within AspP_l: le₁>guo>zhe*

As presented in Table 7.7, there is a clear development pattern of *le₁>guo>zhe* in the data of Charles, Daisy, Fiona, Grace and Harry. Recall that such an acquisition order is not predicted in OG (along the predicted route based on the syntactic tree). Nonetheless, if Cinque (2004) is right to argue that each morpheme corresponds to one functional projection, it is likely to predict further functional projections like AspP_l, AspP_g, AspP_z respectively headed by *le*, *guo* and *zhe*.

- b. *wo*(X2) *mei* *qu* *guo* *zhongguo*.
 1SG NEG go GUO China
 ‘I have not been to China.’ (Harry: T7_Neg2)
- c. *wo* *shiliu* *sui* *de* *shihou* *qu* *guo* *faguo*.
 1SG 16 year DE time go GUO France
 ‘When I was 16, I had been to France.’ (Harry: T7_Neg2)

It is reasonable to argue that *guo* is not productive in the learners’ data. Nonetheless, as *guo* was supplied consecutively over the data collection sessions, it was considered as emerging in line with the acquisition criteria of this study.

7.6.2.2 *Contrasting situation in the emergence of zhe in L2 learners’ data*

Contrasting situation is observed in L2 learners’ acquisition of durative aspect marker *zhe*. On the one hand, *zhe* was persistently absent from almost all L2 learners’ data; on the other hand, as shown in Table 7.7, Emily managed to supply three target-like instances as early as T2. However, *zhe* did not re-occur in her ensuing data sessions. The following section will first explore the long absence of *zhe* and then discuss the optionality of *zhe* in Emily’s data. The difficulties of acquiring *zhe* is in effect not a phenomenon unique for learners in the present study. It has been explicitly recorded in Wen (1997) and Wang (2012). Wen studies L1 English learners of Mandarin at two proficiency levels, called by Wen ‘low’ and ‘more advanced’⁵³. The low learners were 10 students who had a Mandarin learning period of 15 months, and the more advanced learners had learned Mandarin for 27 months. Note that her low learners were to some extent equivalent to the Year 2 learners in this study. Wen had three test tasks to elicit learners’ use of *zhe*, *le* (PFV) and *guo*. Her first task was questions and answers and aimed to elicit *le* and *guo*, her second task picture description to elicit *zhe* by questions and answers and her third task, another picture description task, was administered to elicit all three aspect markers. After the first interview, Wen found that “the durative *-zhe* was seldom used, the reason for the infrequent use of *zhe* was not immediately clear” (1997: 8). Wen reflects that there might be two reasons for the sparse production. In the first place, the designed context and the verbs used in it might not be obligatory enough for the use of *zhe* and in the second place; the learners might not have established *zhe* in their functional interlanguage. Wen adapted her study and added another test task, where high collocation verbs with *zhe* or

⁵³ OG studies L2 naturalistic learners. For those learners, it was not clear what input they actually received other than it was comparable in nature to the primary linguistic data children receive, i.e. utterances in the learner’s environment. If OG claims that L2 acquisition is the result of interaction between X’ theory and L2 input, the future studies should delve into input and see how it affects learners’ L2 acquisition.

zhengzai were provided and learners were asked to write a paragraph based on the given pictures. Wen finds that learners' acquisition of *zhe* was later than that of *le* and *guo*, and that there was a significant difference between the two groups of learners at two different proficiency levels. Wen attributes learners' difficulties in use of *zhe* to the multi-functions of *zhe* and learners' insensitivity to the pragmatic constraints on the use of *zhe*. The former derived from learners' sparse use and the latter was exhibited in learners' syntactically appropriate production but pragmatically unacceptable clauses in learners' actual production of *zhe*.

The durative *zhe* has strict pragmatic constraints. It is frequently used in narratives and descriptions for background information in discourse. It seems that learners are not sensitive to the pragmatic constraints.

(Wen 1997: 22)

Wen (1997) also identifies three types of errors in learners' use of *zhe*: replacing *zhe* with *le*, replacing *zhe* with *zhengzai* and omission of *zhe*. From Wen's study, we can see that indeed the acquisition of *zhe* is difficult for L2 learners of Mandarin. Wang's (2012) study also reports that Swedish learners of Mandarin produced aspect markers in order of *le* (PFV) > *guo* > *zhe* > *zai*. Both Wen's and Wang's studies give evidence of the sparse production in the present study. Note that Wen's participants are similar to the participants in this study. Nonetheless, the present study also highlights several points, which are different from those of Wen's study. Firstly, the errors in this study were primarily the omission of *zhe*. Secondly, the argument of learners' insensitivity to narratives and descriptions for background information is untenable. I argue that the absence of *zhe* might be related to the late input in the classroom of *zhe*. As will be mentioned in section 7.8, the lesson for *zhe* in the textbook is the latest among all the functional elements tested in this study and learners still have not established the functional projection of *zhe* as the functional head of AspP_l, particularly in relation to activity and stative verbs. The long-term absence of *zhe* from the great majority of learners' production also challenges the AH (see Chapter 4) that holds that learners are sensitive to the inherent lexical aspect of verbs. According to the hypothesis, learners will first supply *zhe* to activity and stative verbs. The above may partially explain the non-acquisition of *zhe* by the majority of Year 2 learners. However, it renders no help to the interpretation of the early emergence of *zhe* by Emily and the absence from production in her later data.

7.7 The Source of L2 Mandarin Development

OG (Vainikka and Young-Scholten 2011) holds that the acquisition stages are due to the interaction between Universal Grammar and the input. However, how UG interacts with language input needs elaboration.

First, we must look closer at the input order of the text material to obtain a better understanding of the acquisition order of the L2 learners. As noted previously, the textbook for the L2 learners in this study is *Integrated Chinese* (Yao, Liu et al. 2005). The order of the linguistic elements observed in the textbook was as follows: $le_h > \{le_h + le_l\} > zai > ba > guo > \{guo \& le\} > \text{double } le > \{mei \& le\} > bei > zhe$ ⁵⁴. According to one of the Mandarin instructors of the programme, by the end of their first year of study, learners are supposed to have been exposed to Part I, Level 1 of the *Integrated Chinese*, involving functional structures with le_h , le_l and zai . By the end of Year 2, they will have covered Part II, Level I, entailing the rest of the linguistic elements tested in this study, i.e. guo , zhe , ba and bei constructions.

A close examination of learners' actual acquisition order reveals the interplay of the textbook input order and predicted order based on the proposed Mandarin syntactic tree. Such a statement has been illustrated by the following points. Firstly, in regard to the Year 1 learners, here Charles, the order of $le_l > le_h$ is unlikely to be constrained by the input order, $le_h > le_l$; instead, it is more likely to say that the acquisition order is constrained by X' theory, that is, due to its high syntactic position of le_h in the syntactic tree. The acquisition order for Year 2 learners, as discussed earlier, is: $le_l > le_h > zai$, $ba > bei$ and $le_l > guo > zhe$ of the internal order of $AspP_l$. It is clear from Year 2 learners that the input order regarding aspect makers le_h , le_l and zai differs from the acquisition order and internal order of $AspP_l$ due to learners' unanimous production of le_l in spite of reinforced input order of $le_h > le_l$. Although zai is supplied later than le_h , its acquisition precedes the acquisition of le_h . The acquisition order of ba and bei does not yield consistent results relating to the textbook input order or the predicted order due to the syntactic structure.

7.8 Predictive Power and Explanatory Strengths of OG with References to FT/FA, SMBA and PT

The study has provided compelling evidence from Mandarin learners' language over one academic year to demonstrate that OG has overall correctly predicted L2 Mandarin

⁵⁴ { } means that the two linguistics items was input at the same session.

development and that the interactive framework of input and UG can explain the exceptional cases. In other words, English speakers acquired functional projections of Mandarin in an incremental way, leading to stage-like development from VP>IP (lower IP-upper IP). The CP layer may be weakly represented by English speakers' acquisition of *le_h*, as scholars like Sybesma (1991) consider it as the projected at TP, which later moves to the CP layer.

There might be concerns over the above claims, as they are generalised regardless of the differences between Vainikka and Young-Scholten's previous study and the present study in two important aspects. Firstly, Vainikka and Young-Scholten's (1994, 1996a, 2011) participants were all naturalistic learners, while the participants in the present study were L2 learners under classroom instruction. Secondly, Vainikka and Young-Scholten used a 60% target-like production as their acquisition criterion while the present study used three consecutive outputs or at least three target-like suppliance as the emergence point of a functional projection.

Interestingly, in view of those differences, the analysis reveals a similar acquisition pattern based on the route hypothesised for the Mandarin syntactic tree (Vainikka and Young-Scholten 2015). The cross-linguistic data from the acquisition of L2 Mandarin, L2 German, indicates that consistent interaction between X' theory and language input, reviewed through the textbook input order constrains L2 development. The above discussion and conclusions make it possible for the present study to focus on evidence to evaluate OG's predictive power and explanatory strengths with reference to those of FT/FA, SMBA and PT.

According to the presented results, the present study poses challenges to specific claims of the FT/FA Hypothesis and SBMA, as summarised in Table 7.8. Firstly, the results do not verify three essential arguments against OT from the FT/FA Hypothesis. They are: (1) the absence of a functional morpheme as the absence of its pertinent functional projection; (2) the transfer of functional projection from the initial stage and (3) the lack of the stage-like development of functional projections due to an innate fully-fledged syntactic based on Strong Continuity Hypothesis (Epstein, Flynn and Martohardjono 1996).

Secondly, no substantial evidence was found in the data of the present study that indicates the transfer of L1 functional projections during the acquisition process, as proposed by MSBA. It is worth pointing out that there are no equivalent functional projections between English and Mandarin. The functional projection that could potentially transfer into Mandarin from English

was TP headed by –ed (past tense) or progressive AspP headed by –ing. Earlier acquisition of English found that progressive aspect was first acquired; however, in learners’ acquisition of Mandarin, *zai* which heads AspP_m was acquired later than AspP_l headed by *le_l*. As to *le_l*, it has frequently been held to be equivalent of past tense -ed in English. In that case, people may argue that the acquisition of *le_l* in this thesis is due to the transfer of the English past tense. This thesis provides evidence against postulations of FT/FA and MSBA, as summarised in Table 7.8; however, it is also likely that acquisition is due to the early input of *le_l* in L2 learners’ classroom instruction.

Table 7.8 Unverified hypotheses

	Arguments	Conclusion
FT/FA Hypothesis	<ul style="list-style-type: none"> (1) Stage-like development based on functional projections; (2) The absence of functional heads does not mean the absence of functional projections; (3) Transfer of L1 functional projections 	<ul style="list-style-type: none"> (1) Not verified (2) Not verified
MSBA	<ul style="list-style-type: none"> (1) Absence of functional projection at the initial stage; (2) The transfer of functional projection in the acquisition process 	<ul style="list-style-type: none"> (1) Confirmed (2) Uncertain

7.9 Conclusion

This chapter confirms that L2 learners’ initial supplience of L2 Mandarin VP word order does not contradict that of L1 VP and that there is largely an incremental and stage-like development in L2 learners’ acquisition of Mandarin. Moreover, it attempts to explain the acquisition results within the framework of X’ theory, while simultaneously considering L2 Mandarin textbook input. It concludes that while L2 learners’ acquisition results are mixed, the overall development matches the predicted route based on the hypothesised syntactic tree for Mandarin. That suggests the hypotheses of close matching of morpheme with syntactic structure verified

by L2 learners' acquisition of German (Vainikka and Young-Scholten 1994, 1996a, 2011) are very likely to apply to L2 acquisition of Mandarin, a typologically different language.

CHAPTER 8 CONCLUSION

8.1 Introduction

This thesis has tracked the acquisition of Mandarin syntax by eight adult L1 English speakers and made a comprehensive analysis (both longitudinal and cross-sectional) of their data. The aim was to test the suitability of the model of OG (Vainikka and Young-Scholten 2011) for the acquisition of Mandarin. As noted previously, OG is a theory of syntax and acquisition proposed because of L2 German acquisition data. This has also been applied recently to L2 English by learners from different L1 backgrounds and in naturalistic acquisition environments, for instance, Mobaraki's (2007) study of two Farsi children's acquisition of English; Young-Scholten and Strom's (2006) study of adult Somali and Vietnamese learners of L2 English, and Vainikka, Young-Scholten, Ijuin and Jarad's (2017) study of Arabic and Urdu learners of L2 English. Mandarin syntax differs significantly from that of European languages, for instance, German and English, as it lacks overtly marked tense and agreement but possesses aspect marking and *ba* and *bei* constructions. The examination of OG's applicability to the development of a typologically different language, like Mandarin, is of great significance in gaining a better understanding of universal routes and the principles of second-language acquisition.

The review of the theoretical and empirical literature in Chapters 2, 3 and 4 has yielded the following two research questions that need to be addressed in this study:

- Q1: Where the word order in the verb phrase is different in English and Mandarin, do the learners in this study use the order of their L1 English or that of L2 Mandarin?
- Q2: Do L2 Mandarin learners project functional elements in a stage-like manner, that is, from bottom to top, in accordance with the predicted route?

Based on the Mandarin clause structure model developed in Chapter 3, this study predicted the following L2 development route: $AspP_l > BaP > BeiP > AspP_m > NegP > AspP_h$ and hold that functional projections are highly likely to be acquired in an ordered sequence, with a left one acquired ahead of the one on its right.

This concluding chapter summarises the findings pertinent to the research questions and discusses further issues that have arisen from the results of the present work. It is structured into five sections. Section 8.2 summarises the major findings of the present study. Section 8.3

reflects upon the strengths and weaknesses of the present research. Section 8.4 proceeds to discuss the implications of the research results, and Section 8.5 concludes with suggestions for future research.

8.2 Summary of the Major Findings

As reported in Chapter 2, one hotly debated issue in generative approaches to L2 acquisition is whether L2 learners have a fully-fledged mental representation of the hierarchical functional projections at the initial state of L2 acquisition. If they do not, it explored how L2 learners build up the system of functional projections over the course of acquisition. Based on different conceptualisations of this fundamental issue, Schwartz and Sprouse (1994, 1996) and Lardiere (2008) have argued for a full syntactic tree, based on the L1, from the initial state of L2 acquisition. However, Vainikka and Young-Scholten (1994, 1996a) have argued that L2 functional projections are built up gradually through the interaction of L2 input and the transfer of L1 lexical projections. Both approaches assume direct access to Universal Grammar. This thesis tested the argument by examining the acquisition of Mandarin, a typologically different language from those focused on so far in this debate.

This study took Vainikka and Young-Scholten's (1998, 2011) model and put it to the test by investigating the acquisition of eight English speakers of functional projections at the IP layer. It looked at the evidence for whether they posited *AspP_l*, *BaP*, *BeiP*, *AspP_m*, *NegP* and *AspP_h*, and when. Quantitative analyses were made of the collected oral data from the perspective of individual learners, different year groups, linguistic items, data collection sessions and test tasks. In light of the emergence and accuracy criteria adopted in this study, the main findings are:

- i) Both Year 1 and Year 2 learners used their VP word order, similar to their L1 at the VO level; but when Mandarin and English differ, in particular with regard to the use of OV and VAdv word order, learners tended to hold on to their L1 word order. A small amount of OV order was found in the learners' data -- this might have been due to learners' transfer of the word order of another second language that they were learning, i.e. German.
- ii) By the end of the data collection period, one of the *ab initio* learners had failed to establish any functional projections at the IP layer; she continued to produce bare VPs apart from *NegP*. The other learner posited lower functional projections at the IP layer, i.e. *NegP* and *AspP_l*, but only towards the end of her first year.

- iii) The data for the most advanced Year 1 learner and all the Year 2 learners showed that they were acquiring functional projections, with their development route going from the lower IP stage to the higher IP stage;
- iv) There was a clear $AspP_l > AspP_m > AspP_h$ development pattern in the data for both Year 1 and Year 2 learners; similarly there was a consistent pattern of $BaP > BeiP$ development in the data for Year 2 learners;
- v) L2 learners displayed similar developmental patterns in the acquisition of *Mei/Bu+VP*;
- vi) L2 learners' acceptability judgements did not generate many significant data.

Overall, the present study found that a clear developmental pattern emerged in the L2 learners' production data, with bare VP utterances coming first, followed by those containing functional material located in the lower IP and, finally, the material in the upper IP stages.

The results reveal that the development stages found in the data correspond primarily to the stages predicted by the model of OG, given the Mandarin clause structure developed model in Chapter 3. In other words, English speakers' acquisition of Mandarin demonstrates the absence of functional material at the start, followed by the gradual building of the various relevant projections in a step-like fashion. Thus, we conclude that the results provide evidence that OG can predict and explain the L2 grammatical development of a typologically different language, such as Mandarin. Simultaneously, the results obtained in this study do not verify three claims put forth by the Full Transfer and Full Access Hypothesis proposed by Schwartz and Sprouse (1993/1994, 1994, 1996) and extended by Lardiere (1998, 2008) and others (see Section 6.4, Chapter 6). Moreover, the findings support MSBA's proposal regarding the absence of functional projections from the initial stage; nevertheless, there lacks strong evidence for its proposed L1 functional projection transfer during the process of acquisition.

8.3 Reflections on the Present Research

The present study is the first longitudinal and cross-sectional study to probe adult L2 learners' acquisition of Mandarin from the OG perspective. It has shed some light on how learners with L1 lacking overt inflectional morphology acquire, over time, an L2 aspect morphology and particular constructions in a target L2. As noted above, the findings of this study reveal a stage-like development compatible with the findings in Vainikka and Young-Scholten's (1994, 1996a, 1998, 2011) study of L1 Korean, Turkish, Italian and Spanish learners of L2 German. They are also compatible with the findings from L2 learners' acquisition of English (Mobaraki 2007; Young-Scholten and Strom 2006; Vainikka, Young-Scholten, Ijuin and Jarad 2017).

Furthermore, it should be pointed out that, while the role of cognition in the L2 acquisition was not the focus of the present study, some evidence relating to the importance of cognitive strategies was found in L2 Mandarin development of Charles, one of the Year 1 learners. As noted in earlier chapters, he seemed to have sought out far more opportunities for learning or acquiring Mandarin than all the other learners in the study. Similar cognitive factors were also found to influence the production data of the two child L2 participants of Mobaraki (2007) and George, a young adult learner in Vainikka and Young-Scholten (2011). Nevertheless, despite such factors and language-specific features, it is found that L2 learners universally start L2 acquisition without transferred L1 functional projections and functional projections go through an upward construction process, as predicted by OG (Vainikka and Young-Scholten 2011).

It is important to note that the findings offer support for the predictions of OG specifically with regard to functional projections at the IP level. Unlike Vainikka and Young-Scholten (1994), L2 learners' projection of subjects in the specifier position was not examined in this study; moreover, the acquisition of functional projections at CP layer, that is, the study of the acquisition of questions and complex clauses, was outside the scope of this study. Hence, this study can make only a weak claim about the development from the IP to the CP layer, as demonstrated by the aspect marker *le_h*. According to Sybesma (1997b), *le_h* is posited to be base-generated at IP layer and then moved to the CP layer.

Furthermore, it should be noted that the participants in this study were learning Mandarin under classroom instruction. Although the vast majority of their production consisted of simple clauses with SVO order, learners were also observed to produce complex clauses, particularly the Year 2s. Therefore, there is a scope for further study of the IP to the CP development route.

The weaknesses of the present study can be summarised as follows:

- (1) The present study cannot make a comprehensive claim of VP-IP-CP development in L2 learners' construction of Mandarin functional projections, as claimed in OG (Vainikka and Young-Scholten 1994, 1996a, 1998, 2011). This is because its focus has been on the hierarchical development from the VP to the IP stage. In other words, the research scope of the present study, though *le_h* can be argued to land finally at the CP layer, sheds almost no light on L2 learners' acquisition of functional elements at the CP layer.

- (2) Methodologically, ‘not know’ was used as a middle point on the Likert scale in the grammaticality judgement tasks. As pointed out by the examiners of the thesis, it is arguable to what extent results involving such an undefined variable are convincing. That is a technical issue that needs to be explored in the future.
- (3) The test of OG by using Mandarin as a typologically different language to be acquired by L1 English speakers can shed some light on the significant issue of the present study, i.e. the stage-like development; however, it becomes less helpful when the L1 transfer of VP headedness needs to be examined. Further studies need to take into account more L2 Mandarin learners from different L1 backgrounds.

8.4 Implications of the Research Findings

As noted in Chapter 1, the present study makes a novel contribution to SLA research in theoretical, methodological and practical aspects. That is, through the extension of a syntactic Mandarin tree (Vainikka and Young-Scholten 2015), it probed whether there were OG-based universal functional projection sequences through the longitudinal and cross-sectional study of adult L2 Mandarin development over one academic year. It also helped solve a longstanding issue in longitudinal studies, i.e. missing data in the longitudinal research due to participant’s absence from data collection sessions, by adopting the missing value analysis in the SPSS software package. Finally, this study advances SLA research by contributing the transcripts of the oral production data (story narration) to CHILDES to allow for data sharing and cross-linguistic studies.

Additionally, the findings of the present research have implications for at least two applied linguistic areas, namely, syllabus design and assessment. Firstly, the results can help syllabus designers and language instructors gain a clearer picture of the natural developmental features, thereby allowing them to adjust their present stage order of the L2 syllabuses or stage-like goals. That is also in line with Pienemann’s Teachability Hypothesis (1989, 1998), which claims that language development can be facilitated by providing learners with language input that is slightly above their present acquisition stage. Secondly, a stage-like proposal is also relevant to the assessment of L2 Mandarin learners’ morpho-syntactic competence (Spinner 2011). Based on OG, Young-Scholten and Ijuin (2006) designed an assessment for L2 adult American English learners. The expected acquisition order for L2 learners’ morpho-syntactic competence in the present HSK (Chinese Proficiency Test) syllabuses (Hanban levels 1-3) is arranged as follows: *le_n* (level 1) > *le_h*, *zai*, *zhe*, *le_l* (Level 2) > *le_h*, *zai*, *zhe*, *le_l*, *ba* and *bei* constructions (level

3). Possibly, such an order means that L2 learners should have acquired or learned *le_h* at the initial stage, potentially acquired *zhe* too early and mastered a good knowledge of Mandarin structure by the time the Level 1 examination is set up. The proposed development will be considerably challenging for L2 learners. The results obtained in the present study may bring further sophistication and improvement to the existing level/stage targets for L2 learners in the Chinese proficiency test (HSK), which has six proficiency levels but only the first three have morpho-syntactic objectives.

8.5 Directions for Future Research

This present study has testified the applicability of OG as a linguistic and second-language acquisition theory adult learners' acquisition of Mandarin as an L2. As proposed by OG, there was a detected stage-like development based on learners' acquisition of functional projections, as discovered by Vainikka and Young-Scholten (1994, 1996a, 2011), and there was also some variability, as noted in Chapters 6 and 7. Among the findings, the stage-like development outcome is promising; further research regarding the L2 acquisition of Mandarin can be conducted along this path by seeking answers to the following questions:

- (1) Will the study of naturalistic L2 Mandarin learners yield the same results as the present study?
As noted in the thesis, the results of the present study were obtained from participants who were primarily receiving classroom instruction. It is worth recalling that various researchers (e.g. Ellis 1989a and 1989b) have claimed that the routes of L2 acquisition resemble each other irrespective of the environments in which L2 acquisition occurs. It is also worth noting that Vainikka and Young-Scholten's ideas are based on naturalistic learners (of L2 German and English). Both longitudinal and experimental data in naturalistic and instructed environments are required to verify such a claim.

- (2) Will data from learners from diverse L1 backgrounds shed more light on the L2 learners' acquisition of Mandarin VP head directionality and functional projections? The present study is restricted regarding tracing only the development of L2 learners with a single language background. L1s with contrastive features in VP headedness and functional projections represented by inflectional morphologies have been considered as the bottleneck of L2 acquisition (Slabakova 2016), but further empirical data from Mandarin is needed to verify such a claim.

- (3) Will the acquisition order of ba <bei constructions remain the same if L2 learners receive experimental input of ba and bei constructions simultaneously? An answer to such a question can testify whether computational efforts incurred by the syntactic position of the constructions mainly constrain L2 development.
- (4) In what specific ways can the knowledge of stage-like development be applied to the design of L2 Mandarin course materials and teaching syllabuses, and to the setting-up of L2 assessments and L2 objectives for learners at different levels?
- (5) How can the stage-like development help with the diagnosis of language impairments in L2 Mandarin development and what light can such impairment data shed on the exact nature of L2 acquisition?

Among the proposed research questions, the one of primary importance is the further testing of the results on L2 learners from different L1 backgrounds and under different learning environments, that is, under naturalistic and classroom settings. Such research justifies the extent to which the conclusions can be generalisable to the acquisition of typologically diverse languages. Further confirmation of the development stages observed in the present study can help to substantially revise teaching syllabuses, language tests or language proficiency assessments.

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APPENDIXES

Appendix I Participant consent form (sample)

Please tick the right column of the following table to give your consent.

I confirm that I have read and understood the provided Participant Information Sheet for this research.	
I confirm I have been provided information in relation to the researcher and her supervisors and that inquiries or concerns can be directed to them or the ethical official of the School of English Literature, Language and Linguistics.	
I understand that my participation in the project is on a voluntary basis and that I agree to be recorded in the data collection process without being paid.	
I understand that the confidentiality of my identity will be guaranteed, in case that extracts of my recording are published in any form.	
<p>I have been informed that recordings of my language performance and my personal information will be:</p> <ul style="list-style-type: none"> • stored on a password-protected hard drive by the researcher; • in an anonymized form when quoted in published work or public presentation; • used solely for research purposes; 	
I understand that I can withdraw from the research at any time and without giving any explanation for the withdrawal.	
<p>Please select one of the following:</p> <p>(1) On the condition that my identity be anonymized, I agree to contribute the transcriptions of my recordings to CHILDES, the largest language acquisition database in the world.</p> <p>(2) I don't agree to contribute transcriptions of my recordings to CHILDES even if my identity is anonymized but I agree that my answer to this statement does not affect my consent to the rest of the statements on the form.</p>	
<p>Name of the participant _____ Signature of the participant _____</p> <p>Date of giving the consent _____</p> <p>Name of the researcher _____ Signature of the researcher _____</p> <p>Date of taking the consent _____</p>	

Appendix II Participant information questionnaire

Please fill in the blanks or circle the appropriate answers.

1. Your name _____
2. Your age _____
3. Gender _____
4. What is your first language? _____
5. What are the other language(s) you have learned? _____
6. How do you evaluate your current level of its/their proficiency?

7. After classroom teaching, how many hours per week do you usually spend in learning Chinese?

8. Have you ever been to China or another Chinese-speaking country? Yes/No
If yes, how long? _____
9. Have you ever lived in a Chinese-speaking community? Please circle: yes/no
10. Do you have Chinese-speaking friends or housemates? Please circle: yes/no
11. Do you take part in any type of activity that involves communication in Chinese on a regular basis?
12. How do you evaluate your current Chinese proficiency?

Your signature _____

Date of the signature _____

Appendix III VP test tasks

Describe the following pictures with the words given. If you don't have equivalent vocabulary, describe the pictures in a way you think most appropriate.



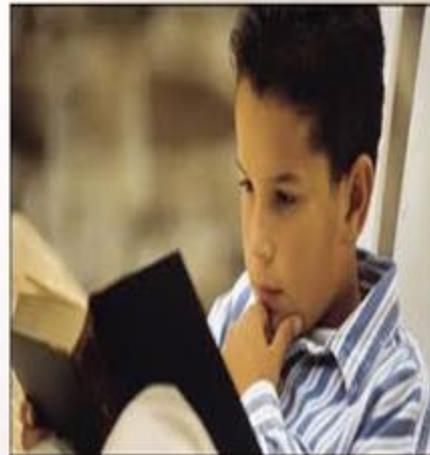
elder sister / gift / hold



daddy/ mug / break



daddy/ those stories / hear of /from my grandpa



elder brother/ book /read

Appendix IV NegP test tasks



Task 1. Talk about the lady in the picture.



Task 2 Talk about the pictures based on the crosses or ticks on the right.

Task 3 Judge how acceptable the following sentences are according to the given scales.

1	2	3	4	5
Completely unacceptable	Possibly unacceptable	I don't know	Possibly acceptable	Completely acceptable

- 爸爸 没 经历 过 战争。
Baba mei jingli guo zhanzheng.
 Dad MEI experience GUO war
 'Dad did not experience the War.'
- 小 王 了 没 遇到 那 个 同学。
Xiao Wang le mei yudao na ge tongxue.
 Junior Wang LE MEI meet that CL classmate
 (Target: *xiao Wang mei yudao na ge tongxue* or *xiao Wang yudao na ge tongxue le.*)
 'Junior Wang did not come across that classmate.'
- 我 去年 没 给 她 发 过 邮件。
Wo qunian mei gei ta fa guo youjian..
 1SG last year MEI give her send GUO email
 'I didn't send her any post last year.'
- 小 李 没 在 杯子 洗。
Xiao Li mei zai bei zi xi.
 Little Li MEI ZAI mug wash
 'Little Li was not washing the cup.'

Appendix V BaP test tasks

Task 1 Make new sentences with the given information.



1. 人们在龟甲上写字。
ren men zai gui jia shang xie zi.
 'People wrote characters on tortoise shells.'
 人们_____。

2. 李时珍记录了草药的功能。
Li shizhen ji lu le cao yao de gong neng.
 'Li Shizhen recorded the function of herbs.'
 李时珍_____。

Task 2 Judge how acceptable the following sentences are according to the given scales.

1	2	3	4	5
Completely unacceptable	Possibly unacceptable	I don't know	Possibly acceptable	Completely acceptable

1. 老师把抄了那封信一遍。
Laoshi ba chao le na feng xin yi bian.
 Teacher BA copy LE that CL letter one time
 (Target: *laoshi ba nafengxin cha le yibian.*)
 'The teacher copied the letter once.'
2. 他改动了一把家庭作业好几次。
Ta gaidong le ba jiating zuoye hao ji ci.
 3SG change LE BA home work good several times
 (Target: *ta be jiaoting zuoye gaidong le haojici.*)
 'He made changes to his homework several times.'
3. 她爸爸把自行车卖了。
ta baba ba zixingche mai le.
 3SG dad BA bicycle sell LE
 'Her dad sold the bike.'

4. 把 他 和 朋友 推 倒 了 那 个 房子。
ba ta he pengyou tui dao le that CL house
 BA 3SG and friend push down LE that CL house
 (Target: *ta he pengyou ba nage fangzi tuidao le.*)
 ‘He and his friend pushed down the house.’

Task 3 Translate the following sentences into Chinese and use *ba* wherever you think appropriate.

1. I put the book on the table.
2. He took me for my sister.
3. When buying a bottle of water this afternoon, I said *mài* instead of *mǎi*.
4. Please give a careful look at this drawing.
5. Ask him to return the book.
6. Shut the window.
7. Mum has forgotten about it.
8. Have you put your shoes on?
9. What has he lost?
10. I won't give him my telephone number.
11. I can't finish this within the time given.
12. I am not willing to rewrite this.

Appendix VI *BeiP* tasks

Task 1 Make sentences with the given information.



1. demolish



2. flood



3. chase



4. arrest

Task 2 Judge how acceptable the following sentences are according to the given scales.

1	2	3	4	5
Completely unacceptable	Possibly unacceptable	I don't know	Possibly acceptable	Completely acceptable

1. 他 打败 被 对手。
Ta dabei bei duishou.
 3SG defeat BEI opponent
 (Target: *ta bei duishou dabai le.*)
 'He was defeated by his opponent.'

2. 房子 没 被 卖 出去。
Fangzi mei bei mai chuqu..
 House NEG BEI sell out go
 'The house was not sold out.'

3. 他 被 骗 了。
He bei pian le.
 3SG BEI cheat PFV/CRS
 'He was/has been cheated.'

4. 他 的 故事 纪念 被 人们。
Ta de gushi jinan bei renmen.
 3SG DE story remember BEI people
 (Target: *ta de gushi bei renmen jinian.*)
 'His story is remembered by people.'

Appendix VI AspP test tasks---story-narrations



The Pear Story



The Wise Little Hen

Appendix VII A sample transcription and coding text

T2

Task_picture description

12. 爸爸喝一杯茶 (pause) 了。 (*lei*)

Task_negation 1

她不去了英国。 (*lei*)

我不看了她的 poems. (*Nlei*)

Task_negation 2

11. Has she gone to the cinema?

他去了看电影。 (*Nlei*)

Task_Pear Story

那个男人有 er 在 (*zai*), er(...) em 那个男人看 **在(*zai*)looking things through**。现在一个男人来和他的 goat (...) [stop to eat biscuits] 一个男人和他的 goat em em **来了(*lei*)** , 来了。他们 **去了(*lei*)**。 em 现在一个男孩子来了(...) on a bicycle. 那个男孩子 sees the man's baskets of pears on the floor. 那个男孩子 takes one basket of pears, picks up his bike and leaves with the pears. 这个男男人 **不看了(*Nlei*)**。 Em. 一个女孩子来了 and 和现在 the boy who has fallen off his bike. 现在 , 三三个男孩子来了 and they help the first boy pick up pears he has dropped when he falls off his bike。一个男孩子打打球球。 One of the boys returns the hat to the original boy that he left behind. 现在他们去了。

Task_Wise Little Hen

那是家。那是 little wise hen 的家。 Little wise hen, 现在 little wise hen er 在 Peter pig's 的家在。 (...) 现在 little wise hen 和她的家 Donald Duck 的家在。 (...) er Donald Duck 不喜欢 help (.) little hen. (...) Little hen 的孩子工作和 little hen **在工作(*zai*)**。 Little hen 的家跳舞跳舞跳舞。

Appendix VIII Year 2 learners' suppliance of linguistic items in the production data

Aspect markers of Daisy (1) in PD and Story Narration (1)																				
Task	PICTURE DESCRIPTION										STORY NARRATION									
	zhe		le _l		guo		zai		le _h		zhe		le _l		guo		zai		le _h	
S	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0
3	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
4	0	0	0	0	0	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0
5	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0
6	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0
7	0	0	0	0	1	0	0	0	0	1	0	0	3	1	0	0	1	0	2	0
8	0	0	0	2	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0
9	0	0	2	1	1	0	0	0	0	0	0	0	4	0	0	0	0	0	2	0

Aspect markers of Daisy (2) in ba and bei test tasks																				
Task	BA CONSTRUCTION										BEI CONSTRUCTION									
	zhe		le _l		guo		zai		le _h		zhe		le _l		guo		zai		le _h	
S	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
2	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	2	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
4	0	0	3	1	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
6	0	0	1	2	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0
7	0	0	3	1	0	0	0	0	1	0	0	0	4	0	0	0	0	0	0	0
8	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
9	0	0	4	0	0	0	0	0	2	0	0	0	4	0	0	0	0	0	0	0

Aspect markers of Daisy (3) in Neg1 and Neg2 test tasks (3)																				
		NEG1										NEG2								
Task	<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>		<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>	
T	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	1	1
5	0	0	0	1	0	0	2	0	0	0	0	0	3	2	1	0	0	0	0	0
6	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2
7	0	0	0	1	2	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0
8	0	0	0	0	1	0	0	0	0	0	0	0	4	2	1	0	0	0	0	0
9	0	0	1	0	1	0	0	0	0	0	0	0	8	2	2	0	0	0	0	0

Aspect markers of Emily(1) in PD and SN (<i>Story narration</i>)																				
		<i>PICTURE DESCRIPTION</i>										<i>STORY NARRATION</i>								
Tasks	<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>		<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>	
T	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	
1	0	0	2	1	0	0	0	0	0	1	0	0	4	0	0	0	0	0	0	2
2	0	0	1	1	0	0	0	0	0	0	4	0	1	0	0	0	0	0	0	0
3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	1	0	0	5	0	0	0	0	0	0	0
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Aspect markers of Emily (2) in <i>ba</i> and <i>bei</i> test tasks																				
Task s	BA CONSTRUCTION										BEI CONSTRUCTION									
	<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>		<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>	
F	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Aspect markers of Emily (3) in Neg1 and Neg 2 test tasks																				
Tasks s	NEG1										NEG2									
	<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>		<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>	
	Accurate	Inaccurat	Accurate	Inaccurat	Accurate	Inaccurat	Accurate	Inaccurat	Accurate	Inaccurat	Accurate	Inaccurat	Accurate	Inaccurat	Accurate	Inaccurat	Accurate	Inaccurat	Accurate	Inaccurat
	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0
4	0	0	1	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	2	0
7	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Aspect markers of Fiona (1) in PD and SN (<i>Story narration</i>)																				
		PICTURE DESCRIPTION										STORY NARRATION								
Task	<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>		<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>	
	T	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate
1	0	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	2	2	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1	0
3	0	0	2	0	0	0	0	0	1	0	0	0	1	0	1	2	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	2	0
5	0	0	2	0	0	0	1	0	0	0	0	0	1	0	0	1	0	1	0	0
6	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	0	0	2	0	0	0	2	0	2	0	0	0	0	0	1	2	2	2	0	0
9	0	0	0	0	0	0	1	0	2	1	a	a	a	a	a	a	a	a	a	a

Aspect markers of Fiona (2) in <i>ba</i> and <i>bei</i> construction test tasks																				
		BA CONSTRUCTION										BEI CONSTRUCTION								
Task	<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>		<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>	
	T	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0		0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
5	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	2	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	0	0	2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
9	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Aspect markers of Fiona (3) in Neg1 and Neg2 test tasks																				
Task	NEG1										NEG2									
	zhe		le _l		guo		zai		le _h		zhe		le _l		guo		zai		le _h	
T	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0
5	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
6	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	0	0	1	0	0	0	0	0	0	0	1	0	2	0	0	0	2	0	2	0
9	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Aspect markers of Grace (3) in Neg1 and Neg 2 test tasks																				
Task	NEG1										NEG2									
	zhe		le _l		guo		zai		le _h		zhe		le _l		guo		zai		le _h	
T	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0
5	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
6	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
7	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
8	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
9	0	0	0	0	1	0	1	0	0	0	0	0	4	3	1	0	0	0	0	0

Aspect markers of Grace (1) in PD and SN (<i>Story narration</i>)																			
PICTURE DESCRIPTION										STORY NARRATION									
<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>		<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>	
Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
0	0	1	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
0	0	2	2	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
0	0	2	2	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0
0	0	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0
0	0	1	2	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0
0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0

Aspect markers of Grace (2) in <i>ba</i> and <i>bei</i> test tasks																				
Task	BA CONSTRUCTION										BEI CONSTRUCTION									
	<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>		<i>zhe</i>		<i>le_l</i>		<i>guo</i>		<i>zai</i>		<i>le_h</i>	
T	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	2	3	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
3	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0
4	0	0	4	0	1	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0
5	0	0	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
6	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Aspect markers of Grace (3) in Neg1 and Neg 2 test tasks																				
Task	NEG1										NEG2									
	zhe		le _l		guo		zai		le _h		zhe		le _l		guo		zai		le _h	
T	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0
5	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
6	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
7	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
8	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
9	0	0	0	0	1	0	1	0	0	0	0	0	4	3	1	0	0	0	0	0

Aspect markers of Harry (1) in PD and SN (Story narration)																				
Tasks	PICTURE DESCRIPTION										STORY NARRATION									
	zhe		le _l		guo		zai		le _h		zhe		le _l		guo		zai		le _h	
T	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
1	0	0	2	2	1	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	1	1	0
3	0	0	3	0	0	0	0	0	0	2	0	0	4	1	0	0	0	0	0	0
4	0	0	2	1	1	0	0	1	1	0	0	0	1	0	0	0	0	2	1	0
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	0	0	1	0	0	0	1	0	2	0	0	0	3	1	0	0	0	1	3	0
7	0	0	3	1	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
8	0	0	1	0	1	0	0	0	1	0	0	0	7	1	0	0	1	0	1	0
9	0	0	0	2	1	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0

Aspect markers of Harry (2) in <i>ba</i> and <i>bei</i> test tasks																				
T as ks	BA TASKS										BEI TASKS									
	<i>zhe</i>		<i>lei</i>		<i>guo</i>		<i>zai</i>		<i>lei_h</i>		<i>zhe</i>		<i>lei</i>		<i>guo</i>		<i>zai</i>		<i>lei_h</i>	
T	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
2	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
3	0	0	1	1	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
4	0	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Aspect markers of Harry (3) in Neg1 and Neg2 test tasks																				
T as ks	NEG1										NEG2									
	<i>zhe</i>		<i>lei</i>		<i>guo</i>		<i>zai</i>		<i>lei_h</i>		<i>zhe</i>		<i>lei</i>		<i>guo</i>		<i>zai</i>		<i>lei_h</i>	
T	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
3	0	0	0	1	1	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0
4	0	0	0	0	1	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	0	0	0	0
7	0	0	0	0	1	0	0	0	0	0	0	0	6	0	2	0	0	0	0	0
8	0	0	0	0	1	0	0	0	0	0	0	0	5	3	1	1	0	0	0	0
9	0	0	0	1	2	0	0	0	0	0	0	0	3	2	3	0	0	0	0	0

<i>Ba</i> and <i>bei</i> in Daisy's production data																
Tasks	PICTURE DESCRIPTION				NEG1				NEG2				BA COSTRUCTION			
	<i>BA</i>		<i>BEI</i>		<i>BA</i>		<i>BEI</i>		<i>BA</i>		<i>BEI</i>		<i>BA</i>		<i>BEI</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	0	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-
T2	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0
T3	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0
T4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T5	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
T6	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0
T7	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0
T8	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
T9	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0

<i>Ba</i> and <i>bei</i> in Daisy's production data (2)													
Tasks	BEI CONSTRUCTION				<i>PEAR STORY</i>				<i>WISE LITTLE HEN</i>				
	<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	
T1	0	0	0	0	0	0	0	0	0	0	0	0	0
T2	0	0	0	0	0	0	0	0	0	0	0	0	0
T3	0	0	1	0	0	0	0	0	0	0	0	0	0
T4	0	0	0	0	0	0	0	0	0	0	0	0	0
T5	0	0	0	0	0	0	0	0	0	0	0	0	0
T6	0	0	0	0	0	0	0	0	0	0	0	0	0
T7	0	0	1	1	0	0	0	0	0	0	0	0	0
T8	0	0	3	0	0	0	0	0	0	0	0	0	0
T9	0	0	0	1	0	0	0	0	0	0	0	0	0

<i>Ba</i> and <i>bei</i> in Emily's production data (1)																
Tasks	PICTURE DESCRIPTION				NEG1				NEG2				BA CONSTRUCTION			
	<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-
T2	0	1	0	0	0	0	0	0	0	0	0	0	0	8	0	0
T3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
T7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

<i>Ba</i> and <i>bei</i> in Emily's production data (2)													
Tasks	BEI CONSTRUCTION				PEAR STORY				WISE LITTLE HEN				
	<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	
T1	0	0	0	0	0	0	0	0	0	0	0	0	
T2	0	0	0	0	0	0	0	0	0	0	0	0	
T3	0	0	0	0	0	0	0	0	0	0	0	0	
T4	0	0	0	0	0	0	0	0	0	0	0	0	
T5	-	-	-	-	-	-	-	-	-	-	-	-	
T6	0	0	0	0	0	0	0	0	0	0	0	0	
T7	0	0	0	1	0	0	0	0	0	0	0	0	
T8	-	-	-	-	-	-	-	-	-	-	-	-	
T9	-	-	-	-	-	-	-	-	-	-	-	-	

<i>Ba</i> and <i>bei</i> in Fiona's production data (1)																
Tasks	PICTURE DESCRIPTION				NEG1				NEG2				BA CONSTRUCTION			
	<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-
T2	2	4	0	0	0	0	0	0	0	0	0	0	1	3	0	0
T3	1	5	0	0	0	0	0	0	1	0	0	0	1	0	0	0
T4	0	6	0	0	0	0	0	0	0	0	0	0	2	6	0	0
T5	0	5	0	0	0	0	0	0	0	0	0	0	0	6	0	0
T6	0	6	0	0	0	0	0	0	0	0	0	0	2	7	0	0
T7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T8	2	6	0	2	0	0	0	0	1	1	0	0	2	6	0	0
T9	0	0	0	0	0	0	0	0	0	0	0	0	1	10	0	0

<i>Ba</i> and <i>bei</i> in Fiona's production data (2)													
asks	BEI CONSTRUCTION				PEAR STORY				WISE LITTLE HEN				
	<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	
T1	0	0	0	0	0	0	0	0	0	0	0	0	
T2	0	0	0	1	0	0	0	0	0	0	0	0	
T3	0	0	4	0	0	0	0	0	0	0	0	0	
T4	0	0	1	0	0	0	0	0	0	0	0	0	
T5	0	0	2	2	0	4	0	0	0	0	0	0	
T6	0	0	0	1	0	1	0	0	0	0	0	0	
T7	-	-	-	-	-	-	-	-	-	-	-	-	
T8	0	0	4	0	0	0	0	0	0	0	0	0	
T9	0	0	0	0	0	0	0	0	0	0	0	0	

<i>Ba</i> and <i>bei</i> in Grace's production data (1)																
Tasks	PICTURE DESCRIPTION				NEG1				NEG2				BA CONSTRUCTION			
	<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-
T2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
T3	0	0	0	0	0	0	0	0	0	0	0	0	3	4	0	0
T4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
T5	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0
T6	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0
T7	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
T8	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0
T9	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0

<i>Ba</i> and <i>bei</i> in Grace's production data (2)													
Tasks	BEI CONSTRUCTION				<i>PEAR STORY</i>				<i>WISE LITTLE HEN</i>				
	<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	
T1	0	0	0	0	0	0	0	0	0	0	0	0	0
T2	0	0	0	0	0	0	0	0	0	0	0	0	0
T3	0	0	0	0	0	0	0	0	0	0	0	0	0
T4	0	0	0	0	0	0	0	0	0	0	0	0	0
T5	0	0	0	0	0	0	0	0	0	0	0	0	0
T6	0	0	0	0	0	0	0	0	0	0	0	0	0
T7	0	0	0	0	0	0	0	0	0	0	0	0	0
T8	0	0	0	0	0	0	0	0	0	0	0	0	0
T9	0	0	0	0	0	0	0	0	0	0	0	0	0

<i>Ba and bei in Harry's production data (1)</i>																
Tasks	PICTURE DESCRIPTION				NEG1				NEG2				BACONSTRUC-TION			
	<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-
T2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
T3	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
T4	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0	0
T5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T6	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
T7	0	0	0	1	0	0	0	0	0	0	0	0	0	7	0	0
T8	0	0	1	0	0	0	0	0	0	0	0	0	1	8	0	0
T9	0	0	1	0	0	0	0	0	0	0	0	0	4	0	0	0

<i>Ba and bei in Fiona's production data (2)</i>													
Tasks	<i>BEI CONSTRUCTION</i>				<i>PEAR STORY</i>				<i>WISE LITTLE HEN</i>				
	<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		<i>Ba</i>		<i>Bei</i>		
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	
T1	0	0	0	0	0	0	0	0	0	0	0	0	
T2	0	0	2	0	0	0	1	0	0	0	0	0	
T3	0	0	3	1	0	0	2	0	0	0	0	0	
T4	3	0	0	0	0	0	0	0	0	0	0	0	
T5	-	-	-	-	-	-	-	-	-	-	-	-	
T6	0	0	1	0	0	0	0	0	0	0	0	0	
T7	0	0	1	0	0	0	0	0	0	0	0	0	
T8	0	0	1	1	0	0	1	0	0	0	0	1	
T9	0	0	0	1	0	0	1	0	0	0	0	0	

Daisy' negation production (1)												
Tasks	PICTURE DESCRIPTION				NEG1				NEG2			
	<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei-</i>		<i>Bu</i>		<i>Mei-</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	0	1	0	0	5	0	0	0	-	-	-	-
T2	1	0	0	0	4	0	0	0	7	2	2	0
T3	1	0	0	0	5	0	2	0	6	1	3	0
T4	1	0	0	0	6	0	1	0	7	1	3	0
T5	1	0	0	0	4	0	1	0	6	1	3	0
T6	1	0	0	0	4	0	0	0	4	0	1	0
T7	1	0	0	0	6	0	1	0	8	1	9	0
T8	1	0	0	0	4	0	0	0	7	0	3	0
T9	1	0	1	0	5	0	0	0	6	1	1	0

Daisy' negation production (2)																
Tasks	BA CONSTRUCTION				BEI CONSTRUCTION				PEAR STORY				WISE LITTLE HEN			
	<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	-	-	-	-	1	0	0	0	2	2	0	0	-	-	-	-
T2	3	1	0	0	0	0	0	0	5	4	0	1	0	1	0	0
T3	4	1	1	0	0	0	0	0	2	0	0	0	5	0	1	0
T4	3	1	1	0	0	0	0	0	2	0	1	0	3	0	1	0
T5	3	0	1	0	0	0	0	0	3	0	1	0	3	0	0	1
T6	2	0	1	0	0	0	0	0	2	0	1	0	1	0	0	0
T7	0	2	1	0	0	0	0	0	2	1	1	0	4	3	1	0
T8	1	0	0	0	0	0	0	0	1	1	0	3	3	0	2	0
T9	1	0	1	0	0	0	0	0	0	2	1	0	5	1	0	0

Emily's negation production (1)												
Tasks	PICTURE DESCRIPTION				NEG1				NEG2			
	<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei-</i>		<i>Bu</i>		<i>Mei-</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	1	1	0	0	2	0	0	0	-	-	-	-
T2	1	0	0	0	2	0	0	0	6	0	0	0
T3	1	0	0	0	1	0	0	1	2	0	1	0
T4	1	0	0	0	2	0	0	0	1	2	1	0
T5	-	-	-	-	-	-	-	-	-	-	-	-
T6	0	0	0	0	2	0	0	0	3	0	1	0
T7	0	0	0	0	5	1	0	0	4	1	2	1
T8	-	-	-	-	-	-	-	-	-	-	-	-
T9	-	-	-	-	-	-	-	-	-	-	-	-

Emily's negation production (2)																
Tasks	BA CONSTRUCTION				BEI CONSTRUCTION				PEAR STORY				WISE LITTLE HEN			
	<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	-	-	-	-	2	0	0	0	0	2	0	0	-	-	-	-
T2	3	0	0	0	3	1	0	0	0	0	0	0	1	0	0	0
T3	3	0	0	0	2	1	0	0	1	0	1	0	5	0	0	0
T4	3	0	2	0	1	1	0	0	1	0	1	0	3	0	0	0
T5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T6	3	0	3	0	0	0	0	0	2	0	0	0	4	0	2	0
T7	3	1	2	0	0	1	0	0	1	0	2	0	2	0	1	0
T8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fiona's negation production (1)												
Tasks	PICTURE DESCRIPTION				NEG1				NEG2			
	Bu		Mei		Bu		Mei-		Bu		Mei-	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	2	0	0	0	3	0	0	0	-	-	-	-
T2	3	0	0	0	5	0	1	0	4	1	2	0
T3	1	1	0	0	3	0	4	0	5	4	3	0
T4	2	0	0	0	1	3	1	0	7	2	4	0
T5	2	0	0	0	2	0	2	0	7	0	1	0
T6	1	0	0	0	5	0	0	0	4	0	2	0
T7	-	-	-	-	-	-	-	-	-	-	-	-
T8	1	1	0	0	3	0	0	0	5	0	2	0
T9	2	0	0	0	4	1	1	0	3	1	3	0

Fiona's negation production (1)																
Tasks	BA CONSTRUCTION				BEI CONSTRUCTION				PEAR STORY				WISE LITTLE HEN			
			Mei		Bu		Mei		Bu		Mei		Bu		Mei	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	-	-	-	-	3	0	0	0	2	0	0	0	-	-	-	-
T2	2	0	0	0	1	0	0	0	0	0	0	0	6	0	0	0
T3	4	0	1	0	0	0	0	0	1	0	0	0	9	1	0	0
T4	3	1	1	0	0	0	0	0	2	0	1	0	6	0	2	0
T5	5	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0
T6	3	0	0	0	2	0	0	0	0	0	1	0	2	1	1	0
T7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T8	3	0	0	0	0	0	0	0	1	0	1	0	4	0	0	0
T9	3	0	1	0	1	0	0	0	4	0	1	0	6	1	0	0

Grace's negation production (1)												
Tasks	PICTURE DESCRIPTION				NEG1				NEG2			
	<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei-</i>		<i>Bu</i>		<i>Mei-</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	0	0	0	0	0	0	1	0	-	-	-	-
T2	0	0	0	0	2	1	0	0	5	2	2	0
T3	0	0	0	0	3	0	1	0	5	1	2	0
T4	0	0	0	0	3	1	1	0	6	1	3	0
T5	0	0	0	0	2	0	2	0	6	0	2	0
T6	0	0	0	0	2	0	2	0	5	0	1	1
T7	0	0	0	0	5	0	2	0	10	1	3	0
T8	0	0	0	0	3	0	0	0	2	1	3	0
T9	1	0	0	0	1	0	1	0	4	1	3	0

Grace's negation production (2)																
Tasks	BA CONSTRUCTION				BEI CONSTRUCTION				PEAR STORY				WISE LITTLE HEN			
	<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	-	-	-	-	0	0	0	0	1	0	0	0	-	-	-	-
T2	3	1	0	0	0	0	0	0	0	0	0	0	4	0	0	0
T3	2	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0
T4	3	1	0	0	0	0	0	0	0	0	1	0	2	0	0	0
T5	4	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
T6	3	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
T7	4	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0
T8	3	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0
T9	3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0

Harry's negation production (1)												
Tasks	PICTURE DESCRIPTION				NEG1				NEG2			
	<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei-</i>		<i>Bu</i>		<i>Mei-</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	2	0	0	0	4	0	0	0	-	-	-	-
T2	1	0	0	0	3	1	1	0	4	2	1	0
T3	3	0	0	0	2	0	2	0	3	2	4	0
T4	3	0	0	1	4	0	1	0	5	1	3	1
T5	-	-	-	-	-	-	-	-	-	-	-	-
T6	0	1	0	0	3	0	0	0	1	1	0	0
T7	3	0	0	0	2	0	1	1	9	1	6	0
T8	2	0	0	0	4	1	1	0	3	1	3	0
T9	2	0	0	0	1	0	1	0	5	2	3	0

Harry's negation production (2)																
Test tasks	BA CONSTRUCTION				BEI CONSTRUCTION				PEAR STORY				WISE LITTLE HEN			
	<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei</i>		<i>Bu</i>		<i>Mei</i>	
	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate	Accurate	Inaccurate
T1	-	-	-	-	2	2	2	1	1	0	2	0	-	-	-	-
T2	3	2	0	0	0	0	0	0	0	0	0	0	2	0	2	0
T3	5	0	0	0	0	0	0	0	1	0	0	0	3	1	0	0
T4	3	0	0	0	1	0	0	0	2	0	2	0	6	1	0	0
T5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T6	3	0	1	0	1	0	0	0	2	1	0	0	4	2	1	0
T7	4	0	1	0	1	0	0	0	4	1	0	0	1	3	1	0
T8	3	0	1	0	1	0	0	0	4	0	1	0	6	1	0	0
T9	3	0	0	0	2	0	0	0	3	3	0	0	10	1	0	0

