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**SECOND LANGUAGE ACQUISITION OF
CHINESE GRAMMATICAL MORPHEMES:
A PROCESSABILITY PERSPECTIVE**

YANYIN ZHANG

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Except where it is otherwise acknowledged in the text, this thesis represents the original research of the author.

Yanyin Zhang

YANYIN ZHANG

Canberra, April 2001

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Second Language Acquisition of Chinese Grammatical Morphemes: A Processability Perspective

Abstract

This study investigates the second language acquisition of eight Chinese grammatical morphemes by three English-speaking learners. Adopting the theoretical framework and analytical methods of Processability Theory, the study focuses on the developmental sequence of the morphemes, their points of emergence and their subsequent refinement. The influence of formal instruction is examined as a variable, and the predictive power of the processing hierarchy of the interlanguage morphology proposed in Processability Theory (Pienemann 1999) is tested.

The study employed a longitudinal design. Three Australian university students enrolled in a first year intensive Chinese course participated as informants. They were all native speakers of English and had no prior knowledge of Chinese. Their interlanguage speech data was collected regularly through task-based oral interviews over a period of one academic year. A total of nine interviews were conducted with two subjects, and eight interviews with one subject. Data was then transcribed and grammatical features tagged.

Data analysis was performed through distributional analysis which detailed the linguistic environment of each grammatical morpheme so that the precise way in which the form entered the interlanguage could be determined. Emergence criteria stipulated in Processability Theory were then applied to locate the acquisition point of the form. The subsequent unfolding refinement of the form was examined in terms of the expansion of its semantic, functional and linguistic contexts.

The results showed that the overall morphological progression in the interlanguage of the subjects was compatible with the processing hierarchy hypothesized in Processability Theory. The morphemes emerged according to the prescribed stages. Developmental gaps occurred within a stage, but never across a stage. The overall grammatical sequencing of the syllabus was also compatible with the processing sequence. However, the learners did not respond to instruction in a neat manner and there were considerable variations both within the acquisition pattern of individual learners and among the learners. Many of these variations would defy explanation on the basis of instruction. The only clear evidence of the role of instruction was that it always preceded each emergence point.

The research also showed that the developmental process of the morphemes was associated with the semantic and grammatical analysis of the lexical items in the second language, the categorial analysis by the learners of lexical items which cross-categorize, the form-functional complexities of the morpheme, the production strategies of the learners and their learning orientations.

Abbreviations

ADJ	adjective marker
ADV	adverb
AP	adjective phrase
ASP	aspect
ATT	attributive marker
AUX	auxiliary verb
CL	classifier
COMP	complement
DET	determiner
DO	direct object
DUR	durative marker
EXP	experiential marker
GEN	genitive marker
Int	interview
IO	indirect object
LOC	location / locative
N	noun
NOM	nominalizer
NP	noun phrase
NUM	numeral
OBJ	object
P	preposition
PAR	particle
PFV	perfective marker
POSS	possessive
PRED	predicate
PROG	progressive marker
Q	question
RC	relative clause marker
SPEC	specifier
SUBJ	subject
T	task
V	verb
V-COMP	verb complement
VP	verb phrase
WH	<i>wh</i> -word
wk	week

Chapter 1

Introduction: Research Statement

[The] lines of inquiry most likely to give fruitful results in the early stages of a discipline's development are those to which the largest number of people devotes their energy, not necessarily those that are correct.

O'Grady (1987:ix)

The focus of this study is to document the development of eight Chinese grammatical morphemes in the interlanguage (IL) of three English-speaking learners. The purpose is to determine the sequence of linguistic rule development and to trace the developmental course of the rule from its emergence.

Within the scope of this objective, there are two related issues, which the present study also aims to address:

- a) the extent to which formal instruction affects the grammatical progression in the interlanguage;
- b) the adequacy of Processability Theory (Pienemann 1999) as a descriptive and an explanatory approach to second language acquisition (SLA) of Mandarin Chinese.

The first issue is concerned with the efficacy of formal instruction, including teaching methods and materials, in language studies. While it is claimed that for adult second language (L2) learners, formal instruction of some sort is necessary and even imperative (e.g., Krashen 1982, Gregg 1996), and that certain ways of teaching are better in promoting learning than others (e.g., Lightbown & Spada 1990), the question still remains why teaching, using whatever methods, sometimes makes a difference to all learners, but at other times only to some learners (e.g., Pienemann 1987b). Apparently, the issue of effective instruction is related in some fundamental ways to other factors, one of which is the natural course of language development.

Many SLA theories, models, and empirical studies have endeavored to discover this natural course (e.g., Dulay & Burt 1973, 1974, Krashen 1982, Meisel, Clahsen & Pienemann 1981, Pienemann & Håkansson 1999, Johnston 1997, Huter 1998, Qian 1997, Wang 1997, Shi 1998). Processability Theory (Pienemann 1999) is the latest proposal in SLA which makes use of the psychological mechanisms underlying on-line human information processing and spontaneous speech production to construct a

developmental hierarchy of L2 morpho-syntax. It aims at predicting "which structures can be processed by a learner at a given level of development" (Pienemann 1999:331). The processability account of the progression of L2 grammar constitutes an explanation of the acquisition sequence.

In this study, the choice of Processability Theory over a number of other, perhaps more popular, theories (e.g., Universal Grammar or UG) is motivated by three factors. The first factor has to do with the central thesis of this study, which is concerned with the developmental aspect of language acquisition. Processability Theory, with its commitment to the delineation and prediction of the transitional stages in the development of L2 grammar, provides a principled approach according to which the step-by-step process of L2 grammatical evolution can be described and explained. Secondly, Processability Theory provides objective criteria for clear identification and demarcation of developmental stages in a learner. These stages can be determined "on the basis of concrete *observations*, as opposed to subjective judgments" (Johnston 1997:343, italics original), and are therefore operationable and testable. Finally, as a newcomer, Processability Theory and the hypotheses it proposes need to be tested. However, no theory can sensibly be assessed until a great deal of data has become available (Rosenberg 1986, cited in Beretta 1991). To date, cross-linguistic evidence supporting Processability Theory has come from synthetic languages (e.g., English, Swedish, German) and one agglutinating language (Japanese) (see Pienemann 1999 for a detailed analysis and review). The present study will add to this body of data a language from yet another typology, Chinese, an isolating, analytic language.

At this point, an operational definition of the topic is in order. In the general sense of the term, second language acquisition refers to all aspects of language that the learner needs to master. However, most of the research focus and research findings have been confined to how learners acquire L2 grammatical sub-systems (Selinker 1985). The centrality of syntax and morphology in SLA is perhaps largely due to its theoretical and cognitive appeal, as can be testified in part by the large body of UG-oriented research in SLA (e.g., Bley-Vroman 1990, Cook 1996, Eubank 1991, Schwartz 1992, Shimura 1990, Tomaselli & Schwartz 1990, Uziel 1993, White 1990, White & Juffs 1993). Likewise, rather than attempting to cover every aspect relevant to the learning of Mandarin Chinese, this study will focus only on the acquisition of eight Chinese grammatical morphemes as observed in the IL speech of the learners.

The use of speech production data rather than written data is motivated by the fact that the language processing mechanisms underlying speaking are different from those underlying writing (Levelt 1989, Pienemann 1999). Grammatical operations in the

spontaneous speech production of a native speaker are largely automatic. This is because during speech, information must be processed online and this does not allow full utilization of time, attention, memory and other resources that are commonly available to writing. Compared to written samples, speech production data is more suitable for tapping into the current state of a learner's L2 processing skills.

The following is a set of definitions of some key terms used in the study.

a) The proper noun "Chinese" is used throughout the study to mean *Putonghua* 'Common Speech / Language': the standard dialect of the People's Republic of China. A more apt term would be "Modern Standard Chinese" (MSC), used in Kratochvil (1968). "Chinese" is chosen in this study for its transparency and general familiarity to the learners.

b) The distinction between "language learning" and "language acquisition" (Krashen 1982) is not maintained in the present study. Both are used in the same sense as the term "language development" to mean the process of acquiring a language.¹

c) Similarly, no distinction is made, unless specified, between "second language" (L2) "foreign language," and "target language." They all refer to the language other than one's mother tongue, be it the third or fourth language one is learning.

The structure of the study is as follows. It starts with a review of the theoretical background of language acquisition (Chapter 2). Two fundamental issues are discussed: the learnability issue or the "logical" problem, and the developmental issue. The review focuses more on the latter as it is directly relevant to the present study. Major theoretical developments in both areas together with empirical findings are presented.

Chapter 3 gives an overview of research in Chinese as a second language (CSL). Eight data-based studies are critically reviewed with regard to their data analysis, methodology and theory application.

After the two literature review chapters, a formal description of the eight Chinese grammatical morphemes is given in the descriptive framework of Lexical-Functional Grammar (LFG) (Chapter 4). A processability hierarchy for these morphemes is established following the general principles of Processability Theory.

¹See Cook (1988) for the differentiation between "language acquisition" and "language development."

The research methodology of the study and the rationale are presented in Chapter 5, followed by a diachronic description of the acquisition process of the eight morphemes in the IL of the subjects (Chapter 6). The description serves as the basis for the discussion of a number of issues related to the objectives of the study: the relationship between formal instruction, processing constraints, and the acquisition pattern found in the present study, language teachability, language transfer, etc. (Chapter 7)

The thesis concludes with a summary of the major findings from the present study. Relevant findings from previous studies are presented to provide a wider context for the present findings. Finally, limitations of the study are discussed with a view for improvement for future research.

Chapter 2

Theoretical Foci of Language Acquisition: A Review

Language acquisition research addresses two fundamental questions: a) how is linguistic knowledge acquired? b) how does language acquisition proceed? The first question is concerned with the learnability issue or the logical problem, and the second question with the developmental issue or the transition problem (Gregg 1992, 1996). It is the second question, the step-by-step emergence of an interlanguage grammar, which forms the central concern of the present study.

This review will focus on the research interests and efforts in the construction of a language development theory which accounts for the transition mechanisms in the language learning process. Three major approaches are discussed, namely, the continuity approach, the maturational approach, and the incrementalist approach. Their theoretical positions and relevant empirical studies are examined. In order to place the developmental issue into a wider context, the learnability problem is discussed first with the focus on the key concepts, hypotheses, and arguments. The aim of the review is to provide the necessary background for the present study on the L2 acquisition of Chinese grammatical morphemes.

2.1. The learnability issue

The question of "how is linguistic knowledge acquired?" is derived from the observation of the gap between the linguistic data to which a child is exposed and the linguistic knowledge he or she eventually attains. The quality and range of the former are apparently not comparable to the latter and cannot account for the richness and uniformity of the latter (Bley-Vromar 1989, Cook 1991, White 1989b). To date, there does not seem to be major disagreement about the discrepancy between the input received and the competence attained.

The fascination of the question lies in the answer(s): i.e., the kind of learning theory which can provide a solution to the learnability problem, "how can one learn a language on the basis of underdetermined data?" The learning theories formulated so far are informed by various linguistic, philosophical and epistemological perspectives. One of them, the "nativism" viewpoint, finds the solution in a learning mechanism which is linguistic in character and which is thought to be genetically available. This mechanism was called by Chomsky the "language acquisition device" (LAD). It acts upon the

narrowly limited and underdetermined linguistic experience (i.e., input) to form a full and mature grammar which is "independen[t] of intelligence, motivation and emotional state" (Chomsky 1965:58).

Over the last three decades, the rationalist argument for positing an innate learning device has prompted intense research into the exact nature and specification of the device. Much of the research energy prior to the appearance of the Minimalist Program in 1993 was concentrated on the description of the principles which all languages obey (e.g., Structural Dependency, Subjacency, Binding), and a set of parameters which allow for limited variations among languages (e.g., pro-drop, headedness). This approach has resulted in a powerful theory of grammar called the "Government and Binding" (GB) theory or "Universal Grammar."¹ It specifies "a system of knowledge of what a human language can be and innate domain-specific procedures for arriving at a grammar" (Bley-Vroman 1989:41).

According to the UG supporters, this system of knowledge (i.e., UG principles), which every native speaker of a language attains, is simply too abstract, too complex and too intricate to be learnable from experience. Such learning experience as correction and approval, imitation, explanation, and social interaction cannot serve as an alternative solution because it cannot be shown to occur in the language learning process of every normal child, although every child eventually masters a language. In other words, it is not enough to argue on the logical ground that a certain form of environment is helpful to language learning. One must show that it is indeed available to all the learners (Cook 1991). Given the complexity of the UG principles and the implicit nature of language knowledge in the speakers, it is doubtful whether externally provided learning assistance can play a determining role even if it does occur uniformly (Cook 1991, White 1989b). If important aspects of language are not acquired from experience, then they must be already present in the mind (Cook 1991, Eubank 1991a).

However, the UG proponents do not deny the role of the environment in language acquisition. They argue that language input functions as a "trigger" for the innate UG-based learning mechanisms to be activated (Cook 1991, White 1989). For example, "children acquire Binding by using the principles they know and by learning which words are anaphors and which are pronominals" (Cook 1991:71). They learn the headedness of their language by observing the headedness value in the input they receive (Cook 1991). The input provides evidence for them to determine the values of the structures which are left unspecified by UG. While such input must be present, it does

¹See Chomsky (1981a, 1981b). Haegeman's (1991) exposition of GB is more accessible while Cook (1991), Cook and Newson (1996), and White (1989b) all provide a highly readable rendering of GB plus its application to language acquisition.

not have to be rich because the mind is equipped with mechanisms which are specifically designed for language learning.

Thus, UG serves as a powerful solution to the logical problem of first language acquisition. Empirical research showed that no "wild grammar" (i.e., violation of UG principles) was found in the speech samples of young children (see, e.g., Crain and Nakayama 1987, also Cook 1991, White 1989b). It seems that rather than going for any formally possible grammar, children followed the principles stipulated by UG (Lust 1994, Deprez and Pierce 1993, Radford 1994). UG appears to have a constraining effect on the type of formal hypothesis children entertain. While many of the UG-oriented studies endeavor to describe and explain first language acquisition, an extensive review of the child language literature in syntactic development led O'Grady (1997:358) to conclude that "in general, developmental facts offer no special support for the view of syntax associated with GB-based theories of grammar" (also Jordens 1988, O'Grady, Peters and Masterson 1989). In fact, O'Grady et al. (1989) argued that non-UG inspired explanations can equally account for the acquisition of a particular rule. Their analysis of the pro-drop showed that English speaking children supplied subjects to the sentences at the same time as they developed tensed verbs. In other words, the setting of the non-pro-drop parameter occurred at the same time as the distinction between +/-FINITE verbs was acquired. This approach is in contrast with UG-based pro-drop studies which employ the "Morphological Uniformity Principle" (e.g., Hilles 1986, 1991).

Furthermore, O'Grady (1997) pointed out that some properties of the acquisition device inferred from developmental facts do not seem to have anything to do with the question of whether there is an inborn grammatical system such as UG. He listed the following features observed from child language and data analysis: the tendency to be conservative in identifying verbs that undergo inversion, and to overextend case forms on the basis of generality of occurrence; young children's aversion to gaps in proportion to their distance from the associated "missing" element, and their preference for forward patterns of pronominalization. It seems that UG, as a dominant language acquisition theory, is very much open to debate and empirical testing.

In the last two decades, the interest in UG and its role in language acquisition were extended to second language acquisition research. Whether UG operates in adult second language learners is an issue of further controversy, motivating intense debate, speculation and empirical investigations. Two extreme views are held, respectively called by Gregg (1992) the "theist" and the "deist" views. The "theist" position regards UG as being fully available and responsible for second language acquisition (e.g., DuPlessis, Solin, Travis and White 1987, Eubank 1991c, Flynn and Espinal 1985, Schwartz 1991,

Schwartz and Sprouse 1996, White 1985, 1989a, 1990). The "deist" position, however, holds that UG is dead in adult learners and that the LAD is not functional the way it is in a child (e.g., Bley-Vroman 1989, Clahsen and Muysken 1986, Schachter 1989, 1990, Jordens 1991, Klein 1991, Meisel 1991, 1997). There is widespread failure among adult learners to achieve native-like competence in the target language, although a small number of adults, an estimated 5% according to Selinker (1972), do achieve native-like competence in the target language (e.g., Coppieters 1987). In addition, a middle position exists which regards adults' access to UG possible through the mediation of the mother tongue (e.g., Bley-Vroman 1989, Schachter 1989).

Thus, the logical problem of second language acquisition "becomes that of explaining the quite high level of competence that is clearly possible in some cases, while permitting the wide range of variation that is also observed" (Bley-Vroman 1989:50, also Cook 1991). The burden of proof falls upon the theists (Gregg 1992). Experimental studies were carried out on both sides to prove their respective views, followed by intense discussions on rationalist and theoretical grounds (e.g., Eubank 1991b). Most of the experimental studies, according to Eubank (1991a:24), "concentrated on five areas: head position and anaphor direction, anaphoric binding, the recognition of UG violations in the L2, the *pro*-drop phenomenon, and the development of Germanic word order." The findings, however, were far from conclusive. Furthermore, comparisons between child first language learners and adult second learners yielded similarities in some cases (Meisel 1991, Vainikka and Young-Scholten 1996b) and differences in others (Clahsen 1990, Clahsen and Muysken 1986, Meisel 1991). The results of grammaticality judgment tests were often better than chance but not as good as the native speakers (Bley-Vroman, Felix and Ioup 1988, Gregg 1992). On the last point, Bley-Vroman et al. (1988:27) observed that

UG is concerned with the notion of possible grammar. The consequences of UG are not merely statistical. Violations of the Complex NP Constraint are not just ungrammatical "more often than not." They are ungrammatical -- period. If access to UG explains why the non-native speakers did better than chance, what explains why they did not do as well as native-speakers?

Partial access to UG was then proposed to account for many of the incompatibilities between data, hypothesis, and results (e.g., Bley-Vroman, Felix and Ioup 1988, Hawkins, Towell and Bazergui 1993, Hawkins and Chan 1997), and the "all-or-nothing answers" to the UG accessibility were no longer fully entertained (Felix 1991:101). Obviously, this state of affairs is far from promising any resolution of the controversy. Consequently, calls have been made for "specific proposals about the interface between

input and language processor" so that the "homunculus problem" can be avoided altogether (Gregg 1992: 36).²

In 1993, the overall linguistic theory that had provided the focus and motivation for much of the acquisition research above was changing. GB theory, within which much of the solution to the logical problem was based, underwent fundamental re-conceptualization. The resulting "Minimalist Program," although still a theory of "principles and parameters," has abandoned some of the key notions in the GB framework (Cook and Newson 1996). This radical revision of the theory, as with earlier revisions of grammatical theories, has created more inconvenience to psycholinguists and language acquisition researchers. As Pienemann (1999) pointed out, linguistic phenomena must be first (and once more) described in the minimalist version of UG before subjecting them to empirical tests. If some of the specific principles and crucial notions are no longer contained in the new version, where does it leave the conclusions drawn from empirical tests conducted within the GB framework? The problem / dilemma caused by the instability of linguistic theory for SLA researchers could leave them in a state of permanent, dynamic re-vamp of language acquisition theory and studies (Beretta 1991, also Birdsong 1991, Pinker 1984, Gregg 1989a, 1996).³

Apart from UG, there are alternative approaches to the learnability problem. Some proposals are made within the nativist tradition which is committed to an innately structured acquisition device for language, for example, the "general nativism" approach (O'Grady 1987, 1991, 1997), the "inductivist approach" (Maratsos and Chalkley 1981, Maratsos 1982, Braine 1987), and the "semantic approach" (Schlesinger 1982, 1988). Other proposals stem from very different perspectives. For example, the "constructivist approach" sees a close relationship between cognitive development and language acquisition, with the former acting as the prerequisite (Piaget 1976, Slobin 1973). The "connectionist approach" is uncommitted to the existence of syntactic representations (e.g., Rumelhart and McClelland 1987). Some "functionalist approaches" deny the basic premises of the logical problem, i.e., the "poverty-of-stimulus hypothesis" and the complexity of the fully developed grammar (e.g., Bates and MacWhinney 1982, Bates and Elman 1992, Snow and Ferguson 1977). Others emphasize the role of input and interaction over innate properties (Krashen 1980, Long 1985).⁴ Each one of these proposals has something to say about the learnability problem. Although it is not the purpose of the present work to review all of these approaches, it is fair to say that as

²The "homunculus problem" refers to the nativist's argument for an innate, language-specific acquisition device, which functions like "a little man" inside our mind to direct the course of language acquisition.

³An exposition on the relationship between linguistic theory and psycholinguistic research can be found in Reber (1987) and Fodor, Bever and Garrett (1974).

⁴For a synthesized description and review of these approaches, see O'Grady (1997), and Pienemann (1999).

language acquisition theories, they fall short to varying degrees of the descriptive adequacy of the following key aspects of a second language acquisition theory (see Pienemann 1999, Gregg 1992):

- a) a systematic description of the target grammar
- b) a systematic description of the input
- c) the specifications of the learning device
- d) the specifications of the initial state

A learning theory must explain what one is learning, what the learning device is like and how it acts upon the input available in the environment, and what kind of individual knowledge is brought to the task of learning (Pinker 1984). So far, there does not yet seem to be a learning theory which adequately addresses all these issues (Gregg 1992, 1996).

2.2. The developmental issue

While the learnability problem is concerned with the type of learning device "needed to construct a grammar in response to experience," the developmental issue deals with "the real-time operation of the acquisition device in response to...[the] day-to-day experience with language" (O'Grady 1997:5). Given the presence of a learning device, how does it act upon the input and what does the learning process look like as the result of this interaction? Like the learnability problem, the developmental problem of how the acquisition proceeds and why it follows a certain developmental path must also have a solution. The specific emergence sequence "T1, T2, T3," rather than "T1, T3, T2" must be explainable (Gregg 1989a). In order to achieve this goal, Gregg (1996:73) proposed that

the developmental problem requires a transition theory...a causal theory that makes use of a parser--that is, a mechanism that is specifically designed to operate on linguistic input within the framework of a property theory of that input.

Research into first language development has generally been conducted in the observation and description of the "step-by-step emergence of grammatical patterns and the type of errors that may occur prior to the attainment of mature linguistic competence" (O'Grady 1997:4). Various aspects of child language from over twenty L1s were documented in Slobin's (1985, 1992, 1997) collection of cross-linguistic study of first language acquisition.

In second language acquisition research, the earliest developmentally oriented attempt was perhaps the "morpheme order studies" (Dulay and Burt 1973, 1974). Based on the data elicited from a large number of ESL learners of varying ages and from different first language backgrounds, a common rank order of a subset of English grammatical morphemes was established (Figure 2.2-1). While not rigidly invariant, the order was also far from random (Krashen 1977), and was confirmed by "many studies conducted with sufficient methodological rigour and showing sufficiently consistent general findings" (Larsen-Freeman and Long 1991:92).

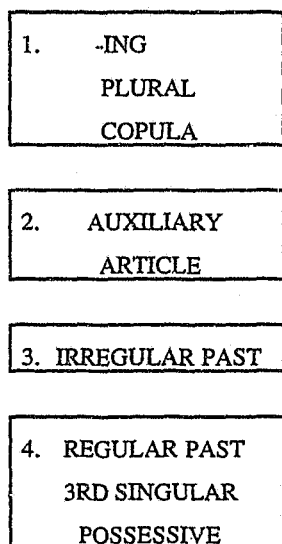


Figure 2.2-1. Krashen's (1977) "Natural Order" for ESL.

However, all Larsen-Freeman and Long (1991:92) were able to conclude after listing four or five alternative but highly speculative explanations was that something was going on. No valid explanation has been advanced to date because the "morpheme order studies" themselves were conducted without any theoretical motivation (Gregg 1984). As such, the order obtained remains a mystery and all attempted explanations appear *ad hoc* and putative.⁵

While accurate description is of great value, explanation is the goal that a scientific discipline strives for (Gregg 1996).⁶ Second language acquisition research is no exception. However, compared to the fruitful outcome in the construction of a language

⁵Recently, however, there are fresh attempts to explain morpheme order by using UG-based analysis, for example, the X'-theory or functional projection (Zobl and Liceras 1994, Vainikka and Young-Scholten 1996b).

⁶According to Gregg (1996), progress in any scientific discipline is made by focusing on the explanatory problem. Accurate and consistent descriptions are crucial, but they themselves are not the ultimate goal of scientific research.

learning theory, the central position of the developmental issue in a comprehensive theory of language acquisition has only been acknowledged fairly recently (Myles 1995, Gregg 1996, O'Grady 1997, Pienemann 1999). The progress towards a theory of language development, i.e., a transition theory, is slow. In general, there have been three broad approaches towards the construction of a transition theory: the continuity approach, the maturational approach, and the incrementalist approach (O'Grady 1997).⁷ Each of these approaches is reviewed in the following sections.

2.2.1. The continuity approach

Underlying the continuity approach is the Continuity Hypothesis, first formulated in developmental psychology in order to construct a theory which was intended to be both parsimonious and explanatory in its accounts of data (Macnamara 1982, Pinker 1984). The Continuity Hypothesis states that, in the absence of evidence to the contrary, the cognitive mechanisms of children and adults are essentially identical (Macnamara 1982). According to the Continuity Hypothesis, developmental changes are to be attributed to quantitative changes in the children's knowledge base, in their increased access to computational procedures of the knowledge base, and in the size of their working memory (Pinker 1984). In other words, developmental changes are not viewed as qualitative changes to the cognitive mechanisms of the mind.

Applying the continuity assumption to language development, it is considered that the grammatical mechanisms used in first language acquisition are qualitatively identical to those employed in adult second language acquisition. As O'Grady (1997:331) put it, "[t]he language acquisition process is 'continuous' in the sense that the language device analyzes experience in terms of the same notions and relations at all stages of development." In contemporary linguistic investigation, the Continuity Hypothesis is often associated with UG-based research into language acquisition.

There are two versions of the Continuity Hypothesis. The strong version holds that the child has at its disposal a fully-fledged UG from the outset of language acquisition (e.g., Poeppel and Wexler 1993, Lust 1994). The functional categories and their phrasal structures are available in the child's grammar from the earliest stage of syntactic development. The non-occurrence of certain structures (e.g., CP) at the early stages of language development is due to the lack of lexical acquisition (e.g., the complementizers *that*, *whether*, *if*, etc.) rather than the absence of functional projection (O'Grady 1997). The weak version contends, however, that although UG principles and parameters are present from the beginning of acquisition, the child does not make use of all of them

⁷O'Grady (1997) calls them "developmental theories" in his comprehensive review of the syntactic development of child language. Their theoretical status, however, is not so clear in second language acquisition. "Approach" perhaps is a more apt term in this regard.

immediately. Instead, these principles and parameters become available to the child in a gradual manner, and the syntax develops as the result of interaction between the X'-Theory and the input (e.g., Clahsen, Eisenbeiss and Vainikka 1994, Vainikka and Young-Scholten 1996b).

As an explanation for the step-by-step development of language acquisition, the Continuity Hypothesis has been invoked in the study of parameter setting and emergence of syntactic structures. Both seem to be closely associated with lexical acquisition. In an extensive study of child language within the GB model, Hymas (1986) investigated the development of the pro-drop parameter in the language acquisition of English-speaking children. She found that children started from the setting for the parameter that allows null-subject sentences. Once they learned that English is non-pro-drop from the positive evidence in the environment, they supplied subjects to every sentence. According to Hymas, this process was mediated by input: the presence of the dummy subject *it* and *there* in "weather" sentences and existential sentences. She further supported her analysis by showing that English children acquired expletive subjects at about the same time as they acquired full lexical subjects.

Many syntactic structures are developed as the result of lexical acquisition, which involves both the addition of specific lexical items to the mental lexicon and the discovery of special properties, associated with each one of them. For example, according to O'Grady (1997), CP projection is determined by the acquisition of complementizers such as *whether*, *that*, *for*. The absence of complex sentence structures in the early language of the child could be due to the lack of complementizer in the mental lexicon. The "control condition/theory," on the other hand, requires the addition and the analysis of the syntactic properties of verbs such as *persuade*, *tell*, *promise*. Finally, the value of the domain parameter of pronominal co-reference is attained by the acquisition of pronouns such as *him* and *himself*.

In essence, the Continuity Hypothesis in the study of the first language development is closely related to the basic concepts of UG. The developmental facts are accounted for as the interaction between the UG-based principles and parameters on the one hand, and input and lexical acquisition on the other.

In the study of second language development, the Continuity Hypothesis has been invoked largely in the debate over whether or not UG continues to operate in adult learners at all. It seems that regardless of one's position on the issue, some sort of continuity is assumed. For example, the proponents of "non-UG-accessibility" (e.g., Klein 1991, Clahsen 1988b, 1989, Meisel 1991, Jordens 1991, Bley-Vroman 1989)

argue for the presence and use of general problem solving skills in adult second language learning, thereby assuming cognitive continuity. The supporters for "UG-is-alive" (e.g., Flynn 1988, Flynn and Espinal 1985, Eubank 1991c, Schwartz and Sprouse 1994, 1996, White 1985, White and Juffs 1993) and "UG-via-L1" (e.g., Bley-Vroman 1989) both assume continuing operation of the language learning device either fully or in some form in second language learners. They argue that once activated, the language learning mechanism will continue to operate. L1 is one instantiation of UG, to which every native speaker of a language has access already.

The majority of the UG-oriented SLA research studies employing the notion of continuity centre around the learnability issue or L2 linguistic knowledge / competence of adult learners. The purpose is to solve the controversy over whether or not second language learning by adults is also guided and constrained by the principles of UG. If the learners can show that their generalization (or intuition) of UG-stipulated structures in the second language goes beyond that provided in the input and in their first language, then UG must be accessible to the learners (e.g. White 1985, White and Genesee 1996, Schachter 1989). In this context, the research interest is in the linguistic "intuition" or knowledge as demonstrated in grammaticality judgement tests. Less attention is paid to the developmental aspect of language acquisition, i.e., the actual L2 production or performance.

One of the few UG-based studies concerned with second language development examined the step-by-step construction of L2 phrase structures by adult learners of German (Vainikka and Young-Scholten 1994). The findings were based on data from 11 Turkish and 6 Korean adults acquiring German without formal instruction. Three developmental stages were found:

Stage one: The VP stage in which the nominative Spec (IP) position does not exist. There is no functional projection, and the VP structure of the L1 is transferred to the L2;

Stage two: The IP stage where function projection emerges. L2 VP structure (German) becomes target-like but SV-agreement is still absent;

Stage three: This is the CP stage where there is some evidence of CP (e.g., *wh*- and *yes/no* questions), and the agreement paradigm emerges.

The authors concluded that "only lexical projections constitute the L2 learner's initial state" (Vainikka and Young-Scholten 1994:7). Functional projections developed at Stage two as the result of interaction of X'-Theory and the target language input. This showed a

gradual access to UG principles by second language learners, thus supporting the "weak continuity" hypothesis (also Vainikka and Young-Scholten 1996b).

2.2.2. The maturational approach

The maturational approach proposes that the language acquisition process is driven by a biologically determined schedule which operates independently of experience (e.g., Lenneberg 1967, Gleitman 1981). A study which investigated the emergence of one-word stage, two- and three-word "telegraphic" structures, and functional categories in normal children, blind children, and deaf children of non-signing parents found that, despite their widely different linguistic experiences, these children all reached the same stages of development at about the same ages (12 months for the one-word stage, 24 months for the two- and three-word stage, and 36 months for the functional category stage) (Gleitman 1981). Maturationally controlled stages of syntactic development were also reported in Radford (1990), and Guilfoyle and Noonan (1992). Radford (1990), for example, proposed that children initially produce unanalyzed single words. This "pregrammatical" stage is followed, at around age 20 months, by the "lexical stage" in which "telegraphic" forms of structures signal the emergence of major lexical categories (N, V, A and P). Finally, "functional categories" begin to appear at about age 2. According to the proponents of the maturational approach, the sequential emergence of language features is a function of biological development not unlike the physical growth of a child, which is marked by major physiological landmarks in successive stages (see Lenneberg 1967).

Within UG-based language acquisition research, the maturational approach regards the genetic timetable as being responsible for making available various components of UG to children (e.g., Felix 1987, 1988, Bickerton 1991). It constrains the type of hypotheses about language that children are able to make at a given point in time. Therefore, exposure to relevant linguistic data prior to that point does nothing to enhance the children's grammar.

This view of language development runs counter to the key notion underlying the strong continuity assumption, but it is compatible with the central thesis of the weak continuity assumption except that the weak continuity assumption relies on input rather than maturation. Instead of having the whole package, i.e., grammatical knowledge and learning mechanisms, available to the child from the very beginning, the maturational approach sees it unfolding gradually in an orderly manner under the control of an innately specified biological timetable (Radford 1990). This, as some proponents suggest, not only accounts better for the developmental facts (Felix 1987, 1988, 1991), but is also biologically more plausible (Kean 1988).

What then is the role of maturation in adult second language acquisition? According to Gregg (1992), adults have done away with whatever maturation there is. Maturation factors cannot be invoked as an explanation for developmental stages (Vainikka and Young-Scholten 1994). SLA research adopting a maturational approach is mainly interested in two questions: first, whether those who begin their second language learning after the end of the "Critical Period(s)" are able to reach native-like competence and performance (Long 1990, Hyltenstam 1992, Coppetiers 1987, Birdsong 1991). Once again, it is the learnability issue that occupies the attention of most scholars engaged in this line of research. The second question is whether maturation can account for the difference between the ultimate attainment of child and adult learners. The findings, as in UG-based studies, are often inconclusive, and the analysis and explanation are controversial (e.g., Coppetiers 1987, Birdsong 1991). Despite the heated debate on the autonomous or general nature of the "Critical Period(s)" and its role in second language learning, no study has been carried out to investigate the maturationally determined developmental course of second language learning. This perhaps suggests an implicit consensus in the field: whatever developmental patterns one discovers in adult second language acquisition, they cannot be attributed to maturational effects.

2.2.3. The incrementalist approach

According to the incrementalist approach, language development is a cumulative process which takes place in small increments toward a mature grammar. Each increment comes about by new elements being added to the existing linguistic or language processing system. As the result, the new items are cumulatively more complex grammatically, conceptually, or processing-wise. For example, in English, *were* is semantically more complex than the plural ending *-s* since *were* encodes the notions of "plurality" and "past" while *-s* only "plurality" (O'Grady 1997). Syntactic structures involving permutations take more processing resources than simple SVO sentences (Clahsen 1980, 1984). Consequently, cumulatively more complex morphemes, structures, and concepts are predicted to emerge later than their simpler counterparts, all other things being equal (e.g., frequency, perceptual salience, communicative importance, etc.).

This "Developmental Law," as O'Grady (1997:349) called it, differs from the continuity and maturational approaches in that it does not make reference to the inborn or biological mechanisms such as UG or maturation. Instead, the notion of "cumulative complexity" is relatively neutral in its assumptions and can be used to explore potentially any phenomena which exhibit a "cumulative" relationship.

In some of the early studies of child language (e.g., Brown 1973, Brown and Hanlon 1970), "cumulative complexity" is reflected in the derivational complexity of Transformational Grammar. The relative complexity of a sentence is measured by the number of transformational rules applied in order to derive the surface structure. For example, the sentence types "negation" and "question" are more complex than "simple, active, affirmative, declarative sentences" because "negation" and "question" add at least one new rule to the "simple, active, affirmative, declarative" structures (Brown and Hanlon 1970).

The notion of derivational complexity was used to study the developmental sequence of child language. It was predicated that the more transformational steps there were in the formation of a particular syntactic structure, the more complex the structure was and the later it would emerge (e.g., Brown and Hanlon 1970). Brown and Hanlon (1970) studied eight sentence types which exhibited derivational relationships. On the basis of the order of derivational complexity of the sentences, they made nineteen predictions of their emergence in the natural speech of three young children. For example, the simple negation *We did not have a ball* is derivationally more complex than the simple, active, affirmative, declarative sentence *We had a ball* because the negation involves the addition of the negative "tag." The simple negation was therefore predicted to be acquired after the simple, active, affirmative declarative sentence.⁸ The results from the natural speech data of three young children supported the majority of the predictions: structures emerged in the order of derivational complexity.

Brown and Hanlon (1970) acknowledged that a progression from derivational simplicity to complexity was not found in every case. For example, noun phrases with separate verbs in transformed position occurred well before they occurred in untransformed position. A similar instance was found in the following example.

- (1) The children are playing soccer in the street.
(no transformation)

⁸The sentences being studied were

1. simple, active, affirmative, declarative sentences *We had a ball.*
2. simple yes-no questions *Did we have a ball?*
3. simple negatives *We didn't have ball.*
4. simple truncated predicates *We did.*
5. simple negative yes-no questions *Didn't we have a ball?*
6. simple truncated questions, also used as affirmative tag *Did we? The old man doesn't drive well, does he?*
7. simple truncated negatives *We didn't.*
8. simple truncated negative questions, also used as negative tag *Didn't we? The old man drives well, doesn't he?*

- (2) Are the children ___ playing soccer in the street?
(one transformation: inversion)
- (3) Where are the children ___ playing soccer ___?
(two transformations: inversion, *wh*-movement)

The degree of cumulative complexity of the three sentences above differs from each other. According to Transformational Grammar, (1) is least complex while (3) is the most complex, because (1) does not involve any transformation steps while (2) involves one step and (3) two steps.

Accordingly, the developmental order of these three constructions should be (1) > (2) > (3). Developmental facts, however, suggest otherwise: (2) and (3) do not often emerge in a sequential order. They are sometimes acquired at the same time (e.g., Ingram and Tyack 1979, Erreich 1984). In addition, children do not produce *wh*- questions shown in (3) with inversion but without *wh* movement (e.g., Are the children ___ playing soccer where?), although this is a logically possible intermediary stage (Bellugi 1971, Brown 1968, Pinker 1984, Stromswold 1995). Apparently, the notion of "cumulative complexity" by way of Transformational Grammar is not adequate for explaining facts of language development (O'Grady 1997), nor does derivational complexity correspond in any simple way to the psychological complexity involved in sentence processing (Fodor and Garrett 1966).

In more recent discussions of child language, the incrementalist approach and the notion of "cumulative complexity" have been adopted as an alternative explanation to the UG-oriented account. Research on the subject pro-drop phenomenon has explored the role of tense in the early child language of English (O'Grady 1991, 1997, O'Grady, Peters and Masterson 1989). According to O'Grady et al. (1989), subject pro-drop depends on the +/- tensed verb, therefore its appearance can only take place at a stage where the tense system in the child's language has not yet developed, or where the grammar of the child does not exhibit contrasts in the tense system. Furthermore, as tensed verbs are cumulatively more complex than untensed verbs, they will occur later than the untensed verbs. Therefore, the timing and order of subject pro-drop stage in child language can be predicted to follow the acquisition sequence of "untensed verb/subject pro-drop > tensed verb/subject".⁹

There are a number of problems, however, in the notion and application of "cumulative complexity." First of all, its theoretical basis, Transformational Grammar, does not have

⁹For an alternative analysis using processing factors, see Bloom (1990a) and Valian (1991). Hymas' (1986) and Hilles' (1991) analyses were based on the "Morphological Uniformity Principle" of UG (Jaeggli and Safir 1988).

psychological reality (see Fodor and Garrett 1966 for a review).¹⁰ It does not account for the way sentences are processed by the speakers. Secondly, the predictive and explanatory power of "cumulative complexity" as a research framework is restricted. A wide range of language phenomena does not enter into a relationship of cumulative complexity even though they are acquired in a sequential order. For example, while English plural morpheme *-s* emerges in the child grammar before the past tense form *-ed*, the plural marker is not cumulatively more complex than *-ed* (O'Grady 1997). In Brown and Hanlon (1970:19), an order does not obtain for many of the eight sentence types (e.g., questions and negations). Secondly, when the calculation of cumulative complexity is determined by a particular grammatical analysis, different grammatical analysis may affect the calculation which in turn may lead to very different (and possibly erroneous) predictions and accounts of the step-by-step development (e.g., Transformational Grammar) (O'Grady 1997). This, in fact, points at the conceptual problem in the notion of "cumulative complexity," that is, there is no measure of "complexity" that is generally agreed upon (Pienemann 1999, personal communication).

While much of the research in the first language acquisition adopting the incrementalist approach centers around the grammatical and conceptual complexity of linguistic materials, studies in the second language acquisition which are incrementalist in their approach, and which are most influential and complete in the description and explanation, focus on the psycholinguistic aspect of language processing and language acquisition. Much of the discussion and exploration is concerned with the interrelationship between the declarative knowledge (i.e., grammatical rules) and procedural skill (i.e., the production of the rules), and the application of the knowledge in the production of L2 morphosyntactic structures in a fluent and automatized manner (Andersen 1995, Paradis 1994, Bialystok 1991). In this context, second language acquisition is viewed as a process of acquiring the necessary procedural skills to handle L2 structural operations (see Levelt 1978, McLaughlin, Rossman and McLeod 1983, McLaughlin 1987, Hulstijn 1990, Schmidt 1992, Pienemann 1999). According to Pienemann, formal L2 structural options may be produced by the learner only when the L2 processing procedures relating to these options are developed. The procedures differ in terms of their computational complexities and necessary processing resources, and this difference determines the processing hierarchy or developmental sequence of the linguistic structures in a second language.

¹⁰It is important to note that Transformational Grammar was not designed to account for the psychological complexity of language processing and language acquisition. Fodor and Garrett (1966) suggested that the idea that derivational complexity ought to correspond to psychological complexity derived from a notion that the grammar of a language might function as an actual component of the psychological programs involved in understanding sentences.

In the following sections, two of the procedural skill approaches are reviewed. They are the "strategies approach" as formulated in Clahsen (1979, 1984)¹¹ and "Processability Theory" (Pienemann 1999). Both are concerned with the interaction between grammar and processing mechanisms involved in the acquisition of grammar.

a) The strategies approach

Processing strategies were conceptualized in psycholinguistics by researchers such as Bever (1970) whose research into speech processing identified a number of "processing strategies" to account for the online language processing behavior of native speakers. Based on Bever's (1970) work on comprehension and a number of other research findings from memory research and from the processing of subordinate and main clauses, Clahsen (1979, 1984) proposed a set of processing strategies which was incorporated in the Multi-dimensional Model of the ZISA project (Zweitsprachenwerb Italienischer und Spanischer Arbeiter) in the early 1980's (Meisel, Clahsen and Pienemann 1981, see Larsen-Freeman and Long 1991 for a review). These processing strategies were used to explain the developmental dimension of second language acquisition, one of the two dimensions in the Model.¹²

According to the strategies approach, "the psychological complexity of a structure is dependent on the degree of re-ordering and rearrangement of linguistic material involved in the process of mapping underlying semantics onto surface structure" (Pienemann 1999:46). The more permutations of linguistic materials there are in a structure, and the more levels of the structure are involved in the permutation, the more complex the structure is. The three processing strategies Clahsen (1984) proposed were ordered in a sequence relating to the notions of psychological complexity and permutation.

- 1) Canonical Order Strategy (COS): No movement of constituents takes place either into or out of the underlying sequence of the constituents.
- 2) Initialization-Finalization Strategy (IFS): The underlying sequence of the canonical order is not to be disturbed. However, constituent movement in the initial and final positions can take place.
- 3) Subordinate Clause Strategy (SCS): There is no permutation in the subordinate clause.

¹¹ Scholars who work in first and second language acquisition have also proposed "learning strategies" or "communication strategies" to explain the way language acquisition takes place (Slobin 1973, 1977, 1985, Tarone 1981, Faerch and Kasper 1984, Bialystok 1981, O'Malley and Chamot 1990). As most of them do not have a psycholinguistic perspective and are not incrementalistic, they are not included in the present discussion of the "strategies approach."

¹²The variational and socio-psychological dimensions will not be reviewed here as they do not pertain to the central claim of the "incrementalist approach."

Two observations are in order at this point. First, the historical context of the notion of "permutation" (and for that matter, constituent "re-ordering" and "rearrangement") needs to be emphasized. It was used in the strategies approach with reference to Transformational Grammar, the leading linguistic theory of 1960's and 1970's. Secondly, compared to the "operating principles" (Slobin 1973, 1977, 1985) and various "learning / communication strategies" (see O'Malley and Chamot 1990 for a review) the addition of which increases the acquisition power of the learner, Clahsen's three strategies form a set of processing constraints on the development of L2 syntax. The acquisition of various structural rules in fact relies on the removal or "shedding" of the constraints, i.e., the strategies. The specific application of the processing strategies can be seen in the development of L2 German word order rules investigated by the ZISA project. The three processing strategies yielded the following five developmental stages (Pienemann 1984, 1989). The plus sign "+" in front of the processing strategies at the end of the structural description and in Table 2.2.3-1 indicates the operation of the given strategy, while the minus sign "-" implies its removal or "shedding."

Stage x: canonical order (SVO) -- canonical word order dominates. No permutation of any kind occurs. [+COS, +SCS].

Stage x+1: adverb preposing (ADV) -- adjuncts occur only in the initial and the final positions. The canonical word order remains. [+COS, +IFS, +SCS].

Stage x+2: verb separation (SEP) -- constituent re-ordering is possible only when constituents are moved from internal to the initial or final positions. Canonical word order is disrupted. [-COS, +IFS, +SCS].

Stage x+3: inversion (INV) -- sentence internal permutation occurs: subject and verb invert within a string. [-COS, -IFS, +SCS]

Stage x+4: verb final (V-END) -- differential word order of the subordinate and main clause: the finite verb is moved to the clause final position of the subordinate clause. [-COS, -IFS, -SCS].

Table 2.2.3-1. Implicational scale of strategies

Stages /Strategy->	COS	IFS	SCS
x (SVO)	+	n/a	+
x+1 (ADV)	+	+	+
x+2 (SEP)	-	+	+
x+3 (INV)	-	-	+
x+4 (V-END)	-	-	-

The five developmental stages of L2 German word order rules showed that second language development proceeds incrementally in a process of removing the processing constraints in an orderly and step-by-step manner. The COS, IFS and SCS strategies are being "shed" one by one as the learner progresses from Stage x to Stage x + 4 (Table 2.2.3-1). The strategy "shedding" means that the learner has gained more resources to process the structures located at a given stage. Thus, at stage x+2, learners are no longer constrained by canonical word order [-COS], and a number of constituent re-orderings can take place within the constraint of the saliency principle [+IFS] and subordinate clause [+SCS]. Conceptualized this way, language development occurs incrementally in terms of successive disposal of processing constraints such that more skills are developed to apply the rules in the production of an L2.

The processing strategies were claimed to function as universal constraints on second language development (Larsen-Freeman and Long 1991). A number of research questions or hypotheses were proposed and tested. The first was whether or not these processing strategies, which were formulated to account for naturalistic second language acquisition, were also applicable to formal second language acquisition. The second one focused on the extendibility of the strategies and the developmental order in the acquisition of languages other than German. And the third question was concerned with the teachability issue, i.e., whether formal instruction could alter the developmental sequence.

Investigations of classroom learners of German in both second and foreign language settings found the same five-stage developmental sequence formed by the ZISA researchers (e.g., Pienemann 1984, 1987b, Jansen 1991, Ellis 1989, Westmoreland 1983). Johnston's (1985, 1997) longitudinal studies of acquisition of English as a second language by untutored learners of Vietnamese and Polish backgrounds also provided ample evidence to support the hypothesized acquisition order.

The processing strategies were also used to construct a developmental order of Japanese as a second language. Two studies investigating the acquisition of Japanese word order

and grammatical particles found that instructed learners gradually acquired Japanese grammar in a sequence "predictable by the processing strategies hypothesized to govern them" (Larsen-Freeman and Long 1991:277, Doi and Yoshioka 1987, Yoshioka and Doi 1988, cited in Larsen-Freeman and Long 1991).

The teachability hypothesis was addressed by Pienemann (1984, 1987b, 1989). In an experiment testing the hypothesis, Pienemann selected as subjects 10 Italian school children between the ages of seven and nine in a German school. These children were either at stage ADV ($x+1$) or SEP ($x+2$) in their German interlanguage. A structure at stage $x+3$ (INV) was taught intensively for two weeks. At the end of the teaching period, it was found that the children whose German had been at stage $x+2$ (SEP) successfully acquired the structure. The children who had been at an earlier stage, in contrast, failed to learn it. The differential effects of teaching on their German interlanguage demonstrated that one can only learn a given structure successfully if it is located one stage above one's current stage. There was no skipping of stages through instruction (see also Ellis 1989, Jansen 1991, Boss 1996).

The empirical studies employing or testing the strategies approach have proved the developmental sequence of word order found by the ZISA researchers to be rock solid (Pienemann 1999). The subsequent extension to morphology (Pienemann and Johnston 1987b) also turned out to work well. However, the strategies approach has some limitations. In a comprehensive review, Pienemann (1999) pointed out four major drawbacks of the approach. One of them is concerned with the empirical basis of the processing strategies. Being strategies for L2 production, they were formulated on the basis of research findings on speech comprehension, not speech production. Secondly, Pienemann stated that the strategies themselves "are not sufficient prerequisites for the learnability of the structures in question" (1999, p.52). In other words, it is difficult to explain "why and how L2s are learnable" (Pienemann 1999:53). Part of this drawback is due to the lack of a formal grammar in the framework of the strategies approach to facilitate the interface between various explanatory modules, e.g., the learning device, the target language grammar, learnability, etc. which are all essential to a theory of language development. The role of grammar is peripheral in the approach. Pienemann (1999) stated that the processing strategies are not linguistic in nature and cannot be "grammar substitutes" (p.49). What the strategy approach is defining is processing complexity. Thus, the developmental schedule of grammatical structures which fall into the range of strategy description at a given stage can be predicted. However, the strategy description of each developmental stage (e.g., Stage $x+1$: [+COS, +IFS, +SCS]) does not have a set of explicit grammatical rules for the specification of linguistic forms. This is partly due to the belief that L2 learners, having in their command at least one language, do not need to

acquire the grammatical categories and phrase structures of an L2. What needs to be acquired is the online production skill in an L2, which is constrained by the processing resources available to the learner at various points along the developmental path.

Pienemann (1999) challenged this view of L2 learning. He pointed out that L2 lexical items do not always have their exact correlates in L1. Therefore, transfer of entire L1 syntactic categories does not seem feasible when one is learning an L2. The learner must analyze every L2 lexical item in order to assign to it a (correct) syntactic category so that L2 morphological and syntactic elements (i.e., grammar) can develop. The close link between lexicon and syntax has also been recognized and formalized in some of the more recent linguistic paradigms (Singleton 1999).

Finally, the connection of the processing strategies to transformation was seen as a further drawback in the strategies approach (Pienemann 1999). The conceptualization of processing complexity in terms of constituent movement or structural permutation was influenced by Transformational Grammar, a theory which has been challenged for its lack of psychological plausibility (Bresnan 1982b, Horrocks 1987, Levelt 1989). Apart from that, Pienemann (1999:51) pointed out that the transformation connection "limits the strategies approach to the domain of word order," while grammatical morphology, a major task in L2 learning, is left unaccounted for.

Limitations notwithstanding, the strategies approach contributed to the SLA research beyond mere description (Larsen-Freeman and Long 1991). It was also the first model which provided the systematic and well-articulated proposal for the highly regular and incremental nature of second language development.

b) Processability Theory

In *Language Processing and Second Language Development: Processability Theory* (Pienemann 1999), Pienemann defines Processability Theory as a theoretical framework for second language acquisition which "rests on the incorporation of a number of key cognitive factors into a psychologically plausible grammatical system" (p.xv). The theory "spell[s] out the sequence in which language processing routines develop in the learner, [and thus] delineate[s] those grammars that are processable at different points of development" (p.1).

Processability Theory has a historical connection with the strategies approach. Its author, Pienemann, was one of the three principal researchers who developed the Multi-dimensional Model in the 1970's. Secondly, Processability Theory also adopts a processing (as opposed to language internal) perspective to second language acquisition.

Finally, language development is conceptualized as an incremental process in the sense that procedural skills are added in a gradual and sequential manner to the second language processing system of the learner.

There are important differences between Processability Theory and its precursor. The most important one is that Processability Theory implements a theory of grammar -- Lexical-Functional Grammar (LFG) (Halle, Bresnan and Miller 1978, Bresnan 1982a, Bresnan and Kaplan 1982) -- into its central framework. The implementation has important theoretical and practical implications. It not only enables the interface between various explanatory modules (e.g., the learning device, the target language grammar, learnability, etc.), but also renders Processability Theory interpretable in and applicable to grammatical structures in individual languages.

Secondly, according to Processability Theory, learning target language-specific grammatical properties is as essential to second language acquisition as developing the procedural skills to process L2 grammatical information (Pienemann 1999). This is in contrast to the strategies approach which assumes that adult learners do not need to acquire target language categories and phrase structures because these were already present in the learners' competence via their L1.

Finally, the strategies approach associated processing complexity with the extent of permutation involved in the transformational operation of a structure. In Processability Theory, the complexity of procedural skills is defined by the extent of information exchange between grammatical constituents of a structure (e.g., subject-verb agreement, plural and/or gender agreement within NP, etc.). In this regard, Processability Theory has extended the scope of the predictive and explanatory coverage to areas of both syntax and morphology while the strategies approach was restricted to word order alone.

Processability Theory is formulated on the basis of a number of speech production models (e.g., Levelt 1989, Kempen and Hoenkamp 1987) and Lexical-Functional Grammar (LFG) (Halle, Bresnan and Miller 1978, Bresnan 1982a, Bresnan and Kaplan 1982). Levelt's (1989) model proposes three levels of information processing underlying language production: Conceptualizing, Formulating, and Articulating. Conceptualizing is concerned with the generation of ideas, while Articulating deals with the actual output of the ideas in phonetic form. The middle level, i.e., Formulating, is where linguistic structures are built and grammatical encoding takes place. In order to account for fluent language production in real time as well as such speech phenomena as intra-sentence pauses, Kempen and Hoenkamp (1987) argued that the three levels of processing mechanism must work in parallel and are temporally aligned. This means that the

Conceptualizer delivers whatever it generates to the Formulator, regardless of how fragmentary or incomplete its output is. The Formulator starts grammatical encoding of the conceptual material upon receiving it and hands down the finished product to the Articulator. Meanwhile, the Conceptualizer continues to generate the next piece of material. The process of sentence construction during speech is incremental and piecemeal in the sense that a complete sentence is manufactured in a series of small outputs or "iterations" originated from the Conceptualizer (also Levelt 1989) rather than in one large chunk which is conceptually complete from the very beginning (e.g., Forster 1979).

Focusing on the architecture of the Formulator and the role of the lexicon in sentence construction, Processability Theory spells out five components which constitute the procedures of syntactic construction and their psychological environments and constraints (Pienemann 1999:74). They are

1. Syntactic procedures and their specific stores
2. Word order rules
3. Diacritic parameters in the lexicon
4. The lexical category of lemmata
5. Functorization rules

Syntactic procedures "are experts in the building of constituent structures" (Pienemann 1999:66). According to Pienemann (1999), they are instigated by activated lemmata in the mental lexicon. The grammatical information of the lemma such as its lexical category and argument structure motivates the process of grammatical encoding: category N builds NP, category V builds VP, etc. Once a phrase is constructed, its grammatical function is assigned by a set of Appointment rules. An NP, for example, is typically assigned the function of "the subject of" S. This process enables the phrase to be attached to a higher node, an S, for example, so that the process of sentence construction is continued (Pienemann 1999:65-70).

The grammatical encoding is also directed by Word Order rules and Functorization rules (Pienemann 1999). The former "co-ordinate the assembly of phrasal subprocedures" (Pienemann 1999:70). However, the encoding applies only to configurational languages. For non-configurational languages, Pienemann (1999:70) assumes that "grammatical roles can be specified directly from the semantic roles specified in the conceptual structure." Functorization rules (Kempen and Hoenkamp 1987) are responsible for the activation of free grammatical morphemes and the insertion of bound grammatical morphemes. A sample rule was given in Pienemann (1999:67) as follows:

NP, N, <Ref-indefinite, Number - singular>

Pienemann (1999:67) explains that "[t]his rule ensures that the branch Det is attached to NP, the lemma for 'A' is activated, and the lexeme 'a' is inserted."

Syntactic procedures are characterized by their complete automaticity, hence, fast speed, (Pienemann 1999). The process of grammatical encoding requires neither conscious attention nor awareness of the (native) speaker (Levelt 1989, Garman 1990), or speech production could not be fast and fluent. The second feature of syntactic procedures is that they contain storage facilities (Pienemann 1999). These facilities are necessary for two reasons. First, the non-linearity often found between the natural orders of propositions and the word orders of a language (Levelt 1981, 1983) means that one proposition must be temporarily stored for later use. In the sentence "He washed the car after taking it to the garage," for example, the second proposition (or action) "taking the car to the garage" took place before the first one although in terms of word order, it is positioned after the first one. In the process of language production, the second proposition needs to be "postponed" in production and temporarily deposited in the storage until the proposition of "car wash" is linguistically constructed and produced.

Storage is also necessary for morphological processing. For example, in subject-verb agreement in English, the information of 'number' and 'person' of the subject NP and the 'tense' of the proposition must be stored until the verb is available to realize the information. Pienemann (1999:60) points out that these two types of storage are different in nature. When speaking, one's attention is on the meaning to be conveyed. Therefore, "[p]ropositional information is ... temporarily stored in Working Memory which ... is the resource for temporary attentive processes... It has a highly limited capacity and is therefore not suitable to process great amounts of grammatical information at high speed" (Pienemann 1999:60). On the other hand, grammatical information such as morphological agreement is below the level of consciousness unless it is learned and memorized. Therefore, such information is held "temporarily in the Syntactic Buffer, a memory store which is highly task-specific and in which specialized grammatical processors can deposit information of a specific nature" (Pienemann 1999:60, also Levelt 1989, Engelkamp 1974). The capacity of information storage and its fast retrieval during speaking have formed some of the psychological constraints underlying on-line speech production.

An important component which facilitates the whole process of grammatical encoding above is the mental lexicon (Bresnan 1982b, Kempen and Hoenkamp 1987, Levelt 1989,

Pienemann 1999). The process of mapping conceptual materials onto linguistic form starts with lexical items or words. It involves access and retrieval of words, as well as analysis and utilization of the semantic and grammatical information encoded in words for the construction of a syntactic context / structure. The close relationship between lexicon and syntax is being recognized more and more in both grammatical theories (the Projection Principle in GB, LFG) and language acquisition research (for a review, see Singleton 1999).

In LFG, lexicon is one of the three components, the other two being constituent structure and functional structure (Pienemann 1999:93). A simplified version of a lexical entry in the mental lexicon shown below (Figure 2.2.3-1) demonstrates the presence of various pieces of semantic and grammatical information which feeds into the syntactic structure of the word. A sentence with the verb GIVE would be ill-formed if it had only two arguments (X, Y, or X, Z, or Y, Z), or if one or more of the thematic roles for the arguments was not properly identified (e.g., X-agent, *Y-instrument, *Z-location). According to Pienemann (1999:63), the lexical information stored with the entry for the verb 'communicates' with other constituents in the sentence; "[t]he verb 'knows' that it has three arguments: it also 'knows' what their grammatical roles are." "Communication" also occurs between grammatical morphemes. English subject-verb agreement cited above is a case in point. The head of the subject NP must contain the following information in its lexical entry: number - SINGULAR, person - 3RD. The information is then communicated to the verb which at the same time receives the 'tense - present' information from the conceptual structure. The output is the insertion of '-s' on the verb. In LFG, the process is expressed in three main well-formedness conditions: the Uniqueness condition (that each attribute is assigned a unique value and not a set of inconsistent values), the Completeness condition ("that subcategorization requirements are met"), and the Coherence condition ("that every argument is the argument of some predicate") (Sells 1985:146, Horrocks 1987).

In summary, the language Processor makes use of lexicon during the syntactic building process in three steps (Pienemann 1999:73):

- 1) it identifies grammatical information in the lexical entry,
- 2) it temporarily stores that information,
- 3) it utilizes the information at another point in the constituent structure.

give: conceptual specification:
CAUSE (X, (GO_{poss} (Y, (FROM/TO (X,Z))))))
conceptual arguments: (X, Y, Z)
syntactic category: V
grammatical functions: (SUBJ, DO, IO)
relations to COMP: none
lexical pointer: 713
diacritic features: tense

aspect
mood
person
number
pitch accent

Reproduced from Levelt (1989:191)
Figure 2.2.3-1. Lemma for 'give'

"Communication" or exchange of grammatical information between the constituents of a structure is a key aspect of language processing (Pienemann 1999). Similar views and proposals have been made, albeit in different versions, in LFG (Bresnan 1982, Bresnan and Kaplan 1982), and IPG (Kempen and Hoenkamp (1987). As language processing (i.e., grammatical encoding) during speech production is fast and largely automatic, and as languages often contain surface features which are not shared with each other, learning a second language, from an acquisition point of view, means to create language-specific procedures capable of processing L2 grammatical features on-line.

According to Processability Theory (Pienemann 1999), these processing procedures are developed in increments, starting from psycholinguistically less complex one(s). The simplest procedure involves no exchange of grammatical information between constituents, and there is no syntactic store necessary and no syntactic non-linearity present.

Based on this general principle, single words and phrases, formulaic expressions, etc. constitute the beginning stage of the second language acquisition process. Production of these invariant forms does not require any language specific procedures, and L2 lexical or phrasal items enter the lexicon as pre-fabricated units. Their grammatical features (word category, valency property, morphological features) are not analyzed.

At the second stage, information originated in the Conceptualizer (e.g., 'past' time reference) activates a certain value (e.g., PAST) for the diacritic feature of the lexical entry (e.g., 'tense' in the verb). The lexical morpheme (e.g., '-ed') is inserted as the result. This process does not involve any information exchange between linguistic constituents, nor does information storage take place. All that is necessary is the identification of the lexical category of the lemma (VERB). This is a Category Procedure.

The next procedure not only requires the recognition of the lexical category of the lemma, it also involves information transfer and deposit. For example, in a French NP *une table* 'a table,' the lemma TABLE 'table' contains the diacritic features of 'gender - FEMININE' and 'number - SINGULAR.' These features and values match those of UNE 'a.' The encoding process of the NP identifies these diacritic features and their values in the lexical entry for the lemma TABLE 'table,' deposits them in the NP-procedure, and utilizes them for the activation of UNE where identical features exist. The output is a phrase, and the procedure is specialized in phrase construction, namely, the Phrasal Procedure.

In the next procedure, information exchange occurs across phrasal boundaries. Subject-Verb agreement is a case in point. In English, the diacritic features of the subject NP 'number - SINGULAR,' 'person - 3RD' must match the head of the VP when the time reference is 'present.' This means that the grammatical information of the NP must be stored temporarily until the verb is delivered. However, the storage cannot be the Phrasal Procedure, because NP and VP are two different phrases and because information must be retrieved and transferred across the phrasal boundary. Therefore, an S-procedure must be created for the operation.

The processing procedures are psycholinguistic manifestations of the computational mechanisms for processing the grammar. They are developed gradually and their availability determines the shape of L2 grammar. The application of the processing procedures to second language acquisition has yielded a hierarchy of five developmental stages (Pienemann 1999:79).

Stage 1. Word access / Lemma: This is the beginning stage of L2 development. This stage is characterized by the complete absence of any language-specific procedures. As such, only invariant forms such as individual words and phrases, and formulaic expressions are produced because they directly map the underlying meaning and do not involve any information exchange between constituents. Grammatical morphemes are either absent or occur as part of an invariant form.

Stage 2. Category Procedure: The Category Procedure enables the L2 words to be assigned a grammatical category (N, V, A, P, etc.). Once this is achieved, lexical morphemes can be produced. Lexical morphemes are those bound forms which do not exchange information with any other constituents in a given structure. The information encoded in these morphemes is related to the conceptual structure. The English past tense marker *-ed* and genitive marker *-s* are lexical morphemes. Serial word order sentences

(e.g., SVO) are produced because they map semantic roles directly onto surface linguistic forms.

Stage 3. Phrasal Procedure: At this stage, phrases are formed. Grammatical affixes which require information transfer within a phrase can be produced, as shown in the example of French NP *une table* 'a table' above. These affixes are called phrasal morphemes. In terms of word order, the serial order is maintained, but the salient positions (i.e., the initial and the final positions) are utilized for various adjunct materials (e.g., time and location).

Stage 4. S-procedure: At this stage, information transfer occurs across phrasal boundaries. Inter-phrasal morphemes (e.g., 3rd person singular *-s*) emerge. Also at this stage, phrases are assigned a grammatical function (e.g., as subject / object of). Target language-specific word orders emerge.

Stage 5. Sub-clause Procedure: This stage is characterized by the occurrence of complex sentence structures: e.g., embedded clauses and subordinate clauses. The processing procedure for dependent clauses in some languages is different from that for independent or main clauses. To produce a dependent clause in those languages, some rules initially developed for the main clause must be abandoned (e.g., SV-inversion in English questions) and further analysis needs to be carried out on the lexical item of complementizer (Pienemann 1999:86). Table 2.2.3-2 is a summary of the processing procedures and structural outcomes.

Table 2.2.3-2. Processing procedures and structural outcomes

Processing Procedures	Info. Exchange	Morpheme	Word order
5. Sub-clause procedure	+	inter-phrasal	sub-clause
4. S-procedure	+	inter-phrasal	L2 word order
3. Phrasal procedure	+	phrasal	(X)SVO(Y)
2. Category procedure	-	lexical	SVO
1. word / lemma	-	none / monomorphemic chunks	"words"/ invariant forms

The five processing procedures form a hierarchy defined by the presence or absence of information exchange, by the type of information exchange, and by the necessity of information storage. The hierarchy represents an implicational scale: a procedure higher on the hierarchy implies the presence of the procedure(s) lower on it. By the same token, a procedure lower on the scale acts as a prerequisite to the procedure(s) above it. Thus,

[a] word needs to be added to the target language lexicon before its grammatical category can be assigned. The grammatical category of a word is needed before a category procedure is called. Only if the grammatical category of the head of phrase is assigned can the phrasal procedure be called. Only if a phrasal procedure has been completed and its value is returned can Appointment Rules determine the function of the phrase. And only if the function of the phrase has been determined can it be attached to the S-node and sentential information be stored in the S-holder.

(Pienemann 1999:80).

Each procedure interlocks with its neighbouring procedures so that "skipping" is ruled out and progression in the learning of second language grammar is made in successive increments. Table 2.2.3-3 displays the implicational relationship between the procedures and their corresponding linguistic structures.

Table 2.2.3-3. Implicational scale of processability hierarchy

Processing procedures	T ₁	T ₂	T ₃	T ₄	T ₅
5 Sub-clause procedure	-	-	-	-	+ inter-phrasal morpheme; L2 word order in main and sub-clause
4 S-procedure	-	-	-	+ inter-phrasal morpheme; L2 word order in main clause	+
3 Phrasal procedure	-	-	+ phrasal morpheme; canonical order and saliency	+	+
2 Category procedure	-	+ lexical morpheme; canonical order	+	+	+
1 word/lemma	+ words	+	+	+	+

Cf. Pienemann (1999:79). Slightly adapted.

In Pienemann's (1999) view, the set of processing procedures acts as a constraint on the developmental course of second language grammar. This is expressed by the Hypothesis Space: the range within which "formal grammatical hypotheses can be entertained" (Pienemann 1999:9). Learners are unable to make a hypothesis about grammatical structures which are beyond their current level of processing capacity. The application of the notion of Hypothesis Space and Processability Hierarchy in this regard yields three outcomes:

- 1) a (limited) set of grammatical structures which may be produced by learners at a given stage of L2 development,
- 2) a range of structural variations which may or may not conform to L2 grammar at the same stage,
- 3) a prediction of the developmental sequence of a given interlanguage.

Since the processability hierarchy is expressed in terms of a theory of grammar (i.e., LFG), and since grammatical operations are defined by information exchange or feature unification, Processability Theory lends itself to the study of second language development of any language provided the structural description of the language is carried out in processing terms. To date, empirical studies using Processability Theory to investigate the development of L2 grammar are few in number mainly because the theory in its mature form is new. However, a number of studies have been re-interpreted within the framework of Processability Theory, and the findings have lent themselves to the test of the processing hierarchy and the predictions it makes.

Pienemann and Håkansson (1999) reviewed fourteen major empirical studies on the acquisition of L2 Swedish morpho-syntax (SSL). These studies varied in their research focus and research design, subject selection, data type, methods of analysis, acquisition criteria and interpretation of the findings. Despite the diversities, their findings confirmed the developmental sequence predicted by the processability hierarchy. For example, the development of Swedish noun and verb morphology started with invariant forms or unanalyzed chunks (Anderson 1992, Lahtinen 1993, Viberg 1991). Lexical morphemes (e.g., definiteness and gender affixes on the noun) appeared next (Anderson 1991, Lahtinen 1993, Hammarberg 1996, Salameh, Håkansson and Nettelblatt, forthcoming). This was then followed by phrasal morphemes (e.g., gender agreement between the article and the noun, and between adjectives and the noun in an NP) (Lahtinen 1993, Hammarberg 1996). The inter-phrasal morphemes emerged last (e.g., gender agreement between a predicative adjective and the subject noun) (Hammarberg 1996).

Orderly development was also observed for syntax. At each stage in which a particular morpheme appeared, the corresponding syntactic structure appeared as well. Thus, canonical word order (Stage 2) emerged first (Håkansson and Nettelblatt 1993, 1996). ADV-fronting (Stage 3) preceded the "yes/no Question" which required INVERSION (Stage 4) (Hyltenstam 1977, 1978, Bolander 1988, Rahkonen 1993, Håkansson and Nettelblatt 1993, 1996). The subordinate clause procedure (Stage 5) developed last of all, as no regularity could be observed in the learners' use of inversion rule in the

Grammatical features in the form of verbal affixes are added to the stem one after another in the following order (Shibatani 1990:307)

Vstem - causative - passive - aspect - desiderative - NEG - tense

These are essentially lexical morphemes as the concepts encoded in them can be mapped directly after the verb stem (Pienemann 1999). No information transfer is required. However, when more than one verb occurs in a sentence (SOVV), only the last verb is finite and can be marked for the grammatical features listed above. In terms of information exchange, the two verbs must communicate with each other in the encoding process in order for a particular form to be applied (Pienemann 1999). The affixes produced are therefore phrasal morphemes.

Two studies were re-interpreted within the framework of Processability Theory. Kawaguchi (1996) was a cross-sectional study of eight learners of Japanese at an Australian university (also Kawaguchi 1998). Huter (1998), on the other hand, was a longitudinal study of five Australian university students learning Japanese as a second language (JSL). In their studies, data was collected once every six months over a three-year period. A range of communicative tasks was used in both studies to elicit spoken Japanese interlanguage data from the subjects. The findings of the two studies were fairly identical. At first, no subjects produced any forms without affixes. All subjects acquired lexical morphemes, but only some of them acquired phrasal morphemes. In both studies, a clear implicational pattern was established: those learners who had phrasal morphemes in their interlanguage system also had lexical morphemes, while not all of those learners who had acquired lexical morphemes had acquired phrasal morphemes.

Taken together, the findings of GSL, SSL, ESL and JSL studies have demonstrated the developmental uniformity of morphosyntactic structures of interlanguage. This uniformity is not due to chance, but is a function of the procedural skills required in the processing of interlanguage grammar. In learning a second language, learners need to develop language-specific processing mechanisms to perform linguistic operations of the target language. Empirical findings have shown that even if the native and the target languages are comparable in some structures, the learner still needs to develop processing skills for the production of those structures in the target language (Håkansson 1996, Pienemann 1981). Based on these arguments and with the support of empirical evidence, Pienemann (1999) drew the following two conclusions.

a) Contrary to the "full transfer/full access model" of Schwartz and Sprouse (1994, 1996), "bulk transfer" from the first language does not and will not happen. The learner

has to analyze L2 lexical items, their semantic and syntactic values and features, in the way these items are annotated in the L2 lexicon. It is not a feasible scenario that one would learn and produce a second language via a complete set of one's first language grammar. L2-specific linguistic structure has to be created at some point of the learning process if learning is to take place.

b) Contrary to the claims of variable IL competence (Tarone 1985, Ellis 1985a, 1985b), the interlanguage system is fundamentally steady and stable. Differences found in two sets of interlanguage speech samples at a given point do not always represent developmental differences. In other words, "variations in accuracy rates across tasks do not automatically indicate differences in the rule system used by the learner or their internalized linguistic skills, much less differences in the stage of acquisition" (Pienemann 1999:277, also Gregg 1989b). Essentially, the following scenario will not happen: a learner produces Stage-5 features in one task but fails to do so in another in which there are sufficient contexts (or opportunities) for Stage-5 features.

To sum up, Processability Theory provides a principled approach to the description, prediction and explanation of developing grammatical systems. It delineates the transitional sequence according to which language processing skills responsible for the acquisition of grammar are acquired. Processability Theory is based on two essential components:

1. the psycholinguistically based speech processing mechanisms of sentence generation and production, and
2. the characterization of target language grammar within LFG.

Central to the characterization is the process of information exchange and feature unification of various grammatical constituents. The theory's predictive power derives from the interaction between these two components -- "the availability of structural options to the learner is constrained by processing procedures on the one hand and the architecture of the target language on the other" (Pienemann 1999:169)

Finally, Processability Theory does not make statements about how the procedural skills / processing mechanisms are learned or developed. It is not error analysis focusing on the accuracy rate of some aspects of language use and production. It is not about the acquisition of semantic functions in relation to a form. Processability Theory acknowledges that the form-function relationship has an impact on the acquisition of the form. The overall thesis of Processability Theory supports the view that language

development takes place by increments in which developmental steps are interlocked with each other in an implicationally arranged manner.

2.3. Summary

The description of the two fundamental issues of language acquisition in this chapter has offered a survey of the research interests and findings over the last thirty years or so. Concerned with the "logical problem" of language learning, the learnability issue was formulated on the basis of the observation of the gap between the complexity of the language system and the speed with which young children acquire their mother tongue. In the pursuit of a solution to the problem, theoretical models and rationalist arguments of various perspectives have been put forward. The innatist position and its linguistic correlate, Universal Grammar, have offered the most powerful and influential research outcome to date.

While the learnability issue has received most of the attention due to its epistemological appeal and vigorous theory construction in the generative tradition, the developmental issue has also made its way into language acquisition theory. Three broad research perspectives have been on the scene. The continuity perspective is largely UG-oriented. It assumes the basic cognitive structure underlying the language acquisition process and investigates whether or not language acquisition takes place under the guidance of UG. The maturational approach, on the other hand, tackles language development from a biological point of view. A genetically pre-set timetable for language is assumed and utilized to explain the difference between the outcomes of child language and adult second language learning.

Finally, with the incrementalist approach, language development is regarded as a gradual process in which progression is gained in small, sequential steps. In the 1960's and early 1970's, the exploration of language development was guided by Transformational Grammar, specifically, by the derivational complexity of sentence structures. It was soon found that linguistic models of grammar (i.e., Transformational Grammar) did not necessarily correspond to psychological processing of language in comprehension, production and acquisition. On the other hand, psycholinguistic models of language processing such as those used in the strategies approach and Processability Theory appear capable of offering more precise predictions and explanations for the acquisition process. Processability Theory, for example, contains proposals for a set of developmental stages for second language acquisition of syntax and morphology. The general predictions and stages have found empirical support from both synthetic and agglutinating languages (Swedish, German, English, and Japanese). The present study

aims to contribute to SLA research by examining yet another typologically diverse language, Mandarin Chinese -- an analytic language.

Chapter 3

Chinese as a Second Language Research: Overview

In this chapter, a critical review of the empirical studies of Chinese as a second language (CSL) is presented. The first section gives a historical background of CSL as a part of the SLA discipline. It is followed by a description of CSL studies. The critique of the studies is offered in the last section.

3.1. Overview

As a discipline, Chinese as a second language has a short history and its relationship to SLA research is not always well defined. In the 1980's, there was heated debate about the status of CSL (Liu 1999):

- a) whether or not CSL is a discipline in its own right;
- b) whether CSL is concerned with language study or with Sinology;
- c) whether CSL relates to Chinese linguistics or language pedagogy.

A consensus was reached eventually granting the status of CSL a discipline in its own right. The primary purpose of CSL was not to produce Sinologists but competent language users. Language pedagogy, not linguistics, should be the focus of CSL research (Liu 1999).

Following the discussion of the 1980's, the 1990's saw the introduction of IL theories from the West into the CSL research scene. The emphasis during this period centered on error analysis, acquisition sequence and processes, individual learner variation and language learning environment (Liu 1999).

In the early work on error analysis, researchers followed the traditional procedures (Corder 1967, 1971, 1974). They collected a large number of ill-formed sentences produced by the learners. These sentences were then categorized according to the errors, and their lexical, structural and semantic problems were analyzed and explanations were offered. According to Liu (1999), the purpose of error analysis research at that time was to aid classroom teaching. It was concerned more with the pedagogical practice of the teacher than psychological mechanisms of the learner, and was to a certain degree influenced by Contrastive Analysis (Lado 1957). By the late 80's and early 90's,

sentence analysis of this kind focused more on the identification of acquisition features of CSL.

In addition to error analysis, CSL also embarked on the study of acquisition sequence and processes. A number of researchers started to employ data-based research methodologies and statistical procedures to carry out their investigations. The most notable studies in this area, according to Liu (1999), were Sun (1993) on the acquisition of the perfective marker *le*, Wang (1997) on the acquisition of negators *bu* and *mei*, Qian (1997) on the acquisition of directional complement structure, Shi (1998) on the acquisition sequence of 22 sentence types, Sun (1999) on the acquisition of the perfective marker *le*, the stative marker *zhe*, the experiential marker *guo*, and Wang (1999) on the acquisition process of negative comparative structures.

Data-based research (such as the studies mentioned above) represents only a small proportion of the CSL research effort. According to a survey (Gui and Ning 1997, cited in Jiang 1999), only 3% of the 755 articles published in four language teaching journals between 1993 and 1995 were empirical studies. Jiang's follow-up survey of 305 articles in four journals between 1995 and 1998 did not see a significant increase: data-based studies were a mere 3.6% (Jiang 1999). Qian's comprehensive bibliography of CSL examined more than 100 journals over a twenty-year period between 1977 and 1998, of which fewer than 10 articles were data-based studies (Qian, 1999). The majority of published research is concerned with introducing SLA theories from the West, describing teaching experience, analyzing Chinese sentence structures or usages, and discussing the errors made by learners (Liu 1999, Jiang 1999).

The limited number of data-based studies served as "pioneers" in CSL mainly because of their research methodologies, statistical analysis, and findings (Liu 1999). More importantly, they departed from the early goal and definition of CSL as a discipline to produce competent language users. Changing the conceptual direction of CSL, these studies focused on the description and explanation of the acquisition features of CSL, a focus in line with western trends of SLA research. Theories developed in the West were being used more and more in these works.

The promising developments aside, there are problems in CSL research. In their critique of the CSL research, Liu (1999) and Jiang (1999) pointed out that the description of western SLA theories often failed to be accurate; the studies of pedagogical practice were not directed by pedagogical or acquisition theories and scientific research methodologies; error analysis concentrated mainly on correction and not enough attention was paid to

error sources and regularities. The recognition of these problems is a first step toward a more disciplined and constructive effort in CSL research and development.

3.2. CSL Studies

Eight empirical studies of CSL are reviewed in this section. Unlike the majority of CSL works which focused on error analysis, these eight studies were concerned with the description of the acquisition patterns of L2 Chinese grammatical morphemes and sentence structures. The review starts with a detailed description of each study--its purpose, methodology, findings and conclusions. A summary critique follows addressing such issues as the data, the analysis and the theory application.

The first and perhaps the only acquisition study using longitudinal design and corpus data from natural conversation was Sun (1993), which investigated the acquisition process of the aspectual marker *le* by two beginners L (male) and W (female). Both were native speakers of English. Sun recognized that without a proper knowledge of the learning process and its constraints, it would be difficult to teach in an efficient and informed way. In the study, the completive function of the aspect marker *le* (*le1*, verb-final) and the inchoative function of the modal particle *le* (*le2*, sentence-final) were the focus of investigation.

The first data collection session took place about four weeks after the semester started. The semester was also the beginning of L and W's acquisition of Chinese. Data was then collected once every two weeks for a period of four months. Altogether 6 sessions were held with L and 8 with W. During each one-hour session, the researcher and the learner were engaged in casual conversation. The conversations were tape-recorded and later transcribed.

The findings showed that the two learners differed in the acquisition of *le*. *Le2* appeared first in L's speech in session 3, and was initially used as a past tense marker. An example of L's use of *le2* is given in (1). *Le1* occurred first in session 4, as shown in (2). The two *les* were used interchangeably for a while, as shown in L's repeating the same sentence with different *les*, as shown in (3). (The markers are underlined).

- (1) S: Ni baba he mama lai -guo Beijing ma? ...lai-guo meiyou?
you dad and mom come-EXP Beijing Q-par? ...come-EXP not
Have your mom and dad been to Beijing? Have they?
- > L: e, lai -guo meiyou? wo mama, baba lai Beijing le.
e, come-EXP not? I mom, dad come Beijing LE
Have they? My mom and dad came to Beijing.

S: Lai -guo ma?
come-EXP Q-par.
Have they?

--> L: e, 1986, 1986 wo mama baba lai Beijing le. Jinnian wo mama
e, 1986, 1986 I mom dad come Beijing LE. this-year I mom
dad mei lai Beijing.
baba not come Beijing

In 1986 my mom and dad came to Beijing. This year my mom and
dad did not come to Beijing.

(Session 3, Sun 1993:67)

(2) → L: Shang xingqi-ri, xingqi-tian, wo kan-le zuqiu bisai...
last Sunday, Sunday, I see-LE football match...

Last Sunday I saw a football game.

(Session 4, Sun 1993:68)

(3) S: Na ni zai Xinxilan hua-guo bin ma?
well you in New Zealand skate-EXP ice Q-par.
Have you done ice-skating in New Zealand?

--> L: Hua, huabin le, hua -le bin.
skate, skate-ice LE, skate-LE ice
I did ice-skating; I skated.

(Session 6, Sun 1993:69)

Not only were the two *les* in conflict with each other in L's speech, they also conflicted with related aspect markers such as the experiential marker *guo*(EXP), as in (3) and past event marker *shi...de* in (4). During the entire four-month period of observation, *le* occupied the dominant position in L's IL and "resisted" other aspect markers which were introduced later.

(4) → L: ...jiuyue, jiuyue ta lai -le Beijing.
...September, September he come-LE Beijing.
In September, September he came to Beijing.

Tamen, shi jiuyue lai -de Beijing.
they, be September come-DE Beijing

They came to Beijing in September. (Session 4, Sun 1999:68-69)

In contrast, the two *les* as defined by Sun never occurred in W's speech although W did use *le* in what Sun called *guding jieyou* "chunk structure" of which *le* was a part (p.71).

In the discussion, Sun (1993) speculated that *le*₂ might be acquired ahead of *le*₁. In terms of the acquisition process, however, it was not known how the learners came to differentiate the two *les*, matching their identical form with their respective functions. According to Sun, language transfer was responsible for the use of *le* as a past tense marker at the initial stage. He recognized that this explanation could not be applied to W, whose IL production did not contain this usage of *le*. In the end, individual variation was offered as the main reason for the difference between L and W, whose personality, socialization patterns, and preferences on grammatical accuracy (L) vs. communicative efficiency (W) all contributed to the differential acquisition of *le*:

Zhao (1997) carried out a similar study to Sun (1993). Zhao followed Sun's functional definition of the two *les*, used longitudinal observations and a written task to collect the data. A native speaker of English (M) was interviewed regularly in three periods over two years. Each period was three months in length with a 6-month interval between the periods. During each period, the subject was interviewed 8 times. The interviews took the form of conversation and tasks. The conversation topics were pre-determined by the researcher to ensure the presence of *le* context. The tasks ranged from picture description to retelling of videos and past experiences.

In the written task, a group of learners of Chinese were asked to fill in *le* in the blanks provided in both single sentences and in paragraphs. Only the results from 23 subjects whose native language was English were used in the analysis.

To analyze the data, Zhao first categorized the errors into four types: over-application, under-application, wrong position, confusion with other related structures. Frequency counts were carried out to obtain the percentage of each error type over the three observational periods. Zhao also calculated the percentage of *le* occurrences in optional contexts. The general trend was that both optional *le* occurrences and errors decreased following the passage of time. In the discussion of errors, Zhao hypothesized that over-application, wrong position, and confusion with other related structures were due to the influence of "tense" in M's mother tongue. Under-application, on the other hand, was the result of acquisition features of different periods. In the initial period, M might have focused more on communicative content instead of linguistic form. Functional words such as *le* were therefore omitted. However, in the later period, it was the lack of full

knowledge of the rule which governed the non-occurrence of *le* which attributed to the under-application.

Zhao used the same analytical method for the written data and the findings corroborated those of the longitudinal data. However, he found more errors in paragraphs than in single sentences. Zhao pointed out that the use of *le* was not determined by sentence structures, but by contexts and discourse.

One problem with Zhao's study is that he did not use a control group for the written task. Presumably Zhao took the test items from some published source and used that as the marking criterion. While this practice is fine in many research situations, it is potentially misleading and unreliable in the study of *le*. That is because there has to date been no comprehensive and sound grammatical account of *le* (Li and Thompson 1981, Teng 1999). Its use seems to be constrained by both linguistic context and the individual speaker's perception of the event. The lack of a sound and systematic description of the grammar of *le* has made it difficult to study its acquisition in any principled way. To make the matter worse, native speakers' grammatical judgment in a test similar to Zhao's was far from unanimous (cited in Li and Thompson 1981:191-192, 194). All these problems point to the pitfalls of using one's intuition as the marking criterion in the study of *le*.

Teng (1999) also carried out a study on the acquisition of *le* in L2 Chinese by native speakers of English. He adopted the grammatical framework of Lu (1981) as the theoretical foundation to abstract 6 sentence types in which the morpheme *le* occurs. The subjects were 9 beginning level learners at the Mandarin Training Center, Taiwan Normal University. Their proficiency level was defined in terms of the textbooks used. The data was collected from the written work of the learners over a period of 9 months. The entire corpus consisted of 932 isolated and connected sentences which contained the morpheme *le*.

Using accuracy percentage as a tool of analysis, Teng found that *le2* was acquired earlier than *le1* and that the *le* associated with "change of state" or "new situation" (*le2*) was used with fewer errors than that with "perfectivity" (*le1*). Teng concluded that there was an acquisition sequence of *les* in terms of their functional features. He claimed that the acquisition pattern observed in his study paralleled that of first language acquisition in Kong (1993). On the basis of the findings, Teng put forward four pedagogical proposals for teaching *le* to beginners.

The problem with Teng's conclusion about the acquisition order of the *les* in the 6 sentence types is that of validity. The accuracy count, in the form of percentage of correct forms vs. errors of each sentence type, was not subjected to statistical analysis. It is therefore questionable whether the conclusions drawn on the basis of the frequency data can be supported with confidence. The statement that "a progression from more to fewer errors ... can be clearly seen in our data" (Teng 1999:58) was only in the sense of numerical value.

Sun (1999) examined the acquisition of three aspect markers: the perfective marker *le*, the continuous marker *zhe*, and the experiential marker *guo*. Sun hypothesized that 1) the acquisition of the grammatical markers was closely related to the verb types; 2) sentence structures affected the acquisition of grammatical markers.

Sun's data came from the Chinese IL Data Bank, which stores more than one million words of written sources of various types by learners of Chinese. After searching the Data Bank files, Sun selected those sentences which contained the three aspect markers. After discarding those which lacked "authenticity" (i.e., sentences unlikely to be written by learners at a particular level), a total of 579 *le* sentences from 158 essays, 199 *zhe* sentences from 81 essays, and 74 *guo* sentences from 47 essays were obtained.

The subjects whose data Sun used were English-speaking learners at 8 different learning levels, each level being defined as one semester. The study was based on the data from the first 7 levels as the data from level 8 was insufficient.

To test the first hypothesis, Sun counted the occurrences of each of the three aspectual markers in relation to individual verbs and found that certain verbs tended to attract a certain aspect marker. Action verbs which were *zhongjie-xin qingzhuang* (having an end point) (Sun 1999:53-54)¹ (or bounded) were often used by the learners with the perfective marker *le*. Verbs, which occurred most frequently with the continuous or stative marker *zhe*, were all statives. Lack of sufficient data rendered it impossible to draw conclusions about the experiential marker *guo*.

After calculating the percentage of correct forms and errors, Sun found that *le* occurred initially with verbs which were "bounded." Verbs, which did not have an end point (i.e., *fei zhongjie-xin qingzhuang* (not having an end point) or "unbounded", were more difficult to master.

¹A similar approach can be found in Li and Thompson (1981:185), "[T]he verbal aspect suffix *-le* expresses perfectivity, that is, it indicates that an event is being viewed in its entirety or as a whole. An event is viewed in its entirety if it is *bounded* temporally, spatially, or conceptually."

The accuracy measure was also used to test the second hypothesis, i.e., that sentence structures affected the acquisition of aspect markers. Sun listed 7 sentence structures in which *le* often occurred, three in which *zhe* (durative marker) often occurred; and three in which *guo* (experiential marker) often occurred. The accuracy analysis showed that structures which contained time, number and frequency constituents tended to have a high accuracy rate with *le*. These constituents embodied the notion of "boundedness" (Li and Thompson 1981:185ff).

Compared to the acquisition of *le*, Sun found that the acquisition of the continuous marker *zhe* was easier than that of *le* because from level 5 onwards, no error was made. Sun explained that this was because the usage of *zhe* was more regular in terms of its form-function relationship than that of *le*.

Finally, according to Sun, the acquisition of the experiential *guo* started late with high error frequency. Sentences with time constituents tended to be acquired earlier than other structures.

In conclusion, Sun stated that the acquisition order of the three aspectual markers seemed to be dependent upon sorting out the relationship between form and function. Sun acknowledged the limitation imposed on the data analysis by the data search method: it was not possible to analyze those instances in which the aspectual markers should have been supplied but were not. In addition, Sun did not specify which *le* he was analyzing, *le1* or *le2*.

Wang (1997) studied the acquisition process of two negators *bu* (not, present/ future) and *mei* (not, past). He aimed at finding out

- a) the distribution of *bu* and *mei* in the IL negative sentence structures,
- b) the distribution of *bu* and *mei* with verbs and modal auxiliaries,
- c) the acquisition of special rules.

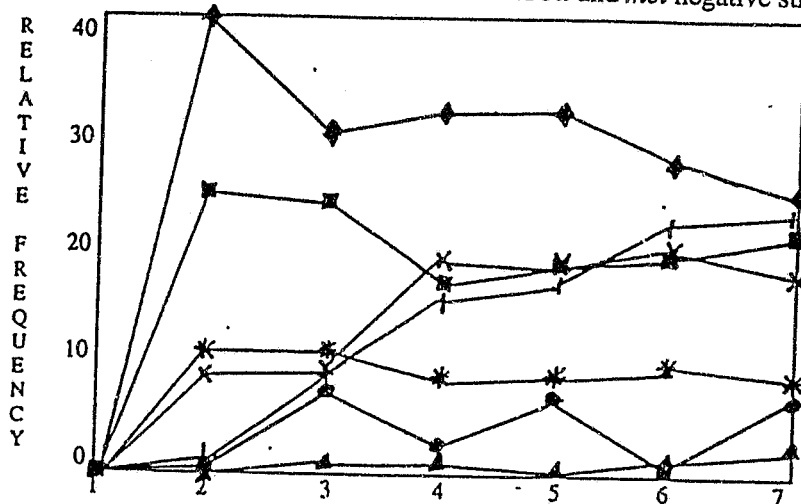
Wang used data from the Chinese Interlanguage Data Bank. After screening 1,032 negative sentences, he selected 914 for analysis. These sentences were produced by English native speakers at the first 6 semester levels of proficiency.

By way of structural description, Wang listed 10 sentence types with *bu* and four with *mei*. He emphasized that the classification did not follow the linguistic categorization of the negative structures in Chinese. Instead, it was based on the IL data. Certain linguistic and pedagogically important structures were not included because their occurrences in the

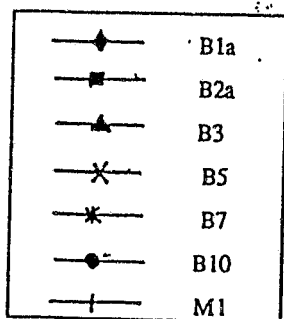
data were too limited. Ill-formed negative sentences were not included either as the errors were often too complex to fit into his framework of structural description.

Calculating the *xiangdui pinlu* (relative frequency) of 7 (of the 14) sentence types at each semester level, Wang found three major acquisition levels (Table 3.2-1): those above 20 in the table belonged to level one. Two structural types reached the level (*bu* + verb or adj). Those between 10 and 20 belonged to level two. Once more, two structural types reached the level (*bu* + modal, *mei* + verb). The rest belonged to level three, which were below 10. Wang claimed that this represented a certain acquisition order: the lower the acquisition level, the more complex the negative sentence structures. He also claimed that the contrast between the native and target languages could alter the acquisition order.

Table 3.2-1. Distribution of *bu* and *mei* negative structures*



*Reproduction of Wang (1997:94)



- B1a *bu* (tai) + V
not (quite) + V
- B2a *bu* (tai; hen) + Adj
not (quite; very) + Adj
- B3 V *bu* (wan; le)
V not (finish; PVF)
- B5 *bu* (yao; xiang; hui) V/Adj
not (will, would, can) V/Adj
- B7 *bu shi* + N/V
not be + N/V
- B10 (gen, he) ... *bu yiyang*
(with, and) ...not same
- M1 *mei*+V
not + V (perfective)

In the discussion, Wang proposed three stages in the acquisition process of the negators:

- a) the beginning stage when the learning process was activated
- b) the climax stage when the learner used new items in large quantities, often resulting in over-generalization,
- c) the stable or mature stage when the acquisition was complete.

Wang stated that the length of the acquisition process to a certain degree reflected the level of difficulty of a structure, which in turn indicated the acquisition sequence.

To investigate the second issue, i.e., the distribution of the negators with verbs and modal auxiliaries, Wang categorized the verbs in the data into three groups: modal auxiliaries, adjectival verbs, and verbs. Each group was further classified into sub-groups. Wang then examined the distribution of these verbs across the 6 proficiency levels. He found that 44 verbs occurred at least once at three proficiency levels. He called these verbs *gongheci* (basic verbs--*translation mine*).²

After calculating the frequency of *gongheci* in each verb type across 6 proficiency levels, Wang found that at the beginning level, especially at the first level, *gongheci* was dominant. As the proficiency increased, the number of *gongheci* decreased and verbs became more diverse. At the 5th and 6th levels, *gongheci* disappeared completely. This phenomenon showed that at the beginning level, the negators occurred only with a limited number of verbs. As learning went on, the verbs increased in variety. The process, according to Wang, reflected the change of learning strategy from a relatively "closed" type to more a more open one.

Finally, using the diffusion model, Wang analyzed the acquisition process of *bu* and *mei*. Here Wang relied on the ill-formed negative sentences, dividing them into two types: *bu* replacing *mei*, and *mei* replacing *bu*. Wang found four developmental periods. At the beginning, learners mainly used *bu* to negate everything. The dominance of *bu*, however, quickly gave way to the simultaneous and indiscrimitory application of both *bu* and *mei*. The third period was characterized by the tendency to over-apply *mei* and under-use *bu*. Finally, learners acquired the respective functions of *bu* and *mei*, and errors became rare. In conclusion, Wang pointed out that the acquisition process of *bu* and *mei* as a whole was a slow process of diffusion. Changes occurred within each period continuously.

²The literal meaning of *gongheci* is "general nucleus word." Wang coined the term.

In another study on negation, Wang (1999) examined the acquisition process of a negative comparative structure *he/gen... bu yiyang* (not the same as...) by English speaking learners. The data consisted of 54 negative comparative sentences from the Chinese IL Data Bank. They were produced by learners from 6 proficiency levels.

Wang first examined the IL structural contexts in which the negative comparative form occurred. He listed 8 of them (Wang 1999:30):

- Type 1 A *he/gen* B *bu yiyang*
A and/with B not same
 A is not the same as B
- Type 2 A *bu (shi) gen* B *yiyang*
A not (be) with B same
 A is not the same as B
- Type 3 V + A *gen* B *bu yiyang*
 V + A with B not same
 A (clause) is not the same as B (clause)
- Type 4 A (collective) + *bu yiyang*
A (collective) + not same
 A (x₁, x₂, ...x_n) are not the same
- Type 5 A *bu hui gen* B *yiyang + adj*
A not can with B same + adj
 A can not be as ... as B
- Type 6 A (*gen/he*) B *bu yiyang de + N* (incl. *you bu yiyang de + N*)
A (with/and) B not same ADJ+ N (incl. have not same ADJ + N)
 A and B do not have the same N
- Type 7 A *bu xiang* B *yiyang + adj*
A not as B same + adj
 A is not as ... as B
- Type 8 *ba* A (V) *gen* B *bu yiyang* (V)
BA A (V) with B not same (V)
 not regard A the same as B

Using a frequency count, Wang then examined the distribution of each structure across 6 proficiency levels. Three stages of the acquisition process were found as the result.

Formulaic forms characterized stage 1. The negation phrase *bu yiyang* 'not the same' was used as one form in three basic negative comparative structures (a, c, d).

At stage 2, structural variations started to appear. The negator *bu* became separated from *yiyang* 'same' and was positioned before the main verb.

At the final stage, all but the three basic structures disappeared. The reason for their disappearance, Wang hypothesized, was partly due to the match between the structural forms and the functions these forms served, and partly due to the acquisition of forms with similar functions (e.g., *butong* 'not the same'). This acquisition process from structural chunk to structural variation and finally to target-like use was explained in terms of learning strategies, psychological constraints, and the learners' analysis of linguistic contexts.

Wang recognized that lack of data in over half of the cells in the distributional table (Table 3.2-2) could pose problems for his hypothesis and conclusion, but he did not specify what they might be. Furthermore, the frequency counts of some of the structures were extremely low (e.g. 2.3%). Once more, this was not taken into account when positing acquisition stages and periods. Certain fine-grained analysis and evidence was lacking to support the conclusion that the structures at stage 1 were formulaic in nature, while the same structures at stage 3 were target language-like.

Table 3.2-2. Distribution of "he/gen...bu yiyang" by English-speaking learners (relative frequency)*

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8
Term 1**	****	****	****	****	****	****	****	****
Term 2	13.7	****	4.5	2.3	****	****	****	****
Term 3	6.9	2.3	****	2.3	2.3	****	4.6	****
Term 4	16.2	2.3	2.3	4.6	****	4.6	****	4.6
Term 5	****	****	****	4.6	****	****	****	****
Term 6	4.6	****	2.3	****	****	6.9	****	****
Total	41.1	4.6	16.1	13.8	2.3	11.5	4.6	4.6

*Reproduced from Wang (1999:31, Table 4). Translation mine.

**The 6 terms correspond to 6 proficiency levels. The word "term" was used in Wang's (1999) table.

Qian (1997) investigated the acquisition order of the directional complement structure. She categorized the structure into more than 15 sub-types according to both structural features (e.g. with and without object, simple and complex directional complement, directional complement with non-directional meaning) and lexical items of the complement (*qilai* 'to begin,' *xialai* 'to begin,' etc.). Her subjects were Japanese learners of Chinese at the beginning, intermediate and advanced proficiency levels. Qian

collected three types of data: essays and letters written by the learners from which 401 directional complement structures were obtained; a multiple choice test by 90 learners (30 from each level), and a translation exercise by 60 learners (20 from each level).

Qian carried out three types of calculation:

- a) the frequency of correct forms obtained in the translation task, and the percentage of the learners whose translation was accurate in meaning regardless of whether the directional complement structure was used or not,
- b) the percentage of learners who used the directional complement structure regardless of whether the use was correct or not,
- c) the percentage of learners who used the directional complement correctly.

On the basis of the results of these calculations, as well as the consideration of a number of other structures, Qian concluded that the learners in general acquired the directional complement structure which did not contain an object before that which did. Directional complements with non-directional meaning were learned last.

In contrast to the rest of the study, which presents data and explanation in a detailed and clear manner, the conclusion seemed to be drawn in an ad hoc way. How exactly Qian took into consideration other structural variables was not specified. Consequently, there is no way for the reader to verify her conclusion against any of the statistical data in the paper because the conclusion was not entirely based on the results presented. It is possible that in the data, the directional complement had occurred in other structures, but distributional analysis was not conducted to tease out each and every linguistic context.

Shi, in 1998, published a study titled "the acquisition order of 22 sentence types of contemporary Chinese by foreign students in China." The "foreign students" in the study were native speakers of Korean and English. The 22 sentence types consisted of 11 pairs: 6 of them were declaratives and 5 were interrogatives. Each pair was defined by a main structural feature: e.g. COP, *ba*-structure, comparative, passive with *bei*, possessive with *you* (have), etc.

The selection of the sentence types was based on the following criteria:

- a) they were "operationalizable" in the sense that they were indexed in the Chinese IL Data Bank and could be extracted from the Bank;
- b) they were representative of the "typical special sentence types" of modern Chinese (*dianxing teshu jushi*, p.77, translation mine);

c) they were of communicative importance in daily life (referring mainly to the interrogatives);

d) they were of pedagogical importance, as defined by *The Outline of the Standard for Chinese Grammar and Language Proficiency* (1996) and *The Outline of Pedagogical Grammar of Chinese as a Second Language* (1995);

e) they were identified as important and difficult structures in CSL teaching practice.

Shi (1998) collected four types of data.

a) A total of 7,611 sentences containing the 22 sentence types were extracted from the Chinese IL Data Bank. They were single sentences written by learners of Chinese across six proficiency levels.

b) A grammatical test of the 22 sentence types was carried out. There were 6 test items for each sentence type and a total of 132 items in the test. Thirty of the items were blank-fillings, and the rest multiple choice. The participants were 162 adult learners of Chinese from three universities in Beijing, and 95 elementary school students from year 3 to year 5 in Beijing.

c) Two surveys were conducted during the test. The subjects were asked to rate the degree of difficulty of each item on a scale of 7. In a separate survey, the same subjects were asked to judge on a scale of 7 the degree of difficulty, the rate of learning, and the order of acquisition of the 22 sentence types.

d) A learner of Korean background was observed over a period of 7.5 months. He was interviewed on average once every two weeks, each time for 58 minutes. The interview took the form of casual conversation. A diary was kept of his Chinese IL production. A total of 3,267 sentences containing the 22 sentence types from the conversation, and 1,783 sentences containing the relevant sentence types from the diary were obtained from the learner.

Shi put forward 10 hypotheses, one of which is directly relevant to the present review, i.e. there existed an acquisition order of the 22 sentence types of modern Chinese.

Shi first applied an accuracy measure to the Data Bank data across the 6 proficiency levels. She then set 80% as the acquisition criterion and established an "Implicational

Scaling" of two orders. The Difficulty Order was obtained by ranking the sentence types which had been used accurately at least 80% of the times. The Proficiency Order was based on the number of sentence types which reached the 80% accuracy criterion at a proficiency level. Missing data (i.e., non-occurrences) was treated as non-acquisition because "it is not possible to calculate the rate of accurate use" (Wang 1999:80, translation mine). Applying a series of statistical procedures to the implicational scale, the accuracy rate of the Data Bank data as a whole, and the proficiency levels, Shi found three stages in the learning of the 22 sentence types.

Stage one consisted of 4 sentence types: equational COP sentences in both declarative and simple interrogative forms (T1, T15), canonical SVO sentences in both declarative and *wh*-interrogative forms (T3, T17). Five sentence types belonged to Stage three: rhetorical questions (T13, T14), existential sentences with two verbs (T4), confirmation question (T16), and affirmative-negative questions with the auxiliary *shi* 'be' (a rare form). The remaining 14 sentence types belonged to Stage two.

On the basis of the obtained order as well as (unspecified) variations, Shi put forward the "Natural Order Variant Hypothesis" (p.90). The Hypothesis consisted of three components.

a) The Natural Order: The acquisition order is fixed and immune to external influence. However, "the Natural Order exists only in theory; it does not occur in reality. It is embedded inside any Natural Order Variant" (Shi 1999:90, translation mine).

b) The Natural Order Variant: the Natural Order Variant is an acquisition order, which is observable and amenable to external influence. Due to a large amount of classroom training, first language influence, and emphasis by the teacher, the sequence of acquisition could be altered. Type B structures, which in a natural environment were acquired after Type A, could be learned before A. Shi pointed out that the variation of the order was not free. Instead, it was constrained by the Natural Order, a circular argument which Shi rectified in her proposal for an "Acquisition Hierarchy" (p.90). The "Acquisition Hierarchy" was defined as acquisition stages: the hierarchy of the stages is fixed; sentence types within a stage are similar in their level of difficulty and would be acquired at approximately the same time. However, their acquisition order may not be fixed, exhibiting the Natural Order Variant phenomenon. Sentence types across stages, on the other hand, will be acquired according to the acquisition hierarchy. No stage is to be skipped. According to Shi (1998:91), the Acquisition Hierarchy "reflects truly the Natural Order and the shared characteristics of SLA" (translation mine).

The critique of Shi's study will be presented in Section 3.3 where several theoretical as well as practical problems in CSL studies are addressed. One immediate point which should be made is Shi's Implicational Scaling (Table 3.2-3). The Implicational Scaling offered little by way of explanation. For example, the implication line which runs across several sentence types and proficiency levels, presumably marking the acquisition stages or hierarchy, is positioned in such a way that it neither corresponds to the 1's and the 0's, nor to the accumulated values of the "corrects" and the "errors." In other words, the implication pattern reflects neither the accuracy nor the error. In addition, it does not appear to mark the first successful learning instance, or the point from which systematic and consistent performance took place. Indeed, it is difficult to read much out of the table.

Secondly, the Implicational Scaling does not seem to be consistent with the objective acquisition order Shi had found (Table 3.2-4). For instance, according to the implication table (Table 3.2-3), the leftmost sentence type, the agentive passive structure (T9, Subj.+ passive morpheme + Obj.+V + le), had not been acquired by any learner. Yet, it was a stage-two structure according to the objective acquisition order (Table 3.2-4). On the other hand, T13, according to the implication table, was an easy structure since all learners except the beginners had acquired it. In the objective acquisition order, however, T13 was located at Stage three, as one of the most difficult structures. Shi did not offer any explanation or justification about the placement of T9 or T13.

Similar discrepancies existed with regard to other sentence types. These inconsistencies make it difficult to accept Shi's "Difficult--Easy" continuum on the Scaling. They pose serious doubts about the "difficult-easy" criteria Shi used for the linguistic structures in the study. It also makes one wonder about her analysis through which the Scaling and the Acquisition Order were obtained.

Table 3.2-3. Implicational Scale of the Data Bank**
Binary Scale at 80% Criterion

		Difficult <-----> Easy																						
M o s t	T Y P E	9	20	8	7	4	22	19	14	10	6	5	21	16	12	11	2	18	15	17	13	3	1	Total
	P R O F I C I E N C Y	L6	0	0	1	1	0	1	0	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1
L5		0	1	0	0	0	0	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
L4		0	0	0	0	0	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
L3		0	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	1	1	1	1	1
L2		0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1
L1		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1
L e a s t	V*	0	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	4	4	5	5	6	6	61
	X*	0	1	1	1	1	2	2	3	3	1	3	0	2	1	1	1	0	1	1	1	0	0	26

**Reproduction of Shi (1998:80)

*V = correct; X = incorrect.

Table 3.2-4. Objective acquisition order of 22 sentence types by learners*

Stage One					Stage Two										Stage Three								
T1	T3	T17	T15	->	T11	T21	T8	T19	T5	T2	T6	T10	T18	T7	T9	T12	T20	->	T22	T13	T16	T4	T14

Reproduced from Shi (1998:91, translation mine)

3.3. Critique

The review above has offered a detailed description of the relevant CSL studies. The critique has been kept to the minimum mainly because certain problems are shared by most of the studies and will be addressed systematically in this section. The critique that follows will examine three areas: the data, theory application, and the analysis.

3.3.1. Data

3.3.1.1. Data source

Except for Sun (1993) and Zhao (1997) whose studies used oral data from the learners, all others used written data from the Chinese Interlanguage Data Bank or from written sources. Although Shi's (1998) study included oral data, the main part of the conclusion was based on the written data. The issue of oral vs. written data is not a simple matter of data type. It is concerned with the question of what constitutes valid material for the study of second language acquisition.

It is well known that different theoretical concerns motivate the use of different data. The probe into second language competence, for example, would employ grammaticality judgment tests to collect data (e.g., White 1989a). Second language performance oriented research, however, typically uses oral data. The reason is simple. Speech is produced under time constraints. The time constraints are such that the grammatical processing of phrases and sentences cannot be otherwise but automatic. Long-term memory has a very limited role to play in the process (Levelt 1989, Myles 1995, Pienemann 1999). Under these circumstances, the linguistic output is more likely to reflect the true state of a learner's IL system.

Writing, on the other hand, uses very different processing mechanisms. The characteristics of speech as outlined above do not pertain to writing. Assisted by time, memory, conscious monitoring and a number of other resources, the learner is able to outperform his/her current level of second language proficiency. Indeed, Sun (1999) had to discard some of the sentences from his sample which, according to him, "lacked authenticity." In other words, learners at a certain proficiency level could not possibly produce them. In essence, the potential gap between a learner's actual proficiency and his/her performance is not only greater in written data, but the exact nature and size of the gap cannot be properly assessed.

Most of the CSL acquisition studies used the data from the Chinese IL Data Bank which stores written essays from learners of varying proficiency levels and first language backgrounds. No information was provided in any of the studies as to the conditions under which the essays were written. It is not known if such information is available in

the Data Bank in the first place. Consequently, the findings of those studies and the ground for the conclusions must be assessed cautiously.

3.3.1.2. Data screen

As the Chinese IL Data Bank contains an enormous amount of data (approximately 104 million words in total³), it is inevitable that researchers need to search and select the data which is relevant to the purpose of the investigations. Possibly due to the way the data is indexed or tagged, the researchers could only obtain those which are marked for certain features (see Wang 1997, 1999, Shi 1998; Sun 1999; Teng 1999). For example, if one would like to study the perfective aspect marker *le*, only the sentences in which *le* has occurred can be retrieved from the Data Bank. Sentences in which *le* should have occurred but did not cannot be obtained because the perfective context is not tagged or marked in the Data Bank. Depending on the linguistic structures to be studied, this constraint on data can seriously affect the analysis and the result.

Since the data contains only the occurrences of given grammatical features, the only way to analyze the data is by an accuracy count of what has occurred and by error analysis of the incorrect rule applications. Those, in fact, were the dominant methods used by the CSL researchers (except for Sun 1993; Wang 1997, 1999). Even Sun (1999) who examined the relationship between the semantic categories of verbs and aspectual markers carried out an accuracy count.

Leaving aside for the moment the adequacy and appropriateness of accuracy measures in SLA, we shall focus on the issue of what it means to analyze exclusively the cases where a certain form is supplied. Very simply, conclusions may be unfounded and totally misleading. A 90% accuracy rate under those circumstances would indicate that the learner has acquired the form. However, because zero-suppliance was not taken into consideration due to the indexation methods used in the Data Bank, it is perfectly possible that 90% of the time the learner did not even produce the form in obligatory contexts. That would mean that the form hardly emerged in the learner's IL. In SLA research, non-suppliance is as important as suppliance (see Schachter 1974). Leaving it out renders the findings difficult to interpret and the conclusions invalid.

3.3.1.3. Data quantity and missing data

Although the Chinese IL Data Bank provides a large data corpus to be used in CSL studies, after data distribution across proficiency levels, the sample size for some structures has become too small to draw any meaningful conclusions. For example, Sun

³104 million *zi*. Whether *zi* means "written character," or the equivalent of a semantic and syntactic unit "word" is unclear. My guess is "written character," given the current practice of counting in publications and the unsolved question of what constitutes a "word" in Chinese.

(1999) calculated the number of correct and incorrect uses of the perfective aspect marker *le* with 8 verbs at three or more proficiency levels (7 levels in total). The vast majority of the levels contained no more than 4 occurrences of either the correct forms or the incorrect forms. Many had zero occurrence (also see Table 5 and Table 7, Sun 1999:59, 62). Conclusions based on an extremely small sample are difficult to sustain, if at all.

In some studies, the size of the overall data corpus was specified but not the amount of data for each structure in the statistical analysis (Wang 1997, Qian 1999). Given that it was common for these acquisition studies to examine more than 10 structures over more than 5 proficiency levels, it is suspected that the data quantity of some structures at some levels was very small.

Data quantity is important in SLA research. A small corpus not only makes it difficult to carry out certain kinds of analysis, namely, distributional analysis or statistical analysis, but the results and conclusions could be unreliable. It is dangerous to conclude from one or two occurrences of a certain form that the learner has acquired the form. Furthermore, data quantity limits the choice of analytical methods. For example, distributional analysis often requires the break-down of linguistic contexts into smaller units, such as words or even morphemes (Pienemann 1999). Such an analysis cannot be carried out unless the data corpus is large enough so that each unit is sufficiently represented.

Another issue pertaining to data quantity is missing data. Its treatment has invoked much debate (see Hudson 1993). In Wang's (1999) descriptive study of the developmental process of the negative comparative structure, the distribution table contained 63% empty cells or "missing data" (30 out of 48, see Table 3.2-2). Shi (1998), in constructing the Implicational Scaling, treated missing data as non-acquisition. The rest of the CSL studies did not provide information on missing data. Consequently, it is not always clear if a zero symbol in a table means "missing data" or "zero accuracy."

There is no reason to treat missing data as evidence of non-acquisition. When a form is not represented in the sample, it simply means that no information is available about it in terms of acquisition. No other conclusions can or should be drawn. Given that language production is made in context, non-occurrence of a particular form (e.g., past tense *-ed*) may very likely be the result of the context being absent (i.e., no mention of any past event).

3.3.2. Data analysis

Apart from Wang (1997, 1999), all the CSL studies reviewed in this chapter applied accuracy measures to the data analysis. The percentage of the correct vs. incorrect forms was calculated first, followed sometimes by statistical calculations (e.g. Shi 1998) and error analysis (e.g. Zhao 1997, Teng 1999) before conclusions. Accuracy was being rationalized and used as the measurement for acquisition. Qian (1997:95) stated that "the more the accurate occurrences and the fewer the erroneous occurrences were, the easier it is for the students (to learn). Therefore, a sequential order of the correct and incorrect occurrences will yield the acquisition order of directional complement structure" (translation mine). Shi (1998:79) made a similar statement, "Regarding the Data Bank data, the higher the frequency or percentage of accurate use of a structure, the easier it is and the earlier it can be acquired" (translation mine).

This line of reasoning was behind the morpheme order studies in the 1970's. Those studies used accuracy measures to obtain the rank order of morphemes. An acquisition sequence was then established on the basis of the accuracy order.

Criticisms have been leveled against the morpheme order studies over the years. Larsen-Freeman and Long (1991:242) noted that the morpheme order studies "actually addressed accuracy, or difficulty, orders, not acquisition orders." Lack of theoretical motivation and explanation (Gregg 1984; Pienemann and Johnston 1987), and the use of 80% or so accuracy rate for acquisition criteria, were also felt to be serious flaws of the morpheme order studies (Larsen-Freeman and Long 1991).

In his recent book, Pienemann (1999) addressed the issue of "accuracy measurements" in SLA. He pointed out that

[t]here is no guarantee that the accuracy of morpheme insertion will increase steadily in relation to any two morphemes or in relation to any two learners. On the contrary, it is quite likely and well attested in empirical studies that accuracy rates develop with highly variable gradients in relation to grammatical items and individual learners.
(p.137)

In other words, "...it is impossible to predict how suppliance in obligatory contexts will develop in any given structure and learners" (Pienemann 1999:138). Consequently, accuracy rates "lack validity as developmental criteria" (Pienemann 1999:143). Pienemann proposed instead the "emergence criterion," which in operational terms means the point at which the learner uses a given form in sufficient number of contexts⁴

⁴According to Pienemann (1999:146-147), one or two contexts in which there is a single rule application is not sufficient to test the emergence hypothesis. A minimum of three contexts is usually used in language acquisition studies. For details, see Section 5.6.

which vary lexically or structurally. Unlike the accuracy rate, which fluctuates with structures and learners, the emergence point remains constant and stable. It indicates the beginning of an acquisition process (Pienemann, 1999:138).

Although most of the CSL studies employed accuracy measures, the use of the accuracy result in these studies was far from being consistent. Shi (1998) was the only one who had set an accuracy-based acquisition criterion. Teng (1999) compared the accuracy readings of the structures: the higher the reading, the earlier the structure to be acquired. Sun (1999) averaged the accuracy rate across the proficiency levels for each structure and used that to work out the acquisition order. In Qian (1997), the accuracy result was not used in any explicit way in the construction of the acquisition order. It seems that the accuracy-based analyses such as those above were fundamentally identical to those used in the morpheme order studies. Furthermore, it is difficult to rationalize the use of total accuracy average across all proficiency levels to determine the status of acquisition, because the state of one's IL system cannot be the average of the accuracy rate over the years of learning.

3.3.3. Theory application

One particular feature which is shared by the CSL studies is that to a large extent they are data-driven. Lack of theory finds its expression in two areas: the selection and description of linguistic structures to be studied, and the explanation of the findings. Where theory was used, it was often detached from the empirical evidence.

3.3.3.1. Selection and description of sentence structures

The selection of sentence structures in the CSL acquisition research was in general based on descriptive or pedagogical grammar (Qian 1997), the available data from the Data Bank (Wang 1997, 1999), and reasons external to grammar (Shi 1998). As a result, the structures (or "sentence types") selected often showed variety not unlike that of a "mixed salad." Take Shi (1998:78) for example. The 22 sentence types were paired into 11 structures in their affirmative and interrogative forms:

- *shi* "be" sentence (simple COP and relative clause): T1, T2
- *you* "have" sentence (possessive and existential structures): T3, T4
- *shi...de* sentence (past marking and nominalizing predicative adjectives): T5, T6
- *ba* sentence (the so-called "disposal" structure): T7, T8
- *bei* sentence (passive): T9, T10
- comparative sentence: T11, T12
- rhetorical questions: T13, T14

- simple questions: T15, T16
- special questions (or *wh*-questions in English): T17, T18
- choice questions: T19, T20
- affirmative-negative questions: T21, T22

The last example (T22) was on the verge of being unacceptable. It was at best ambiguous without context.

T22. S+ shi bu shi +V+O+ne?" (affirmative-negative question)

Ni shi bu shi xue hanyu ne? ?
you be not be learn Chinese Q-par.
 Are you studying Chinese?

(Shi 1998:78, English gloss mine)

As can be seen, these 22 "sentence types" differ greatly from each other in their syntactic structures. Lacking structural coherence and connection, they were chosen on a number of grounds, none of which was directly related to acquisition theory or even descriptive grammar.

A theory-driven IL developmental study would select grammatical structures according to an acquisition theory or hypothesis which underlies the acquisition order of these structures. For example, the ZISA study carried out in the 70's and 80's adopted a psycholinguistic perspective in its analysis of German word order. Instead of 10 or 20 structures, 5 basic rules were proposed corresponding to five acquisition stages. These were IL rules for German word order, based on processing principles, and they covered a large variety of German "sentence types" (Clahsen 1980, Meisel, Clahsen and Pienemann 1983, for a brief and comprehensive summary, see Larsen-Freeman and Long 1991, or Pienemann, 1999). Acquisition of these rules (or the "sentence types" they represent) means acquisition of increasingly complex processing strategies. Not only could a particular "sentence type" be located at one of these five stages, but an implicational scaling is logically plausible and explainable. Similar theory-driven selection of linguistic structures can also be found in a variety of languages, e.g., English (Johnston 1985, 1998), Swedish (Pienemann and Håkansson 1999), and Japanese (Huter 1998, Kawaguchi 1996).

In contrast, "random" selection of structures, in practical terms, would likely result in multiple, but unprincipled acquisition orders. It is possible that selection of a cohort of very different sentence types would produce varying accuracy rates among them, and

would therefore render them "order-able." Such an approach could only lead the research inquiries on a wild chase of "order." It does not inform the researcher of any fundamental principles which underlie the order discovered.

In addition to the data-driven features in structural selection, structural description is another weakness in the CSL studies. Two points are worth mentioning. First, more often than not, the CSL research did not offer a clear, detailed grammatical description of the structures to be studied. The studies on the acquisition of "sentence types" simply categorized the structures without providing any form of grammatical description (Qian 1997, Wang 1997, 1999, Shi, 1998). The textbook definition was often given in the studies on aspectual markers (Sun 1993, Zhao 1997, Sun 1999). The lack of systematic structural description in the studies is related to the data-driven nature of the CSL research as a whole.

Secondly, some aspects of Chinese grammar are not well described in general linguistics. For example, it is well known that there is no adequate grammatical description of the perfective aspectual marker *le* and the modal particle *le* (see Li and Thompson 1981:239). Teng (1999:59) pointed out that "the optionality of 'le'...has not been well studied at all even in Chinese linguistic analyses to date." To further complicate the matter, native speakers of Chinese do not seem to have consensus in their judgments on where *le* should and should not occur in a text (e.g., Li and Thompson 1981:191ff). It is difficult to envisage how the acquisition of a "mysterious" form such as *le* could be studied under such circumstances. The conclusion drawn by Zhao (1997:305), at the end of the error analysis, that the learner "did not understand the nature, use, conditions and constraints of usage of *le*," is also an apt comment on the linguists of Chinese.

In the empirical study of language acquisition, it is essential that a grammatical framework be used to oversee the investigation from the selection of the forms to structural description and explanation of the findings. In many studies, the grammatical theory has served as the point of departure for research hypothesis. Having a grammatical theory and description of some aspects of language is simply the basis of a study whose focus is on the acquisition of those aspects.

3.3.3.2. Explanation of findings

Due to the data-driven nature of the CSL studies, the acquisition sequences found in the studies are often not explained. This is reminiscent of the morpheme studies in the 1970's (Dulay and Burt 1973, 1974, Dulay, Burt and Krashen 1982). Of the many problems besetting the morpheme studies is the lack of explanation. The acquisition order found for

the morphemes could not tell us why it was so (Gregg 1984; Pienemann and Johnston 1987a).

In his study of the acquisition process of the negative comparative structure, Wang (1999) did offer a number of explanations in terms of learners' simplification strategy, psychological constraints, and cognitive and creative processes. However, due to serious data shortage, the explanations do not seem to have the power they should to account for the facts.

Shi (1998) also tried to explain her findings by using theories. She applied the Resetting Hypothesis in UG, Cognitive Complexity theory, and Markedness theory. However, her efforts were dampened by the fact that the theories were often detached from the empirical evidence. They were applied in a "vacuum" fashion, so to speak, and were not capable of explaining the findings.

For example, UG and the Resetting Hypothesis were invoked to show that the acquisition sequence found in the 22 sentence types was due to the influence and constraints of UG, and in particular, the resetting of parameters. However, Shi did not define nor give an example of what sorts of parameters in the 22 sentence types were "reset." No evidence from the study was used to demonstrate the relevance of UG in relation to the acquisition order she had found. UG was simply presented and described as a "theory," detached from the empirical facts of the study.

The notion of cognitive complexity was defined by Shi to refer to "the distance or the levels between the deep structure and the surface structure, or the levels needed to set a (parameter) value" (Shi, 1998:94, translation mine). Shi concluded on the basis of her study that the acquisition order was closely related to the cognitive complexity of sentence structures. However, nowhere in the study did Shi analyze the degree of cognitive complexity of her 22 sentence types in terms of the distance between the surface and deep structures. The transformational process was not demonstrated.

Furthermore, Shi presented the role of learning strategy, learning style, L1 influence, etc. as another type of "cognitive complexity" which, according to her, "has determined the acquisition order to a large extent" (Shi 1998:94, translation mine). Yet again, Shi did not support her claim with empirical evidence, evidence which could demonstrate that the learners' learning strategy and L1 correlated "to a large extent" with the acquisition sequence she had discovered. In this regard, the theory was yet again applied in a "top-down" fashion, detached from the data.

The third theory Shi used in her discussion was Markedness Theory. Greenberg's (1966) definition of markedness, i.e. "high frequency" and "neutrality," was provided, and four sentence types were given as examples of the "marked" and "unmarked" structures. However, the discussion did not apply the theory in a systematic fashion. The notion of "high frequency" and "neutrality" was not operationalized, and most of the 22 sentence types as well as their acquisition order were left unexplained.

Similar use of theory to flag a point rather than explain it was also found in Zhao (1997) who mentioned "fossilization" in his discussion of the acquisition of *le* (1997). His definition of "fossilization" was *pianyu de wanguxing* (persistent nature of errors). In his analysis, "fossilization" seemed to mean errors which occurred at a high proficiency level or at a high percentage. For example, Zhao (1997:304-306) found that "...many errors at the beginning level still show up later at a high level" (translation mine). He also found higher percentage of errors in IL paragraphs than in single sentences (p.307). However, in order to demonstrate that a given form is fossilized, it is necessary to show that the form has been used, incorrectly, by the learner consistently. "Fossilization" is not a quantitative phenomenon. It is a qualitative feature in the IL system and can only be made certain by a detailed analysis, not frequency count.

3.4. Summary

CSL research in recent years has seen a slow increase of empirical studies. Morphological markers (mainly aspectual markers) and sentence structures have been the foci of these investigations. As pioneers in a non-empirical research tradition, the beginning is inevitably filled with excitement and problems alike. The critique above has pointed out three major problems which many of the CSL studies on acquisition order share: the data (i.e., its source, type, and quantity), the analysis (i.e. the use of accuracy measures), and the theory application. Lack of access to (more recent) SLA/IL theories and literature is partly responsible for the deficiencies in CSL research. It has contributed to the use of out-dated theory (e.g., Shi's "Natural Order Variant Hypothesis" (1998:90f)). Theoretical as well as descriptive research in Chinese grammar has yet to provide a sound linguistic base for CSL research to be carried out successfully.

Chapter 4

Chinese Grammatical Morphemes

The objective of this chapter is to present a formal description of the grammatical and processing features of the eight Chinese grammatical morphemes under investigation. The importance of the description is self-evident: one cannot study how the learner acquires an L2 grammar without a clear understanding of the grammar itself. Furthermore, grammar is given a central role in Processability Theory: it acts as a set of constraints on L2 development. Grammatical description, therefore, makes it possible to specify processing constraints and thereby delineate the course of acquisition.

In principle, the description of a grammar and the construction of a grammatical theory can take many forms (Bresnan 1978). However, given the psycholinguistic orientation of the present study, it seems important that the grammatical description meets the dual condition of descriptive adequacy and psychological plausibility. For this reason, the description will be carried out in the general framework of Lexical-Functional Grammar (LFG) and Processability Theory (Bresnan 1978, Bresnan and Kaplan 1982, Sells 1985, Horrocks 1987, Pienemann 1999). According to Pienemann (1999:93), "LFG belongs to the 'family' of unification grammars" which, among other things, specifies that lexical entries of the lexicon contain semantic and syntactic information and that such information must be compatible among constituents in order for the structure to be well-formed. The idea of information transfer and compatibility also lies in the centre of Processability Theory (Pienemann 1999) which specifies and predicts the sequential development of L2 grammar. The psycholinguistically based description may not coincide with the traditional grammatical analysis simply because structural similarity does not necessarily lead to processing similarity.

The discussion that follows starts with a brief introduction of the major features of Chinese grammar and the relevance of the psycholinguistic approach to Chinese grammar. Following Pienemann (1999), morphemes are categorized according to their processing features. Finally, the 8 Chinese grammatical morphemes are described.

4.1. Chinese

Chinese possesses few grammatical morphemes compared to inflectional languages. These grammatical morphemes typically do not exhibit morphophonemic or morphological variations. Most of the morphemes are characterized by three features: they are bound forms, they do not possess tones, and they do not have lexical semantic

content. The extent to which these three features apply varies somewhat among the morphemes, often as a matter of degree of formalization. For example, classifiers, many of which still possess tones and semantic content, are sometimes regarded as a class between "word" and "particle" (Chao 1982). The progressive marker *zhengzai* has a full tone, although its variants do not.¹

Typologically, Chinese is an isolating or analytic language (Norman, 1988). The grammatical relationship between constituents is expressed largely by word order or by the use of grammatical particles rather than by morphological affixation.² Such grammatical categories as person, gender, case and grammatical functions (subject and object) are not morphologically marked. Chinese also does not mark tense, although there are a number of aspectual markers. Plural marking is commonly realized through lexical means, e.g. numerals, *yixie* 'some,' *hen-duo* 'many' instead of the plural morpheme *-men*. The verbs do not have conjugation paradigms, and the pronouns do not have case paradigms. Grammatical agreement between subject and verb, or between the adjective and noun, does not exist. These characteristics suggest that much of the grammatical apparatus found in Indo-European languages is not employed in Chinese. In fact, the lack of morphological shape/change of words and the topic-comment structure of the connected sentences have motivated some linguists to regard Chinese as a *yuyixing yuyan* 'semantic-based' language (e.g. Xu 1997).

Given the lack of a complex morphological system, one might at first glance assume that a different type of learning task might be involved in the acquisition of Chinese as a second language. It might appear that there is no need to learn grammatical formatives and their intricate relationships in and across constituents because these formatives by and large do not exist in Chinese. This would mean that the development of processing procedures such as those proposed in the Processability Theory would not be an issue in the acquisition of Chinese.

¹*Zhengzai* is treated by many Chinese grammarians as a time adverb (Fang 1996, Xing 1998, Liu, Deng & Liu 1991). Ma (1987) and Fei (1992) claimed that "there is no such a thing as the 'progressive aspect' in Beijing dialect" (cited in Xu 1997:505). However, the claim was made in the context of the stative or continuous aspect marker *zhe*. It is not known if it refers to the terminology or the function. Different terminologies are often used for *zhengzai*. For example, Li & Thompson (1981) called it "durative" or "imperfective." Liu et al. (1991), the authors of the textbook *Practical Chinese Reader*, called it "progressive." Regarding its function, *zhengzai* and its variants can and do indicate progressive aspect while time adverbs usually cannot. For instance, the time adverb *yijing* 'already' cannot be used without the perfective aspect marker *le*, or *cengjing* 'once' without the experiential marker *guo*. The present work will not join the debate. Instead, it will focus solely on the acquisition material and keep both the form and the term "progressive" in the description.

²Terminologies vary in the description of Chinese grammar. In addition to "morpheme," the terms: "particle," "marker" and "affix" are also used to refer to the same grammatical constituents.

Examining Chinese grammar closely, however, we find that Chinese does employ a number of grammatical morphemes to mark grammatical functions, for example, the genitive *-de*, the perfective *-le*, the classifiers, etc.. Grammatical and semantic information is encoded in these morphemes and information transfer between constituents occurs in the process of phrase and sentence constructions. Examples (1) and (2) below illustrate the mechanisms of this process.

Example (1) shows transfer of information between the head noun, the classifier (CL) and the numeral. Example (2) shows the same phenomenon between a preposition and its complement.

- (1) Bide you yi tiao gou.
Peter has a CL dog

Peter owns (or has) a dog

This example is a translated version of an English sentence from Pienemann (1999:94). The (simplified) lexical entries of the sentence are given below:

Bide:	N,	(PRED)	=	'PETER'
you:	V,	(PRED)	=	'HAVE <(SUBJ) (OBJ)>'
yi:	NUM,	(SPEC)	=	'YI'
		(NUM)	=	+
tiao:	CL,	(NUM)	=	+
		(HUMAN)	=	-
		(SHAPE)	=	LONG AND NARROW
gou:	N,	(PRED)	=	'DOG'
		(NUM)	=	+
		(HUMAN)	=	-
		(SHAPE)	=	LONG AND NARROW

A number of features in the lexical entries of the NP *yi tiao gou* 'a dog' match. The NUM (numeral) feature is present in all three entries. The minus '-' value for HUMAN is annotated in both the classifier *tiao* and the noun *gou* 'dog.' Feature unification thus ensures that the NP is well-formed. Changing the value of the lexical items would block the unification process and render the NP ungrammatical, as (1.1) and (1.2) show :

- (1.1) *yi tiao gou* --> **yi wei gou*
one CL dog *one CL dog*
 a dog a dog

- (1.2) *yi tiao gou* --> **yi tiao ren*
one CL dog *one CL person*
 a dog a person

The new classifier in (1.1) *wei* has the value +HUMAN. This conflicts with that of the head noun 'dog.' In (1.2), the head noun is 'ren-person.' Its +HUMAN value does not match that of the classifier *tiao* (-HUMAN). Both NPs are ill-formed. In both instances, feature unification cannot be completed.

An exchange of grammatical information also occurs within PP, between the preposition³ and its complement. The locative preposition *zai* 'in/at'⁴ requires its complement to be a locative noun. If the lexical entry of a noun does not have this feature, such as many common nouns, a "localizer" (LOC) must be added to it (2). If not, the information encoded in the preposition *zai* cannot be transferred successfully to its complement, and the locative PP would be ill-formed (2.1):

- (2) *zai shan shang*
at mountain LOC
 on the mountain.

- (2.1) **zai shan*
at mountain

The examples above show that formal devices do exist in Chinese grammar. Learners of Chinese therefore face a learning task similar to the ESL or GSL learners: they need to develop the procedural skills necessary for L2 grammatical operations.

In the following section, the analysis of Chinese grammatical morphemes is based on the principles of Processability Theory (Pienemann 1999) and the framework and formalism of LFG as explicated in Sells (1995). The extent to which information exchange is carried in and across phrases defines the morpheme types and processing constraints. The morphemes to be described are what the grammarians of Chinese commonly call *jiegou zhuci* "structural particles," *Yuqi zhuci* "modal particles," which perform a variety of pragmatic functions, are not included due to a lack of adequate description of their function in the literature and their peripheral position in teaching and learning, especially during the early stages. Secondly, the morphemes selected are by no means exhaustive. Not all the morphemes contained in the syllabus of the first-year Chinese program at the Australian National University, where the data was collected, are examined. Only those

³The term "preposition" is used here for descriptive transparency.

⁴Depending on the sentence structure, *zai* could also be a verb.

for which sufficient acquisitional data was obtained are discussed. That means those morphemes taught toward the end of the observation period have to be excluded (e.g., *ba* disposal, directional morphemes, resultative morphemes, etc.). Thirdly, the grammatical facts presented are by no means comprehensive, nor do they represent the full grammar of a native speaker of Chinese. The reason for this is simple: it is not the purpose of the present work to write a comprehensive grammar of Chinese but to describe those aspects of the grammar which the first-year learners in the present study were required to learn. Therefore, only those aspects to which the subjects were exposed in their Chinese language classes are described. A few grammatical morphemes commonly considered important have to be excluded either because the data was insufficient for analytical purposes (e.g. stative marker *-zhe*, "disposal" morpheme *ba-*, passive *bei-*, etc.), or because a general lack of understanding and descriptive adequacy has rendered it impossible to study them in any language acquisition context (e.g. perfective marker *-le*, inchoative marker *-le*). Finally, The terms "particle," "morpheme," and "marker" are used interchangeably.

4.2. Chinese grammatical morphemes

Table 4.2-1 displays an overview of the eight Chinese grammatical morphemes classified according to the processing mechanisms specified in Processability Theory. Five of them are lexical morphemes, two are phrasal morphemes, and one is an inter-phrasal morpheme. Before being used as a descriptive and predicative model for the acquisition of L2 Chinese grammar, it is necessary to justify the classification through systematic grammatical analysis of each one of the morphemes listed in the table.

Table 4.2-1. Chinese Grammatical Morphemes

Categories	Morphemes	Symbols
Lexical	Progressive <i>zhengzai</i> -*	(PROG)
	Experiential <i>-guo</i>	(EXP)
	Genitive <i>-de</i>	(GEN)
	Attributive <i>-de</i>	(ATT)
	Adjective <i>-de</i>	(ADJ)
Phrasal	Classifier	(CL)
	Verb-Complement <i>-de</i>	(COMP)
Inter-phrasal	Relative clause <i>de</i>	(RC)

*Its variants: *zhengzai(...ne)*, *zai(...ne)*, *zheng(...ne)*, *...ne*.

4.2.1. Lexical morphemes

Five morphemes belong to the category of lexical morphemes. They are the progressive aspect marker *zhengzai* (PROG), the experiential aspect marker *guo* (EXP), the genitive suffix *-de* (GEN), the attributive morpheme *-de* (ATT), and the adjective suffix *-de* (ADJ). The main characteristic of these morphemes is that their insertion does not involve any feature unifications with other constituents of a phrase or a sentence. This characteristic will be demonstrated in the following analysis.

4.2.1.1. Aspect markers

The progressive marker *zhengzai-* (PROG) and the experiential marker *-guo* (EXP) are two of the aspectual markers which contain semantic information relating to the shape of the action. The progressive marker *zhengzai-* (PROG) refers to an action in progress at the moment of speaking. The experiential marker *-guo* (EXP), on the other hand, denotes an action or event which "took place in the past. It is often used to emphasize experience" (Liu, Deng & Liu 1988: 46). In the following two examples, (3) shows that the action "eating" is being performed at the particular time, 6 o'clock, whereas (4) indicates that the speaker has had the experience of eating a snake.

- (3) Ta 6 dian zhengzai chi-fan.
he/she 6 o'clock PROG. eat-meal.

He/She is/was having a meal at 6 o'clock.

- (4) Wo chi-guo she.
I eat-EXP snake.

I have eaten a snake before.

The examples illustrate that whether or not the progressive or experiential marker is used in a sentence is a matter of how the action or event is viewed or experienced by the speaker. It is the conceptual idea of the speaker, not the linguistic context, that dictates the application of the aspectual marker. As the information of grammatical aspect is encoded in the lexical entry of the verb *chi* 'eat' (5), a lexical search instigated by the conceptual material will call up the verb as well as the relevant diacritic features, i.e., aspectual markers (3.1) (4.1). The following is merely a subset of the lexical entry of the verb *chi* 'eat.'

- (3.1) [zhengzai-chi]_v
PROG eat

eating

zhengzai-chi: V, (PRED) = 'CHI <(SUBJ) (OBJ)>'
(ASP) = PROG.

(4.1) [chi -guo]_v
eat EXP.

have eaten

chi-guo: V, (PRED) = 'CHI <(SUBJ) (OBJ)>
(ASP) = EXP

(5) chi: conceptual arguments: (X, Y)
syntactic category: V
grammatical function: (SUBJ, DO)
diacritic features: aspect (progressive, experiential, etc.)
etc.

4.2.1.2. Genitive and attributive markers

The syntactic frame in which *-de* (GEN) and *-de* (ATT) occur is identical: NP₁(-*de*) NP₂.⁵ However, the information encoded in them is different, as shown in (6) and (7). In (6), *-de* (GEN) is a genitive suffix, marking the noun *laoshi* 'teacher' as possessor. In (7), *-de* (ATT) is an attributive suffix, marking the noun *mutou* 'wood' as modifier. Once more, only a subset of the lexical entry of the nouns is listed in the examples.

(6) [laoshi -de shu]_{np}
teacher-GEN book
teacher's book

laoshi-de: N, (AGENT) = +
(POSS) = +

(7) [mutou-de fangzi]_{np}
wood -ATT house
a wooden house / a house made of wood

mutou-de: N, (AGENT) = -
(ATT) = +

Depending on the semantic category of the noun, more features may be present, resulting sometimes in the possible presence of both *-de* (GEN) and *-de* (ATT) functions. In (8), if *Beijing-de* 'Beijing's' is interpreted as the "owner" or "operator" of the universities,

⁵The description in this section follows to a certain extent the mainstream analysis of the "N1 (de) N2" structure, which categorizes the semantic information into two broad types: possession and attribution (Wen 1998, Zhu 1998). The morpheme *-de* in the former is a genitive marker (+GEN), in the latter, an attributive marker (+ATT). However, the criteria with which the semantic relationships between the two nouns are determined are unresolved.

the genitive function of *-de* (GEN) is being called for. If, on the other hand, *Beijing-de* 'Beijing's' is understood as the location of the universities, the attributive function of *-de* (ATT) is in use.

- (8) Beijing-de daxue
Beijing-GEN/ATT universities
Universities in Beijing

Beijing-de: N, (AGENT) = +
 (POSS) = +
 (LOC) = +
 (ATT) = +

Example (8) in which there is multiple interpretation of the NP demonstrates that the exact function of *-de* (GEN) and *-de* (ATT) is determined by the conceptual material, i.e., how the relationship between N₁ and N₂ is viewed by the speaker.⁶ These markers are not involved in any information exchange with constituents elsewhere in a sentence. They are lexical morphemes.

4.2.1.3. Adjective suffix

There are three non-nominal suffixes: the adjective suffix *-de*, the adverb suffix *-de*, and the verb suffix *-de* (Zhu 1998).⁷ They are homophonous in speech, but orthographically different.⁸ They are often referred to as "structural particles" (Norman 1988, Liu, Deng and Liu 1991), perhaps because they do not encode any lexical semantic meaning. In the following, the adjective and the verb suffixes will be discussed and their status in the processing hierarchy will be demonstrated. The adverb suffix will not be analyzed for the reasons mentioned in Section 4.1.

The traditional analysis treats adjective suffix *-de* as a marker of NP (Chao 1982), a marker for the noun (Fang 1996), or a nominalizer (Li & Thompson 1981). It is said to

⁶The issue is far more complex. *-De* omission results in identical forms to compound nouns (N N) which may or may not share the same meaning with NPs. For a relatively detailed discussion, see Zhu (1998), Xu (1997), Wen (1998, 1999).

⁷This is another thorny issue for which there is no agreement. Zhu (1998) proposed four *des* according to their functions: adjective suffix, adverb suffix, auxiliary (i.e., nominalizer), and verb suffix. Xu (1997) strongly disagreed with this analysis, stating that there was no historical and dialectological basis for such classification. The present work will not attempt to discuss the nature of *de(s)*. Nor will it side with one grammarian or the other. The *des* will be examined and described from the point of view of language processing and language acquisition. In this regard, there is definitely more than one *de* (see also Liu et al. 1991).

⁸The orthographic difference is a historical artefact, or the result of a small scale language reform in the 1920's. For a detailed historical account of the evolution of the written *de*, see Ling and Jia (1991). Today, writing one form of *de* in the context of another is becoming more common. While acknowledging the trend, some Chinese linguists continue to emphasize the differentiation of the linguistic contexts in which the *-des* should be used (see Xing 1998).

be a phrasal particle because it occurs in an NP (Chao 1982). There are two types of adjectives in Chinese (Xu 1997, Xing 1998, Zhu 1998). Type one adjectives are mainly monosyllabic (e.g., *da* 'big,' *xiao* 'small,' *hao* 'good'), and allow *-de* (ADJ) to occur optionally when combined with a noun to form an NP (9a). Type two adjectives, on the other hand, are largely polysyllabic, and *-de*.(ADJ) is obligatory in an NP except in set phrases.

Type two adjectives can be further divided into two sub-types. Sub-type one is derived from monosyllabic adjectives through the addition of an adverb (usually a degree word), e.g., *hen* 'very,' *ting* 'fairly, rather' (colloquial), *gen* 'even more' (in comparison) (9b). Sub-type two adjectives are polysyllabic (9c). The following examples illustrate the different types of adjective in the NP.

(9a) Type one: monosyllabic

hao dongxi.
good thing
good things

hao -de dongxi
good-ADJ thing
good things

(9b) Type two, sub-type one: adverb + monosyllabic

hen hao -de dongxi
very good-ADJ thing
very good things

*hen hao dongxi
very good thing
very good things

(9c) Type two, sub-type two: polysyllabic

hao -kan -de dongxi
good-look-ADJ thing
pretty things

*hao-kan dongxi
good-look thing
pretty things

Two points need further discussion. The first one has to do with grammatical justification of treating *-de* (ADJ) as an adjective suffix. To say that *-de* (ADJ) is an adjective suffix is to say that the same form which cannot take *-de* at all is not an adjective. This is true. In fact, *-de* distinguishes the adjective class from the stative verb class, as shown in the following two examples:

- (10) Ta shi yi ge hen renshen-de ren (adjective)
he/she be a CL.very serious -DE person
He/She is a serious person
- (11) Ta hen renzhen. (stative verb)
he/she very serious
He is serious.

The examples demonstrate that, in Chinese, the adjective and the stative verb share the same root. It is not possible to determine in isolation the lexical class of a given form (e.g., *renzhen* 'serious, attentive'). In a structural context, however, its class membership is clear: the adjective can be followed by *-de* (10), while the stative verb cannot (11).⁹ The formal relationship between the two lexical classes can be stated by means of a lexical redundancy rule:

derived adjective: (stative verb) --> (+/- *-de*)
or
derived V_{stative}: (adjective) --> (- *-de*)

The second point is concerned with the justification of treating *-de* (ADJ) as a lexical morpheme. It seems that adjectives are annotated for the number of syllable (12) (13), whereas stative verbs are not (12.1) (13.1). The syllable feature determines whether the suffix *-de* (ADJ) is necessary or not. If an adjective is polysyllabic, *-de* (ADJ) must be

⁹Alternatively, one can say that *-de* is a marker for grammatical function rather than lexical class. Those forms which function as modifiers (i.e., attributive or adverbial) are marked by *-de* (8). However, this analysis would not be able to account for the adjectives in the predicate position (*-de* obligatory), which is also the position where stative verbs occur.

inserted, otherwise, it is highly optional and usually omitted.¹⁰

(12) renzhen: ADJ, SYLLABLE = 2
SUFFIX = +

(12.1) renzhen: V, (PRED) = 'RENZHEN<SUBJ>'

(13) hao: ADJ, SYLLABLE = 1
SUFFIX = - (or +)

(13.1) hao: V, (PRED) = 'HAO<SUBJ>'

It appears that *-de* (ADJ) insertion does not rely on the conceptual structure. Instead, the linguistic (or syllable) context of the adjective in a NP is an essential factor. This, at first glance, makes the morpheme *-de* (ADJ) an unlikely candidate for a lexical morpheme. However, the insertion process shows that when an adjective is selected as the result of lexical search, the information of syllable in the adjective entry calls for the activation of the suffix *-de* (ADJ) and the communication of this piece of information is kept within the lexical entry of the adjective. No constituents outside the adjective itself are involved in the process. Therefore, *-de* (ADJ) is a lexical morpheme.

4.2.2. Phrasal morphemes

4.2.2.1. Verb-complement marker

The verb suffix *-de* (COMP) occurs in the "verb complement structure." The structure denotes the manner of the action (14) or the extent of the action (15). The mainstream analysis of the suffix treats it as a complement marker (Chao 1982, Fang 1996, Xing 1998), a form glossed as "Complex Stative Construction" (CSC) (Li & Thompson 1981:623), a structural particle to connect the verb and its complement (i.e., *buyu*) (Liu, Deng & Liu 1991), or a verb suffix (Zhu 1998:126). The discussion that follows will focus on the "complement of manner," and leave out "complement of extent" since the former was one of the main teaching and research objectives in the present study.

¹⁰There are compound nouns which contain an adjective. For example,

lao-yumi 'old-corn

old-corn

corn

This does not belong to the phenomenon being discussed here.

- (14) Wo pao-de hen kuai.
 I run-COMP very fast.
 I am a fast runner.

- (15) Wo pao-de tui dou duan le.
 I run-COMP leg all break PFV.
 I have run so much that my legs were broken.

The verb complement structure in which *V-de* (COMP) occurs can be written as a lexical rule. In the two examples below, (16) does not contain a complement, whereas (17) does. The relevant parts of the lexical entries of the verbs are given in (16.1) and (17.1).

- (16) Ta pao.
 he run
 He runs.

- (17) Ta pao-de hen kuai.
 he run-COMP very fast
 He runs fast.

(16.1) pao: V, PRED = 'PAO <(SUBJ)>'

(17.1) pao-de: V, PRED = 'PAO-DE <(SUBJ) (V-COMP)>'

The verb *pao* 'run' in (16) contains only the SUBJ argument (16.1), whereas the verb *pao-de* in (17) has two arguments, SUBJ and V-COMP (17.1). The suffix *-de* (COMP) in fact changes the subcategorization of the verb. The *V-de* form subcategorizes for SUBJ and V-COMP, while the *V* form for SUBJ only. This generalization can be tested through sentences which violate this condition (18) (19):

- (18) *Ta pao hen kuai.
 he run very fast

- (19) *Ta pao-de.
 he run-COMP

(18.1) PRED 'PAO <(SUBJ)>
 SUBJ 'TA'
 *V-COMP V_{stative}

(19.1) PRED 'PAO-DE <(SUBJ) (V-COMP)>
 SUBJ 'TA'
 V-COMP ?

The V-COMP in (18) (underlined) is not and cannot be called for by the predicate *pao* 'run,' which subcategorizes for SUBJ only (18.1). Its f-structure in (18.1) shows a predicate argument structure which does not contain V-COMP. Sentence (18) therefore violates the Coherence condition of LFG and is ill-formed. On the other hand, the predicate in (19) *pao-de* 'pao' calls for the V-COMP argument, but V-COMP is absent. Since the f-structure (19.1) does not provide a value for V-COMP, and (19) does not contain a post-verbal V-COMP, the Completeness condition of LFG is violated, and the sentence is ungrammatical.

As a large number of verbs can be members of either of the paired constructions "V, V-de," the systematic correspondence can be stated as a lexical redundancy rule. The rule for the *V-de* form would state that a V-COMP be added in the predicate argument structure:

V-de: (SUBJ) --> (SUBJ) (V-COMP)

In Chinese grammar, post-verbal constituents such as frequency and duration are also analyzed as "complement" (Fang 1997, Xing 1998, Li & Thompson 1981, Liu, Deng & Liu 1991), although syntactically they are adjuncts. Following the traditional analysis, the c-structure of the sentences containing the frequency and duration "complement" would look exactly identical to that of the sentences containing a verb complement (20).

(20) S --> NP VP
 VP --> V COMP

Following LFG, however, the c-structure of these two types of sentences is different: the complement is part of the c-structure (21) whereas the duration and frequency complement is not (22).

(21) S --> NP VP
 VP --> V COMP

- (22) S --> NP VP
 VP --> V

The difference in the c-structure is reflected in the f-structure. The f-structure of (23) contains no COMP because the verb *pao* 'run' does not subcategorize for it (23.1). If a constituent appears, such as frequency or duration, it is an adjunct, outside the predicate-argument framework of the verb (24). On the other hand, the f-structure of (25) has a COMP, a V-COMP, since the subcategorization of *V-de* requires it (25.1). If other types of constituent appear instead, the sentence is ungrammatical. Thus, sentence (26) is ill-formed because the obligatory argument V-COMP is absent, and the NP adjunct (i.e., frequency and duration constituents), which is not in the subcategorization frame of the predicate *pao-de* 'run', is present.

- (23) Ta pao.
he run
 He runs

- (23.1) SUBJ [PRED'TA']
 PREL ['PAO<(SUBJ)']

- (24) Ta pao yi xiaoshi / yi bian .
he run one hour / one time
 He runs one hour / once.

- (25) Ta pao-de hen kuai.
he run-COMP very fast
 He runs fast.

- (25.1) SUBJ [PRED'TA']
 PREL ['PAO-DE<(SUBJ) (V-COMP)']
 V-COMP [PRED'KUAI']

- (26) *Ta pao-de yi xiaoshi / yi bian.
he run-COMP one hour / one time
 (He runs for one hour / once.)

The analysis above leads to the conclusion that *-de* (COMP) is a lexical morpheme, residing in the lexical entry of the verb. Depending on the conceptual material, which may or may not contain a complement, the lexical search will locate either *V-de* (COMP) or simply *V*, each then forming a structure in accordance with the specified functional rules.

However, when the conceptual material of a complement is delivered, the semantic and phrasal categories of the complement must be sorted out first (i.e., whether it is NP or V_{stative}, and whether it denotes manner, frequency or duration). This information is then transferred to the verb category and the final selection is made between *V-de* (COMP) and *V*. From this point of view, there is communication between the complement and the verb with regard to the application of *-de* (COMP) in the sentence. The linguistic context does have a constraining role on the use of *-de* (COMP). Since the process of information transfer occurs within VP, *-de* (COMP) is classified as a phrasal morpheme.

4.2.2.2. Classifiers

Chinese classifiers are a closed set of particles "associated with nouns when the noun is enumerated" (Dobson, 1974:14). They are positioned between the numeral and the noun. The classifiers are formalized in varying degrees. The majority of them are still tonal, and their status as a "word" or a "morpheme" is not always clear-cut (Chao 1982). In the following example (27), the simplified lexical entries of the lexical items are listed.

(27) [san ben shu]_{NP}
three CL. book
 three books

san:	DET,	(SPEC) = 'SAN' (three) (NUM) = +
ben:	CL,	(NUM) = + (SHAPE) = BOUNDED MATERIAL (HUMAN) = -
shu:	N,	(PRED) = 'SHU' (book) (NUM) = + (SHAPE) = BOUNDED MATERIAL (HUMAN) = -

The lexical schemata above display two essential characteristics: 1) the SHAPE and HUMAN features are present in the classifier and the noun; 2) the NUM (numeral) feature is present in all the lexical items of the NP. These pieces of grammatical information are being transferred between the lexical items in the NP during the process of NP construction.

The classifier is only activated by the presence of the numeral when there is a numeral in the NP. Without the linguistic context of the numeral, the insertion process of the classifier would not be triggered, or the NP would be ungrammatical (28). When the

classifier is called for by the numeral, it must first be identified. This identification process is triggered by the noun, specifically, by certain characteristics of the referent of the noun (e.g., shape, function, size, etc.) which must match those of the classifier. The insertion of the classifier therefore is contingent upon two linguistic contexts in a NP: the numeral for insertion, and the noun for accuracy of the form. It is a phrasal morpheme.

- (28) *ben shu
 CLbook
 book

As the classifier and the noun share certain features, the classifier can serve as the pro-form for the noun (29).

- (29) san ben
 three CL
 three books

4.2.3. Inter-phrasal morphemes

Consistent with the "modifier-modified" word order in the NP, the relative clause structure in Chinese also places the head noun after the clausal modifier. The grammatical morpheme *-de* is used to mark the relationship between the two constituents. In sentence (30) below, *ge* 'song' is the head noun, while in (31), *ren* 'person' is the head noun. The gap indicated by the underlined space marks the logical position of the head noun.

- (30) Ta chang de ge . hen haoting.
 He/She sing RC song very good-hear
 The songs he/she sings/sang are nice.
- (31) Chang ge de ren shi wo didi.
 sing song RC person is I younger-brother
 The person who sang is my younger brother.

Following Sells' (1985) LFG analysis, the f-structure of the relative clause of (30) and (31) shows that *ge* 'song' is the object of *chang* 'sing' in (30.1), and *ren* 'person' is the subject of *chang* 'sing' in (31.1). The missing value of OBJ is linked to the FOCUS value through a functional control equation (omitted here).

(30.1)	FOCUS SUBJ OBJ PRED	[PRED'GE'] [PRED'TA'] } [] 'CHANG <(SUBJ) (OBJ)>
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(31.1)	FOCUS SUBJ OBJ PRED	[PRED'REN'] } [] [PRED'GE'] 'CHANG<(SUBJ)(OBJ)>]
--------	------------------------------	---

What then is the nature of the morpheme *de* (RC) in the relative clause structure? Zhu (1993) has analyzed it as an auxiliary to turn a predicative constituent into a nominal constituent (cited in Xu 1997:492). Li and Thompson (1981) held the same view but used different terminology. They treated the *de* (RC) as a nominalizer (NOM) (Li & Thompson 1981:xxiii). In any case, *de* (RC) seems to contain the information of nominalization.

de: PAR, NOM = +

Structurally, *de* (RC) is identical to *de* (ATT) and *-de* (GEN). They all occur between the modifier and the modified in a NP. Their functional similarity is apparent: linking the modifier with the modified in a NP. In terms of information processing, however, *de* (RC) requires more processing resources than *de* (ATT) and *-de* (GEN). Specifically, it must recognize

- a) the VP or S' as the modifier;
- b) the presence of a syntactic gap in the VP or S';
- c) the logical connection between the gap and the FOCUS

Put differently, the FOCUS value and the missing value must refer to the same argument (Zhu 1983:25, cited in Xu 1997:493, Lu 1997). These procedures demonstrate that the syntactic and semantic information of the relative clause and the head noun is exchanged via the particle *de* (RC), making it an inter-phrasal morpheme as the information transfer occurs across phrasal boundaries, between a clause and a noun.

4.3. Summary

A total of six lexical morphemes, one phrasal morpheme and one inter-phrasal morpheme are discussed. The lexical morphemes each belong to the lexical entry of a lemma and are activated with the lemma at the call of the conceptual material. The classifier is a phrasal morpheme because its activation is predicated upon the presence of the numeral specifier in the NP. The process of information exchange of the NUM value between the numeral and the noun is crucial for its application. Finally, the relative clause *de* (RC) is an inter-phrasal morpheme. Its insertion is conditioned by the alignment between two constituents across phrasal boundaries.

The description and categorization of the 8 grammatical morphemes serve as the linguistic foundation upon which the course of their development can be investigated in a theoretically motivated and developmentally plausible way. It also makes possible the prediction of the acquisition sequence of these morphemes, as shown in Table 4.3-1.

Table 4.3-1. Processing procedures applied to Chinese

Developmental Stage	Processing Procedure	Morpheme Type	Morpheme
4	S-procedure	Inter-Phrasal	<i>de</i> (RC)
3	phrasal procedure	Phrasal	Classifier (CL) Verb-Complement <i>-de</i> (COMP)
2	category procedure	Lexical	Progressive <i>zhengzai-</i> (PROG) Experiential <i>-guo</i> (EXP) Genitive <i>-de</i> (GEN) Attributive- <i>de</i> (ATT) Adjective- <i>de</i> (ADJ)
1	word / lemma	'words'	none / invariant forms

Chapter 5

Research Methodology and Data Analysis

Research methodology and data analysis are two of the components crucial to the quality of a research study and its outcome. In this chapter, a detailed description of the methodological issues and analytical procedures of the study will be offered. The first part, from 5.1 to 5.3, focuses on the methodology. Information about the research design, the informants, the data collection procedure, and the elicitation tasks is presented. Sections 5.4 to 5.6 describes methods of data treatment and analysis. As the choice of a particular method of data collection and data analysis is directed by the theoretical orientations of the study, rationales are presented to justify the choice.

5.1. The design

In the investigation of the acquisition process of a second language, one faces a number of choices regarding research design and data collection. The final decision is usually made in the context of the research goal as well as the constraints of the research environment. Admittedly the optimal research design in second language acquisition studies would be systematic observation of a large number of naturalistic L2 learners over a period of time, collecting spontaneous L2 speech from them in natural interactional settings. However, logistical difficulties and resource limitations often render this impossible. It is now even doubtful if in a target language environment, pure naturalistic L2 (adult) learners exist or are empirically representative (Johnston 1998).

Given the goals of the present study, i.e., documenting the acquisition process of Chinese grammatical morphemes by native speakers of English in a formal learning setting and assessing the influence of instruction on the acquisition process, the research methods of this study have incorporated three components. First, a longitudinal design was chosen over cross-sectional design. Regular and systematic observation and data collection over a period of time (one academic year) yields more comprehensive and detailed information on the developmental patterns (e.g., Meisel, Clahsen and Pienemann 1981). Secondly, various forms of tasks were used in the data collection sessions. The tasks provided communicative contexts which were conducive to the production of certain linguistic forms (i.e. grammatical morphemes). Thirdly, the elicitation of the linguistic forms went in tandem with the teaching timetable. A form was targeted in the data collection sessions after it had been taught and practised. That is because in order to describe L2 Chinese development, one must be able to target those structures that had

occurred in the input to the extent that one can reasonably ensure that there was a chance for them to be learned (Pienemann, personal communication). Together, the longitudinal observation, the data collection instruments, and the link between the data and instruction ensured a valid study of the development of grammar in a foreign language. The findings were then related to the developmental hierarchy proposed in the Processability Theory and the Teachability Hypothesis (Pienemann 1987, 1999).

5.2. Informants

5.2.1. Selection of informants

Informants were selected from the pool of over 50 students enrolled in the first-year Chinese language program at the Australian National University (ANU). Since neither the lecturer nor the tutor knew any of the students well when the selection was carried out, a short questionnaire was distributed to every student. The questionnaire elicited basic biographical information of the students and their previous language learning experience. Eight students were chosen initially to be the informants. To a large extent, they satisfied the following criteria:

- a) they had zero proficiency in Mandarin Chinese at the start of the program, allowing a few formulaic expressions;
- b) they were all native speakers of English from English-speaking families;
- c) they were not shy and enjoyed speaking Chinese;
- d) they either had positive and successful language learning experience in the past, or were monolingual English speakers. They were active in learning and had no apparent motivational or attitudinal problems.

These criteria were set up on the basis of the following rationale.

- a) As the goal of this study is to document the acquisition process of L2 Chinese grammar, it is important to capture the initial stage(s) where the basic grammatical system is being established. Learners with zero proficiency at the start are homogeneous as far as their knowledge of Chinese is concerned. The acquisition pattern observed from such learners offers good data for description and hypothesis testing because it is "uncontaminated" by previous learning.
- b) The decision to restrict the L1 background of the informants to that of English aimed at controlling the L1 variable, especially since the exact extent of potential L1 interference in the learning of Chinese L2 could not be determined in the present study. Ideally, the informants should be monolingual speakers of English as even one's L2 might affect to some degree the learning of another language (Håkansson 1994). However, it was

difficult to find strict monolingual speakers in the age group enrolled in the first-year Chinese program at ANU. Out of over fifty students, only two were monolingual. They participated in the study initially but did not remain to the end.

c) The third criterion was a practical one. The purpose to have informants who were not shy and who enjoyed speaking was to make sure that a sufficient quantity of language data could be obtained from them. In child language studies, researchers selected babies who were talkative, active, not shy in front of strangers (i.e., researchers), and had clear enunciation (Brown 1974, Erbaugh 1982). With adult L2 learners, factors such as attitude, motivation and anxiety, etc. would make speaking an L2 a formidable task for many beginning learners. In order to obtain sufficient speech data during each interview, it was necessary to select as informants those who were relatively extrovert in personality and who would enjoy speaking Chinese with a native speaker (i.e., the researcher) who was a stranger to them.

d) The immediate goal of the last criterion was to ensure that the findings obtained from the data reflect the true state of the learners' language development to the extent possible and that such factors as negative attitude, low motivation, inactive participation etc. play as little a role in the learning process as possible. Given the lack of a more reliable measurement of these factors, especially at the beginning of the learning process, previous language learning experience might serve as a prognosis of the learners in this regard.

The positive and successful experience of language learning in the past serves a more important function, though. Through that experience, the learner has equipped himself / herself with the capacity for conscious control of the learning task, that is, the learner has in possession "a kind of 'inbuilt teacher'" (Johnston 1997:134). This capacity, according to Johnston (1997), determines to a large extent the effects of formal instruction and the learning outcome. He states that "[t]hose learners most likely to be able to take advantage of [formal education] will probably be those who have already reaped a fair share of the consciousness-raising function of other forms of education" (p.134). In the context of the present study, the potential informants might differ a great deal in their educational background and life experience. A total control of these variables was impractical. Controlling the previous language learning experience in the form of self-assessment would serve the purpose of ensuring the uniformity of the informants in at least one area. Monolingual English-speaking informants were included to offer opportunities for comparison of the learning processes between them and those who had learned a foreign language before.

Admittedly, the reliability of the third and the fourth criteria was questionable, especially when used to predict the future behavior of a learner. Moreover, their operational definition was rather intuitive. It was recognized that attitude and motivation were dynamic features sensitive to the (learning) environment. It was also recognized that other features or problems not included in the survey might develop at various points during the year. The selection criteria, therefore, served at best as a controlling measure for having a relatively homogeneous group of informants.

5.2.2. Informants

Of the eight informants who agreed to participate in the study, three remained to the end. The two monolingual English-speaking informants withdrew from the study. The remaining informants were given the names Kate, Sharon and Dave respectively.

Kate was 19 years old. She was first-year university student working toward a combined major in Law and Asian Studies. The youngest child of an upper middle class family,¹ she had learned German for four years at high school and had travelled widely before enrolling in the university. She had had very positive German learning experience and would like to continue studying German. In class, Kate was quiet and did not volunteer to speak much. However, every time she spoke, she was always grammatically accurate (personal communication with the tutor). The tutor also reported that Kate had a quick and receptive mind.

Sharon was 22 years old. She was the second child from an upper middle class family. She was taking her first-year Chinese while being a third-year student working toward a combined degree in Indonesian language and Commerce. Having lived and worked in Indonesia before, Sharon planned to go back there to study the following year (which she did). Sharon was not very talkative in class and her performance fluctuated in the first semester. She was outgoing and gregarious.

At the age of 24, Dave was a fourth year student majoring in Korean language. He had also learned Japanese and had lived and studied in Japan and Korea for a year each. Dave was fascinated by Asian languages, especially by their interrelatedness in history and in the writing system. Dave was articulate and active in class, but missed class from time to time due to clashes with his Japanese and Korean language classes. Being a successful and experienced second language learner, Dave had developed his own learning style which did not seem to fit in well with the highly organized intensive course that characterized the first-year Chinese program.

¹The label "upper middle class" here refers to professional background, e.g., lawyers and corporate executives.

The three informants came from similar socio-economic backgrounds and had very similar language learning experiences. This was purely coincidental as this information was not elicited in the survey but was offered during the interviews. A second characteristic shared by the three informants was their apparent success and proficiency in a second language learned previously. Dave was said to sound like a native speaker of Korean on the phone. Sharon used to work in Indonesia and was ready to be a full-time student at an Indonesian university. Kate was functional in German and used the language when traveling in Germany. Dave and Sharon were studying Korean and Indonesian respectively at the time of the data collection. Kate did not enroll in the German language program because of the restrictions of her current degree program. All three learners successfully passed the final examination of Chinese although their final grades varied greatly.

5.3. Data collection method

5.3.1 Procedure

At the beginning of week 5, an informal meeting was arranged with the eight students. At the meeting, I described to them the purpose of the study and their roles in it. I also explained to them the non-binding nature of their participation, i.e. they could withdraw from the study anytime. I promised them complete anonymity in any of the future publications and papers. A written statement to the same effect was handed out to the informants as well. All eight informants agreed to participate in the study.²

The interview started at the end of week 5. In each interview session, a Sony TCM-5000EV tape recorder with an external and internal microphone was used. The interview was conducted with the informants one at a time in an office either at the Australian National University or at the University of Canberra. Each session started with a brief exchange in both Chinese and English. Then the informants were asked to carry out various tasks according to instructions. There was normally a conversation at the end of the interview session.

During the interview, I was careful not to interrupt the speech of the informants. At the same time, in order to ensure that sufficient speech data was produced, I did try, to an extent that would not become intrusive, to interact with the informants by providing unknown vocabulary items and backchannelling signals to encourage more speech. No grammatical explanation or language information other than vocabulary was given during

²As time went on, the pressure of competing academic courses, work and family commitments built up. Five subjects withdrew from the project at various point of time, but not from the Chinese language program. All of them passed the final oral, written and listening comprehension examination at the end of the academic year.

the interview. As time went on, I became more familiar with the informants on a personal level and the interaction became more natural.

Most of the interviews took place between me and the informants one at a time. Arrangements were made towards the end of the year to have the informants work together. However, due to the conflicting timetable of the informants, no group or pair work between the informants was possible until the last interview.

5.3.2. Data collection schedule

The first data collection session took place in week 5 of the first semester. Subsequent sessions were held every three weeks thereafter except during the three class-free periods. A total of nine interviews were conducted over the entire academic year (Table 5.3.2-1). Table 5.3.2-2 shows the length of the interviews. The time displayed is the "net length" of the interviews. It does not include time spent on instruction and explanation during the interview, nor does it include the warm-up chat at the beginning and information elicitation at the end. The gross length of each interview was about 10 to 15 minutes longer. This is a rough estimation, but one that is reasonably accurate, given the number of tasks in each interview and the instruction and explanation required for each task. Due to the time restriction before a class-free period, Sharon missed one session (Interview 6). Kate and Dave both completed all nine interviews.

Table 5.3.2-1. Data collection sessions

Semester	Interview Session	Week	Lessons Covered
1	1	5	1-10
	class free period	8-9	
	2	10	11-17
	3	13	18-23
	4	16	24-27
	winter break	16-20	
2	5	23	28-33
	6	26	34-37
	7	29	38-41
	class free period	30-31	
	8	34	42-46
	9	37	47-49

Table 5.3.2-2. Interview Length (net, minutes)

Interview	Kate	Sharon	Dave
1	15	15	20
2	30	45	40
3	30	30	45
4	40	30	50
5	27	35	20
6	30	missing	35
7	35	45	50
8	20	40	32
9	25*	25*	25*
Total	235 (3.9 hrs)	248 (4.1hrs)	300 (5 hrs)

* The last interview had all three informants together working on the tasks. One-third of the 25 minutes was added to the total length of each informant.

5.3.3. Data elicitation methods

The task-based oral interview was chosen as the principal method to collect IL speech data from the informants. The choice was motivated by the conclusions that can be drawn from different kinds of data elicited through different elicitation techniques. It also reflected the aim of the study: investigating the development of L2 Chinese grammar.

There has been much discussion in sociolinguistic research and second language acquisition research about the speech sample one uses to draw conclusions (Johnston 1997). The focal point of discussion centers around the representativeness of the samples produced in different speech conditions. According to Johnston (1997:122), "unmonitored or 'spontaneous' speech should provide the most direct and reliable evidence about the nature of underlying rule systems or grammars" because it "has not passed through too many (conscious or unconscious) filters." Therefore, a conversation-based, unstructured oral interview allowed the production of "unmonitored" speech. Citing Pienemann (1981), Johnston (1997:124) asserts that the quality of the speech, in language acquisition terms, would be no different from that produced in naturalistic situations.

In the present study, the choice of task-based oral interview over unstructured, conversation-based interview was because the latter does not always guarantee the presence of linguistic contexts in which certain grammatical morphemes are to occur. As Pienemann (1999) demonstrated in a study on task variations, the use of a particular

grammatical form and the quantity of its suppliance were determined by the expressive needs of the speaker in a given communicative situation. In his study, both native speakers and non-native speakers of English created more environment for SV-marking (3rd person singular -s) and more SV-markings in a "Habitual Actions" task (describing the daily duty of a number of professionals shown in a set of photographs) than in an informal interview which "was designed to be as close as possible to a friendly chat" (Pienemann 1999:280, 302). He pointed out that such variations were "brought about by the functional constraints of the communicative task which bias the way the available repertoire of grammatical rules is utilized by the learner" (Pienemann 1999:303).

In addition to the lack of a guarantee of necessary and sufficient functional context, an unstructured, conversation-based interview is also highly limited in eliciting linguistic structures which are not so context sensitive and which can be avoided quite easily. Relative clauses are a case in point. The meaning expressed by a relative clause can always be expressed by two (simple) sentences. In such cases, it would not be useful to rely on the learners' initiative, especially the beginning learners, for the production of the relative clause. One may wait for a long time because individual preference for and confidence in certain features could lead to the overwhelming presence or absence of optional structures (Larsen-Freeman and Long 1991).

The last point leads to the L2 communicative ability of the beginning language learners themselves. It is well-known that beginning learners have difficulties sustaining a conversation (Duff 1993, Dupe 1998). An unstructured, conversation-based interview would, in all likelihood, resemble an "interrogation." A task-based interview, however, provides an "anchor" from which the learner could take some initiative to produce speech (Duff 1993). The latter also limits the chance for the learner to avoid the troublesome aspects of the second language through circumlocution or some other strategies.

All this demonstrates the need and necessity to control the speech production environment so that language acquisition evidence or lack of it could be assessed conclusively.

In the present study, the oral interview consisted of a variety of tasks aimed at eliciting a range of grammatical morphemes in the syllabus of the first-year Chinese language program. Unstructured or semi-structured conversation also took place in the interview. Thus both controlled and free data elicitation procedures were used.

5.3.4. Tasks

According to Willis (1996:23), "tasks are activities where the target language is used by the learner for a communicative purpose (goal) in order to achieve an outcome." In the

present study, tasks are defined somewhat broadly to include grammatical exercises and role-plays. The latter belonged to the minority but was used in order to elicit L2 Chinese speech data for the purpose of compiling a developmental profile of the grammatical morphemes being studied. The tasks were all designed to be carried out orally so that "skills required for the tasks are based on similar components of the language production system" (Pienemann 1999:275).

The majority of the tasks were set up to have specific structural outcomes. Where this was not possible, as in the case of a highly optional structure, the relative clause, a structural exercise was used orally (see (a) below). In the following, a description of each task type (including structural exercises), its aim and use, is presented along with an example.

a) Structural exercise

This exercise was de-contextualized. It was only used to elicit the relative clause and the relative clause marker *de* (RC). As the relative clause is highly optional in use, elicitation was difficult and often unreliable (Sato 1985). To avoid the scenario of "no evidence," a "sentence link" task was designed. This was the only de-contextualized task used in the interview.

Task	Structure	Participants
<i>Sentence link</i>	<i>Relative Clause</i>	<i>Informant + Researcher</i>
The researcher read two simple sentences to the informant. The informant was to join the two sentences orally.		
1) Gupo xihuan guniang. <i>Gupo like girl</i> Gupo likes girls.	2) Guniang zai tiaowu. <i>Girl PROG dance</i> The girl is dancing.	

b) Imitation

This task also aimed at eliciting the relative clause as an alternative or supplement to the "sentence link" task. As has been observed in child language, if a given structure is not part of the child's linguistic system, the child is not able to repeat it in imitation (O'Grady, Dobrovolsky and Aronoff 1989). This technique has been used in both child language and SLA researches (e.g., Slobin and Welsh 1973, Polio 1995). The imitation performed by the learner in the present study was done without the informants being fully aware of it. The task was always incorporated into the conversation as the interview

session came to the end. It took advantage of the fact that during the conversation in which the researcher often initiated the question, learners tended to give the answer by repeating the entire sentence rather than supplying the part asked for, a behavior frequently fostered and encouraged in the language classroom. Thus, if the learner was not aware of the purpose of the question and answer, this task could reasonably assess the state of certain structures in the learner's IL grammar.

Task	Structure	Participants
<i>Imitation</i>	<i>Relative Clause</i>	<i>Informant+ Researcher</i>
The researcher asks a number of questions using the relative clause structure. The questions are all related to the informants' daily life. For example,		
Question:	Zhe shi ni mai de chenshan ma? <i>this be you buy RC shirt Q-par.</i> Did you buy this shirt? / Is this the shirt you bought?	
Expected Answer:	Zhe shi wo mai de chenshan. (complete imitation) <i>this be I buy RC shirt</i> I did buy this shirt.	
	(or)	
	Shi wo mai de. <i>be I buy RC.</i> Yes, I did.	(partial imitation)

c) Picture description

Drawings and photos were used to elicit some linguistic forms. These visual stimuli / material provided contexts for the production of targeted forms. In order to complete the task requirement successfully, e.g. describing a picture, the informants must use the linguistic form(s) appropriate for the situation. In some cases, alternative forms were possible. Most of the time, however, the instruction imposed restrictions on the possible linguistic forms.

Task	Structure	Participants
<i>Picture description</i>	<i>Progressive</i>	<i>Informants</i>
A set of drawings depicting people sleeping, writing, teaching, giving flowers, etc. were shown to the informants. The informants were to describe "what is happening in the drawings."		

d) Guided oral composition

The informants were required to produce connected speech in response to a set of drawings or instruction. The difference between the "guided composition" and "picture description" is that the former elicited connected and coherent speech, while the latter asked for individual sentences.

Task	Structure	Participants
<i>Make up a story</i>	<i>Progressive, Perfective</i>	<i>Informant</i>
The informant was required to make up a story in response to a set of 6 drawings.		
<i>My weekly activity</i>	<i>Perfective</i>	<i>Informant</i>
The weekly activities of the previous semester were presented in a chart. Each informant was to tell his/her mother on the phone about them.		

e) Story retelling

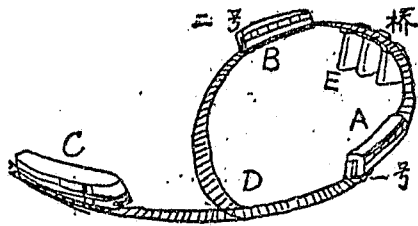
This procedure required the informants to retell a story in their textbook. Usually the story had been taught four or five weeks ago so that the possible effect of rote memorization of forms was minimized.

f) Problem-solving task

This task eliminated the presence and intrusion of the researcher. It also drew the informants' attention to the problem at hand, thus minimizing the attention to the language form. It was used only once in the last interview when all three informants were able to attend the session at the same time.

Task	Structure	Participants
<i>Train maneuver</i>	<i>ba, complement of direction</i>	<i>Informants</i>
This is a puzzle copied from the textbook. The informants worked together to find the solution.		
In the picture, there are two railroad cars and a		

locomotive, which are stopped in positions A, B and C respectively. E is the location of a bridge, which is only wide enough for the locomotive to pass through. The driver is asked to use the locomotive to pull No.1 car into position B and No.2 car into position A. Then he has to move the locomotive back to its original position C. How will the driver manage to do this?



g) Role-play

Role-plays were used from time to time. For each role-play, a situation was set up and the informants had the freedom to choose what to say and how much they wanted to say. The participants needed to negotiate their way through the role-play situations in order to achieve the outcome. The role-plays were carried out between the researcher and each informant most of the time except in the last interview when the informants performed the role-plays among themselves.

Task	Structure	Participants
<i>Make an appointment</i>	<i>Word Order</i>	<i>Informant + Researcher</i>
<p>The informants and the researcher each had a timetable in which several time slots were filled. They needed to make an appointment with each other. Time and place constituents needed to be produced regularly. Their position in a sentence needed to be determined: after the subject (Chinese word order), or sentence-initially.</p>		
<i>(2) Borrow things</i>	<i>Passive, le</i>	<i>Informants</i>
<p>On the role-play cue cards, A will host a party and needs some bowls, chopsticks, chairs, etc. B and C are reluctant to lend A the items because A did not invite them to the party.</p>		

h) Monologue

The informants talked for an extended period of time on a topic given by the interviewer. The topics ranged from describing one's room or house, their classes, the office in which the interview was carried out, to talking about one's family, jobs, holidays, overseas trips. There was no intervention by the researcher during speech production. This method gave the informants the chance to choose and express ideas by using the linguistic forms in their IL repertoire. It also provided the opportunity for avoiding the forms in which the informants were not yet confident. The data reflected only to a certain degree what the informants had at their disposal or was processable at that moment.

i) Conversation

Conversation usually took place at the end of the interview. It was used to facilitate relatively spontaneous speech in a more relaxed manner. In the first few interviews, the conversation often took the form of question and answer. The informants asked questions only when instructed. Later, the conversation became more of a two-way communication event. Both the interviewer and the informants managed to establish and shift topics. The conversations were sometimes as long as the task performance.

To summarize, the tasks used in the present study aimed at tapping into the IL system of the informants. A certain degree of control over the data elicitation was exercised in order to obtain data relevant to the research objective at hand. This means that the tasks were designed in such a way that a high rate of contexts for the targeted structures would be produced by both native speakers of Chinese and, hopefully, learners of Chinese.

Theoretically, it is possible for many tasks to induce the production of certain linguistic structures. In practice, some tasks are more successful than others in doing the job. The tasks used in the present study ranged from controlled (e.g. structural exercise) to semi-controlled (e.g., making up a story, retelling a story) and uncontrolled (e.g., monologue on a topic, conversation). The controlled and semi-controlled tasks supplied communicative contexts for the use of linguistic structures in question. In general, they seemed more effective in eliciting a high rate of targeted structures than uncontrolled tasks, a phenomenon which testifies to the crucial role of specific communicative settings (i.e., tasks) in structural production.

5.4. Data processing

After the completion of the year-long data collection, the interview data underwent substantial treatment. Data treatment refers to the processes by which the speech data elicited during the interview was transcribed, segmented, and tagged so that quantitative analysis could be applied to it. Accuracy and consistency were the central concerns during the entire process.

5.4.1. Transcription

Transcription was carried out shortly after each interview. As subsequent data analysis relied almost exclusively on the transcripts, it was essential that the transcription be performed with a high degree of accuracy. To this end, the data underwent three steps of checking and screening.

In step one, each interview was initially transcribed in Chinese script. Special attention was given to the verbal utterances. Non-lexical utterances such as "ah," "en," pauses,

and intonation patterns of the interrogatives were also recorded in the transcripts. Unclear or mispronounced materials were assessed in context and noted in the Pinyin script (the Chinese phonetic notation) with a question mark in brackets (e.g., *chuang3(?)* 'window' or 'bed'), or with the correct form in brackets (e.g. *chifen(fan4)*).³ Utterance-initial fillers such as "ah", "en" were not always recorded as they were a constant speech feature of the informants. The length of the pause was marked by the plus sign "+": each sign equals approximately between 0.5 to 1 second. Very short pauses were marked by the asterisk "*".⁴

For step two, the Chinese script was converted to Pinyin script.⁵ The conversion served two purposes: 1) to prepare for the computer database; 2) to act as accuracy check. Transcription inaccuracies were corrected during the conversion.

During step three, the transcripts were checked against the recordings. Special attention was paid to those utterances and utterance boundaries which had been identified as ambiguous or unclear. In the case of utterance boundaries, intonation and pauses were used as clues. Although not every single case was resolved with a hundred percent certainty, mis-transcription and inconsistency represented a very small proportion of the data. In the instances where no satisfactory solution was found, a special coding was used to indicate this, and such utterances were not included in the analysis.

The purpose of this extensive checking was to ensure a high degree of transcription accuracy for subsequent data analysis. As the phonology of the beginning learners was often less than clear and accurate, it was unavoidable that subjective decisions had to be made sometimes about the exact identity of the mispronounced materials. These were few in number and, most of the time, the contexts in which these sounds (or words) were produced helped to resolve the ambiguity.

5.4.2. Segmentation

Once the speech data was converted to the written form, it needed to be segmented into discrete units capable of being used as the basic units for analysis. Several possibilities presented themselves: the sentence, the utterance, the T-unit, and the c-unit.

³The numeral indicates the tone.

⁴ These are estimations only. Given the focus of the study, it is not crucial to record the exact pause length.

⁵That the transcription was not done in Pinyin from the start was due to the need for a relatively accurate transcript of the interviews as the basis to work on. Chinese characters facilitated the initial transcription and verification better than Pinyin scripts. The researcher could write Chinese scripts faster during the transcription, and it was also easier for her to read and verify the accuracy of the transcripts in Chinese characters than in Pinyin.

A "sentence" is the basic unit of grammatical analysis, but not necessarily the basic unit of speech production (Sacks, Schegloff and Jefferson 1974, Liddicoat 2001). An utterance, on the other hand, is defined traditionally by intonation as "a stream of speech under a single intonation contour bounded by pauses" (Sato 1985:83). In actual analysis, it is often difficult to determine pauses and intonation contours reliably without technical assistance (Scollon 1974, Brown, Currie and Kenworthy 1980, cited in Crookes 1990). Second language acquisition researchers frequently employ the T-unit (Larsen-Freeman 1978, 1983, Harrington 1986, Pienemann 1999), defined as "one main clause plus whatever subordinate clauses happen to be attached or embedded within it" (Hunt 1966:735, quoted in Crookes 1990:184). The T-unit is based on the grammatical unit of "clause" and suffers the same shortcomings of being unable to accommodate interactional data in which a clause is not always present. For example,

- (1) Q: Have you done your homework?
--> A: Not really.

The analytical unit which is capable of representing data such as (1) is the "communication unit" or c-unit (Loban 1966, cited in Crookes 1990). According to Crookes (1990:184), the c-unit is "closely related to the T-unit, but has the advantage that isolated phrases not accompanied by a verb, but which have a communicative value, can be coded." In operational terms, a c-unit is not unlike that of a "turn construction unit" (TCU) in conversation analysis, defined as "potentially complete as a relevant conversational action in its context" (Liddicoat 2001: 8, also Sacks, Schegloff and Jefferson 1974). Both the c-unit and the TCU are fully designed to cope with speech data obtained in oral interviews such as the ones used in the present study. Therefore, the c-unit was chosen as the basis for segmenting the interlanguage speech. For easy reference, each segmented bit will be called an "utterance" hereafter.⁶

To ensure the consistency of segmentation, a few ground rules were established and they are presented in the following. What could and could not be considered as an utterance was first of all determined according to the operational definition above. The analytical value of a given utterance in relation to the purpose of the study had also played a role in the formulation of the rules. Each segmented utterance was numerically indexed for easy identification and retrieval.

⁶The "utterance" used here is therefore not the same as the "utterance" defined by way of intonation, pausal and semantic criteria.

a) Fluency-related speech phenomena were not separately segmented because they were not utterances according to the definition. These include stuttering as in (2), or repetition as in (3) (underlined).

- (2) Gupo-de tou toufa toufa bai. (Sharon, T2.2, #1)
 Gupo-POSS head headhair headhair white

Gupo's hair is white.

- (3) Ta woshi + ta woshi +he + xizaijian zhongjian you +wo-de
he bedroom+he bedroom+and+ bathroom middle has+ I-POSS

nupengyou -de woshi. (Dave, T3.4, #13)
 female friend-POSS bedroom

Between his bedroom and the bathroom is my girl-friend's bedroom.

b) False starts and sentences which were abandoned mid-way were not treated as utterances as they did not fit the definition. False starts were often followed immediately by corrections marked with "oh sorry" and the like. They were usually short in length, and usually contained no more than two or three words, as example (4) shows.

- (4) Dianshi youbian +(oh sorry) dianshi dui+duimian dianshi duimian you
TV behind +(oh sorry) TV opp+opposite TV opposite has

yi zhang hua. (Dave, T3.2, #8)
 one CL picture

Behind the TV (oh sorry) opposite the TV is a picture.

With regard to incomplete utterances, there were two main types:

First, the informant had changed his / her mind mid-way about what to say so that the semantic content of the following utterance changed, as in (5);

Second, the informant had detected an "error" in the utterance and decided to correct it by re-organizing the utterance, as in (6).

- (5) Dave: Dingyun-de +Dingyun-de I don't know hair.
Dingyun-POSS+Dingyun-POSS I don't know hair

Dingyun's + Dingyun's I don't know hair. (Dave, T2.2, #8)

R: Did I give you the vocabulary "toufa"?
(Researcher)

Dave: (oh I'm sorry) Gupo-de toufa shi (en en) +bai -de.
Gupo-POSS headhair be(en en)+white-NOM

(oh I'm sorry) Gupo's hair is white. (Dave, T2.2, #9)

(6) Zhengzai tiaowu de guniang Gupo (sorry) Gupo xihuan guniang.
PROG- dance RC girl Gupo (sorry) Gupo like girl.

Guniang zhengzai tiaowu. (Sharon, T3.5, #8, #9, #10)
Girl PROG- dance

The girl who is dancing, Gupo (sorry) Gupo likes the girl. The girl is dancing.

The difference between a false start and an "incomplete" utterance was an arbitrary and subjective one at times. However, neither was coded as an "utterance" and subsequently, neither was included in the analysis. Therefore, the categorizations did not pose a problem for consistency in the present study.

c) Subordinate, coordinate, and embedded clauses were segmented as part of the matrix clause. In example (7), the main and the subordinate (underlined) clauses were coded as #8 and #8.1 respectively. This marks their semantic and syntactic connection, and also makes it possible to analyze them as separate clauses.

(7) Xiake yihou wo hui sushe chi wufan. (Kate, T7.4, #8, #8.1)
off-class after I return dorm eat lunch

After (finishing) class, I go back to the dorm to have lunch.

d) Single words and phrases are utterances if they are c-units, as (8) shows. Non-lexical production such as 'en,' 'ahm,' 'oh,' etc. could also be c-units in context. However, they were not treated as such in the present study because they did not have relevant linguistic value or content and therefore did not contribute to the purpose of the study: the development of L2 Chinese grammar.

(8) R: ... ni zenmo hui Kanpeila? ...
you how return Canberra

How did you return to Canberra?

K: gonggong qiche.
public bus

(Kate, T6.6, #65)

By bus.

e) Utterances in English which did not contribute to the task at hand were ignored. These referred to occasional discussion and explanation of various issues (bar grammar), clarifications, etc. English expressions such as 'sorry' 'excuse me,' etc. were not counted as utterances. Code-switching did not belong to this category.

5.4.3. Sample size

The segmented data formed the point of departure for grammatical tagging. This will be described in 5.4.4. In the following, the basic statistics of the data corpus will be presented.

There are various ways to assess the size of the data corpus. For example, time length of an interview indicates to some extent the sample size (see Table 5.3.2-2). However, time is not a precise measurement as it is not sensitive to speech rate and pauses. Faster talkers produce more speech per minute than slow talkers do. Likewise, fluent speakers produce more than non-fluent speakers do. The second disadvantage is that a time measurement does not and cannot differentiate between data which is productive or analyzable and data which is not (e.g., copies, formulaics, English expressions). It obscures the distinction between the data useful for a particular investigative purpose and other irrelevant pieces of information.

Conversational turn is another possibility for measuring the size of the data corpus. However, as turn length is not fixed but negotiated during the interaction (Sacks, Schegloff and Jefferson 1974), it is normal that some speakers have longer turns than others. Equal number of turns taken by two speakers does not mean an equal amount of speech production whether measured by words, phrases, sentences or utterances.

A more precise and sensitive measurement of the size of the data set is counting the number of utterances after the segmentation. The total number of utterances represents the overall size of the data corpus, containing both analyzable and non-analyzable. To separate the two so that the true size of the data corpus can be obtained, one only needs to define what is or what is not "analyzable." In the present study, the following categories of data were considered "non-analyzable."

a) Speech in English: e.g., clarification requests, confirmations, discussions, etc. However, Chinese utterances containing English words or phrases are considered "analyzable" data, as the following examples show:

- (9) Broken Hill shi youming -de mining. (Dave, T8.1, #27)
Broken Hill be have-name-ATT mining

Broken Hill is a well-known mining town.

- (10) Wo yingai respect. (Dave, T7.0, #110)
I should respect

I should respect.

The examples demonstrate the code-switching phenomenon, which is fairly common in bilingual speakers. Code-switching in the present study mostly involves lexical items in the syntactic context of Chinese. This does not affect the investigation of developing grammar in the Chinese interlanguage.

b) Copies: this refers to the informants' repeating the entire utterance of the researcher or his / her own previous utterance. Direct, word-for-word translation of the previous utterance also belongs to this category.

c) Incomplete utterances due to change of topic or self-correction (see examples 4, 5 and 6 above).

d) Utterances which are either acoustically unclear or semantically ambiguous.

f) Non-verbal utterances and fillers.

Although many of the items listed above have discourse functions, they are not relevant to the present study on the interlanguage development of grammatical morphemes. They either do not provide information on the interlanguage form (a, f), or are non-productive (b) and require unqualified guesses during the analysis (d). Data belonging to these categories is not "analyzable" for the acquisition study of grammatical morphemes. An "analyzable utterance" is operationally defined, therefore, as an utterance in Chinese, semantically complete in the local context (which does not equal to "well-formed") and non-repeating.

Table 5.4.3-1. shows the basic statistics of the data corpus. The first column lists the interview sessions. Corresponding to each interview are two pieces of information: the total number of utterances (U) and the total number of analyzable utterances (AU).

Table 5.4.3-1. Number of utterances per informant per interview

Sessions	Kate		Sharon		Dave	
	U	AU	U	AU	U	AU
1	80	72	137	78	118	75
2	179	139	211	142	200	118
3	120	101	165	112	180	157
4	221	201	193	143	242	199
5	166	143	266	192	179	137
6	165	116	No data	No data	180	129
7	169	143	265	170	309	233
8	110	98	308	209	178	147
9	52	47	70	48	78	60
Total	1,262	1,060	1,615	1,094	1,664	1,255

U = utterance; UA = usable utterance

A total of 3,409 analyzable utterances were produced by the informants during the year-long observation. These utterances formed the basis for analysis.

5.4.4. Grammatical tagging

Following segmentation and identification of analyzable utterances, grammatical tagging was carried out on the analyzable utterances. Tagging was initially done manually on the hardcopy of the Pinyin transcript. Though time consuming, manual tagging served the useful purpose of experimenting with various linguistic categories. Specifically, the tagging focused on the syntactic structure of the utterances including word order and morphology. Almost all the grammatical structures and morphemes taught in the first year Chinese program were tagged. Excluded from this process were those which were taught late in the academic year so that there was insufficient data, and those which did not have a clear and comprehensive structural description (see 4.1 for discussion). In general, the tagging followed the traditional grammatical parsing which dissects a defined string of words (i.e., an utterance) into pre-defined grammatical categories (e.g., SVO, negator, progressive marker, NP, etc.).

5.5. Creating the database

The computer program EXCEL was chosen to organize the tagged data. The spreadsheet is flexible enough to allow as many discrete categories to be created as suits the analytical needs. It also permits addition, modification and deletion of categories. The tagged details can be checked against the original data directly as they remain in the same configuration of the spreadsheet. Finally, the "sorting" function groups together all the specified items so that frequency count and distributional analysis can be performed.

The database contains the entire data corpus, each interview taking up a file. The interviewer's speech was not segmented, and her entire turn occupied one row. For the speech produced by the informants, each utterance occupied one row. The columns specified the information of the following 10 broad categories. The entire list of the database categories is contained in Appendix A.

- a) General information about the data. This refers to the task title, interview and task number, informants' identity, utterance verbatim and utterance number.
- b) Utterance type and overall syntactic feature. This specifies whether or not an utterance is productive, copied, unclear, or in English, and whether the utterance is a sentence or phrase, a word, or has subject/object ellipsis.
- c) Functional context. This refers mainly to the temporal context of the utterance, e.g., general, current/present, progressive, past. Although tasks often determined the functional context, each utterance was examined in its own immediate local environment.
- d) Structure type. This refers to whether the utterance is a statement, a question, or a negative sentence, and whether it is a single clause or complex clause containing subordinate, embedded, and coordinate clauses.
- e) Syntactic structure. The word order of a sentence (e.g., SVO) and its constituents (e.g., pron vt n) were tagged.
- f) Verb. The verb(s) of each utterance and their subcategories (transitive, intransitive, ditransitive, stative, copula) were tagged.
- g) Grammatical morphemes: all the grammatical morphemes taught in the first-year Chinese program were included in the database. Their presence and absence in the IL utterances were tagged. Distinctions were made between obligatory and optional contexts, and between "taught" and "not -yet -taught" conditions.
- h) Noun phrase: this category encodes the internal structure of the noun phrase such as genitive, adjective, attributive, predicative, relative clause.
- i) Subordinators and coordinators.
- j) Other: prepositions (or co-verbs), interrogative markers, negators, etc.

The process of data-entry in the spreadsheet served as a checking procedure for tagging consistency. Each completed workbook was then checked once more before "sorting" began.

5.6. Data analysis

Data analysis was carried out through quantitative and interpretive procedures. The quantitative procedures dealt with the frequency of morpheme insertion in context. Distributional analysis was performed. The interpretative procedures applied the emergence criterion on the results to draw conclusions about the state of the IL system.

5.6.1. Quantitative analysis

According to Pienemann (1999:146), the investigation of the developmental process of IL grammar relies on two types of evidence:

- a) "evidence for rule application, i.e. examples of rule application in the presence of contexts;"
- b) "evidence for non-application, i.e., non-application in the presence of contexts or rule x."

"Context" refers to both functional and linguistic environment which licenses a particular linguistic form.

Functional context can be defined at the macro-level as the topic of the conversation at a particular moment. For example, "past" would be one of the contextual features if "last night's activity" is being talked about. Functional context can also refer to some local-level phenomenon such as the second part of an adjacency pair, as the reply to the question "What did you do last night?" would be made in the same "past" context. Both the macro- and micro-level of context affect the rule application of the past tense form -*ed*.

Linguistic context, on the other hand, is defined as the grammatical structure of a sentence. Take English for example. If the subject of a sentence is the 3rd person singular noun or pronominal and the tense is present, then the morpheme -*s* must be suffixed to the verb (e.g., He/John works). In other words, the 3rd person singular -*s* is the rule, which applies in the context of 3rd person singular subject and present tense. The contextual requirement for -*s* to appear is linguistic.

The presence of the rule application context and its quantity in the data set proved to be crucial for any meaningful conclusions on the interlanguage acquisition of grammatical morphemes (Pienemann 1999). The first step of analysis, therefore, was to determine if the context for a particular rule was present. Next, the number of rule application instances was counted and the ratio between the context and rule application was calculated. Distinction was made between zero contexts, less than four contexts, and more than four contexts for every grammatical form, as each one of these distinctions entailed interpretive implications. The outcome of this process was a series of percentage figures for each structural description. Each percentage figure contained four pieces of information: the relative frequency of rule application and non-application, the absence of context, and the minimum number of context (either four or below four).

The issue of minimum number of context needs some explanation. To test the hypothesis that a given rule has emerged, it is necessary to have a large sample of linguistic contexts so that the possibility of monomorphemic chunks or rote memorization of certain forms can be ruled out. Evidence of rule application in one context is inconclusive precisely because such a possibility cannot be settled conclusively. In the case of two contexts, it is still difficult to test the hypothesis if there is only one instance of rule application. Previous studies in language acquisition opted for various options: some used a minimum of two contexts (e.g., Kawaguchi 1998), and three contexts (Kawaguchi 1996, Kopcke 1987, Clahsen 1988b, Huter 1998). Pienemann (1999) used four contexts whereas Clahsen (1984) used five contexts. The present study used four contexts as the minimum size for analysis.

The frequency analysis was carried out in tandem with distributional analysis. Distributional analysis is a procedure which "atomize(s) linguistic contexts as much as possible ... to determine which contexts or even which lexical items are related to which particular interlanguage rules" (Pienemann 1999:39). The logic behind the distributional analysis is that obligatory contexts of the target language are not necessarily relevant to the interlanguage. The interlanguage, especially at the initial stages, may be sensitive to a set of categories and features quite idiosyncratic and only partially target language oriented (for an example, see Pienemann 1999:138-139). In addition, a particular rule could enter the interlanguage system at various linguistic points: lexical or syntactic. Quantitative observations, which amalgamate data in one frequency figure, cannot describe the dynamics of the interlanguage development, nor could they discover the precise point of rule generation in the developmental process of an interlanguage. In order to do so, it is more informative to examine all the linguistic contexts (including lexical items) which are related to particular interlanguage rules at various points of the learning process.

5.6.2. Emergence criteria

Acquisition criteria have been diverse and controversial in language acquisition research (see Larsen-Freeman and Long 1991 for an overview). Furthermore, the criteria have always been arbitrary decisions of individual researchers, albeit decisions made in a specific research context. The majority of the studies in language acquisition have adopted accuracy measurements as acquisition criteria. For example, Brown (1973), in his seminal study on child language, defined the acquisition criterion as the suppliance of a form correctly above 90% in three consecutive samples. Second language acquisition studies, in various modified forms, basically identify the acquisition point as a certain percentage of suppliance of a form in obligatory contexts (e.g., Hakuta 1974, Dulay, Burt and Krashen 1982, Pica 1984). Most of the CSL studies also used accuracy criteria although the exact point of acquisition was not always specified (see Chapter 2).

An accuracy criterion is based on the observation of correct interlanguage forms against the target language norm. It is a quantitative criterion, arbitrary and target language oriented (Larsen-Freeman and Long 1991, Pienemann 1999). Pienemann (1999) pointed out a number of problems associated with the accuracy measurement. One of them is its validity as an acquisition criterion. He pointed out that as "accuracy rates develop with highly variable gradients in relation to grammatical items and individual learner ... [t]here is no guarantee that the accuracy of morpheme insertion will increase steadily in relation to any two morphemes or in relation to any two learners" (p.137). Another problem with the accuracy criterion is the relevance of using the target language as the standard to measure interlanguage development. The accuracy criterion is normative, i.e., learners' speech is measured against native speakers' speech instead of being examined in its own right. As mentioned in section 5.3.2, obligatory contexts of the target language do not necessarily correspond to the interlanguage context in which the rule initially occurs. The exact path through which a form first appears and its subsequent development cannot be observed by using the target language norm. An accuracy criterion based on quantitative observation and target language norm does not offer the chance for a fine-grained description of the developmental process of an IL grammar system.

Instead of an accuracy criterion, an "emergence criterion" was used in the present study to account for the acquisition phenomenon. The emergence criterion was first proposed by Meisel, Clahsen and Pienemann (1981) as part of their Multi-dimensional Model of second language acquisition. Adopting a learner-oriented perspective, the emergence criterion redefines the "acquisition (of a form) as the first appearance of a form in an IL" (Larsen-Freeman and Long 1991:283). Describing the rationale behind the emergence criteria, Pienemann stated (1999:138):

From a speech processing point of view, emergence can be understood as the point in time at which certain skills have, in principle, been attained or at which certain operations can, in principle, be carried out. From a descriptive viewpoint one can say that this is the beginning of an acquisition process, and focusing on the start of this process will allow the researcher to reveal more about the rest of the process.

The underlying foundation of the emergence criterion in the speech processing operation allows the point of emergence to remain constant. This is also an advantage over the accuracy measure, which rarely remains constant in the IL speech produced by adult learners.

The successful application of the emergence criterion is dependent upon two conditions: large sample size and linguistic variation. A small data set does not permit a successful distributional analysis, the first step in identifying the emergence point. It does not guarantee the presence of minimum quantity of contexts for rule application, a condition necessary for ruling out possible chunk-like productions.

The second condition for a successful application of the emergence criterion is that the data must be linguistically varied. Given that Chinese grammatical morphemes do not vary formally, lexical variation (the linguistic environment for the grammatical morpheme) is crucial. For example, if the adjective suffix *-de* (ADJ) occurs only with *hao* 'good' (11), the chances are that *hao-de* 'good' is an unanalyzed unit and the morpheme *-de* (ADJ) is non-productive.

- (11) *hen hao -de ren*
 very good-ADJ person
 a nice person

Only when linguistic forms occur with varying lexical items can the emergence criterion be applied.

In terms of the exact numerical value necessary for drawing a conclusion, there is no fixed rule. Pienemann (1999) stated that there was no requirement for 100% rule suppliance, "[i]n fact, a distribution of 60 to 0 would have been just as much grounds for rejecting the null-hypothesis" (Pienemann 1999:145). In his own study of the development of German word order rules and morphology by an adult learner, Pienemann (1999) used a range of distribution (10% -- 100%) to identify the emergence point. The crucial thing is that all the conditions for the emergence criterion are met.

In the present study, data was analyzed at two levels: first, distributional analysis and a frequency count was carried out. Linguistic and functional contexts of each morpheme were factorized. Next, the emergence criterion was applied to the quantitative results of the analyses in order to identify the point of entry of a particular form into the grammar of the interlanguage. A form was viewed as having emerged if there were at least two tokens in a minimum of four obligatory contexts. In addition, the contexts in which the form occurred must vary lexically. For example, if the progressive marker *zhengzai* -(PROG) occurred exclusively with the verb *tiaowu* 'dance,' it was not considered as having emerged regardless of the number of tokens. On the other hand, if *zhengzai* -(PROG) occurred with two different verbs, it was counted as having emerged provided that there were no less than four progressive contexts. This operation ensured that the grammatical form being investigated was productive and that the chance of mistaking possible morphomorphemic "chunks" for productive occurrences was minimal.

5.7. Summary

In this chapter, a detailed description of the methodological aspects of the study was presented. Research design, informant selection, data elicitation, data treatment and methods of data analysis were discussed extensively. The overall purpose for choosing the task-based oral interview as the data collection procedure was to maximize the production of sufficient data quantity and the control of data quality. The technical processing of the data aimed at ensuring analytical consistency and accuracy. Distributional analysis and the emergence criterion were adopted as the methods of data analysis and interpretative procedure. The work carried out laid the foundation for the description and explanation of the developmental course of the eight Chinese grammatical morphemes.

Acquisition Process: A Diachronic Description

This chapter presents a diachronic description of the development of 8 Chinese grammatical morphemes in the IL system of the three informants. It responds to the goal expressed in the initial research statement: documenting the acquisition process of grammatical morphemes by learners of Chinese. The analysis will focus on the point of emergence, the linguistic environments of the emergence of the forms, and the subsequent evolution of the forms. The findings will serve as the base for the discussion in the next chapter of processing constraints in language learning and the effects of instruction.

The discussion starts with morphemes in the NP: *-de* (GEN), *-de* (ATT), *-de* (ADJ), *de* (RC), classifier (CL). It is followed by the morpheme in a VP: *-de* (COMP). The acquisition of aspectual markers is presented last.

6.1. *-de* (GEN)

The linguistic environment of the genitive suffix *-de* (GEN) can be categorized into four sub-groups:

- a) pronominal (*ni-de shu*, you-GEN book, 'your book')
- b) single noun (including proper noun) (*laoshi-de shu*, teacher-GEN book, 'teacher's book')
- c) NP (*laoshi-de nuer-de shu*, teacher-GEN daughter-GEN book, 'teacher's daughter's book')
- d) *-de* (GEN) deletion in "pronominal + noun (kinship terms) (*wo-__ mama*, I-__ mother, 'my mother')."

To determine the emergence point of the genitive marker, the pronominal environment (a) is not a reliable indicator without the presence of the (optional) deletion rule (d). That is because it is possible to learn "pronoun-*de* (GEN)" as a possessive pronoun (e.g., *wo-de* 'my,' *ni-de* 'your,' *ta-de* (GEN) 'his / her'). In that case, *-de* (GEN) remains an integral part of the pronoun and the unit "pronoun-*de* (GEN)" is, more likely than not, unanalyzed. The use of the deletion rule (d) means the morpheme becomes structurally separable from the pronoun.

On the other hand, the noun and the NP environment (b) (c) may provide evidence to suggest *-de* (GEN) emergence if they vary lexically. As the learning of nominal items (other than the pronoun) is not normally accompanied by a grammatical morpheme, the suffixation of *-de* (GEN) to them can be shown to demonstrate the analyzed nature of the *N-de* (GEN) constituent.

Therefore, the evidence for the acquisition of *-de* (GEN) would be either the complementary application of the deletion and the insertion rules in the pronominal environment (henceforth, pronominal rules), and / or the use of *-de* (GEN) with lexically varied nouns or NPs.

The distributional analysis lays out all the linguistic environments of *-de* (GEN) in the samples of the three informants. The analysis is shown in Tables 6.1-1 to 6.1-3. The first column on the left lists the structural environments. The two values in each cell represent the number of tokens (before the slash) and the relative frequency of the tokens (after the slash). The brackets indicate the presence of less than four contexts in the given sample. Where no evidence is available for a particular structure, the cell is left empty.

Table 6.1-1. Distribution of *-de* (GEN): Kate

Context/Int.-->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
pron- <i>de</i> (+kin)	4 / 1.	5 / .28	0 / 0.	0 / 0.	1 / .10	0 / (0.)			8 / 1.
pron- <i>0</i> (+kin)	0 / 0.	13 / .72	6 / 1.	5 / 1.	9 / .90	3 / (1.)			0 / 0.
pron- <i>de</i> (-kin)		5 / .83	7 / 1.	1 / (.50)	0 / (0.)	0 / (0.)	6 / 66.7	3 / (1.)	
pron- <i>0</i> (-kin)		1 / .17	0 / 0.	1 / (.50)	1 / (1.)	1 / (1.)	3 / 33.3	0 / (0.)	
personal name- <i>de</i>		8 / 1.	7 / 1.	0 / (0.)		6 / 1.			
personal name- <i>0</i>		0 / 0.	0 / 0.	1 / (1.)		0 / 0.			
<i>n-de</i>			1 / (1.)				0 / (0.)		
<i>n-0</i>			0 / (0.)				1 / (1.)		
NP- <i>de</i>		5 / 1.	2 / (.67)			1 / (1.)			
NP- <i>0</i>		0 / 0.	1 / (.33)			0 / (0.)			
country / city / institution- <i>de</i>	0 / 0.	0 / 0.		0 / 0.	0 / 0.	10 / 1. ?food season radio	0 / (0.)	0 / (0.)	
country / city / institution- <i>0</i>	12 / 1. nationa- lity	7 / 1. nationa- lity, lg		9 / 1. news food film emb'ssy dorm	5 / 1. food news restau't nationa- lity	0 / (0.)	1 / (1.) airport	1 / (1.) nationa- lity	

? Possible instances of rule over-application

Table 6.1-2. Distribution of *-de* (GEN): Sharon

Context/Int.->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
pron- <i>de</i> (+kin)	21 / 1.	10 / .53	8 / .62	1 / (.50)	4 / .33	nd	4 / .40	1 / .17	1 / (.33)
pron- <i>0</i> (+kin)	0 / 0.	9 / .47	5 / .38	1 / (.50)	8 / .67		6 / .60	5 / .83	2 / (.67)
pron- <i>de</i> (-kin)	2 / (1.)	3 / .33	13 / 1.	3 / (1.)	1 / (1.)	nd	7 / .88	16 / 1.	14 / 1.
pron- <i>0</i> (-kin)	0 / 0.	6 / .67	0 / 0.	0 / (0.)	0 / (0.)		1 / .12	0 / 0.	0 / 0.
personal name- <i>de</i>		20 / 1.	9 / 1.	3 / (1.)	1 / (1.)	nd	2 / (1.)		
personal name- <i>0</i>		0 / 0.	0 / 0.	0 / (0.)	0 / (0.)		0 / (0.)		
n- <i>de</i>			1 / (1.)	1 / (1.)		nd		0 / (0.)	1 / (1.)
n- <i>0</i>			0 / (0.)	0 / (0.)				1 / (1.)	0 / (0.)
NP- <i>de</i>	2 / (1.)*				0 / (0.)	nd			
NP- <i>0</i>	0 / 0.				1 / (1.)				
country / city / institution- <i>de</i>	0 / 0.	0 / 0.	0 / (0.)	0 / 0.	0 / 0.	nd	7 / 1. weather autumn tree	9 / 1. univ. person culture dictary, hi-sch friend	1 / (1.) person
country / city / institution- <i>0</i>	13 / 1. nationa- lity	4 / 1. nationa- lity	1 / (1.) univ.- dorm	6 / 1. book, CD, tel, car, Ss, song	8 / 1. nationa- lity news food		0 / 0.	6 / 1. lg, nationa- lity dictary	0 / (0.)

nd = no data. Sharon missed Interview 6.

*No lexical variation.

Table 6.1-3. Distribution of *-de* (GEN): Dave

Context/Int.->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
pron- <i>de</i> (+kin)	17 / .85		8 / .57	6 / .60	3 / .60	6 / (1.)	2 / (.67)	1 / (1.)	8 / 1.
pron- <i>de</i> (-kin)	2 / (1.)	6 / 1.	13 / .93	2 / (1.)	3 / .75		3 / (1.)	6 / 1.	10 / 1.
pron- <i>0</i> (+kin)	3 / .15		6 / .43	4 / .40	2 / .40	0 / 0.	1 / (.33)	0 / (0.)	0 / 0.
pron- <i>0</i> (-kin)		0 / 0.	1 / .07	0 / (0.)	1 / .25		0 / (0.)	0 / 0.	0 / 0.
personal name- <i>de</i>	1 / (1.)	26 / 1.	19 / 1.	16 / 1.	5 / 1.				
personal name- <i>0</i>	0 / 0.	0 / 0.	0 / 0	0 / 0.	0 / 0.				
<i>n-de</i>	2 / (1.)	1 / (1.)	1 / (.50)	1 / (1.)					
<i>n-0</i>	0 / (0.)	0 / (0.)	1 / (.50)	0 / (0.)					
NP- <i>de</i>	6 / (1.)		6 / 1.						
NP- <i>0</i>	0 / 0.		0 / 0.						
country / city / institution- <i>de</i>	0 / 0.	0 / (0.)	0 / (0.)	0 / 0.	4 / .36 man'ger refect'y ?food	13 / 1. season coast person popula- tion radio	5 / .56 history hi sch plane	1 / (1.) history	
country / city / institution- <i>0</i>	11 / 1. nationa- lity, lg	2 / (1.) nationa- lity	1 / (1.) nationa- lity	9 / 1. nationa- lity film news embas'y hi-sch- friend	7 / .67 news tea refectory nationa- lity	0 / 0.	4 / .44 lg, bus money dorm	0 / (0.)	

? Possible instances of rule over-application

The distributional analysis of Kate's and Sharon's samples (Tables 6.1-1 and 6.1-2) shows that complementary distribution of the pronominal rules did not occur in the first interview session, week 1. The genitive marker was suffixed to all the pronouns to mark them as the possessor (1) (2). Although Sharon did use *-de* (GEN) twice in contexts other than the pronominal, the two instances were identical in form (see (3) and (4)) and cannot be taken as evidence of productive use.

- (1) Ta shi ta -de mama. (Kate, T1.3, #12)
she be she-GEN mother.
 She is her mother.
- (2) Zhe shi ni -de baba. (Sharon, T1.4, #3)
this be you-GEN father.
 This is your father.

- (3) Ta shi ni -de pengyou-de mama. (Sharon, T1.4, #9)
she be you-GEN friend -GEN mother

She is your friend's mother.

- (4) ?Ni (en) ni shi + ni-de pengyou-de baba. (Sharon, T1.4, #1)
you (en) you be + you-GEN friend-GEN father

?You are your friend's father.

In Interview 2 (week 10), complementary application of the pronominal rule occurred in the samples of both Kate and Sharon. However, *-de* (GEN) deletion was applied only in the context of first person singular pronoun *wo* 'I.' Other pronouns were not affected until the following interview (week 13). While "illegal" application of the deletion rule was not frequent, it did happen. The most notable ones are found in Sharon's sample. The genitive morpheme was deleted in 6 of the 9 NPs of non-kinship relationship (5). On closer examination, however, it turned out that the 6 NPs all contained unfamiliar vocabulary as the head noun. The "illegal" application of the rule, therefore, seems to be a systematic response to the lexical environment of the NP in this particular case. Both limited and "illegal" applications of the pronominal rule signal the productive use of the genitive marker. It is no longer an integral part of the pronouns.

- (5) ?Ni * ni mingzi jiao*Frank /
*you*you name call Frank /*
 You(r) name is Frank? (Sharon, T2.1.1, #2)

Also in Interview 2 (week 10), Kate and Sharon began to mark possessive semantics in the proper noun and NP context (6) (7). Along with the use of the pronominal rule, this indicates the analyzed nature of *-de* (GEN) in Kate's and Sharon's L2 Chinese grammar. On the basis of the evidence presented so far, one can say that the genitive marker *-de* (GEN) emerged in the interlanguage of Kate and Sharon in week 10.

- (6) Na ye shi Palanka-de xie.
that also be Palanka-GEN shoe.
 They are also Palanka's shoes. (Sharon, T2.3, #6)

- (7) Wo mama -de che shi lan-de
I mother-GEN car be blue-NOM
 My mother's car is blue. (Kate, T2.6, #11)

At this point, one may want to ask whether the lack of pronominal rule application in the first observation session with Kate and Sharon might not be induced by the limitations of the tasks (a photo session). An examination of the sample of the third informant from Interview 1 (Table 6.1-3) returns a negative answer. In fact, the informant, Dave, used *-de* (GEN) productively from the start, in Interview 1 (week 5). This is evidenced by the suppliance of *-de* (GEN) not only in the pronominal context but also with proper nouns (8) and NPs (9). It is also evidenced by the complementary application of the pronominal rules, and rule application in a minimal pair, as shown in (9) and (10). All this warrants the conclusion that *-de* (GEN) emerged in Dave's IL in week 5 (Interview 1).

- (8) ... Peipei-de mama (Dave, T1.4, #9)
 ... Peipei-GEN mother
 ... Peipei's mother.
- (9) Ni pengyou-de mama... (Dave, T1.2, #14).
you friend -GEN mother...
 Your friend's mother...
- (10) Ni -de pengyou + Aodaliya-ren ma? (Dave, T1.2, #5)
you-GEN friend + Australia-person Q-par.
 (Is) your friend Australian?

In terms of the lexical context of *-de* (GEN) deletion, Dave did not seem to follow in the footsteps of Kate and Sharon. The three instances of *-de* (GEN) deletion occurred in the context of both first and second person pronoun *wo* 'I' and *ni* 'you.' However, Dave did share one thing with Kate and Sharon when the pronominal rule was used: *-de* (GEN) was produced in the context of proper nouns and NPs (8) (9) (10). Therefore, the conclusion can be drawn that *-de* (GEN) emerged in the interlanguage of Dave in Interview 1, week 5.

To crystalize the picture of the discussion so far, Table 6.1-4 displays the results obtained from applying the emergence criterion to the distributional table of each of the three informants (Tables 6.1-1 to 6.1-3). The "obligatory rule" covers all the *-de* (GEN) contexts except for the pronominal (+kin) context because this is the context for the (optional) "deletion rule." The plus sign "+" means the emergence criterion has been met: there is evidence of rule application in the samples. The minus sign "-" stands for the opposite: sufficient rule application contexts are present in the samples but the rule application does not satisfy the emergence criterion. The brackets indicate insufficient contexts. Empty cells means there is no evidence of context in the samples.

The picture which emerges from the table is clear. Dave acquired the genitive morpheme *-de* (GEN) in Interview 1 (week 5) where the obligatory rule was applied in all obligatory contexts, and where the deletion rule was being used productively. Such evidence was absent from Kate's and Sharon's samples in the first interview, week 5, but became present in the second interview, week 10.

Table 6.1-4. Development of *-de* (GEN)

Informant	Context / Int. -->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
Kate	deletion rule	-	+	+	+	+	(+)			-
	obligatory rule		+	+	(+)	-	+	+	(+)	
Sharon	deletion rule	-	+	+	(+)	+	nd	+	+	(+)
	obligatory rule	(+)	+	+	+	(+)	nd	+	+	+
Dave	deletion rule	+		+	+	+	-	(+)	(-)	-
	obligatory rule	+	+	+	+	+	+	+	+	+

The emergence of *-de* (GEN) is only the beginning of the acquisition process. Its subsequent development involves expansion of marking in more functional contexts. This process is characterized by the gradual addition of semantic features to the lexical items marked by *-de* (GEN).

Following the initial and possibly unanalyzed use of *-de* (GEN) (Kate and Sharon, Interview 1, week 5), *-de* (GEN) continues to mark the most basic possessive relationship between the two nominals and *N-de* (GEN) is annotated for the features [+AGENT] [+HUMAN] [+POSS] in the vast majority of the instances (11) (12).

- (11) Mama he baba-de woshi zai fangjian-de youbian.
mother and father-GEN bedroom be-at house-ATT right
 Mother and father's bedroom is at the right of the house.

(Kate, T3.4, T19)

- (12) Wang jia *Wang-de jia *Wang-de jia you yi ge wuhui.
*Wang home*Wang-GEN home*Wang-GEN home has one CL dance-party.*
 There is a dance party at Wang's house.

(Sharon, T4.8, #22)

Up until Interview 5 (week 23) for Kate and Sharon, and Interview 4 (week 16) for Dave, only 3 NPs were produced in which *N-de* (GEN) contains the feature [-HUMAN] and possibly [+LOC] (for location) (13) (14) (15).

(13) ..sushe-de fan. (Sharon, T3.6, #18)
 ..dorm-GEN meal
 ...the meal in the dorm.

(14) ..daxue -de sushe. (Dave, T2.7.1, #9)
 ...university-GEN dorm.
 ...the dorm at the university.

(15) Wo-de zhongxue -de tongxue... (Dave, T4.9, #32)
 I-GEN high.school-GEN (class)mate

My high school friend. / My friend from high school.

The semantics which *-de* (GEN) indicates in (13) (14) (15) apparently goes beyond simple possession. In fact, the [+LOC] feature in the lexical entries of *sushe* 'dormitory,' *daxue* 'university,' and *zhongxue* 'middle school' makes it possible to interpret the *-de* as an attributive marker. Although it is premature to draw firm conclusions one way or the other about the functional expansion of *-de* (GEN) on the basis of three instances, the data does offer some preliminary indication about the direction in which the development is heading.

Indeed, the [+LOC] feature emerged in the lexical entry of *N-de* (GEN) of the informants in the mid-year, after the first semester. It occurred at different points of time in the samples of the informants. The three distributional tables (Tables 6-1.1 to 6.1-3) show that *-de* (GEN) was used with proper nouns referring to cities, countries, and institutions in the data of Kate in Interview 6 (week 26), Sharon in Interview 7 (week 29),¹ and Dave in Interview 5 (week 23). The addition of the [+LOC] feature signals the end of *-de* (GEN) being used only as a marker for nominals annotated for the [+HUMAN] feature (e.g., personal pronouns, personal names, nouns referring to people). It indicates the functional expansion of *-de* (GEN) marking beyond the simple possessive context in which a human agent is always the possessor. However, as mentioned before, the feature addition also renders the NP semantically ambiguous at times. For example, the *N-de* in (16) (17) (18) and (19) below could arguably be interpreted either as possessor, or as modifier. Both readings are possible. That means that all five features [+AGENT] [-HUMAN] [+LOC] [+POSS] [+ATT] (for "attributive") were potentially present in the lexical entries of *N-de*.²

¹Due to a time clash, Sharon missed Interview 6 (week 26).

²While many nouns of location may potentially contain all these features, their relative weighting is by no means equal in a given context. Some incline to be more [+AGENT][+POSS] and others more [+LOC][+ATT].

- (16) Beijing-de xiatian (Kate, T6.1, #14)
Beijing-GEN summer
 Beijing's summer / summer in Beijing
- (17) Yidali-de fan (Kate, T6.5, #15)
Italy -GEN food
 Italian meal / meals in Italy
- (18) GJ-de daxue (Sharon, T8.3, #75)
GJ-GEN university
 university in GJ / GJ's university
- (19) Chaoxian-de gongsi (Dave, T5.1, #22)
Korea -GEN company
 the Korean company / the company in Korea

One prominent phenomenon accompanying the expansion is that compound nouns were sometimes produced as NPs and were morphologically marked. The NPs in (17) (18) (19) are possible examples. However, it is difficult to assess the exact conceptual material of the informants at the moment of speaking to determine the precise semantic relationship between the two nominals.³ More discussion is presented in the following section (6.2) where the acquisition of the attributive function of *-de* is analyzed.

The convergence of [AGENT] [HUMAN] [LOC] [POSS] and [ATT] features in *N-de* (GEN) is no doubt due to the cumulative effect of lexical learning and lexical analysis. The expressive needs of the informants during the interviews also exerted certain influence. As time went on, the range of topics during the interviews increased far beyond one's "nationality," a compound noun containing a proper noun of country name (*Zhongguo ren*, China person, 'Chinese'). As the communicative needs often exceeded the current vocabulary knowledge of the informants, new forms had to be created to cope with the communicative situation, and this often led to rule applications in the context of compounds (e.g., see (17) above). However, it is precisely the rule-based creation of new forms, rightly or wrongly, which signals the rule learning nature of language acquisition.⁴

³Native speakers would definitely produce (17) as a compound noun *Yidali fan* 'Italian food.'

⁴Similar examples have been found in child language research of the acquisition of the English past tense marker *-ed*. It is often observed that a child would frequently experience a period in which forms such as "goed" are produced.

Based on the distributional analysis shown in Tables 6.1-1 to 6.1-3, the developmental process of *-de* (GEN) underwent three phrases, summarized below. Kate and Sharon went through all three phases, while Phase 1 was not recorded in Dave's samples as Dave had already at Phase 2 in the first interview. The progression was orderly in that no one entered Phase 3 before Phase 2. The pace of the progression differed among the informants, suggesting individual difference in the acquisition process and minimal "side effects" of the interview tasks.

Phase 1: pronoun-*de* (GEN)
No pronominal rule application

Phase 2: Pronominal rule application

N-de (GEN) { [+AGENT]
[+HUMAN]
[+POSS]

Phase 3: Pronominal rule application

N-de (GEN) { [+/-AGENT]
[+/-HUMAN]
[+/-LOC]
[+POSS]
[+ATT]

Table 6.1-5 displays the acquisition process of *-de* (GEN). The plus sign "+" indicates the emergence point of *-de* (GEN), that is, the beginning of productive rule application (Phase 2). The double plus sign "++" signals the rule expansion where *-de* may be annotated for [+ATT], and *N-de* may have an attributive interpretation.

Table 6.1-5. Development of *-de* (GEN)

Int.->	1 wk 5	2 wk 10	3 wk 13	4 wk 16	5 wk 23	6 wk 26	7 wk 29	8 wk 34	9 wk 36
Kate		+							++
Sharon		+				nd		++	
Dave	+					++			

nd = no data.

6.2. *-de* (ATT)

The linguistic environments of *-de* (ATT) are rather similar to those of *-de* (GEN). *-De* (ATT) can occur with pronominals as in (1). It can also be suffixed to single nouns (including proper nouns) (2), and phrases (3). An optional deletion rule also exists but only in the context of pronominals and NPs where the head is a disyllabic locative word, defined as a noun that denotes position (Liu, Deng and Liu 1991:333) as (4) shows.⁵ The difference between *-de* (ATT) and *-de* (GEN) is semantic. The relationship between the two nominals in the examples below is one of attributive rather than possessive. The *-de* marked constituent (underlined) is the modifier.

- (1) ta -de pangbian
he/she-ATT side
next to him/her
- (2) mutou-de fangzi
wood -ATT house
a timber house
- (3) xia ge xingqi-de dianying
next CL week -ATT film
next week's film
- (4) fangzi-__ houbian ta -__ panbian
house-__ behind he/she-__ beside
behind a/the house beside him/her

⁵A "locative noun" is not a proper noun (e.g., the name of a country, a city or a place), nor is it a normal noun annotated for the [+LOC] feature (e.g., university, village, factory). It is, in the equivalent of English, a "preposition" sort of word except that in Chinese, it is classified as a noun (Liu et al. 1991), and it is positioned after the noun. A monosyllabic locative word is probably the formalized form of the disyllabic locative noun. It behaves more like a "postposition" and does not permit *-de* (ATT) to be inserted before it. Compare the following two pairs of examples.

- (1a) zhuozi shang
table on
on the table
- (1b) *zhuozi-de shang
table-ATT on
- (2a) zhuozi shangbian
table on
on the table
- (2b) zhuozi-de shangbian
table -ATT on
on the table

Workers in SLA research, especially in SLA theory building (e.g., UG) have argued that adult second language learners possess a great deal of information about the general character of language (e.g., Bley-Vroman 1989). For example, among other things, they do not need to recreate, in the target language, such categories as "possession" and "modification" or "non-possession" as these are basic semantic categories which can be expected to have the universal character. However, learners do need to learn target language specific devices employed to mark these categories. On the surface, learning Chinese *-de* (ATT) seems to be a straightforward task because one form *-de* serves two functions (genitive and attributive) in rather similar linguistic environments. Perhaps nothing can go terribly wrong if *-de* is inserted between two nominal constituents.

However, not every "N + N" combination permits *-de* insertion. Some nominals form a single lexical unit, i.e., a "word," as in (5a), or a compound noun such as (6a). The insertion of *-de* in these two instances would either change the meaning as in (5b), or result in ungrammaticality as in (6b) even though *hanyu* 'Chinese-language' in (6b) modifies *laoshi* 'teacher.' The task for the learner is to develop the *-de* ATT rule and yet not over-apply it.

- (5a) Zhongguo ren
China person
 the Chinese (nationality)
- (5b) Zhongguo-de ren
China -GEN person
 people in China
- (6a) hanyu laoshi
Chinese teacher
 teacher of Chinese
- (6b) *hanyu -de laoshi
Chinese-ATT teacher
 teacher of Chinese

As with the analysis of *-de* (GEN), the same criteria were used to determine the emergence point of *-de* (ATT). That is, the *-de* (ATT) insertion environment must be varied lexically and / or complementary application of insertion and deletion rules must be used. The accuracy of *-de* (ATT) application as defined by the target language norm is

not a concern, as the analysis aims at the developmental profile of the interlanguage, not the distance between the grammars of the learner and the native speaker.

Tables 6.2-1 to 6.2-3 display the distributional analysis of the data from the three informants. The structural description in the leftmost column specifies various contexts of the attributive marker. "Loc.N" stands for "locative noun" (e.g., *houbian* 'behind, at the back'). The contexts for the pronominal and the proper noun referring to people are not listed separately because there are few instances in the data. These two contexts are included in the "N" (noun) category when they do appear. The tokens of *-de* (ATT) insertion are presented before the slash and their relative frequency after the slash. Empty cells means no evidence was found in the samples. It is important to note that in some of the "N-0" and "city / country / inst.-0" contexts, the deletion rule is obligatory as they are the contexts for compounds. The frequency is calculated on the basis of the deletion rule application, not in relation to its counterpart, the insertion rule application.

Table 6.2-1. Distribution of *-de* (ATT): Kate

Context/Int.->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
N- <i>de</i> Loc.N			19/ .95	9 / 1.	0 (0.)	1 / (1.)	1 / (1.)	0 / 0.	0 / (0.)
N-0 Loc. N			1 / .05	0 / 0.	2 / (1.)	0 / (0.)	0 / (0.)	11 / 1.	1 / (1.)
Loc.N- <i>de</i>				2 / (1.)		1 / (.50)		1 / (1.)	
Loc. N-0				0 / (0.)		1 / (.50)		0 / (0.)	
N- <i>de</i>		0 / (0.)					0 / (0.)		
N-0		1 / (1.) lg class					2 / (1.) dorm- meetin lg- teacher		
NP- <i>de</i>								1 / (1.)	
NP-0								0 / (0.)	
country / city / institution- <i>de</i>	0 / 0.	0 / 0.		0 / 0.	0 / 0.	10 / 1. ?food season radio	0 / (0.)	0 / (0.)	
country / city / institution-0	12 / 1. nationa- -lity	7 / 1. nationa- lity, lg		9 / 1. news food film emb'sy dom	5 / 1. food news restau't nationa- lity	0 / 0.	1 / (1.) airport	1 / (1.) nationa- lity	
other- <i>de</i>									
other-0									

*WO error version of locative NP

? Possible instances of rule over-application

Table 6.2-2. Distribution of *-de* (ATT): Sharon

Context/Int.->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
N- <i>de</i> Loc.N			0 / 0.	0 / (0.)		nd	0 / (0.)	0 / 0.	0 / (0.)
N-0 Loc. N			8 / 1.	2 / (1.)			2 / (1.)	9 / 1.	1 / (1.)
Loc.N- <i>de</i>			0 / 0.	2 / .40		nd	0 / (0.)		
Loc.N-0			7 / 1.*	3 / .60*			1 / (1.)*		
N- <i>de</i>		0. / (0.)	2 / .17 ?lg- book dorm- food	0 / (0.)	0 / 0.	nd	2 / (1.) one's height	0 / 0.	
N-0		2 / (1.) lg class Ss'- dorm	10 / .83 lg class /teacher /book	3 / (1.) lg book / friend	6 / 1. lg Ss /exam /class, bir'day- party N-work N-rest't		0 / (0.)	5 / 1. lg class /exam /teacher /writin'	
NP- <i>de</i>						nd	2 / (1.)	3 / (1.)	
NP-0							0 / (0.)	0 / (0.)	
country / city / institution- <i>de</i>	0 / 0.	0 / 0.	0 / (0.)	0 / 0.	0 / 0.	nd	7 / 1. weather autumn tree	9 / 1. Univ. person culture dict'ary, hi-sch- friend	1 / (1.) person
country / city / institution-0	13 / 1. nationa -lity	4 / 1. nationa -lity	1 / (1.) univ.- dorm	6 / 1. book, CD tel, car song student	8 / 1. nationa -lity news food	nd	0 / 0.	6 / 1. lg nationa -lity dict'ary	0 / (0.)
other- <i>de</i>									
other-0									

nd = no data. Sharon missed Interview 6

*WO error version of locative NP

? Possible instances of rule over-application

Table 6.2-3. Distribution of *-de* (ATT): Dave

Context/Int.->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
N- <i>de</i> Loc.N			14 / .56	0 / 0.	1 / (1.)	0 / (0.)	2 / .40	0 / 0.	
N-0 Loc. N			11/.44 ⁶	7 / 1.	0 / (0.)	2 / (1.)	3 / .60	12 / 1.	
Loc.N- <i>de</i>			0 / (0.)	1 / (1.)	1 / (.50)			2 / (1.)	
Loc.N-0			1 / (1.)*	0 / (0.)	1 / (.50*)			0 / (0.)	
N- <i>de</i>	3 / .50 ?lg- teacher	2 / 1. time- teacher	1 / (1.) ?lg- shangke	1 / 1. lg study	1 / (1.) time- weather	5 / 1. here that- kind of	1 / 1. pron- speed	0 / 0.	
N-0	2 / .40 lg teacher	6 / 1. lg class /teacher	1 (1.) lg book	3 1. tel- book dance- party	1 (1.) Great Wall restau't	2 / 1. lg class /tape	4 / 1. lg study ?such ?this- kind of	4 / 1. lg study /exam ?this- kind of	
NP- <i>de</i>		1 (1.)	6 / 1. loc.NP		1 / (1.)			2 / (1.) loc.NP next-wk	
NP-0		0 / (0.)	8 / 1. Npposs- Loc.N		0 / (0.)			0 / (0.)	
country / city / institution- <i>de</i>	0 / 0.	0 / (0.)	0 / (0.)	0 / 0.	4 / 1. mana- ger refect'y ?food	13 / 1. Season coast ren popula- tion radio	5 / 1. History hi sch plane	1 / (1.) history	
country / city / institution-0	11 / 1. Nationa -lity, lg	2 / (1.) nationa -lity	1 / (1.) nationa- lity	9 / 1. Nationa -lity film news emb'sy hi sch- friend	7 / 1. news tea refect'y nationa -lity	0 / 0.	4 / 1. lg, bus money dorm	0 / (0.)	
other- <i>de</i>						1 / (1.) when...	7 / 1. from...		
other-0						0 / (0.)	0 / 0.		

*WO error version of locative NP

? Possible instances of rule over-application

⁶Three sentential attributives are not included in the count because all of them were structurally and lexically identical, and *-de* (ATT) was not applied (see example below).

Women kan dianshi -de fangzi pangbian... (Dave, T3.4, #22)
we iook TV RC house beside...

Next to the room where we watch TV...

The tables show that for the first 10 weeks (Interviews 1 to 2), *-de* (ATT) was absent from the samples of Kate and Sharon. The samples did contain a number of "N + N" forms which exhibited an attributive relationship (e.g., 'language class'-- 2 tokens, 'student dormitory'-- 1 token). There were also many forms referring to the nationality of a person (e.g., *Zhongguo ren*, China person, 'Chinese'). These forms were given a structural analysis in the classroom and their lexical components or morphemes are listed separately in the vocabulary section of the textbook. It is difficult to assess whether or not the learners had acquired them as single items or whether they had analyzed them as nominal compounds with an attributive relationship between the constituents. In any case, the marker *-de* (ATT) did not occur in these or any other contexts. In the first ten weeks, the *-de* morpheme in the samples of Kate and Sharon served to mark the possessive function exclusively.

Dave's interlanguage data during this period shared certain similarities with Kate's and Sharon's in that *-de* (GEN) was dominant. However, he also produced six NPs which exhibited an attributive relationship and which were marked by *-de* (ATT). Three of them featured "language" as the modifier, as shown in (9) and (10). "Time" was marked as an attributive in another two NPs (11) (12). Although the last example (13) is ill-formed and non-idiomatic, the morpheme *-de* (ATT) does mark the possessive NP *Gupo-de shu he Gupo-de zazhi* 'Gupo's book and Gupo's magazine' as the attributive of the head noun, indicating what the picture is like. These samples are lexically varied and they demonstrate the productive use of the morpheme in semantically non-possessive contexts.

- (9) Yingyu-de laoshi (Dave, T1.3, #13; T1.2, #11)
English-ATT teacher
 English teacher
- (10) Hanyu -de laoshi (Dave, T1.3, #19)
Chinese-ATT teacher
 Chinese teacher
- (11) 11 dian -de hanyu-ke (Dave, T2.6, #12)
11 o'clock-ATT Chinese class
 Chinese class at 11 o'clock
- (12) 10 dian -de hanyu -ke (Dave, T2.6, #9)
10 o'clock-ATT Chinese class
 Chinese class at 10 o'clock

- (13) *Zhe zhang hua (en) Gupo -de +++ shu he Gupo-de [jia]
 this CL picture (en) Gupo-GEN+++book and Gupo-GEN [jia]

zazhi -de zhang hua. (Dave, T2.5, #6)
magazine-ATT CL picture.

This is a picture of Gupo's book and Gupo's magazine.

Further evidence of analyzed use of *-de* (ATT) in Dave's sample came from Interview 1 (week 5). The Chinese form for "language teacher" was produced both as an NP marked by *-de* (ATT) (9) (10), and as a compound noun (15) (16). There was even a minimal pair (see (10) and (15)). This has added to the conclusion drawn above that *N-de* (ATT) was not a monomorphemic chunk, nor was the form for "language teacher." This was where Dave differed from Kate and Sharon. Although *-de* (ATT) application was not stable, and the difference between the NPs involving *-de* (ATT) marking and compound nouns was yet to be sorted out, it was clear that the marker had attained its attributive status in the interlanguage of Dave in Interview 1, week 5.

- (15) Hanyu laoshi (Dave, T1.4, #10)
Chinese-language teacher
 Chinese teacher

- (16) Ribenyu laoshi (Dave, T1.3, #12)
Japanese-language teacher
 Japanese teacher

The attributive marker did not emerge in the interlanguage grammar of Kate and Sharon before the locative NP structure was formally taught in week 12, a week before Interview 3 (week 13). The locative noun was introduced both as the head (underlined in (17)), and as the modifier (underlined in (18)). In both cases, *-de* (ATT) marks the attributive relationship. *-De* (ATT) deletion is possible in the context of (17) and is used exclusively in the textbook, although classroom input from the teachers contained both rules (personal communication with the tutor).

- (17) xizaojian-de zuobian (Dave, T3.4, #15)
 bathroom-ATT left
 on the left of the bathroom

- (18) youbian-de xin (Kate, T4.2, #8)

right -ATT letter

the letter on the right

The locative NPs were produced by all three learners in large quantities in Interview 3 (week 13) and Interview 4 (week 16), as the distributional tables demonstrate. As a result, *-de* (ATT) emerged strongly in Kate's sample in Interview 3, in the locative NP context.

Sharon, however, seemed to have opted for the deletion rule with the locative NP. Sharon followed the textbook examples from the very beginning: *-de* (ATT) was never inserted in the locative NP, as shown in Table 6.2-2 and examples (19) and (20). *-De* (ATT) deletion was consistent, occurring in all locative NPs including those containing the wrong word order (21) (22). Therefore, *-de* (ATT) did not emerge in the locative NP context in Sharon's L2 Chinese. Instead, it did in the "N-de N" context, where in week 13 (Int. 3), two tokens were supplied in sufficient and lexically varied *-de* (ATT) marking contexts (.17) (Table 6.2-2).

- (19) zhuozi xiabian (Sharon, T3.2, #19)
table underneath
underneath the table

- (20) shu pangbian (Sharon, T7.6, #19)
book side
next to the book

(Describing her dormitory: the bathroom is opposite her bedroom)

- (21) *Duimian wo-de woshi you +++ xizaojian. (Sharon, T3.7, #24)
opposite I -GEN bedroom has +++ bathroom
*My bedroom opposite is a bathroom.

(Describing a room: a painting is to the right of the table)

- (22) *Youbian zhuozi zai huar. (Sharon, T3.2, #6)
right table be in/at picture
*The table on the right is a picture.

It seems that the attributive marker *-de* (ATT) developed at a different pace in the interlanguage grammar of the three informants. Similar to the development of the genitive

marker *-de* (GEN), the attributive marker was productive in Dave's interlanguage from the start (Interview 1, week 5). Kate acquired it in Interview 3, week 13, as a response to the teaching of the locative NP structure. Sharon's preference for the deletion rule in the locative NP context delayed *-de* (ATT) emergence for a further 3 weeks.

The emergence of *-de* (ATT) signals the learners' ability to mark the attributive relationship between the head of a NP and other constituents within the NP. The initial *-de* (ATT) marking was rather limited in context, mainly in NPs involving a locative noun as the head, and a normal noun as the modifier. The *N-de* (ATT) contained predominantly the following features: [-AGENT] [-HUMAN] [+ATT] [+/-LOC].

Further progression in the development of *-de* (ATT) saw the emergence of new features in the lexical entries of *N-de* (ATT) as the result of expansion of the subcategories of *N-de* (ATT). Proper nouns referring to cities, countries and institutions, hitherto confined to the compounds, began to occur in NPs and were marked by *-de* (see (21) (22) (23)). With these instances appearing in the interlanguage data of the informants, the [+AGENT] [+POSS] features became part of the lexical entries of *N-de* (ATT), resulting in the NPs being capable of both possessive and attributive interpretations. In other words, the semantic demarcation between *-de* (ATT) and *-de* (GEN) became less rigid. These new features were found in Dave's sample in Interview 5 (week 23), in Kate's in Interview 6 (week 26), and in Sharon's in Interview 7 (week 29).

- (21) Hancheng -*de* population (Dave, T6.5, #55)
Seoul -*GEN/ATT* population
 Seoul's population / the population in Seoul
- (22) Riben -*de* shouyinji (Kate, T6.1, #3)
Japan -*GEN/ATT* radio
 Japan's radio / radio in Japan / radio made in Japan
- (23) North Jakarta -*de* daxue (Sharon, T8.3, #188)
North Jakarta -*ATT/GEN* university
 the university (or universities) in North Jakarta
 North Jakarta university (or universities)

In the above examples, *Hancheng* 'Seoul,' *Riben* 'Japan' and *North Jakarta* 'North Jakarta' can be annotated for either [+LOC] [+ATT] or [+AGENT] [+POSS]. *Hancheng-de population* 'the population of Seoul' (21) could refer either to "the residents of Hancheng" (a possessive reading), or to "everyone in Hancheng, residents or not" (an attributive reading). Similarly, *Riben-de shouyinji* (22), a NP produced by all three informants, meant "the radio(s) made in Japan" in the communicative context of the task.

That was an attributive reading. However, it could also be interpreted as "the radio(s) owned by Japan" in the sense of "belonging." Finally, *North Jakarta-de daxue* 'North Jakarta's university' could refer to the location of the university (an attributive reading) or to the ownership of the university (a possessive reading). Often the distinctions are not clear-cut, hence, the convergence of genitive and attributive features in the *N-de*.

With the convergence of the genitive and attributive features, proper nouns referring to cities, countries and institutions were morphologically marked. Before this, the proper nouns of cities, countries and institutions occurred only in compounds. Nouns referring to "language" were rarely marked by *-de* (ATT) in the data of all three informants (see Tables 6.2-1 to 6.2-3). The distributional tables also show that, overall, there were more compounds ("country / city / institution-0," and most of the "N-0") than NPs, and *-de* (ATT) application contexts were limited mainly to locative NPs and later, to proper nouns referring to countries, cities, and institutions. It seems that learners initially made a lexical distinction between proper nouns referring to cities, countries and institutions, nouns referring to language, and all other type of nouns. This categorization was used to determine, to certain extent, the insertion of *-de* (ATT). Alternatively, learners simply memorized the *-de*-less forms as single lexical items. While this was certainly more than plausible in the case of "one's nationality" and in the first 10 to 13 weeks of learning, it could not adequately account for the variety of nouns which were later modified by "language" and "city / country / institution" without the presence of *-de* (ATT) (see Tables 6.2-1 to 6.2-3).

There seemed to be more learner variation in the acquisition of *-de* (ATT) than *-de* (GEN). The variations were manifested mainly in two areas: the use of the deletion rule and the range of *-de* (ATT) application contexts. Although the deletion rule is optional, its use leads to more target language-like productions. The distributional tables show that in the permitted context (i.e., the locative NP), Sharon preferred the deletion rule while Kate used the insertion rule consistently until Interview 8 (week 34), more than 20 weeks after it was introduced. Dave, on the other hand, used both the deletion and insertion rules from the start. The free variation between the deletion and insertion rules in the locative NP context gave the learners the option to choose. However, the choice seemed to be a psycholinguistically motivated response to the task of language learning and speech production. It appears that both the exclusive use of the deletion rule (Sharon) and the exclusive use of the insertion rule (Kate) reduces the processing load because only one rule template is active in the system.

The distributional tables also show that Dave and Sharon applied the rule in a wider range of contexts than Kate, who produced mainly locative NPs. Dave seemed to be the most

advanced learner. The *N-de* (ATT) in his data often contained features not present in the data of Kate and Sharon. For example, in (24) and (25) below, the *-de* (ATT)-marked constituent is a time phrase, in (26), it is a definite pronoun ([+DEF]),⁷ and in (27), it is a pronoun of location ([+LOC]). Prepositional phrases (PP), locative NPs and possessive NPs were also marked as attributives in Dave's data, indicating greater analysis and full productive use of the morpheme.

- (24) xia ge xingqi -de xingqi san (Dave, T8.5, #38)
next CL week-ATT week three
 next Wednesday
- (25) chuntian deshihou-de jia (Dave, T6.5, #71),
Spring time -ATT holiday
 Spring holiday
- (26) nayang -de shenghuo (Dave, T6.5, #18).
that-kind-ATT life
 that kind of life
- (27) nar -de dongtian (Dave, T6.5, #41)
there-ATT winter
 the winter there

To summarize, the acquisition of *-de* (ATT) seemed to be associated with the formal instruction of locative nouns in the NP structure. The emergence of *-de* (ATT) occurred in the samples of Kate and Sharon not long after the instruction, mainly in this context. It seems that the lexical learning within a syntactic structure is an effective way to introduce *-de* (ATT) into the interlanguage system, because the teaching provides a fixed point for the grammatical morpheme to be sufficiently analyzed (see also Ard and Gass 1987, Sato 1988).

The subsequent maturational process of *-de* (ATT) is rather similar to that of the genitive marker *-de* (GEN). It can be characterized as a gradual expansion of semantic features in the lexical entries of *N-de* (ATT), as shown in the following schema. Phase 1 refers to the period just after the emergence of the attributive marker. The *-de* (ATT) marked constituent is annotated for the [-AGENT] [-HUMAN] [+/-LOC] and [+ATT] features. In Phase 2, more features are added, mainly [+AGENT] [+HUMAN] [+POSS]. Consequently, the NP becomes capable of both attributive and possessive meanings.

⁷-*De* (ATT) omission also occurred in a similar context in Dave's data (*zheyang-0 N* 'this kind of N').

Phase 1. N-*de* (ATT)

[+/-LOC]
 [-AGENT]
 [-HUMAN]
 [+ATT]

Phase 2. N-*de* (ATT), PROPER N-*de* (ATT)

[+/-AGENT]
 [+/-HUMAN]
 [+/-LOC]
 [+POSS]
 [+ATT]

Table 6.2-4 presents a visual summary of the three distributional tables and the analysis above. It shows the point of emergence of *-de* (ATT), indicated by one plus sign "+", and the point of feature expansion, signaled by two plus signs "++", in the interlanguage of the three learners.

Table 6.2-4. Development of *-de* (ATT)

Int.-->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
Kate			+						++
Sharon			+			nd	++		
Dave	+					++			

nd = no data

6.3. *-de* (ADJ)

The adjective occurs in two positions: as an attributive before a noun as shown in (1) below, and as predicative after the copula shown in (2). The analysis in this section focuses on the former.

- (1) xin (-de) yifu
new(-ADJ) clothes
 new clothes

- (2) yifu shi xin -de.
*clothes be new-ADJ*⁸
 The clothes are new.

The adjective marker *-de* (ADJ) in attributive contexts is sensitive to the number of syllables of the adjective. Generally speaking, *-de* (ADJ) is optional after monosyllabic adjectives (or Type 1 adjectives) as (1) shows. Disyllabic adjectives or Type 2 adjectives, as in (3), usually require *-de* (ADJ): This rule includes those consisting of a monosyllabic adjective modified by an adverb of degree as in (4). The exception which pertains to the interlanguage data in the current study is *hen duo*, very many, 'many, a lot of,' which does not require an obligatory *-de* (ADJ) suffix (5).

- (3) piaoliang-de yifu
beautiful -ADJ clothes
 beautiful clothes
- (4) hen hao -de ren
very good-ADJ person
 good person
- (5) hen duo (-de) shu
very many (-ADJ) book
 many books

The assessment for the emergence of the adjective suffix *-de* (ADJ) is based upon its insertion in both optional and obligatory contexts provided that the contexts are lexically varied. Although in the optional rule context, *-de* (ADJ) omission is more idiomatic and

⁸The grammatical status of the marker *-de* here may not be an adjective suffix as it occurs not only with adjectives but also with nouns and verbs in the predicative position (see examples below). Its function seems to nominalize the constituents, i.e., a nominalizer (NOM).

Yifu shi laoshi-de.
clothes be teacher-DE

The clothes are teacher's.

Ta shi changxi-de.
he/she be sing-drama-DE

He/She is a Chinese opera singer.

target language-like, its insertion suggests the beginning of a productive process of the development of the adjective marker in the interlanguage grammar of the learners.

The distributional tables below specify the linguistic environments of *-de* (ADJ). Following the convention established for the presentation, the number of tokens is displayed before the slash and the relative frequency after the slash. Brackets stand for less than four contexts. Empty cells indicate no evidence of context in the sample.

Table 6.3-1. Distribution of *-de* (ADJ): Kate

Adj Type	Context / Int->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
Type 1	mono- <i>de</i>		0/0.	0/(0.)	0/(0.)	1/(1.) old	0/(0.)			
	mono- <i>0</i>		9/1. color	3/(1.) big small	3/(1.) big small color	0/(0.)	1/(1.) small			
Type 2	adv. mono- <i>de</i>			0/(0.)	1/.17 good	0/(0.)	0/(0.)			0/(0.)
	adv. mono- <i>0</i>			3/(1.) many	5/.83 many	3/(1.) many	2/(1.) many			2/(1.) many *big
Type 2	disyllabic- <i>de</i>					1/(1.) good- looking			1/(1.) blue- color	
	disyllabic- <i>0</i>					0/(0.)			0/(0.)	

*Over-application

Table 6.3-2. Distribution of *-de* (ADJ): Sharon

Adj Type	Context / Int->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
Type 1	mono- <i>de</i>		1/(.33) good	0/(0.)	1/(1.) color	0/(0.)	nd	0/(0.)	0/(0.)	0/(0.)
	mono- <i>0</i>		2/(.67) color	1/(1.) color	0/(0.)	2/(1.) good new	nd	1/(1.) small	3/(1.) new big	3/(1.) *enough
Type 2	adv. mono- <i>de</i>			0/(0.)	0/(0.)	1/.12 many	nd	2/.50 many small	0/(0.)	1/(1.) good
	adv. mono- <i>0</i>			2/(1.) many	3/(1.) many ² *good	7/.88 many	nd	2/.50 many	5/1. many	0/(0.)
Type 2	disyllabic- <i>de</i>				0/(0.)	0/(0.)	nd	2/(1.) good- looking		
	disyllabic- <i>0</i>				1/(1.) good *look- ing	1/(1.) *often many	nd	0/(0.)		

*Over-rule application

Table 6.3-3. Distribution of *-de* (ADJ): Dave

Adj Type	Context / Int->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
Type 1	mono- <i>de</i>		2/(1.) color	8/.89 color big, small new	2/.50 color, female	1/(1.) big	0/(0.)	2/.50 hot, *many	2/.22 *many wrong	
	mono- <i>0</i>		0/(0.)	1/.11 small	2/.50 big, small	0/(0.)	2/(1.) big, middle	2/.50 big	7/.78 big old	
Type 2	adv. mono- <i>de</i>	0/(0.)	1/(1.) good	1/(1.) many	4/1. many good small	4/1. many ³ good	2/(1.) good cold	8/.89 many fast, back	2/(1.) good	4/1. many diffi- cult big
	adv. mono- <i>0</i>	1/(1.) *good	0/(0.)	0/(0.)	0/0.	0/0.	0/(0.)	1/.11 *good	0/(0.)	0/0.
Type 2	disyllabic- <i>de</i>			2/(1.) very- deli- cious			2/(1.) beauti- ful	2/(1.) conve- niet, strange	3/(1.) well- known final	
	disyllabic- <i>0</i>			0/(0.)			0/(0.)	0/(0.)	0/(0.)	

*Over-rule application

The distributional tables show that both Kate and Sharon responded overwhelmingly to the optional rule in the Type 1 adjective: *-de* (ADJ) was seldom inserted after a monosyllabic adjective (one from Kate in week 5 and two from Sharon in week 2 and week 4 respectively). Kate and Sharon also produced few disyllabic adjectives: a total of two in Kate's sample and four in Sharon's sample. The other Type 2 environment (adverb + monosyllabic adjective) did attract a number of adjective tokens, but the majority of them belonged to the optional rule context (*hen duo*, very many, 'many, a lot of') and *-de* (ADJ) was not supplied. Indeed, applying the emergence criterion to Table 6.3-1 and Table 6.3-2 leads to the following conclusion: *-de* (ADJ) emerged in Sharon's interlanguage in Interview 7 (week 29) when she supplied four adjective suffixes *-de* (ADJ) in lexically variant environments. The suffix did not emerge in Kate's sample throughout the entire observation period (see Table 6.3-1).

The distributional table of Dave (Table 6.3-3) stands in sharp contrast to Kate's and Sharon's. Dave tended to insert *-de* (ADJ) after every adjective, monosyllabic and disyllabic alike. Indeed, there was more insertion than omission. As the result, *-de* (ADJ) emerged in Interview 3 (week 10), when a total of eleven *-de* (ADJ) insertions occurred: eight after Type 1 adjectives, and three after Type 2 adjectives. Table 6.3-4 summarizes the discussion above by showing the emergence point of *-de* (ADJ) in the interlanguage of the three informants.

Table 6.3-4. Emergence point of *-de* (ADJ)

Informant	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
Kate									
Sharon							+		
Dave			+						

Not only did Dave apply the rule consistently and almost right across the board, he produced more adjective tokens and types than Kate and Sharon. Table 6.3-5 demonstrates that Dave outperformed Kate and Sharon in adjective tokens and types. *-De* (ADJ) insertion was fairly consistent in the obligatory context, i.e., in the context of Type 2 adjectives. The optional rule context within Type 2 adjectives (*hen duo*, very many, 'many, a lot of') was treated as part of the insertion rule.

Table 6.3-5. Token and type of adjectives*

Adj. Type	Structural Context	Kate token:type	Sharon token:type	Dave token:type
Type 1	mono.adj-de	1:1	2:2	17:8
	mono.adj-0	16:3	12:7	14:4
Type 2	adv mono.adj-de	1:1	2:2	13:7
	adv mono.adj-0	1:1	1:1	2:1
Type 2 (many)	adv duo-de	0:0	2:1	14:1
	adv duo-0	14:1	17:1	0:0
Type 2	disyllabic.adj-de	2:2	2:1	9:6
	disyllabic.adj-0	0:0	2:1	0:0

*Color words were counted as one type.

The fact that Kate and Sharon produced relatively few adjective types could have two implications. First, there were few "adjectives" in the interlanguage lexicon of Kate and Sharon which had been analyzed for the attributive function. Many of these forms might have been annotated for some other function (e.g., the predicative function), or other word category (e.g., the stative verb). Secondly, an NP containing an adjective modifier was not often used for descriptive purposes. This begs the question of descriptive needs during the interview. In other words, the insufficient production could be either an artefact of insufficient communicative contexts or a reflection of insufficient functional and categorial analysis of L2 vocabulary. It is necessary, therefore, to explore these two possibilities by examining another structure, one in which stative verbs are used for descriptive purposes.

Chinese stative verbs share the same stem as adjectives (see Chapter 4, Section 4.2.1.3). An isolated form such as *hao*, 'good,' can be either an adjective or a stative verb. This amounts to saying that no precise categorization is possible without a structural context. The stative verb occurs in a predicative position, and serves as a variant of the structure "adjective + N" in its description function. In the following two sets of sentences, the first sentence in each set contains a NP with an adjective modifier (6a) (7a), the second a stative verb (6b) (7b), and the third an adjective in the predicative position (6c) (7c). The adjective and the stative verb in each sentence are underlined.

- (6a) Zhe shi yi ben youming-de xiaoshuo.
this be one CL famous -ADJ novel
 This is a famous novel.

- (6b) Zhe ben xiaoshuo (hen) youming.
 this CL novel (very) famous.
 This novel is famous.
- (6c) Cha shi re -de.⁹
 tea be warm-NOM
 The tea is warm.
- (7a) Zhe shi yi zuo da (-de) fangzi
 this be one CL big (ADJ) house
 This is a big house.
- (7b) Zhe zuo fangzi (hen) da.
 this CL house (very) big
 This house is big.
- (7c) Ta -de fangjian shi da-de. Ni -de fangjian shi xiao-de
 he/she POSS room be big-NOM. you POSS room be small-NOM.
 The big room is his/hers. The small room is yours.

Due to categorial as well as functional cross-overs between the stative verb and the adjective structures, it is possible that the low output of adjectives by Kate and Sharon was compensated for by the liberal use of stative verbs for descriptive purposes.

In order to test this hypothesis, stative verbs were examined in the data. Table 6.3-6 displays the token and the type of the stative verbs alongside that of the adjectives found in the samples of the three informants. Single form production such as (8) and (9) was not counted since the adjective and the stative verb share the same stem and their categorial distinction can only be determined in linguistic structures. "Color terms" were counted collectively as one type. The "overlapping" column at the rightmost displays the number of forms which occurred as both adjectives and stative verbs in the samples of

⁹Not every form can occur in all three positions. *Youming* 'famous' is one of them. It is difficult to conjure up a context in which it occurs in the predicative position. The following sentence sounds non-native-like:

?Zhe ben xiaoshuo shi youming-de.
 this CL novel be famous-NOM

This novel is famous.

each informant. The "overlapping" row at the bottom of the table displays the number of adjective or stative types shared in the samples of all three informants.

(Talking about the price of a dictionary)

- (8) Hen gui. (Sharon, T8.2, #18)
very expensive.
 Expensive.

(Talking about the train in Italy)

- (9) Hen ganjing. (Kate, T6.5, #16)
very clean
 Clean.

Table 6.3-6. Adjectives and Stative Verbs: Type & Token

Informant	Adjective type : token	Stative Verb type : token	Overlapping
Kate	7:35	21: 76	6
Sharon	8:42	24 : 67	6
Dave	19:68	23 : 101	10
Overlapping	4	14	4

Overall, there are more stative verbs than adjectives in the data of all three informants. The breakdown of the adjective and stative verb output over the 9 interviews (Table 6.3-7) shows that Kate and Sharon produced more stative verbs than adjectives in almost every interview. In addition, table 6.3-7 reveals that the gap between the adjective and the stative verb output is more pronounced in Kate's and Sharon's data, with a ratio of one adjective to three stative verbs (1:3). Only six forms in Kate's and Sharon's data were produced as both adjective and stative verb. The other 15 (.71) stative verbs in Kate and 18 (.75) stative verbs in Sharon were not cross-categorized. In contrast, 10 (.43) forms were used by Dave as both adjectives and stative verbs, and 13 (.57) as stative verbs only. The ratio is close to 1:1.

Table 6.3-7. Output of adjective and stative verb type

Informant	Interview -->	1	2	3	4	5	6	7	8	9
		wk 5	wk 10	wk 13	wk 16	wk 23	wk 26	wk 29	wk 34	wk 37
Kate	Adjective	0	1	3	5	3	2	0	1	2
	V _{stative}	0	2	6	5	4	15	7	2	5
Sharon	Adjective	0	2	2	4	4	nd	3	3	2
	V _{stative}	0	1	5	6	10	nd	9	5	2
Dave	Adjective	1	2	6	6	3	5	8	7	3
	V _{stative}	0	1	3	5	6	9	10	6	1

From the acquisition point of view, the fact that Kate and Sharon used more stative verbs than adjectives could mean that a form entered their interlanguage lexicon as a stative verb first. It would later move across the categorial boundary to function as an adjective. This was partly supported by the data: only five forms occurred as adjectives and stative verbs at about the same time (*da* 'big,' *xiao* 'small,' *duo* 'many,' *hao* 'good,' *haokan* 'good-looking'). Other forms first appeared only as stative verbs. Whether or not they eventually came to function as adjectives can not be assessed within the observation period because by the end of the period, no evidence was available to demonstrate that cross-over or further categorial analysis had happened.

This tendency is not observed in Dave's data, which seemed somewhat more balanced between the adjective and stative verb production. Some lexical forms occurred first as adjectives (e.g., *xiao-de* 'small-ADJ', *qiguai-de* 'strange-ADJ' (Interview 7), *youming-de* 'famous-ADJ' (Interview 8)), and others as stative verbs (e.g, *ganjing* 'clean' (Interview 4), *haokan* 'good-looking' (Interview 4), *rongyi* 'easy' (Interview 8)).

It seems that the developmental difference of *-de* (ADJ) of Kate and Sharon on the one hand, and Dave on the other, could be observed in the lexical acquisition of adjectives and stative verbs. If they were acquired at a more or less equal pace, as in Dave's case, the adjective suffix *-de* (ADJ) might develop in due time. But if the stative verb was acquired earlier and faster than the adjective, as in the case of Kate and Sharon, learners would have at their disposal more stative verbs for descriptive purposes. NPs with an adjective modifier would be too limited in number to serve communicative needs.

In summary, the development of *-de* (ADJ) is dependent upon the presence of adjectives. Lack of adequate adjective production by Kate and Sharon, especially the production of disyllabic adjectives, resulted in few instances of *-de* (ADJ) insertion in their data, hence, the delayed emergence of the adjective suffix. The cause for this limited output of

adjectives was found in the way the categorial analysis of the lexical material was carried out by the learners. As Chinese adjectives and stative verbs share the same stem and perform rather similar descriptive functions, the initial categorial analysis of the form would affect the development of *-de* (ADJ). If the majority of the forms are categorized initially as stative verbs, as shown in Kate's and Sharon's samples, there would be a shortage of adjectives in the interlanguage lexicon and data. A natural consequence would be the under-development of *-de* (ADJ). On the other hand, if many of the forms are analyzed as adjectives, then *-de* (ADJ) may have a chance to emerge in due time. The evidence of the categorial analysis by the learners came from the number of stative verbs and adjectives the learners produced when carrying out communicative tasks during the interviews. The samples show that there were sufficient descriptive contexts in the tasks, and the descriptive needs were fulfilled either through the use of stative verbs mainly (Kate and Sharon) or through both stative verbs and adjectives (Dave).

6.4. *-de* (RC)

Chinese relative clauses require a marker to indicate the syntactic relationship between the head and its preceding clausal modifier in which the head is a syntactic component (as subject / object, etc.). The marker is *-de* (RC). The relative clause structure was formally introduced in week 11 (lesson 21), and elicited for the first time in week 13 (Interview 3). Being an optional structure, the relative clause has been well known for its scarcity in natural speech data from language learners, L1 and L2 alike (Bowerman 1979, Bloom et al. 1980; Schumann 1980; Sato 1988). To address this problem and ensure that sufficient evidence was obtained, three elicitation tasks were prepared. The tasks varied greatly in the control and free dimension, and the data elicited thus differed in the degree of spontaneity. The analysis examines the occurrence of *-de* (RC) in each of the three elicitation tasks.

The first task was "sentence-link." It was, essentially, a structural manipulation exercise. A few pairs of simple sentences were delivered orally to the informants, who were asked to put each pair into one sentence. This task was used in Interview 3 (week 13), Interview 4 (week 16), and Interview 5 (week 23). The second task consisted of 10 pairs of drawings. Each pair was identical except in one area (e.g., two identical houses, one having a swimming pool, the other a garden). The informants were to respond to the prompts (in Chinese) "which one (person, house) do you like?" or "which one (person) is good looking?" This task was employed once, in Interview 4 (week 16). The last task was "disguised imitation" in conversation. The researcher asked questions using the relative clause structure. The informants, by answering the questions, often repeated the complete structure or part of it which contained *-de* (RC). This task was used mainly in

Interview 3 (week 13) and Interview 4 (week 16) to supplement the "sentence-link" and the "picture pair" tasks. Both "sentence link" and "picture pair" tasks were trialed on native speakers of Chinese. The relative clause production rate was over 60% for the "sentence link" task, and 80% for the "picture pair" task.

From the point of view of language acquisition, it is doubtful if the speech data obtained from the "sentence link" task constitutes valid data. The task is problematic in three respects:

- a) the extent to which the attention is on form during the speech production, with full recognition of the speakers,
- b) the extent to which the speech is produced on-line and automatic, and
- c) the extent to which the speech resembles normal language use.

Being a quintessential grammar exercise, the "sentence link" task provided ample opportunity for the informants to focus on form. The instruction made the informants further aware of the nature of the task as being structural manipulation. Following each prompt, a delay of between 4 to 9 seconds usually ensued before the informants produced the response. During the "waiting period," it was sometimes obvious that the informants were performing syntactic operations mentally: their fingers tapping or moving on the desk or the knee as if they were moving constituents around. At the same time, the informants were uttering the sentences sub-vocally, as could be seen from their lips. Time was no constraint; the informants were never interrupted or rushed. Under such circumstances, syntactic processing did not take place on-line or automatically, and the formal aspects of language production were handled with full consciousness and recognition. This was far removed from natural language processing and production in which grammatical operation is automatic and below the level of consciousness. Finally, the task itself could hardly be regarded as resembling the situation for natural language use. In summary, the speech data obtained under such circumstances is problematic for language acquisition study and must be treated with caution, especially when used to draw conclusions.

The statistics of *-de* (RC) production in each task are shown in Tables 6.4-1 to 6.4-3. The token and the relative frequency are separated by a slash "/." Empty cells indicate absence of relative clause context. Misplaced *-de* (RC) including *-de* (RC) omission in a relative clause structure is counted as non-rule application. As the morpheme *-de* (RC) is the focus of the analysis, certain structural irregularities and lexical errors are regarded as irrelevant so long as *-de* (RC) is placed in the right position. The same principle applies to the structural output which is not a relative clause but which is communicatively and

structurally possible, as shown in (1) and (2) (the relative clause is underlined). Instances such as (1) and (2) are not included in the tables unless otherwise indicated. This approach explains why Kate and Sharon produced fewer relative clause tokens than Dave in the "sentence link" and "picture pair" tasks, and yet they still reached 100% in frequency.

(1) Prompt: Dingyun jie chenshan, chenshan shi hong-de.
Dingyun borrow shirt, shirt be red -NOM.
 Dingyun borrows a shirt, the shirt is red.

Sharon: Dingyun jie hong chenshan.
Dingyun borrow red shirt
 Dingyun borrows a red shirt. (Sharon, T3.5, #3)

The relative clause version:

Dingyun jie de chenshan shi hong-de
Dingyun borrow RC shirt be red-NOM.
 The shirt that Dingyun has borrowed is red.

(2) Q: Jiao ni koyu de laoshi jiao shemo mingzi?
teach you oral-language RC teacher call what name?
 What is the name of the teacher who teaches you spoken Chinese?

Kate: Wang laoshi jiao wo koyu.
Wang teacher teaches me oral-language
 Teacher Wang teaches me spoken Chinese. (Kate, T3.9, #1)

Table 6.4-1. *-de* (RC) in the "Sentence Link" task

Informant / Int -->	3 (wk 13)	4 (wk 16)	5 (wk 23)
Kate	1 / .14	1 / (1.)	2 / (1.)
Sharon	4 / 1.	1 / (1.)	3 / (1.)
Dave	8 / 1.	2 / (1.)	8 / 1.

Table 6.4-2. *-de* (RC) in the "Picture Pair" task

Informant / Int -->	4 (wk 16)
Kate	3 / (1.)
Sharon	6 / 1.
Dave	11 / 1.

Table 6.4-3. *-de* (RC) in conversation

Informant	Interview ->	1	2	3	4	5	6	7	8	9
		wk5	wk10	wk13	wk16	wk23	wk26	wk29	wk34	wk37
Kate	Imitation			0/0,*	0/(0.)	0/(0.)				
	Spontaneous									
Sharon	Imitation			7/1.	3/7.5	0/(0.)	nd			
	Spontaneous						nd	4/1.	2/(1.)	
Dave	Imitation			6 / 1.	11/1.					
	Spontaneous			15/1.	4 / 1.	6 / 1.	10/1.	6/1.	4/(1.)	3/(1.)

*The structural context was present but no imitation was performed.

nd = No data

Table 6.4-1 shows that Kate had great difficulties connecting two sentences in Interview 3 (wk 13). Six out of seven attempts resulted in misplaced *-de* (RC). The following is a typical example (3):

- (3) Prompts: 1) Baba kan shu; 2) Shu hen duo
 father see book *book very many*
 Father reads books There are many books

Kate: *Shu de baba kan hen duo (Kate, T3.6 #1)
 book RC father see very many

Correct:¹⁰ Baba kan de shu hen duo.
 father see CL book very many
 Father reads a lot of books.
 (or) The books that father reads are a lot.

Sentences such as (3) do not make sense in Chinese, yet, Kate produced them consistently in Interview 3 (week 13). A closer analysis showed that the structural output resembled the English relative clause except that the relative clause pronoun was replaced by *-de* (RC). This indicates that Kate's failure to construct a properly marked Chinese relative clause at this point was largely due to insufficient knowledge of the structure. Her

¹⁰There are other structural possibilities. For example,

Baba kan hen-duo shu. (Sharon, T3.5, #1)
baba read very-many book

Baba has read many books.

resort to English relative clause structure was clearly a production strategy to cope with the task at hand.

Neither Sharon nor Dave produced deviant relative clause structures with a misplaced *-de* (RC). They did not resort to the English structure either. However, Sharon was able to find more alternative ways to link two sentences, as demonstrated in the low quantity of relative clause tokens in Table 6.4-2. Dave managed to produce the relative clause structure consistently in both tasks and in conversation. Clearly, Dave was the most prolific of the three in relative clause production, and Kate was the least.

The results presented in the three tables above demonstrate that *-de* (RC) (and the relative clause) emerged in both Dave's and Sharon's interlanguage in Interview 3, week 13. Kate's total relative clause output in Interview 4 (week 16) met the emergence criterion: over two tokens in no less than four lexically varied contexts. However, if the "sentence link" task is disregarded for its questionable validity, then *-de* (RC) never emerged in Kate's samples, as there were only three tokens and contexts in the "picture pair" task and none in the conversation (see Tables 6.4-2 and 6.4-3).

However, inter-phrasal morphemes, such as English SV-agreement, form a "junction point between morphology and syntax" (Pienemann 1999:115). Likewise, the insertion of *-de* (RC) represents the development of a syntactic structure--the relative clause. According to Pienemann (1999:133), "the distributional evidence that is needed to decide whether a structure is productive in interlanguage *syntax* is quite different from the evidence needed for interlanguage *morphology*." A single instance of a sentence structure suffices to meet the emergence criteria for syntax, while multiple occurrences of a given morpheme in morphologically and lexically variant contexts are necessary to ascertain that the morpheme is not part of a monomorphemic chunk. On the basis of this principle, it is clear that *-de* (RC) (and the relative clause) emerged in Kate's interlanguage in Interview 4 (week 16), where a total of three relative clauses were produced in lexically varied contexts.

Table 6.4-4. *-de* (RC) in the "Picture Pair" task and conversation

Int. -->	1 wk 5	2 wk 10	3 wk 13	4 wk 16	5 wk 23	6 wk 26	7 wk 29	8 wk 34	9 wk 37
Kate			0/0.	3/6 ⁺	0/(0.)	0/(0.)			
Sharon			7/1. ⁺	9/9		nd	4/1.	2/(1.)	
Dave			21/1. ⁺	26/1.	6/1.	10/1.	5/1.	3/(1.)	3/(1.)

+ emergence point

Tables 6.4-4 shows that the relative clause occurred consistently after its emergence in the samples of Sharon and Dave. This was not the case in the sample of Kate. After Interview 4, (week 16), Kate did not produce a single relative clause. In fact, the relative clauses she produced were restricted to the tasks which provided explicit prompts, either oral or visual. The production was "pushed output," so to speak. As soon as the "push" was withdrawn, that is, as soon as the relative clause context was not supplied through tasks, no relative clauses were produced.

Even with the "push," relative clauses were, more often than not, absent (see Tables 6.4-1 and 6.4-2). For example, in response to the prompt in the "picture pair" task, Kate often used two simple sentences to complete the task. Example (4) below is a typical example:

Pictures: 1) a house with a garden; 2) a house with a swimming pool.

(4) Prompt: Ni xihuan na ge fangzi?
you like which CL house
 Which house do you like?

Kate: Wo xihuan yi ge fangzi. Zhe ge fangzi you yi ge
I like one CL house. This CL house has one CL
 xiao huayuan. (T4.2, #21-#22)
small garden.

I like a house. This house has a small garden.

During the conversation, Kate often opted out of the "imitation" situation, using instead "yes / no" (5) or repeating the verb (6) to answer questions.

(5) Q: Ni kai de che shi hong-de ma?
you drive RC car be red -ADJ Q-par
 Is the car you drive red?

Kate: Dui le. (Kate, T4.9, #8)
correct M-par
 Yes

(6) Q: Mama zuo de fan haochi ma?
mother make RC meal delicious Q-par
 Is the meal mother cooks delicious?

Kate: Haochi. (Kate, T3.9, #12)
delicious
Yes.

Alternative structures were also used to cope with the questions cast in the relative clause structure (7) (8).

(7) Q: Jiao ni koyu de laoshi jiao shemo mingzi?
teach you speaking RC teacher call what name?
What is the name of the teacher who teaches you oral Chinese?

Kate: Wang laoshi jiao wo koyu. (Kate, T3.9, #1)
Wang teacher teach I speech
Teacher Wang teaches me oral Chinese.

(8) Q: Baba zuo de fan haochi ma?
father make RC meal delicious Q-par
Is the meal father cooks delicious?

Kate: Mei, bu, ta zuo fan zuo de bu hao.
No(past), no, he make meal make- COMP not good
No, he does not cook well. (Kate, T5.6, #15.)

When imitation was attempted, *-de* (RC) was not copied (9). Dave and Sharon also opted out sometimes. After all, it is a natural response in natural conversation. The difference, however, was that Dave and Sharon also produced relative clauses spontaneously in conversation.

(9) Q: Shi zai Kanpeila mai de shoubiao ma?
be in Canberra buy RC watch Q-par
Did you buy it in Canberra?

Kate: *Meiyou, wo zai New York. (Kate, T4.9, #48-#49)
not have(past), I be in New York
*No, I in New York.

As mentioned before, Dave was the most prolific relative clause user of the three informants. He produced a wider range of relative clauses than Sharon and Kate. He relativized not only subject and object NPs (10) (11), as did Sharon and Kate, but also time constituents (12) and PPs (13), all of which were marked by *-de*(RC).

- (10) Palanka gei wo de yi shu hua haokan. (Dave, T4.2, #8)
Palanka give I RC one CL flower good-looking
 The bunch of flowers Palanka gave me is beautiful.
- (11) Gupo-de baba shi jiao hanyu de laoshi. (Dave, T3.3., #31)
Gupo-GEN father be teach Chinese RC teacher
 Gupo's father teaches Chinese.
- (12) Nin qu Brisbane de na yi tian wo ye chu-qu le.
you go Brisbane RC that one day I also go-out PFV
 I also went out the day you went to Brisbane. (Dave, T8.5, #25)
- (13) Zai shu shang gua-zhe de paizi (Dave, T6.2, #12)
be/at tree on hang-DUR RC board
 The board which hangs on the tree.

Apparently, the three informants were at different levels of *-de* (RC) development. Dave seemed to be the most advanced as he was able to use *-de* (RC) to mark a wide range of constituents as clausal modifiers. Kate, in contrast, was at the beginning of the developmental course for *-de* (RC). Evidence in Interview 4 (week 16) seemed to indicate that *-de* (RC) was emerging in Kate's IL grammar. Its subsequent absence in the data could be due to a number of factors, an issue which is explored in Chapter 7.

6.5. Classifiers

Classifiers (CL) are positioned between a numeral (ordinal and cardinal) or a demonstrative pronoun, and the head noun. However, this rule does not apply to nouns such as *tian* 'day,' *nian* 'year,' *fen* 'minute', age and frequency expressions. When both the numeral and the demonstrative pronoun are present in an NP, the word order is "demonstrative pronoun + numeral + classifier" as shown in (1). The classifier is optional in two contexts: after the demonstrative pronoun (2), and with time expressions involving *xiaoshi* 'hour,' *xingqi* 'week,' and so forth (3).

- (1) Wo hen xihuan na san ben zidian.
 I very like that 3 CL dictionary
 I like those three dictionaries.
- (2) Zhe (ge) xuesheng hen renzhen.
this (CL) student very attentive
 This student is attentive.

- (3) Wo xue -le 10 (ge) xiaoshi / xingqi.
 I study-PFV 10 (CL) hour / week.
 I (have) studied for 10 hours / weeks

Tables 6.5-1 to 6.5-3 display the distribution of the classifier in a number of structural environments produced by the informants, including the three main environments: the numeral (num-CL), the demonstrative pronoun (demo-CL), and the combination of the two (demo-num-CL). Optional contexts are not listed separately. The "other-CL" refers to contexts other than the three above. The "0-CL" covers contexts in which the classifier occurs without the numeral or the demonstrative pronoun. The "over-application" at the bottom of each table is aimed at documenting classifiers used in non-classifier contexts, such as in NPs which contain a head not annotated for a classifier (e.g., *tian* 'day,' *nian* 'year' *fen* 'minute').

Table 6.5-1. Distribution of classifiers: Kate

Interview->	1 wk 5	2 wk 10	3 wk 13	4 wk 16	5 wk 23	6 wk 26	7 wk 29	8 wk 34	9 wk 37
num-CL		2/(1.)	9/1.	26/1.	15/1.	18/.95	4/.80	12/1.	4/1.
num-0		0/(0.)	0/0.	0/0.	0/0.	1/.05	1/.20	0/0.	0/0.
demo-CL		1/(1.)	2/(1.)	12/1.	1/(1.)	3/(1.)	2/(1.)	4/1.	
demo-0		0/(0.)	0/(0.)	0/0.	0/(0.)	0/(0.)	0/(0.)	0/0.	
demo-num-CL									
demo-num-0									
other-CL		0		1 next- week					
0-CL		*1 pants		0					
over-application					2 minut frequ- ency		1 day		

* Acceptable in context

Table 6.5-2. Distribution of classifiers: Sharon

Interview->	1 wk 5	2 wk 10	3 wk 13	4 wk 16	5 wk 23	6 wk 26	7 wk 29	8 wk 34	9 wk 37
num-CL		12/1.	5/.83	5/..83	13/1.	nd	6/(1.)	14/.93	7/.78
num-0		0/0.	1/.17	1/.17	0/0.		0/(0.)	1/.07	2/.22
demo-CL		6/1.*		11/1.	3/1.	nd	1/(1.)	10/1.	
demo-0		0/0.		0/0.	0/0.		0/(0.)	0/0.	
demo-num-CL									
demo-num-0									
other-cl				1 pre- vious- week				0	
0-CL				1 envelop				2 coffee	
over application					1 two CLs	nd	1 page	1 frequ- ency	

*Non-productive instances.

Table 6.5-3. Distribution of classifiers: Dave

Interview->	1 wk 5	2 wk 10	3 wk 13	4 wk 16	5 wk 23	6 wk 26	7 wk 29	8 wk 34	9 wk 37
num-CL		1/(1.)	11/1.	14/1. cardi- nal	3/1. every	10/1. cardi- al, every	11/1.	8/1.	4/1.
num-0		0/(0.)	0/0.	0/0.	0/0.	0/0.	0/0.	0/0.	0/0.
demo-CL		7/.44*	0/0.	12/.71		2/(1.)	7/1.	7/.88	
demo-0		9/.56	7/1.	5/.29		0/(0.)	0/0.	1/.12	
demo-num-CL			4/1.	1/(1.)	2/(1.)	3/(1.)		1/(1.)	
demo-num-0			0/0.	0/(0.)	0/(0.)	0/(0.)		0/(0.)	
other-CL					2 pre- vious- week		2 next- week	2 next- week	2 previous -week
0-CL		2 picture	1 maga- zine		0		0	0	0
over-application		4 day	1 day			1 time			

*Non-productive instances.

In the first structural context "numeral-classifier-noun," the insertion of the classifier by the informants was fairly consistent throughout the observation period. There were a few non-insertions, mainly in the samples of Kate and Sharon (see examples (4) (5) (6)).

Some of these could be due to less well developed analysis of non-prototypical numerals. Example (4) is a case in point. The numeral *ban* 'half' is not as prototypical as "one" or "two," and therefore, might not have been annotated yet for the "numeral" value in Kate's L2 mental lexicon.

In example (5), the function of the classifier as a pro-form for the noun had not been developed. The classifier was syntactically "neutral" or closer to the noun than to the numeral, and was applied only when the head noun was overtly present. This analysis is supported by some of the instances of "over-application" in the data, an issue to be discussed shortly.

- (4) ...ban ___ Yidali (Kate, T6.5, #10)
 ...half Italy
 ...half Italian

- (5) Q: Ji ge?
 how many CL
 How many?

Sharon: Shi-er ___ (Sharon, T3.9, #28)
 twelve
 Twelve

- (6) Di yi ge xingqi wo xuexi shi-san ___ (en) Zhongguo++ zi.
 First CL week I study thirteen (en) China ++ word
 The first week I learned 13 Chinese words. (Sharon, T4.4, #1)

In the second structural context -- "demonstrative pronoun + classifier + noun," both Kate and Sharon followed the insertion rule faithfully. Dave, however, seemed to favor the optional rule initially. There were more instances of classifier omission than insertion in his samples of Interview 2 (week 10) and Interview 3 (week 13). The distributional tables also show that rule application in this context was well developed in the interlanguage of both Sharon and Dave in Interview 2 (week 10), with an insertion rate of 100% and 44% respectively. However, a closer examination of the data reveals that the six classifier insertions by Sharon and seven by Dave in Interview 2 (week 10) would not have occurred without corrections from the interviewer (see example (7) below). At this point, in Interview 2 (week 10), the "demonstrative pronoun" context was non-productive in the interlanguage of any of the informants.

- (7) Dave: Zhang hua (Dave, T2.5, #1)
 CL picture
 picture
- R: zhe
 this
 this
- Dave: (oh) Zhe zhang zhe zhang hua (en)...
 (oh) This CL this CL picture (en)...
 (oh) This picture (Dave, T2.5, #2)

The third structural context "demonstrative pronoun + numeral + classifier + noun" was present only in Dave's data. It first occurred in Interview 4 (week 16), but there were no lexical variations. Every instance of this structure in Interview 4 and Interview 5 was *zhe yi ge X*, 'this one CL. X, 'this X.' Variations appeared in Interview 6 (week 26), signaling the beginning of the structure being productive. Not only did Dave produce the classifier in more structural contexts than Kate and Sharon, his samples exhibited more variations. For example, in the "numeral" context, he used ordinal numbers, cardinal numbers and the quantifier *mei* 'every.'

Finally, the "other-CL" context was limited to two set phrases: *shang ge xingqi*, up CL week 'last week,' and *xia ge xingqi*, down CL week 'next week.' However, classifier over-application occurred in the samples of all three informants. One type of over-application seemed to have resulted either from less well developed annotation of the head noun or less well developed on-line processing. In Chinese, not every noun permits a classifier in the presence of a numeral or a demonstrative pronoun. As mentioned at the beginning of this section, time words such as *tian* 'day,' *nian* 'year,' *fen* 'minute,' frequency expressions and so on do not permit a classifier. Yet these lexical items occasionally attracted the classifier in the data (4 for Kate, 3 for Sharon, and 6 for Dave). Such instances belonged to the minority and indeed, the classifier was omitted with most of these NPs. The fluctuation represents a normal interlanguage behavior during the learning process when each and every lexical item in the target language must be analyzed for its semantic and syntactic features, and their processing during speech production goes from less developed and controlled to developed and automatic.

The second type of over-application was structural. The classifier occurred with the nominal head but without the numeral or the demonstrative pronoun (1 for Kate, 3 for Sharon, and 3 for Dave), as shown in (8) and (9). These structural aberrations indicated that the classifier was instigated by the noun rather than the numeral or the demonstrative

pronoun. Given that NPs containing a numeral / demonstrative pronoun and a classifier but not a head noun were never produced, this hypothesis was not entirely implausible.

- (8) *Zhang hua (Dave, T2.5, #1)
CL picture
(the) picture
- (9) *Wo xihuan zuobian-de feng xin. (Sharon, T4.2, #11)
I like left -ATT CL letter
I like the letter on the left.

These two types of over-applications, though few in number, may provide evidence for the developmental state of the classifier in the interlanguage of the informants. It was fairly obvious that each and every noun was being analyzed for the classifier feature, and that this analysis was not complete for some of the nouns. Furthermore, the syntactic function of the classifier as a pro-form for the head noun was not yet developed in the interlanguage of the informants. If it had been developed, the NP containing "numeral + CL" would have occurred since ample contexts were present in the tasks and it is a frequent form of NP in the speech of native Chinese speakers.

The developmental path of the classifier revealed in the distributional tables (Tables 6.5-1 to 6.5-3) is clear. If non-productive instances are disregarded, the classifier emerged strongly in the interlanguage of Sharon and Dave in Interview 2, week 10, and in that of Kate three weeks later. The classifier started in the "numeral" context, and soon made its way into the "demonstrative pronoun" context (Interview 4 in Kate and Sharon, Interview 3 in Dave). The "demonstrative pronoun + classifier" context was about to emerge in Dave in Interview 6 (week 26). Table 6.5-4 summarizes the gradual emergence of the classifier in these contexts.

Table 6.5-4. Emergence point of the classifier

Informant	Int. ->	1	2	3	4	5	6	7	8	9
		wk 5	wk 10	wk 13	wk 16	wk 23	wk 26	wk 29	wk 34	wk 37
Kate	num-CL			+						
	demo-CL				+					
	num-demo-CL									
Sharon	num-CL		+							
	demo-CL				+					
	num-demo-CL									
Dave	num-CL			+						
	demo-CL				+					
	num-demo-CL			+						

The analysis above has focused on the structural development of the classifier. As far as the form of the classifier is concerned, *ge* was used most frequently, often substituting for other classifiers. Apparently, it was easier for the learners to acquire the grammatical function of the classifier than the form, which is noun-specific in most cases (Li & Thompson 1981) and must be learned individually in relation to every noun. The situation is not unlike that of the gender feature in German nouns, an "idiosyncratic diacritic feature...the value of which has to be acquired individually for every lexical entry" (Pienemann 1999:159).

6.6. *-de* (COMP)

-De (COMP) is a verb suffix. The *V-de* (COMP) sub-categorizes for verb complement (VCOMP), as shown in the following scheme (1). (For details, see Section 4.2.2.1).

(1) chang-de: V, PREL 'CHANG-DE <(SUBJ)
(VCOMP)>'

Ta chang-de hen hao.
He sing -COMP very good
He sings well.

-De (COMP) was introduced to the informants in Interview 3, week 13, and was first elicited in Interview 4, week 16. The distribution of *-de* (COMP) is displayed in Tables 6.6-1 to 6.6-3. Three structural contexts are listed in the tables: the target language "V-

de" structure, the verb complement structure without the *-de* (COMP) marker ("V-0"), and the same structure with a marker other than *-de* (COMP).

6.6-1. Distribution of *-de* (COMP): Kate

Interview->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
V- <i>de</i>				12/1.	4/1.	4/1.			
V-0				0/0.	0/0.	0/0.			
V-other									

6.6-2. Distribution of *-de* (COMP): Sharon

Interview->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
V- <i>de</i>				13/.93	2/(1.)	nd	4/.80	2/(1.)	
V-0				1/.07	0/(0.)		0/0.	0/(0.)	
V-other							1/.20		

6.6-3. Distribution of *-de* (COMP): Dave

Interview->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
V- <i>de</i>				15/.83	1/(1.)	2/(1.)		4/.57	2/(1.)
V-0				1/.06	0/(0.)	0/(0.)		3/.43	0/(0.)
V-other				2/.11					

The tables show that all three learners acquired *-de* (COMP) soon after it was taught. The samples from Kate were most target-like, without any misapplications. They were also the most limited, occurring only when the context was provided in the tasks and in conversation. Kate was not inclined to create contexts, a characteristic of her throughout the interviews.

Both Sharon and Dave had some aberrations in rule application, although the number was small. Both, at some point, used the perfective marker *-le* (PFV) in the context of *-de* (COMP) as examples (2) and (3) show. At first glance, it is difficult to decide whether the substitution was due to phonological proximity of the two forms (*le* and *de*), or whether it was the result of functional confusion since both forms could mark a past event.

On closer examination, it was found that in Dave's data, the two *-le* (PFV) tokens in the verb complement occurred with the time reference for habitual actions (see (2) and (3)).

6.7. Aspect Markers

Aspect markers are the grammatical realization of temporal semantics. Over the years, a growing body of research has investigated the development of (tense)-aspect morphology in second language acquisition (see Bardovi-Harlig 1999 for an overview). In the following, a brief summary of the major research paradigms and findings is presented. This will serve as the background to the investigation of the development of Chinese progressive and experiential aspect markers in the interlanguage grammar of the three informants.

Two major research paradigms have been developed to guide the scholarly work in the acquisition of grammatical aspect: the form-oriented approach and the meaning or concept-oriented approach (Bardovi-Harlig 1999). The form-oriented approach first identifies a particular form and then examines its distribution in the interlanguage, thereby determining its functional role in the interlanguage system. The meaning/concept-oriented approach, on the other hand, first identifies a concept, such as the progressive, and investigates how it is expressed linguistically in the grammar of the interlanguage. While differing in focus and analytic methodology (more quantitative in the former and more qualitative in the latter), both approaches are characterized by their attention to the relation of form and meaning (Bardovi-Harlig 1999, also Long and Sato 1984).

Concept-oriented studies of six target European languages (Dutch, English, French, German, Italian, Swedish) have found that the development of the temporal marking system "exhibits a sequence from pragmatic to lexical to grammatical devices" (Bardovi-Harlig 1999:350, Dietrich et al. 1995, Giacalone Ramat and Banfi 1990). The beginning learners use discourse principles such as chronological order and scaffolding to indicate temporal meaning (Meisel 1987, Schumann 1987). Time adverbials such as position (*now, at six o'clock*), duration, frequency and contrast (*already, yet*) are employed next for temporal reference, while verbs remain morphologically unmarked or in the "base" form (Klein 1993, 1994, Meisel 1980). The verbal morphology appears after the adverbials, unsystematically at first, and learners continue to rely on time adverbials (Meisel 1987, Schumann 1987). It is only with the increasing use of tense morphology that the time adverbials decrease and gradually give way to grammatical morphology for temporal marking (Bardovi-Harlig 1992).

The form-oriented studies, by definition, begin the investigation at the last stage of the meaning-oriented studies, namely verbal morphology.¹ Many of them draw on theories of inherent, or lexical aspect, categorizing verbs according to their inherent temporal

¹Bardovi-Harlig (1999:353) further divided the form-oriented analyses into two groups according to the function that they investigate, as "markers of lexical aspectual category and discourse organization." The present brief review will not cover the discourse function.

makeup (e.g., dynamic, stative, punctual, etc.) and examining the distribution of aspectual markers in these lexical categories. Some of the findings are (Bardovi-Harlig 1999:359):

a) the progressive marker tends to occur first with predicates of activities (verbs with inherent duration without specific end point, e.g., *sleep, study*);

b) the (perfective) past marking is first applied on predicates of achievements (verbs which capture the beginning or end of an action, e.g., *begin, end*) and accomplishments (verbs with inherent duration but having an end point, e.g., *build*), and it gradually spreads to verbs of other categories.

The early morphological forms in L2 may not mark the function as they do in the target language (Johnston 1997, Pienemann 1999). In general, form precedes function in acquisition (Klein 1994, Bardovi-Harlig 1999).

Toward the end of her overview article, Bardovi-Harlig stated, "[t]here have been no second language studies of adult learning languages with aspectual systems such as Chinese ..." (1999:371). The observation was constrained most certainly by Bardovi-Harlig's inability to read publications in Chinese or by the non-availability of such publications to her, for there have been studies on the acquisition of Chinese perfective, durative (or stative), and experiential aspectual markers (see review in Chapter 4). Unfortunately, all but one study (Sun 1999) are target language oriented and focus on error analysis. The interpretation and conclusion are accuracy-based.

The following description of the developmental course of the two Chinese aspect markers will employ the analytic approaches of both form and concept-oriented research paradigms. It starts with the concept-oriented analysis, investigating what linguistic devices the learners used to mark the progressive and experiential aspects before the grammatical marking appeared. Form-oriented analysis is then employed to examine the distribution of the aspect markers in various semantic, structural, and lexical contexts. In this way, the point of entry for the rule into the interlanguage grammar, and possibly the path of the rule development, can be identified.

Before the analysis begins, it is necessary to clarify the practical issue of how to determine the aspectual context in relation to the relative frequency of rule application.

The notion "aspect" is largely conceptual in nature. When to use progressive or perfective aspect in the description of an action depends on the speaker's view of the action (Comrie

1976, Jacobs 1995). For this reason, aspect is also sometimes labeled as "viewpoint" aspect (Smith 1983). Consequently, the same situation or task presented to two speakers may result in differential markings due to differential viewpoints of the speakers toward the action. A good example is found in Task 5.2. The task required the informants to describe a set of pictures, and to relate each picture to their own experience. The following three examples are the first utterances from the informants in response to a picture.

Picture 1: At doctor's office. A few students are being examined by the doctors. Some are at the back and one at the front.

(1) Kate: Gupo kanbing. (Kate, T5.2, #1)
Gupo see-illness
 Gupo visits a doctor.

(2) Sharon: Zhe zhang hua, ta qu kan daifu. (Sharon, T5.2, #1)
this CL picture, he go see doctor
 In this picture, he goes to see a doctor.

(3) Dave: *Zhe xuesheng-men zhengzai kan daifu ne.
this student -PL PROG see doctor PROG
 *This students are visiting a doctor. (Dave, T5.2, #1)

The examples show that the three informants viewed the situation depicted in the picture in three different ways. Dave was focusing on the action-in-progress (3), while Sharon was attending to the general situation of "seeing a doctor" (2). Kate seemed to view the situation as a general fact (1). The difficulty is that one does NOT know for certain if the informants indeed viewed the picture the way indicated in their output. The interpretation of how Dave, Sharon and Kate viewed the picture is dependent entirely upon what they produced and what aspect markers were or were not used. This means that in the analysis employing token counts and relative frequency, the decision to reward Dave for marking the progressive aspect and penalize Kate for not doing so, or vice versa, cannot but rely upon a) the native speakers' performance on the same task, and b) the researcher's intuition. In the current study, both methods are employed to determine the overall rule application context: the actual number of aspect marker insertions is assessed against the total number of possible contexts on the basis of the performance of the native Chinese and/or the researcher's intuition when native-speaker data is not available.² Simply taking the output of the marker at its face value, i.e., regarding it as true representation of the

²Presumably, many studies on the acquisition of tense-aspect system of a second language relied on the intuition of the native speaker, i.e., the researcher him/herself. Bardovi-Harlig's overview (1999) of the field was conspicuously silent on the analytical basis of the findings in both form and concept-oriented approaches.

con. pual structure, would mean no difference between possible occurrence and actual occurrence. The relative frequency of the progressive marker insertion would have been 100% in every case. Methodologically, this is not satisfactory.

In some cases, discourse and linguistic context would exercise constraint on the output (e.g., the answer to a question about one's past experience must minimally contain the verb and the experiential of perfective marker). In the context of Task 5.2, both Dave and Sharon's utterances were functionally appropriate whereas Kate's was questionable. In the analysis one token was counted against one context for Dave (1/1.), zero token against one context for Kate (0/0.), and neither the token nor the context was counted for Sharon because neither was present.

6.7.1. *zhengzai-* (PROG)

The progressive marker *zhengzai-* (PROG), including its variants, was taught in week 12. From week 13 (Interview 3) onwards, it was elicited through pictures depicting various actions, e.g., people sleeping, drinking, talking on the phone, writing, teaching, dancing, etc. As complement to the pictorial cues, the instruction for the picture description tasks was delivered in English in the progressive aspect ("Please describe / tell me what these people are doing in these pictures"). A few of the tasks were trialed on native speakers of Chinese and the progressive marker was invariably used in the description. The tasks proved to be natural as well as effective in eliciting the progressive marker. Other types of tasks were also used, for example, making up a story based on a series of drawings (T6.4), a role-play of "surveillance" (T7.2), and on-line description of a video clip (T8.2). These tasks were not designed to probe the progressive aspect *per se*, but the progressive context was potentially present.

The result of the data analysis is displayed in Table 6.7.1-1. The progressive marker tokens and their relative frequency are shown before and after the slash "/". Brackets indicate less than four progressive contexts. Empty cells stand for no evidence of context. It must be pointed out that the progressive aspect marker *zhengzai-* (PROG) and its variants were never applied in non-progressive contexts.

Table 6.7.1-1. Development of the progressive marker

Int. -->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
Kate		0/(0.)	0/0.	2/13 ⁺	2/29	0/0.	3/38	0/(0.)	
Sharon		0/(0.)	8/42 ⁺	4/40	1/25	nd	2/29		0/(0.)
Dave			9/50 ⁺	19/95	7/78	1/(1.)	1/17	9/90	

+ the emergence point.

The table shows that before classroom instruction of the progressive aspect in week 12, the progressive context was created by Kate and Sharon (Interview 2, week 10). However, the marker itself was not used, nor were time adverbials (see (4) and (5)). Kate and Sharon simply produced the base form of the verb to describe the pictures. This is to be expected as the learners had no *a priori* knowledge of how the target language represents progressive semantics linguistically.

Task 2.5: Picture description. Two girls and one boy are sitting on the ground, chatting. One of the girls is holding a cup in her hand.

(4) Dingyun he kafei. (Kate, T2.5, #8)
Dingyun drink coffee
Dingyun drinks coffee.

(5) Zhe zhe zhang hua Dingyun he cha. (Sharon, T2.5, #9)
this this CL picture Dingyun drink tea
In this picture Dingyun drinks tea.

Zero marking of the progressive context disappeared from Sharon's samples after the instruction in week 12, but it persisted in Kate's for three more weeks (see table 6.7.1-1). Time adverbs were not extensively used in the progressive context with or without the progressive marker. Both Kate and Sharon used the adverb *xianzai* 'now' once in Interview 7 (week 29). The surprise was that neither Kate nor Sharon applied a single progressive marker in the "picture description" tasks, tasks which provided the progressive context most directly and explicitly.³

Compared to Sharon and Dave, Kate's overall marking was low. The number of progressive tokens was between zero, two and three, or less than 40%. Kate seemed to prefer not to insert the progressive marker. Furthermore, the progressive markers which did occur were largely "pushed output." In Interview 4 (week 16), the two tokens occurred in a task which provided three sets of pictures of contrasting aspects: modal, progressive and perfective (6). Although the two tokens in Interview 5 (week 23) were contained in the task prompt (see (7) and (8)), the IL forms produced by Kate were not the exact copy of the forms in the prompt. All this shows that Kate was capable of marking the progressive context only when it was absolutely necessary, as in example (6). Examples (7) and (8) demonstrate her skill in making categorial distinctions between

³Similar learner behavior was noted by Nunan (1997). One subject in his data did not produce a single present continuous marker in the task designed for it, yet she did in other tasks not designed to probe the marker.

the grammatical morpheme *zai* (PROG) and the verb *zai* (be in/at). The low insertion rate was, therefore, was not due to her lack of proficiency or knowledge of progressive aspect in Chinese interlanguage. It was largely a production strategy, an issue which will be discussed in Chapter 7.

(6) Picture set 1:

- 1a) next to a man's head is a bubble in which there is a hamburger;
- 1b) a man is eating a hamburger;
- 1c) empty plates in front of a man.

Kate: Ta xiang chi-fan.
he think eat-meal.

He wants to eat.

Ta zhengzai chi-fan ne.
he PROG eat-meal PROG

He is eating.

Ta chi-le (oh) chi-le chi-le fan.
he eat -PFV (oh) eat PFV eat - PFV meal

He has eaten.

(Kate, T4.7, #4, #5, #6).

- (7) Prompt: a) Zhe shi Meiguo -ren. b) Ta zai ban qianzheng.
this be American-person. he PROG make Visa
This is an American. He is applying for Visa.

Kate: Meiguo -ren zhengzai ban qianzheng.
American-person PROG make Visa

The American is applying for Visa. (Kate, T5.3, #5)

- (8) Prompt: a) Gupo xihuan Aodaliya-ren. b) Aodaliya-ren zai chang-ge
Gupo like Australia-person. Australia-person PROG sing-song
Gupo like the Australian. The Australian is singing.

Kate: Gupo xihuan de Aodaliyaren zhengzai chang-ge.
Gupo like RC Australian PROG sing-song

The Australian Gupo likes is singing. (Kate, T5.3, #7)

Table 6.7.1-1 shows that Dave marked the progressive context fairly consistently as soon as the grammatical marker was taught. The suppliance rate was high except in Interview 7 (week 29) where only one out of potentially nine progressive contexts was marked. Further examination of the data revealed that there were in fact twelve tokens of the progressive morpheme *zhengzai* -(PROG) in Interview 7 (week 29). Eleven of these occurred in the sentence initial position instead of after the verb. And four of the eleven utterances expressed progressive semantics. An example is given in (9). Dave was not alone in this. Sharon also produced *zhengzai* -(PROG) once in the sentence initial position, as example (10) shows. The question is whether the form *zhengzai* in these cases was meant to be a progressive marker, a mis-placed one at that, or whether it was phonological deviation of the adverb *xianzai* 'now' since the two are phonetically close, and *xianzai* 'now' was often placed in the sentence initial position by Dave (11). If the latter case was true, then the progressive context was not marked in these instances.

- (9) ?Zhengzai ta shang shan. (Dave, T7.2, #21)
 (now?) he ascend mountain
 (Now) he climbs the mountain.
- (10) ?Zhengzai ta ta ta zai ta zhengzai da diangua+ne.
 (now?) he he he PROG he PROG make phone +PROG
 (Now) he is making a phone call. (Sharon, #4.2, #10)
- (11) Xianzai ta yao shuijiao le. (Dave, T7.2, #1)
now he FUT sleep PFV
 Now he is going to sleep.

Another form *jianzai* (a nonsensical form) also occurred in the sentence initial position in Dave's samples (12). The form is phonetically similar to both *xianzai* 'now' and *zhengzai*-(PROG). It occurred once, but in the progressive context marked by *ne*(PROG), a sentence final variant of the progressive marker (see (9)). It seems that there certainly was some degree of phonological confusion in the interlanguage of Dave and, to some extent, in that of Sharon. However, it is not possible to precisely determine the exact functional status of the sentence-initial form *zhengzai* without further data from Dave. Unfortunately, it is not possible to collect more data or conduct an interview with him at this point.

- (12) ?Jianzai ta qichuang qichuang ne. (Dave, T7.2, #5)
 (?) he get-up get-up PROG
 (Now?) he is getting up.

In terms of verb types which were marked by the progressive marker, there were 7 in Kate's data, 14 in Sharon's and 34 in Dave's. Dave also used more variants of the progressive marker (*zhengzai...ne, zhengzai, zai, ...ne*) than Kate and Sharon, who produced *zhengzai-* (PROG) most of the time. The behavior seems consistent with the general characteristic of the informants: Kate being the most restrictive and Dave the most "adventurous".

Once the progressive form emerged in the interlanguage of the informants (Interview 3 for Sharon and Dave, and Interview 4 for Kate), two questions remain to be investigated:

- a) in what lexical and temporal environment was the form first applied?
- b) what was the pattern of spread to other environments?

To answer these questions, a distributional analysis was performed and the results are shown in Tables 6.7.1-2 to 6.7.1-4. The tables set out three types of context. First, the temporal context: whether the time reference in the utterances was present or past. This was largely established on the basis of task features, time expressions, and the local context of talk in the interview. The second context was the semantic aspect: whether progressive semantics was present. Finally, the temporal make-up of lexical verbs, or the lexical aspect of the verbs was specified: whether the verbs were activity verbs (those which have inherent duration, no specific end point and atelic), event verbs (those which have the beginning or the end of an action, and are durative like activity), or state verbs (those which persist over time without change) (Bardovi-Harlig 1999:358). In the tables, the presence of the feature / context in the data is indicated by a plus sign "+". The absence of the context is not marked unless it is stressed. In that case, a minus sign "-" is used.

Table 6.7.1-2. Distribution of the progressive marker: Kate

Context / Interview ->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
time ref, present		+	+	+	+	+	+	+	
time ref, past		-	-	-	-	-	-	-	
aspect: progressive		+	+	+	+	+	+	+	
aspect: other		-	-	-	-	-	-	-	
verb, activity +PROG		-	-	2	2	-	2	-	
verb, event +PROG		-	-	-	-	-	1	-	
verb, state +PROG		-	-	-	-	-	-	-	

Table 6.7.1-3. Distribution of the progressive marker: Sharon

Context / Interview ->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
time ref, present		+	+	+	+	nd	+		+
time ref, past		-	-	-	-	nd	-		-
aspect: progressive		+	+	+	+	nd	+		+
aspect: other		-	-	-	-	nd	-		-
verb, activity +PROG		-	8	4	1	nd	1		-
verb, event +PROG		-	-	-	-	nd	1		-
verb, state +PROG		-	-	-	-	nd	-		-

Table 6.7.1-4. Distribution of the progressive marker: Dave

Context / Interview ->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
time ref, present			+	+	+	+	+	+	
time ref, past			-	-	-	-	-	-	
aspect: progressive			+	+	+	+	+	+	
aspect: other			-	-	-	-	-	-	
verb, activity +PROG			8	19	7	1	-	5	
verb, event +PROG			-	-	-	-	1	3	
verb, state +PROG			-	-	-	-	-	1	

The distribution analysis shows that the progressive marking never occurred in non-progressive aspect (e.g., perfective, experiential) or with past time reference. In all three distributional tables, the marker first occurred in the present time context with activity verbs. The activities were singing, sleeping, waiting, showering, dancing, reading, etc. Verbs of event appeared for the first time in Interview 7 (week 29), e.g., getting up, going out, turning on the radio, etc. There is one instance of progressive marking on the state verb (10), but the single case could have been a fortuitous hit or a verbless sentence.⁴

- (10) Ta zheng-zai classroom li. (Dave, T8.3, #11)
 he PROG-be-in/at classroom in
 He is in the classroom right now.

⁴When the main verb of a sentence is the locative *zai* 'be in/at,' the progressive marker could be *zheng* (PROG) instead of *zhengzai*-(PROG).

The developmental path of the progressive aspect rule in Chinese seems to be consistent with the hypothesized path in the literature: the rule is more sensitive to the process aspect of the action as represented by activity and event verbs than to the state of an action, symbolized by the state verb (Andersen and Shirai 1996, see also Ard and Gass 1984). Within the process aspect of the action, activity verbs are more favored with progressive marking than event verbs. However, the present study has captured only the earliest stage(s) of the rule development. The few tokens of the event and state progressive marking could only serve as indications of the direction of subsequent rule development.

6.7.2 *-guo* (EXP)

The experiential marker *-guo* (EXP) is used to emphasize an experience which took place in the past, whether it was action or state (Sun 1999; also see Chapter 4). Impervious to the lexical aspect of the verb (Sun 1999), the marker can be suffixed to practically any verb to stress the fact that the action or state denoted by the verb happened at least once and that it is no longer the case (Fang 1996, Li and Thompson 1981, Chao 1968). According to Sun's (1999) study of formal Chinese language learners (see Chapter 3), the acquisition of *-guo* (EXP) starts relatively late, usually in the second semester. It tends to occur with relatively fewer verbs compared to other aspect markers. Learners misuse the marker extensively at the beginning.

Table 6.7.2-1 is a statistical summary of *-guo* (EXP) insertion by the informants. Both the token of the marker (before the slash) and its rate of insertion (after the slash) are displayed in the table. As usual, the brackets indicate less than four rule application contexts, and empty cells stand for absence of experiential context in the given samples.

Table 6.7.2-1. The development of *-guo* (EXP)

Interview->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
Kate					1/1.79 ⁺	2/1.50*			
Sharon				0/(0.)	2/1.12 ⁺	nd	1/(1.)	4/80	
Dave					15/1.75 ⁺	3/1.60	2/(.67)	2/(1.)	

*The marker was not suffixed to the verb, but to the negator *mei* 'not'
+ the emergence point

The table shows massive production of the experiential marker by Kate and Dave in Interview 5 (week 23), apparently in response to the task "relating one's experience to the pictures." However, the same task effect did not touch Sharon. In compliance with the requirement, Sharon described her normal, everyday experiences rather than "once-upon-a-time" experience. When her everyday experiences disagreed with the pictures, negation in the perfective aspect was used. The following is a typical example (1)

(1) Picture 2: People on the airplane.

*Zai zhe zhe zhang hua, tamen qu tamen zuo feiji qu Zhongguo.
in this this CL picture, they go they sit plane go China.

In this picture, they go to China by plane.

?Wo mei qu Zhongguo, keshi wo changchang qu Yinduguo.
I not(PFV) go China, but I often go Indonesia.

I did not go to China, but I often go to Indonesia.

Wo changchang zuo feiji qu Yinduguo.
I often sit plane go Indonesia.

I often go to Indonesia by plane. (Sharon, T5.2, #6, #7-#7.1, #8)

The utterance marked by a question mark at the beginning is formally grammatical. However, in the context of the discourse, there is something functionally inappropriate about a perfective for experiential substitution. She was expressing her experience ("I have never been to China") in factual terms ("I did not go to China"). Due to the different conceptualization of the task situation, the possible experiential contexts were reduced by more than half in Sharon's data. Consequently, most of the experiential contexts were obtained in conversation where the interviewer asked Sharon questions about her past experiences. In answering the questions, Sharon often failed to copy the marker *-guo* (EXP) in the question. In later interviews, imitative copies took place (1 in Interview 7 and 3 in Interview 8), but not spontaneous production of the marker.

Once more, Dave was the most prolific of the three informants. He produced experiential contexts rather consistently after the initial peak production in Interview 5 (week 23).

Table 6.7.2-1 also shows that the overall production of *-guo* (EXP) was rather limited compared to other grammatical morphemes. There seemed to be few experiential contexts, which led to few occurrences of the marker *-guo* (EXP). Interview 5 (week 23) provided the opportunity for the learners to apply the *-guo* (EXP) rule, hence, its emergence. However, the limited semantic function of the marker in the Chinese language as a whole, and the restricted range of communicative contexts in the interviews in particular, did not sustain consistent production of sufficient experiential context in subsequent interview sessions.

The point of emergence having been determined (Interview 5, week 23 for all three informants), it is time to investigate the manner of *-guo* (EXP) development. The three distribution tables below (6.7.2-2 to 6.7.2-4) are set up for each of the three informants. The functional and structural contexts for morpheme insertion are specified in the following categories: time reference (present and past), aspect (experiential and perfective), and verb suffixes (*-guo* (EXP), *-le* (PFV), *-guo...le* (PFV)). The row at the bottom refers to suffixation to lexical categories other than the verb. The plus sign "+" stands for the presence of the context, and the minus sign "-" the absence of the context when it is emphasized. Otherwise, no sign is given. The token of the suffix is represented by the numeral.

Table 6.7.2-2. Distribution of *-guo* (EXP): Kate

Context / Int. -->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
time ref. present					-	-			
time ref. past					+	+			
aspect: experiential					+	+			
aspect: perfective					-	-			
verb <i>-guo</i> (EXP)					11	0			
verb <i>-le</i> (PFV)					0	1			
verb <i>-guo-le</i> (PFV)					0	0			
other <i>-guo</i> (EXP)*					0	2			

*"Other" = negative marker *mei* 'not.'

Table 6.7.2-3. Distribution of *-guo* (EXP): Sharon

Context / Int.-->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
time ref. present				-	-	nd	-	-	
time ref. past				+	+	nd	+	+	
aspect: experiential				+	+	nd	+	+	
aspect: perfective				-	-	nd	-	-	
verb <i>-guo</i> (EXP)				0	2	nd	1	4	
verb <i>-le</i> (PFV)				-	3	nd	-	-	
verb <i>-guo-le</i> (PFV)				-	-	nd	-	-	
other <i>-guo</i> (EXP)				-	-	nd	-	-	

Table 6.7.2-4. Distribution of *-guo* (EXP): Dave

Context / Int.-->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
time ref. present					-	-	-	-	
time ref. past					+	+	+	+	
aspect: experiential					+	+	+	+	
aspect: perfective					-	-	-	-	
verb <i>-guo</i> (EXP)					15	3	2	2	
verb <i>-le</i> (PFV)					0	0	0	0	
verb <i>-guo-le</i> (PFV)					5	2	1	0	
other <i>-guo</i> (EXP)*					-	-	-	-	

The distributional tables show that the experiential marker was never used in the context where the time reference, either covert or overt, was present. It never occurred in the perfective context either. However, the reverse was not true. The perfective marker *-le* (PFV) was sometimes produced in the experiential context, as shown in examples (1) and (2).

- (1) ?Wo wo chi-le Zhongguo fan. (Sharon, T5.6, #31)
I I eat-PFV China meal
 I ate / have eaten Chinese food.
- (2) *Yiqian wo qu-le hen duo. (Kate, T6.6, #33)
before I go-PFV very many
 In the past, I went / have been there many times.

The "conflict" between *-le* (PFV) and *-guo* (EXP), such as that found in (1) and (2), has been reported in the literature. In a longitudinal study of the acquisition of the perfective *-le* (PFV) and modal particle *-le* (MP) by two English-speaking learners of Chinese, Sun (1993) documented this phenomenon of over-application of the perfective marker *-le* (PFV) in the experiential context (for details, see Chapter 3). In a separate study on the acquisition of *-guo* (EXP), however, no such instance was mentioned (Sun 1999). The conflicting results are most likely due to the technical tagging and indexing method employed for the Data Bank data which formed the basis for Sun's (1999) study. In any case, the shared temporal reference (i.e., past) between *-le* (PFV) and *-guo* (EXP) makes functional cross-over highly possible.⁵

⁵Although *-le* (PFV) is a non-tensed aspectual marker, its default time reference seems to be past. That is, "[u]nless the context makes it clear that a different time is being referred to, a perfective sentence with *-le* will be understood to refer to past time" (Li and Thompson 1981:215).

The substitution of *-le* (PFV) for *-guo* (EXP) in the experiential context did not occur in Dave's speech. Instead, *-guo* (EXP) and *-le* (PFV) were sometimes used in combination (mainly in Interview 5, week 23) to indicate past experience (3) (4).

- (3) *Wo yi ci + qu-guo + Changcheng cating le. (Dave, T5.2, #29)
I once +go-EXP+Great Wall restaurant Mpar.
I have been to the Great Wall restaurant once.

- (4) *Wo ye you youyong-guo-le (oh) youyong-guo-le.
I also swi swim -EXP-PFV (oh) swim -EXP-PFV
I have also swum. (Dave, T5.2, #18)

Functionally, the form *-guo-le* is a perfective marker, signaling the completion of an action (Fang 1996). However, the action should be fairly recent and specific to the situation of the moment. Its use in the general perfective or experiential context, as in Dave's samples, is functionally inappropriate. The perfective aspect was taught before the experiential aspect, and its functional range was considerably wider than the experiential aspect. Therefore, the extension of both *-le*(PFV) and *-guo-le* (PFV) to mark the experiential aspect is only one of the interlanguage form-function problems which learners needed to solve in their learning process.

In a different distributional table (6.7.2-5) which specifies the lexical environment in which *-guo* (EXP) occurred, *-guo* (EXP) appeared to be suffixed with a limited number of verb types. The lexical verb *qu* 'go' seems to be the preferred one (76%). This was in partial agreement with Sun's (1999) finding which was based on interlanguage written materials (Table 6.7-6). These findings may suggest that the experiential marker develops in the interlanguage grammar through the lexical verb *qu* 'go.' That is, the concept of "having been to somewhere" serves as the anchor for the development of the experiential semantics at an early stage.⁶

⁶Task effects cannot be entirely discounted in the present study. However, Sun's (1993) study employed casual conversation as the elicitation method. While the topic of "travel experience" might be one of the favorite topics in the conversation, hence, more production of the lexical verb *qu* 'go' with *-guo* (EXP) suffix, it also shows that the concept of "having been to somewhere" may embody the prototypical experiential semantics marked by the morpheme *-guo* (EXP) in Chinese.

Table 6.7.2-5. Lexical verbs suffixed with *-guo* (EXP)

Verb Type	Kate	Sharon	Dave	Total
qu 'go'	6	6	25	37 (.76)
chi 'eat'	1	1	0	2 (.04)
he 'drink'	1	0	1	2 (.04)
you-yong 'swim'	1**	0	1	2 (.04)
kan 'watch'	2	0	0	2 (.04)
zhu 'live, stay'	0	0	1	1 (.02)
zuo 'do'	0	0	1	1 (.02)
non-verb*	2	0	0	2 (.04)
Total	13	7	29	49

*The non-verb form was the negator *mei* (not PFV). The verb was missing in both instances.

**The verb was separated, and *-guo* (EXP) was inserted after *you* 'swim.'

Table 6.7.2-6. Reproduction of Table 4 in Sun (1999:58)

Verb Type*	Semester	Token
qu 'go'	5	13
kan 'watch, look, read'	5	19
zhu 'live, stay'	2	2
jingli 'experience'	2	2
shangxue 'go to school'	2	2

*English gloss mine.

6.8. Summary

This chapter describes the developmental process of eight Chinese grammatical morphemes. The descriptive approach is diachronic and the analysis focuses on the evolutionary course of the morphemes, starting from their first systematic appearance in the interlanguage samples of the three learners. The distributional analysis is employed to delineate the structural and functional context of each morpheme so that not only their point of emergence can be determined, but also their subsequent development in terms of expansion of structural and functional context for marking.

The analysis has yielded the following findings.

- 1) The possessive marker *-de* (GEN) and the attributive marker *-de* (ATT) emerged relatively early in the interlanguage of the informants. In the beginning, the nouns and pronouns being marked were strictly [+HUMAN] for *-de*(GEN) and [-HUMAN] for *-de* (ATT). When lexical items with the [+LOC] feature began to be marked, the two

morphemes became functionally converged. That is, the "*N-de*" form could have both possessive and attribution interpretations. This means that the rule application was no longer restricted to one or two lexical and functional environments. It was also found that the acquisition of locative words in a syntactic structure seemed to have a positive effect on the development of the attributive marker *-de* (ATT).

2) The development of the adjective marker *-de* (ADJ) was found to be linked, and in a way dependent upon, the acquisition of L2 adjective and stative verbs. Identical in the base form, the two lexical categories serve rather similar communicative functions (descriptive) albeit in different syntactic structures (adjectives in NP and stative verbs in VP). The preference for categorizing the lexical items into the verb class could lead to adjectives being under-represented in the L2 lexicon and consequently affect the timely emergence of *-de*(ADJ).

3) The relative clause marker *-de* (RC) was found to be infrequent in the data due to low production of the relative clause structure. This did not come as a surprise since the complex sentence structures, whether actively elicited or spontaneously produced, has been found to be rare in SLA literature (e.g., Sato 1985). Although all three informants produced the relative clause in one task or another, spontaneous and consistent use of the structure was only found in Dave's samples.

4) The classifier first emerged in the numeral context (numeral + CL + noun), followed by the demonstrative pronoun context (demonstrative pronoun + CL + noun). Further development in other structural context was found only in Dave's samples where the classifier was applied in the context of "demonstrative pronoun + numeral + CL + noun." The function of the classifier as a pro-form for the head noun was not acquired yet by any of the informants during the data collection period.

5) The verb complement marker *-de*(COMP) was acquired as soon as it was taught. The restricted structural context seemed to have assisted its development while the restricted communicative context in the interviews might have hindered the quantity of its production.

6) Although having similar semantic functions as the English progressive suffix *-ing*, the Chinese progressive aspect marker *zhengzai-* (PROG) was not inserted consistently in all the (potential) progressive contexts. Its development appeared to be sensitive to the lexical aspect of the verb, with activity verbs being marked most of the time. Similarly, the experiential marker *-guo*(EXP) was suffixed overwhelmingly to the lexical verb *qu* 'go,' showing the earliest experiential semantics to be "having been to X (location)." The

experiential context was also found to be marked sometimes by the perfective morpheme *-le* or *-guo-le*, an indication of less developed form-function relationship at the initial stage of the acquisition process.

Tables 6.8-1 to 6.8-3 display the entire developmental course of the eight grammatical morphemes in the first year of the informants' Chinese language acquisition experience. The tables are based on the distributional analysis carried out for each of the morphemes as discussed above. Following the convention, the plus sign "+" indicates the presence of more than four structural contexts specified in the first column as well as evidence of productive rule applications. The minus sign "-" also indicates the presence of a relevant context but no rule application. Brackets stand for less than four rule application contexts. If no context was produced in a given sample, then the corresponding cell is left empty. Thus, no structural context for *-de*(GEN) insertion was found in Kate's sample in Interview 1 (Table 6.8-1). In Interview 2, however, Kate produced more than four such contexts and *-de*(GEN) was inserted in at least two of them (which showed lexical variation). In Interview 8, *-de*(GEN) was applied but the total number of context for *-de*(GEN) insertion was less than four. On the other hand, Kate did not produce the progressive marker *zhengzai-* (PROG) in the progressive context in Interview 2 and Interview 3. The difference between these two interviews is that there was sufficient progressive context (more than four) in Interview 3, while the same did not obtain in Interview 2, as shown by a minus sign in brackets.

Table 6.8-1. Development of morphemes: Kate

Morpheme types	Interview ->	1	2	3	4	5	6	7	8	9
		wk 5	wk 10	wk 13	wk 16	wk 23	wk 26	wk 29	wk 34	wk 37
Lexical	<i>-de</i> (GEN)		+	+	+	+	+	+	(+)	+
	<i>-de</i> (ATT)			+	+		+	(+)	(+)	
	<i>-de</i> (ADJ)				(+)	(+)			(+)	(-)
	<i>zhengzai-</i> (PROG)		(-)	-	+	+	-	+	(-)	
	<i>-guo</i> (EXP)					+	(-)			
Phrasal	<i>CL</i>		(+)	+	+	+	+	+	+	+
	<i>-de</i> (COMP)				+	+	+			
Inter-phrasal	<i>-de</i> (RC)			(-)	+	-	-			

Table 6.8-2. Development of morphemes: Sharon

Morpheme types	Interview ->	1 wk 5	2 wk 10	3 wk 13	4 wk 16	5 wk 23	6 wk 26	7 wk 29	8 wk 34	9 wk 37
Lexical	-de (GEN)	(+)	+	+	+	+	nd	+	+	+
	-de (ATT)			(+)	+		nd	+	+	(+)
	-de (ADJ)		(+)		(+)	(+)	nd	+		(+)
	zhengzai- (PROG)		(-)	+	+	+	nd	+		(-)
	-guo (EXP)				(-)	+	nd	(+)	+	
Phrasal	CL		+	+	+	+	nd	+	+	+
	-de (COMP)				+	(+)	nd	+	(+)	
Inter-phrasal	-de (RC)			+	+		nd	+	(+)	

Table 6.8-3. Development of morphemes: Dave

Morpheme types	Interview ->	1 wk 5	2 wk 10	3 wk 13	4 wk 16	5 wk 23	6 wk 26	7 wk 29	8 wk 34	9 wk 37
Lexical	-de (GEN)	+	+	+	+	+	+	+	+	+
	-de (ATT)	+	(+)	+	(+)	(+)	+	+	+	
	-de (ADJ)	(-)	(+)	+	+	+	+	+	+	+
	zhengzai- (PROG)			+	+	+	(+)	+	+	
	-guo (EXP)					+	+	(+)	(+)	
Phrasal	CL		-	+	+	+	+	+	+	+
	-de (COMP)				+	(+)	(+)		+	(+)
Inter-phrasal	-de (RC)			+	+	+	+	+	(+)	(+)

Learner variations were found in the extent to which morphological devices were employed and structural and functional contexts were created. In general, Kate appeared to be the "restrictive" type of learner. She tended not to create contexts for morpheme insertions, and therefore produced fewer grammatical morphemes than Sharon and Dave. Although the semantic meaning encoded in the base form of the words was often sufficient to carry the communicative message, the expressive range and the modulation of meaning without grammatical morphemes was necessarily restricted.

Dave, in contrast, constantly created structural and functional contexts for morpheme insertion. He not only produced the required morphemes in these contexts most of the time, but also tended to do so in optional contexts and sometimes even over-applied them. In terms of acquisition, he was arguably the most advanced of the three informants, being rather consistent in using grammatical devices spontaneously and in

tasks. In terms of accuracy, however, he was the least of the three. The massive production of grammatical morphemes (and complex sentence structures) inevitably led to over-applications and longer sentences. The latter rendered his speech error-prone and noticeably less fluent. Interestingly, the same features also enabled Dave to be more expressive and communicatively more articulate. He could and did describe objects, talk about his hopes and interests, define or identify a particular object (using relative clauses), and express a variety of temporal, logical and sequential relationships in the interviews.

Sharon seemed to be occupying the middle ground between the restrictive Kate and the non-restrictive Dave. She produced more grammatical morphemes than Kate but was not as consistent and prolific as Dave. Her acquisition profile resembled that of Dave in some respects (e.g., active creation of structural and functional context for morpheme insertions) and that of Kate in other respects (fewer adjectives than stative verbs, preference for zero marking in the "picture description" tasks). Sharon was communicatively proficient, especially towards the latter part of the observation period when she had obviously acquired sufficient Chinese vocabulary and grammar to satisfy her expressive needs. Her interlanguage quality as defined by accuracy was good, and there were fewer over-applications and grammatical aberrations in her samples than in Dave's.

The sketchy description of learner variations above was based on the data analysis of a number of grammatical features in the samples, some of which were not presented in this study (e.g., sentence length, number of errors, complex sentence structures). The observation was confirmed by the tutor (Wang, personal communication) and by the results of the accuracy-based oral examination at the end of the year: both Kate and Sharon were awarded higher grades than Dave.

Chapter 7

Language Acquisition: Teachability and Processability

The diachronic description of the development of the eight Chinese grammatical morphemes in the previous chapter has established their points of acquisition by way of distributional analysis and the emergence criterion. The account has adopted an etic approach, focusing on individual morphemes and their internal rule modifications over time.

In this chapter, the development of the eight morphemes is examined in a wider context of second language acquisition, taking into consideration issues of input and language processing. Specifically, the relationship between formal instruction, processing hierarchy, and acquisition sequence is investigated. Issues such as developmental gaps, acquisition differentials, production "withdrawal" and initial interlanguage features are scrutinized in detail. Grounded on the developmental patterns exhibited in the data and described in the previous chapter, the discussion will address the second and the third research questions, namely, the efficacy of instruction in language acquisition and the adequacy of Processability Theory as a descriptive and explanatory approach to second language acquisition.

7.1. Formal instruction, processing hierarchy, and acquisition sequence

In his account of language processability and second language development, Pienemann (1999) states that developmental schedule of L2 grammar (i.e., word order and morphology) is regulated by the processing demands of the structures to be learned. Those structures which do not involve information exchange among the constituents are low in processing demands and should develop before those which do need information sharing. The extent of the information exchange determines their sequence of emergence. Therefore, lexical morphemes develop early because they are derived directly from the conceptual structure (e.g., aspect markers) and do not involve information exchange with other constituents in a sentence. Phrasal morphemes (e.g., the classifier in Chinese, or singular indefinite article *a* in English) are acquired later than the lexical morpheme because the grammatical information encoded in them needs to "agree" with the information encoded in the head of the phrase. Information transfer is involved in the language production process, which implies the development of procedures specific for the phrase construction. Inter-phrasal morphemes are learned last because they must look

to a linguistic constituent across phrasal boundaries for their insertion (e.g., English 3rd person singular *-s*). Thus, the degree of information transfer and the resources involved in each type of information transfer form a hierarchy of morphological acquisition in a second language, as shown in Table 2.2.3-3. The application of the principle to the analysis of Chinese grammatical morphemes has yielded an acquisition hierarchy as displayed in Table 4.3-1.

The implication of the acquisition hierarchy is that in learning a second language, one does not acquire a structure which is higher on the hierarchy without first acquiring the structure lower on it. Research in the acquisition of a number of second languages has corroborated this invariable, processing-based developmental sequence (for a review, see Pienemann 1999). The studies have also demonstrated that formal instruction does not alter the developmental route. Learners will not learn a form located at Stage 3 successfully if their current level of L2 grammar is at Stage 1 of the developmental hierarchy (Pienemann 1984) simply because they do not have the necessary processing resources to handle the Stage 3 form. However, formal instruction can speed up the acquisition process if the learner is ready to learn the form(s) at the next stage of the hierarchy. This is the "Teachability Hypothesis" which claims that instruction is effective if and only if learners themselves have developed sufficient processing skills for the acquisition of the forms (Pienemann 1984).

In the context of the present study, the issue of formal instruction, language processing and the acquisition sequence are particularly important because they offer the opportunity to discover if Processability Theory can stand the test of an empirical investigation of Chinese, a typologically different language from all those having hitherto been studied. The findings will also be of practical pedagogical value.

In order to examine the extent to which the acquisition of the eight Chinese grammatical morphemes corresponds to the processing and instructional sequence, the following preliminary work was carried out.

1) Analyzing the processing procedures involved in each of the grammatical morphemes (see Chapter 4) and constructing a developmental hierarchy on the basis of the analysis. This is shown in Table 7.1-1. The columns labeled "T1, T2, T3" in Table 7.1-1 refer to the sequence of emergence.

2) Analyzing the teaching syllabus and textbooks to locate the morphemes on the instruction timetable. The findings are shown in Table 7.1-2. The cross sign "x" in the table refers to the first time the forms were introduced to the learners in the classroom.

3) Drawing up an acquisition table (Table 7.1-3) based on the findings from the preceding chapter. The information shown in Table 7.1-3 was based on the amalgamated data in Tables 5.8-1 to 5.8-3. The plus sign "+" means successful acquisition of the morpheme, and the minus sign "-" stands for failure to meet the emergence criterion. Brackets () indicate less than four contexts, and the slash "/" means absence of morpheme insertion context in the samples.

Table 7.1-1. Processing hierarchy of eight grammatical morphemes

Processing Procedures	L2 Process	Morpheme	T1	T2	T3	T4
word / lemma	"words" invariant forms	none	+			
Category Procedure	lexical	-de (GEN)	+			
	lexical	-de (ATT)	+			
	lexical	-de (ADJ)	+			
	lexical	zhengzai- (PROG)	+			
	lexical	-guo (EXP)	+			
Phrasal Procedure	phrasal	CL				+
	phrasal	-de (COMP)				+
S-Procedure	inter-phrasal	-de (RC)				+

Table 7.1-2. Instructional sequence of the eight grammatical morphemes

Processing Procedures	L2 Process	Week --> Morpheme	2	7	11	12	13	22
word / lemma	"words"	none						
Category Procedure	lexical	-de (GEN)	x					
		-de (ATT)			x*	x		
		-de (ADJ)			x			
		zhengzai- (PROG)			x			
		guo- (EXP)					x	
Phrasal Procedure	phrasal	CL			x			
		-de (COMP)					x	
S-Procedure	inter-phrasal	-de (RC)					x	

*Not formally taught; appeared once in the 'notes' of the textbook

Table 7.1.-3. Acquisition sequence of the eight grammatical morphemes

Subject	Morph / Int->	1 wk5	2 wk10	3 wk13	4 wk16	5 wk23	6 wk26	7 wk29	8 wk34	9 wk37
Kate	lexical	-	+	+	+	+	+	+	(+)	+
	phrasal	/	(+)	+	+	+	+	+	+	+
	inter-phrasal	/	/	-	+	/	/	/	/	/
Sharon	lexical	(+)	+	+	+	+	nd	+	+	+
	phrasal	/	+	+	+	+	nd	+	+	+
	inter-phrasal	/	/	+	+	/	nd	+	(+)	/
Dave	lexical	+	+	+	+	+	+	+	+	+
	phrasal	/	-	+	+	+	+	+	+	+
	inter-phrasal	/	/	+	+	+	+	+	(+)	(+)

At first glance, the difference between the processing hierarchy (Table 7.1-1) and the instructional sequence (Table 7.1-2) is overwhelming. The latter shows that the lexical morphemes were taught throughout the year and some were introduced much later than the phrasal and inter-phrasal morphemes (e.g., *-de* (ATT), the aspect markers).

Close examination of Table 7.1-2 reveals that the mismatch is superficial. One lexical morpheme (*-de* (GEN)) was taught before the phrasal and inter-phrasal morphemes, and one phrasal morpheme (the classifier) was taught before the inter-phrasal morpheme. Since skill development does not take place in a piecemeal fashion, the ability to process even one lexical morpheme implies the presence of the Category Procedure in the L2 grammar system of the learners, and this prepares the way for the development of phrasal morphemes. Therefore, the teaching of a lexical morpheme before the other two types of morphemes provided the learners the opportunity to develop the necessary pre-requisite skills for the subsequent acquisition of the phrasal morpheme. The implication line (double line) in Tables 7.1-1 and 7.1-2 shows that the same three-tier implicational relationship between the three morpheme types obtains in both processing hierarchy and instructional sequence. Given the fundamental compatibility between the processing hierarchy and the instructional sequence, the next question is whether or not the acquisition pattern reflects this relationship. In other words, whether the lexical morphemes emerged before the phrasal morphemes, which in turn, emerged before the inter-phrasal morpheme?

The overall acquisition profile of the informants is displayed in Table 7.1-3. A three-tier implicational relationship between the morpheme types was present in the interlanguage

development of Kate. A two-tier relationship, however, was found in that of Sharon and Dave.

Kate: lexical > phrasal > inter-phrasal
 Sharon: lexical / phrasal > inter-phrasal
 Dave: lexical > phrasal / inter-phrasal

It is apparent that both Kate's acquisition pattern reflected the theory-based acquisition hierarchy (Table 7.1-1) and the syllabus-based sequence of input (Table 7.1-2). In Sharon's and Dave's acquisition profile, however, some of the stages were not distinguishable. Table 7.1-3 shows that lexical and phrasal morphemes emerged simultaneously in Sharon's data in Interview 2, and phrasal and inter-phrasal morphemes were acquired together by Dave in Interview 3. These findings give rise to the question about the extent to which the developmental sequence found above was caused by the sequence of instruction.

Table 7.1-4 shows that in the study, none of the forms was acquired before they were taught in class or introduced in the textbooks. Therefore the point of acquisition was always after instruction. In the table, the exact week of formal input of each particular morpheme is indicated by a shaded cross "x",¹ and its point of emergence in the interlanguage of the three informants is represented by the initials of the informants (k for Kate, s for Sharon, and d for Dave).

Table 7.1-4. Teaching schedule and morpheme emergence²

Week ->	2	3	5	7	10	11	12	13	16	22	23	26	29	34	37
Interview ->			1		2			3	4		5	6	7	8	9
-de (GEN)	x		d		k/s										
-de (ATT)		x	d				x	k/s							
-de (ADJ)				x				d						s	
PROG							x	s/d	k						
EXP										x	k/d				s
CL				x	s			k/d							
-de (COMP)								x	k/s/d						
-de (RC)						x		s/d	k						

*The form was first noted and the NP paraphrased in the "Notes" of lesson 6.

Apparently, the informants in this study were not able to acquire any of the eight morphemes either from the textbooks or from the lecturer and tutor before these forms

¹Since the syllabus and classroom instruction followed the textbooks closely, the textbooks can be viewed, to some extent, as a reliable indicator of the timing of the initial instruction of a morpheme.

²Weeks between 8-9, 16-20 and 30-31 were class-free periods. Some of the weeks are not included in the tables as they contain no information relevant to either instruction or acquisition.

were taught. Self-report from the informants confirmed that they had no contact with native Chinese speakers outside class. Although they watched Chinese news on SBS sometimes, they could understand it only minimally if at all. Under these circumstances, circumstances not atypical of formal language learning in a non-target language environment, classroom instruction did play an active role in the provision of input. In the present study, the classroom input was clearly crucial to setting the acquisition in motion.

However, instruction cannot dictate acquisition course in terms of when and how. Instruction is only effective if the learner is "ready" for the grammatical forms taught in class. Being "ready" means to have developed the processing procedures for the acquisition of a form located at the next stage. Because of the syllabus, there were not many instances in which forms were introduced before the informants were "ready" for them. Nevertheless, there was some evidence, shown in Table 7.1-3, which demonstrates that learners were not quite ready yet at the time when certain morpheme types were taught. The evidence is found in

- a) Kate, Interview 1 (week 5): the lexical morpheme did not emerge (taught in week 2);
- b) Kate, Interview 3 (week 13): the inter-phrasal morpheme did not emerge (taught in week 11);
- c) Dave, Interview 2 (week 10): the phrasal morpheme did not emerge (taught in week 7).

In all these instances, the informants did not acquire the corresponding morpheme even though it had been taught two to three weeks earlier, practised and tested at the tutorials. The failure to acquire these morphemes cannot be due to poor teaching because in each case, other informants did learn the morpheme from the same input. It could only mean that a given morpheme was introduced at a point where an individual informant was not yet "ready" to acquire it. An examination of Kate's sample in Interview 1 (week 5) confirmed that Kate was at Stage 1 of the processing hierarchy, the stage where only invariant forms are produced (see 7.4 for discussion).

Therefore, formal instruction in the present study exercised a constraining effect on the acquisition of the grammatical morphemes. This was demonstrated in the invariable emergence of the morphemes following the instruction, even though some of them are located lower in the processing hierarchy (see, for example, the emergence of *-de* (COMP), a phrasal morpheme, after *-de* (RC), an inter-phrasal morpheme). Given the

fact that learners would not have *a priori* knowledge of L2 linguistic means for grammatical functions such as tense and aspect, possessive and noun classification, etc., and given that L2 input and contact outside the classroom was extremely limited in the informants' living and study environment, the instructional constraint on the development of the morphemes was not unexpected.

However, instruction did not cause the morphemes to be acquired. Their acquisition was not guaranteed by instruction as it would have been if a cause-effect relationship had existed. This point is supported by Table 7.1-3 and Table 7.1-4. Both tables contain gaps in the overall developmental sequence of the morpheme types (Kate: Interview 1 and Interview 3; Dave: Interview 2, Table 7.1-3), and in the acquisition pattern of each and every morpheme (Table 7.1-4). Apparently, other factors are at work in these instances. One of these would be the degree of development of L2 processing procedures in the informants. That would account for their "readiness" to acquire a particular L2 form at a particular point in time. Learners vary in this respect, and instruction does not help if the processing procedure required for a particular morpheme (e.g., Category Procedure for lexical morphemes) has not been sufficiently developed.

Finally, the simultaneous emergence of two morpheme types in the samples of Sharon and Dave (Table 7.1-3) needs some explanation. It occurred invariably between two adjacent morpheme types or processing procedures. This could not be caused by the sequence of input, as in each case, the morpheme high on the developmental hierarchy was taught before the one below it. The developmental hierarchy does not provide for this phenomenon either, because the procedures underlying the acquisition stages are themselves interlocked in terms of resource sharing. The resource-complex procedure can only develop if some of the resources have already been present (Pienemann 1999, especially p.87). The acquisition patterns of Sharon and Dave were apparently incompatible with this key idea of Processability Theory.

In practice, simultaneous acquisition is always difficult to prove (Pienemann, personal communication). The findings in this study could be a function of the data elicitation schedule. That is, the interval between two interviews was sometimes too long to capture the precise moment of acquisition. The interview sessions were scheduled for every three weeks. However, the learning pace, in all likelihood, would not be so regular. It is perfectly possible that a form in fact emerged between two interview sessions but its emergence was only recorded in the later session in which another form, located at a higher level, happened to emerge. Table 7.1-3 offers some support for this hypothesis. According to the table, lexical and phrasal morphemes emerged simultaneously in Sharon's data in Interview 2 (week 10). However, in the previous session (week 5),

lexical morphemes were applied in a limited number of contexts (as indicated by a plus sign in brackets). This signaled that the lexical morpheme was about to emerge. Similarly, Dave acquired phrasal and inter-phrasal morphemes in Interview 3 (week 13), but the context for the phrasal morpheme (CL) was already present in the previous session (Interview 2, week 10) although there were no productive rule applications. The temporal gap between the creation of linguistic contexts and the acquisition of a linguistic rule is commonplace in language acquisition. Unfortunately, the point of acquisition was not captured by the data collection when it happened.

Given that the possibility that missing an emergence point is potentially unavoidable in data collection,³ it is perhaps necessary to re-phrase the "developmental law" (O'Grady 1997) in a way which accommodates both the theory and the acquisition phenomenon. After all, the lack of certain distinctive stages does not constitute a disconfirmation of the predicative validity of Processability Theory stated in (a). It simply means that the prediction will be stated in a weaker version shown in (b).

- (a) Procedures higher on the hierarchy emerge after procedures lower on the hierarchy.
- (b) Procedures higher on the hierarchy cannot emerge before procedures lower on the hierarchy.

The second statement is now compatible with two situations: a) the phrasal morpheme emerges after the lexical morpheme, and b) the lexical and phrasal morphemes emerge at the same time. "Skipping" over a developmental stage is still ruled out.

To conclude, the correspondence between the L2 developmental hierarchy proposed in Processability Theory (Table 7.1-1) and the sequence of instructional input (Table 7.1-2) means that acquisition should proceed in an orderly manner, following the instructional sequence. The findings have shown that although the point of acquisition of each morpheme occurred after the instruction, the sequence of their development -- lexical morpheme > phrasal morpheme > inter-phrasal morpheme -- was not so uniform among the informants. Specifically, certain types of morphemes were not acquired by some informants after instruction, leaving a gap in the developmental hierarchy (Table 7.1-3). More gaps are present between the time of instruction and the time of acquisition (Table 7.1-4). These findings show that the acquisition patterns were not always related to the teaching syllabus. It was proposed that language processing constraints as stated in Processability Theory and implemented in the processing hierarchy might account for

³This issue is not always discussed in literature. The frequency of data collection sessions often indicates the researcher's concern about the issue. It is a matter of judgement as well as the logistical capabilities of the researcher and research environment.

some of the developmental phenomena. The "gaps" were psycholinguistic reflections of learners being unready for the grammatical structures in the instruction.

7.2. Instruction and developmental "gaps"

While the gaps shown in the developmental hierarchy (Table 7.1-3) are indications of under-developed L2 processing procedures in the learners, many of the gaps in Table 7.1-4 present a different kind of acquisition problem. Following the theoretical proposition of Processability Theory, the lexical morphemes taught later than the phrasal morpheme, and especially after the emergence of the phrasal morpheme, should have been acquired without a hitch as the processing procedures needed for their acquisition were already in place. This, however, did not happen uniformly. If the classifier (CL, a phrasal morpheme) is used as the yardstick, then the following lexical morphemes showed delayed emergence in the samples of the informants:

-de (ADJ): Kate, Sharon, Dave

zhengzai- (PROG): Kate

-guo (EXP): Sharon

The adjective suffix *-de* (ADJ) never emerged in Kate's samples.

Furthermore, the length of acquisition delay varied greatly. Some morphemes took twelve to twenty weeks to emerge (*-guo* (EXP) and *-de* (ADJ) in Sharon), while others emerged after three to six weeks (e.g., *-de* (ADJ) in Dave, *zhengzai-* (PROG) in Kate, *-de* (ATT) in Sharon). Table 7.2-1 details the time of instruction and emergence of those morphemes in question. The dash sign stands for no emergence, and the empty space indicates "no delay."

Table 7.2-1. Length of delay in acquisition

Morphemes	Instruction week	Emergence week (interview)		
		Kate	Sharon*	Dave
<i>-de</i> (ADJ)	7 (before Int 2)	-	29 (7)	13 (3)
<i>zhengzai -</i> (PROG)	12 (before Int 3)	16 (4)		
<i>-guo</i> (EXP)	22 (before Int 5)	34 (8)		

*Sharon missed Interview 6.

It is clear that in both immediate and delayed acquisition situations, there were learner variations. Dave seemed to be more responsive to instruction than Kate and Sharon. Learner variations also showed up in the length of time it took to acquire a morpheme. In general, it seems that Dave took less time than Kate and Sharon. It is important to note

that the morphemes in question here were all lexical ones, and that they were taught either at the same time or after the classifier. The question is how to account for their delayed acquisition when, according to the processing hierarchy, the processing procedures for their acquisition had been developed in the learners already.

The issue of delayed effect of instruction has been reported in language acquisition studies focusing on the developmental process/sequences of English in formal settings (Felix 1981a, Ellis 1984a, Pienemann 1984, 1988, 1989, 1999). Various explanations have been proposed to account for the phenomenon. Among them are frequency-related features of classroom discourse (Ellis 1984a), the difference between input and intake (Krashen 1981), and the psycholinguistic constraints on speech processing and on language teachability (Pienemann 1984, 1989, 1999).

While there is little doubt that all the factors above (and more) may play a role in the delayed emergence of a particular form, their respective contribution to the problem may not be equal in a given language learning setting. Regarding the discourse features of the classroom, the three informants in the present study received instruction from the same lecturer and tutor, in the same setting, and carried out the same tasks in the interviews. While the input provided by the tutor to different tutorial groups cannot be exactly identical, it is not unreasonable to assume that in a highly structured, textbook- and syllabus-driven intensive language course, the input to two consecutive groups of beginning learners would not be drastically different with respect to major classroom discourse features, i.e., the kind of grammatical forms used in teaching. The exhibited difference in the acquisition patterns of individual grammatical morphemes cannot be attributed to input differentials, especially considering that Kate and Dave were in the same tutorial but demonstrated very different developmental patterns.

While input is important in language acquisition, the processing capacity of the input materials is essential for acquisition to take place. The relationship between the two is usually stated in terms of "input" and "intake" (Krashen 1980, 1981, 1982). However, the difference between them as stated in the original form by did not have an empirical base. The question of why "input" of certain form turns into "intake," while that of others does not, cannot be investigated without a psycholinguistic model of speech processing. In this context, Processability Theory is useful, for it offers an explanation for what can or cannot be turned into "intake" at a particular point of time in the second language learning process.

According to Processability Theory, when a particular processing procedure has been developed, the structural form requiring the procedure can in principle emerge. However,

"there is no guarantee that the learner will indeed produce a linguistic rule as soon as s/he is able to do so" (Pienemann 1999:247), and "...there is little reason for such an assumption of uniformity" (Pienemann 1999:245). The structural inter-dependence of grammatical rules (e.g., adverb fronting and subject-verb inversion in German) means that one rule serves as the context (adverb fronting) for the application of the other rule (subject-verb inversion). If the learner holds back the context for the rule application, then acquisition of the rule will be delayed. Moreover, learners vary in the temporal gap between the acquisition of context and the development of the rule.

Applying this principle to the analysis of the protracted emergence of the adjective suffix *-de*(ADJ) in the interlanguage of the informants, it is clear that in order for *-de* (ADJ) to be acquired, adjectives must be added to the L2 lexicon of the learners. Due to the formal cross-over between the adjective and the stative verb in Chinese, a lexical form can be assigned to either category. The consequence does not lie in the semantic function the form serves, either as an adjective or a stative verb, but in the structure in which it appears, either in a NP or in a VP, and in the necessity to be marked, by *-de* (ADJ). The structural interdependence in this case is one between a word (adjective) and the lexical morpheme *-de* (ADJ).

Indeed, the long delay of the acquisition of *-de*(ADJ) by Kate and Sharon was found to be related to the acquisition of adjectives, the structural context for the morpheme insertion. Although in their L2 lexicon, there was a fairly large number of lexical items which formed the stock of adjectives and stative verbs, the majority of them were analyzed by Kate and Sharon as stative verbs, as shown in Table 6.3-7. Adjectives in their L2 lexicon were few in tokens and in type, and Type 2 adjectives -- the obligatory context for the suffix *-de* (ADJ) -- were minimal (Tables 6.3-1 and 6.3-2). As the result, the suffix never emerged in Kate, and only did so in Sharon some 20 weeks after instruction.

A comparison of the protracted emergence of *-de* (ADJ) and the relatively trouble-free emergence of *-de* (ATT) and *-de* (COMP) (Table 7.1-4) further illustrates the crucial role of lexis in the acquisition of lexical morphemes. For *-de* (ATT) and *-de* (COMP) to develop, it is essential that lexical nouns and verbs be present in the lexicon. Fortunately in both first and second language acquisitions, nouns and verbs are always acquired early and at a faster pace than other lexical categories (O'Grady 1997), thus facilitating the development of *-de* (ATT) and *-de* (COMP).

Learner variations were manifested in the acquisition of *-de* (ADJ) and *-de* (ATT). The attributive marker *-de*(ATT) emerged in different context among Kate, Sharon and Dave.

In addition, Kate seemed to have acquired *-de(ATT)* as the result of concentrated teaching of a locative NP structure, whereas Sharon and Dave learned it most likely through some less formal classroom input. Regarding *-de(ADJ)*, Dave acquired adjectives faster than stative verbs during the first four weeks of the interview period, as compared to Kate and Sharon. Both adjective types and tokens increased greatly since the observation began (Adjective Type: 1-2-6-6, Table 6.3-7; Adjective Token: 1-3-12-8, Table 6.3-3). The emergence of *-de(ADJ)*, therefore, did not take long: six weeks according to Table 7.2-1, including two weeks of school break.

While varying categorial analysis of lexical items by the learners could serve as the explanation for the delayed development of the adjective suffix in the interlanguage of Kate and Sharon, the degree of complexity between the form and the function of the experiential aspect marker *-guo(EXP)* may account for its late development in Sharon. As Pienemann states,

[s]ome morphemes have a one-to-one relationship between form and function (e.g., the Finnish genitive marker '-n', <*talo* - *talo-n*>; house - of the house), while other morphemes may express a multitude of functions (e.g. English '-s' for plural, possessive, third person etc.).

(Pienemann 1999:155)

The protracted development of the experiential marker in Sharon's interlanguage may be attributed to a variety of reasons, the form-function relationship being only one of them. The function which the form *-guo (EXP)* performs is derived directly from the conceptual structure of "experiential" -- an event or an action which took place at least once but which is not longer the case. Its insertion in a sentence is not conditioned by the structural relationship between the constituents, but by the expressive needs of the speaker; how the speaker views the event, the action, or the situation determines whether it should be used. The following example (1), taken from Sharon's data and presented in the previous chapter, illustrates this point very well. The task was designed to tap the use of the experiential aspect marker and all the situations were couched in experiential terms in the task instruction. However, Sharon did not interpret the situations as being experiential or in the temporal framework of the past. Instead, she viewed them as habitual situations. The marker *-guo (EXP)*, naturally, was not produced.

Picture 2: People on the airplane

- (1) *Zai zhe zhe zhang hua, tamen qu tamen zuo feiji qu Zhongguo.
in this this CL picture, they go they sit plane go China.

?Wo mei qu Zhongguo, keshi wo changchang qu Yinduguo.
I not(Pst) go China, but I often go Indo-country.

Wo changchang zuo feiji qu Yinduguo.
I often sit plan go Indo-country (Sharon, T5.2, #6, #7, #7.1, #8)

In this picture, they are in a plane to go to China.
 I did not go to China, but I often go to Indonesia.
 I often go to Indonesia by plane.

A compounding problem with the experiential marker *-guo* (EXP) is that it has no simple one-to-one correspondence between the informants' native language (English) and their target language (Chinese). The experiential semantics encoded in the perfective aspect of English is expressed through four grammatical aspects in Chinese, all of them relating to one another in some manner (Figure 7.2-1).

<u>English</u>	<u>Chinese</u>
<i>have V-en</i> (PERF)	{ <ul style="list-style-type: none"> -le (PFV) -guo (EXP) -guo-le (PFV, PAST) (-guo...le (PFV, Mpar))

Figure 7.2-1. Correspondence of Form and Function between Chinese and English

Consequently, in learning *-guo* (EXP), learners must sort out conceptual distinctions among these four situations, which are not formally differentiated in their native language, English. Data from the informants bears out this claim. All four Chinese markers in Figure 7.2-1 were supplied at some point in what are clearly experiential contexts in Chinese (2) (3) (4) (5). Non-suppliance in (6) in the same context resulted in a non-experiential interpretation.

(2) *Yiqian wo qu-le hen duo. (Kate, T6.6, #33)
before I go-PFV very many
 *In the past, I went / have been there many (times).

(3) Wo meiyou qu-guo Changcheng. (Kate, T5.2, #30)
I not-have go EXP Long-wall
 I have not been to the Great Wall.

- (4) *Wo qu++er er ci qu-guo- le Riben. (Dave, T5.2, #10)
I go++2 2 time go-EXP-PST Japan
 I have been to Japan twice.
- (5) *Wo yi ci + qu-guo + Changcheng canting le. (Dave, T5.2, #29)
I once +go-EXP+Great Wall restaurant Mpar.
 I once have been to the Great Wall restaurant.
- (6) *Wo mei qu Changcheng. (Sharon, T5.2, #28)
I not(Pst) go Long-wall
 I did not go the Great Wall (vs. I have not been to the Great Wall)

The data shown in Table 7.1-4 demonstrates that both Kate and Dave had acquired the experiential form after it was taught in class, although there was some functional confusion with the perfective aspect. Kate used it in most of the experiential contexts, while Dave applied all the aspect markers which contain the value of "+PAST," and the application seemed to be in free variation. For two interviews (Interview 5 and Interview 7), Sharon did not insert a single experiential marker. She re-interpreted the actions and events presented in the tasks so that the experiential context was pre-empted.

A further issue of form-function relationship in terms of second language acquisition has to do with the constraints the function has on the emergence of the form. If the functional context of a form is restricted and less frequent in the language, the emergence of the form could be hampered. Compared with such functional contexts as past and future, progressive and perfective, habitual and general, the experiential context is rather limited in its frequency of use and its semantic range. In the present study, tasks were designed to provide the context for its insertion. Otherwise, the topic of one's past experience hardly came up in the data collection sessions.

The delayed acquisition by Kate of the progressive marker *zhengzai-* (PROG) constitutes a different problem from that of *-guo* (EXP). The semantics of *zhengzai-* (PROG) are relatively simple and its functional range clearly defined: action in progress. At the basic level, the level relevant to the learning objective of the informants, there is a one-to-one relationship between form and function and the relationship is quite similar in both the learners' native language and the target language. In fact, when substituting unknown Chinese verbs in the progressive context, the informants used the English *V-ing* form instead of the base form *V* (7) (8) (9).

- (7) Green xiansheng gen Green taitai talking. (Sharon, T3.3, #3)
Green Mr with Green Mrs talking
 Mr. and Mrs. Green are talking.
- (8) D: Wang Yanyan shi ++++dancing
Wang Yanyan is ++++ dancing
 R: tiaowu
dance
 D: zhengzai-tiaowu de nu (Dave, T3.3, #26)
 PROG *dance RC female*
 Yanyan Wang is the woman who is dancing.
- (9) Tamen zai pointing at huar. (Dave, T8.3, #4)
they PROG pointing at picture
 They are pointing at the picture.

Although the Chinese progressive marker was not inserted in every progressive context by the informants, Sharon and Dave did use it fairly frequently (Table 6.7.1-1). In contrast, the marker did not emerge in Kate's samples until Interview 4 (week 16), four weeks after it was taught (Table 6.7.1-1). Even there, only two tokens were produced in 13% of the progressive contexts.

A short temporal delay in emergence is usually not something to be alarmed about. In this particular case, however, an explanation is due, given that the processing procedures for the acquisition of lexical morphemes (the progressive marker being one of them) had already been developed by then. In addition, the cause for the developmental gap of the progressive marker cannot be traced to cross-linguistic differences in the conceptual structure as in the case of the experiential marker. The semantic parameter of Chinese progressive corresponds to that of English, the native language of the informants. The possibility that Kate did not have the knowledge of how to mark the progressive aspect grammatically can also be excluded. Being the objective of classroom instruction in week 12 and the focus of tutorial practice in week 13, the progressive marker was supplied by Kate in the exercises and in the weekly test at the end of week 13. However, she did not produce it in the interview in week 13 (Interview 3).

Therefore, it is possible that Kate chose not to mark the progressive context linguistically, or was unable to do so in actual speech production. The former is related to learner strategies, and the latter to on-line production skills. The two are related to some extent and could be present at the same time to influence the morpheme emergence.

Research in language acquisition has found that learners sometimes do not supply a grammatical marker if it is semantically redundant in some way and if the communicative message is clear without it (Ellis 1985, van Pattern 1985, O'Grady, Dobrovolsky and Aronoff 1989). During the interviews, the progressive context was usually provided by the "picture description" tasks. Apparently, the pictures were clear in terms of who is doing what to whom and when. Even without the progressive marker, misunderstanding the pictorial content was virtually impossible as both the informant and the interviewer were looking and pointing at the same set of pictures. Under these circumstances, the suppliance of the progressive marker was not essential to communicating core facts. However, it would have increased the processing load during speech production because the addition of an extra element inside a canonical structure requires more processing resources than a simple sequential arrangement of words. When contrastive contexts were presented and grammatical marking became crucial to the communication of meaning, Kate used the progressive marker fairly consistently (10)

(10) Picture set 1:

- 1a) a man is thinking about a hamburger;
- 1b) a man is eating a hamburger;
- 1c) empty plates in front of a man.

Kate: 1a) Ta xiang chi-fan.
he think eat-meal.

He wants to eat.

1b) Ta zhengzai chi-fan ne.
he PROG eat-meal PROG.

He is eating.

1c) Ta chi le (oh) chi le chi le fan.
he eat PVF (oh) eat PVF eat PVF meal

He has eaten.

(Kate, T4.7, #4, #5, #6)

It is obvious that Kate had the progressive marker in her linguistic repertoire and was able to use it if, and only if, it was absolutely necessary. To her, it was perhaps a matter of conflict between communicative adequacy and ease of processing. The solution was "avoidance," a notion first proposed by Schachter (1974) to explain the low error rate in the interlanguage production of the English relative clause by Chinese and Japanese learners of English. Her findings were subsequently confirmed by a number of researchers (e.g., Kleinmann 1977, Dagut and Laufer 1985). However, in order to claim

that under-representation of a form is a function of "avoidance," two conditions must be met:

a) the learner must have demonstrated knowledge of the form, at least in isolation (Kleinmann 1977);

b) the native speakers of the L2 use the form in the appropriate context (Seliger 1989, also Bley-Vroman & Hounig 1988).

These two conditions were met in the present study. First, Kate had the knowledge of the progressive marker, shown in her passing the classroom test and in using it in some tasks (see 10 above).⁴ Secondly, the native speakers of Chinese who were asked to perform the same tasks all used the marker where expected. It is important to point out that the use of the "avoidance" strategy was likely to be motivated by "resource-induced production problems" (Pienemann 1999:244). In other words, the strategy entails "a psycholinguistic solution to developmental conflicts," i.e., the learner holds back the context for unprocessable rules (Pienemann 1999:247, also Faerch and Kasper 1984), or they hold back the production of rules requiring processing resources not quite available to them.

There is also evidence to suggest that the delayed development of the progressive marker could be form-related. Two of the progressive variants (*zai-*, *ne*) are identical in form to the existential verb *zai*, 'be in/at,' and an interrogative particle, the sentence-final *ne*. The verb *zai* (be in/at) is a high frequency verb, so is the progressive variant *zai-* (PROG) even though the form *zhengzai...ne* (PROG) was officially taught, perhaps to maximize the formal contrast to the verb. In fact, two informants whose data was not used for analysis had remarked during the interviews that they always tried to look for locative words whenever they heard *zai*. The cross-categorization might have caused anxiety or fear of confusion over these identical forms with distinctive functions.⁵ This affective response might have contributed to the learners' preference for not using the form in situations where meaning was clear without it.

⁴Researchers interested in the "avoidance" phenomenon often satisfied themselves with the information that a given form had been part of the curriculum and textbook (Dagut and Laufer 1985), or that it had been taught (Hulstijn and Marchena 1989). The limitations of this approach are obvious. There is no causal link between "input" and "intake," to use Krashen's (1980, 1981, 1982) terminology. To demonstrate that the learners indeed have the knowledge of the form in their interlanguage, they have to show it at some point in their L2 speech production.

⁵A similar situation exists in the use of *-de*. It was not unusual for the learners to explain in the middle of an utterance which *-de* they were using (personal communication with the tutor, 1997).

Finally, the possibility of potential confusion between phonologically similar forms cannot be ignored. For example, [ɕjæ̌ndzæ̌ɪ] *xianzai* 'now,' [dʒə̌jdzæ̌ɪ] *zhengzai*-(PROG), and [ɕjæ̌ndzæ̌ɪ] *jianzai* (nonsense "word" or lexical gap) are phonologically distinguished by the first syllable. Anecdotal stories from teachers and learners confirm that beginning learners frequently have problems hearing the differences, especially in connected speech. Dave produced all three forms in the sentence initial position in several interviews (11) (12) (13), while two of them, *xianzai* 'now' and *zhengzai* -(PROG) occurred in the sentence initial position in Sharon's sample. It seems that these forms were in free variation at some point in Dave's and Sharon's interlanguage, marking the temporal reference of the present (see specially Dave, Interview 7 (week 29)).

- (11) ?Zhengzai ta shang shan. (Dave, 7.2, #70)
now/PROG he ascend mountain.

Now he is climbing the mountain.

- (12) Jianzai ta qichuang+ qichuang ne. (Dave, T7.2, #54)
now he up-bed + up-bed PROG

Now he is getting up.

- (13) Xianzai ta yao shuijiao le. (Dave, T5.2, #50)
now he want sleep PFV

Now he is going to sleep.

While using lexical means for aspectual marking is part of the developmental process (Bardovi-Harlig 1999), it is not certain whether, when the progressive form *zhengzai*-(PROG) appeared in the sentence-initial position, it was meant to be a progressive marker, or a phonological deviation of the adverb *xianzai* 'now'.⁶

Finally, the possibility remains that the informants (e.g., Kate, and to some extent Sharon) did not view the "picture description" task as semantically progressive. A similar case was reported in Nunan (1997:139) in which a learner failed to produce the required form (*V-ing*) in a picture description task designed to test for evidence of the present progressive. However, she did produce it in other more open tasks. In the present study, tasks which were more open-ended (e.g., making up a story, role-plays, video description, etc.) presented more challenges for the informants since they had to assess the communicative situation, create the progressive context where they saw it, and mark it linguistically. More often than not, the progressive was absent in their speech. This partly accounts for the decrease of marking in Interview 5 (week 23) and Interview 7 (week 29)

⁶In the present study, it is treated as a phonological deviation.

by Sharon, and in Interview 6 (week 26) and Interview 7 (week 29) by Dave. All this means that even though one's first language and the target language are similar in the underlying semantics of a form, the form-function relationship encoded in the form of the target language may still take time to develop. Language transfer in the simple sense of sharing L1 linguistic features in L2 production does not seem to happen so readily.

In conclusion, the aspect markers seem to be variational features which are subject to a certain degree of manipulation by the learners. Developmental conflicts between language processing and on-line language production, and between communicative efficiency and accuracy, are often solved by holding back the production of contexts (as in the case of *-guo* (EXP) in Sharon), or the production of the form (as in the case of *zhengzai* - (PROG) in Kate). Thus, the learners were developing their individual "dialect" in their second language.

7.3. Total "withdrawal": The case of *de* (RC)

For a variety of reasons, such as functional needs, under-developed processing skills, production strategies (e.g., avoidance), and learning strategies, the suppliance of morphemes is often not consistently maintained at a high rate in every data set. A fluctuation of suppliance is expected and in fact, it is accommodated by "a version of the continuity assumption... If a structure has been acquired it will be a constant part of the interlanguage system at later levels of development" (Pienemann 1999:147). Therefore, a low percentage of particular morpheme suppliance after its emergence does not pose a problem to the conclusion that the form has been acquired.

What occurred in the data for Kate, however, presented a special case: a form which had emerged stopped occurring subsequently. The case in point is the relative clause and its marker *de* (RC). Table 6.4-4 (reproduced below) shows that *de* (RC) emerged in Kate's sample in Interview 4 (week 16), one week later than Sharon and Dave. The insertion rate of morpheme was 60% in lexically varied environments. The form and the structure in which it occurred were clearly productive. While the structure remained in the IL speech of Sharon and Dave after its emergence, it disappeared from the samples of Kate after Interview 4 (week 16). Not a single *de*(RC) was found in Kate's samples after Interview 4, even though the relative clause context was provided in the questions asked by the researcher. Kate used a variety of strategies to answer the questions: single words of confirmation or disconfirmation, the Verb-complement structure, and re-formulating the structure, turning a relative clause into a simple SVO structure (for examples, see 6.4). The question is, why did Kate not use the relative clause?

Table 6.4-4. *-de* (RC) in "picture pair" and "conversation" tasks

Int -->	1 wk5	2 wk10	3 wk 13	4 wk16	5 wk23	6 wk 26	7 wk 29	8 wk 34	9 wk 37
Kate			0/0.	3/60 ⁺	0/(0.)	0/(0.)			
Sharon			7/1. ⁺	9/90		nd	4/1.	2/(1.)	
Dave			21/1. ⁺	26/1.	6/1.	10/1.	5/1.	3/(1.)	3/(1.)

+ indicates emergence point.

First, it is important to remember that the relative clause is an optional structure, the use of which is highly variable. It is a much-acknowledged fact that complex sentence structures (including the relative clause) are difficult to elicit from learners, especially in natural conversation. In addition, the communicative function served by the relative clause can be easily fulfilled by two or more simple sentences. Under these circumstances, the learner has a choice whenever a relative clause context presents itself: either using a few simple sentences or one complex sentence, with a relative clause. The outcome often has a psychological motivation. In this particular case, it seems that Kate chose to opt out of the structure which she was not yet proficient or confident enough to manage. The actual relative clause production in week 16 was "pushed" output. That is, it was imposed by the task ("picture pair"). Had the data collection been carried out in a completely natural environment, *de* (RC) (and the relative clause), in all likelihood, would have not been produced, as it never was in the conversation at the end of each interview. From this point of view, it can be argued that *de* (RC) was perhaps not quite developed in Kate's interlanguage system yet.

7.4. Processing hierarchy revisited: Stage One

The psycholinguistic mechanisms underlying speech production and language processing give rise to the fact that language learners initially produce single word utterances and invariant forms. The latter refers to a variety of unanalyzed forms such as monomorphemic units (e.g., "working," "eating") and formulaic chunks (e.g., routine expressions: *Ni hao* 'hello, how do you do; pre-fabricated sentences: *Bu zhidao* 'I don't know,' *Ni shi na guo ren?* 'what's your nationality?'). These characteristics are posited as Stage-One phenomena in the language processing hierarchy. So far in the discussion, the focus has been on the acquisition of forms pertaining to higher developmental stages. The discussion in this section will examine the Stage-One features in the samples in order to complete the picture of Chinese interlanguage development.

Table 7.1-3 shows that Kate and Sharon acquired lexical morphemes in Interview 2 (week 10), while Dave did so in Interview 1 (week 5). This means that developmentally, the period of time during which Kate and Sharon were unable to produce grammatical

affixes productively lasted about ten weeks. In the case of Dave, it lasted five weeks. Indeed, the data analysis in the preceding chapter shows that the productive status of *-de* (GEN), the sole grammatical morpheme in the samples of Interview 1 (week 5), could not be established for Kate, and to a certain extent, for Sharon. It was argued that when occurring exclusively in combinatorial units with pronouns ("pronoun-*-de* (GEN)"), *-de* (GEN) could be part of a monomorphemic unit (e.g., *wo-de* 'my,' *ni-de* 'your' *ta-de* 'his, her'). Such units can be learned as single lexical items, i.e., as possessive or adjective pronouns.

In addition to monomorphemic units, sentential chunks were also produced. These were a variety of interrogative sentences inquiring about one's name, family, nationality, residence, and profession. The productive status of these sentences is difficult to assess because the criterion of lexical and syntactic variation cannot be reliably applied due to the narrow range of communicative contexts in the first interview session. The relatively restricted syntactic possibilities of some sentence structures, notably questions about one's name, must also be taken into account when judging the productiveness of the form.

Despite these considerations, certain sentences do lend themselves to the analysis of Stage-One features. The sentences which are likely to be chunks commonly have a fixed string of constituents and a limited range of lexical items each of which is associated with a structure or a position. They are memorized together with their communicative functions. In the following, Kate's data in Interview 1 (week 5) will be examined to demonstrate this point.

In the first observation session, Kate produced a total of 72 productive utterances in which four verbs were used: *shi* 'be,' *xing* 'to be called (surname)', *jiao* 'be called (given or full name)', and *zhu* 'reside'. These four verbs occurred in three syntactic structures -- COP, SVN, and SVP -- in both declarative and interrogative forms. Chinese interrogatives do not involve constituent movement. Table 7.4-1 summarizes the description above.

Table 7.4-1. Syntactic structures in Kate's data: Interview 1 (week 5)

VERB	DECLARATIVE	INTERROGATIVE
<i>shi</i> 'be'	Pron <i>shi</i> N/NP (COP) <hr/> <ul style="list-style-type: none"> • Ta <i>shi</i> laoshi. he/she be teacher He/She is a teacher. 	Pron <i>shi</i> N/NP Q-par Pron <i>shi</i> Q-word <hr/> <ul style="list-style-type: none"> • Ta <i>shi</i> laoshi ma? he/she be teacher Q-par Is he/she a teacher? • Ta <i>shi</i> shui? he is who Who is he?
<ul style="list-style-type: none"> • <i>xing</i> 'to be called (surname)' • <i>jiao</i> 'to be called (given / full name)' 	Pron <i>xing/jiao</i> Proper N (SVN) <hr/> <ul style="list-style-type: none"> • Ta <i>xing</i> Zhang. he/she call-surname Zhang His/Her family name is Zhang. 	Pron <i>xing/jiao</i> Q-word <hr/> <ul style="list-style-type: none"> • Ta <i>xing</i> shemo? ne/she call-surname what What is his/her family name?
<i>zhu</i> 'reside'	Pron <i>zhu</i> Prep. N (SVP) <hr/> <ul style="list-style-type: none"> • Ta <i>zhu</i> zai Beijing. he/she reside in Beijing He/She lives in Beijing. 	Pron <i>zhu</i> Prep. Q-word <hr/> <ul style="list-style-type: none"> • Ta <i>zhu</i> zai nar? he/she reside in where Where does he/she live?

Distributional analysis of the verbs and their lexical arguments yielded the following findings:

- 1) pronouns never occurred after the verb;
- 2) lexical nouns, proper nouns and PPs never occurred before the verb;
- 3) post-verb constituents were each associated exclusively with a particular verb: lexical nouns with *shi* 'be', proper nouns with *xing* and *jiao* 'be called (surname, given name, full name)', and PPs with *zhu* 'reside'.

It seems that the position of the lexical constituents was invariant in these sentence structures. Given the contextual clues and structural possibilities offered in the elicitation tasks, there was no reason why such fixed distribution should occur, especially with respect to *shi* 'be' and *zhu* 'reside'.

These two features, invariant constituent distribution and structurally attached lexical materials, seem to point at a closed system in which each form performs one and only one function. This was made possible by the limited pronoun types (mostly second and third person singular pronouns) and proper noun types in the samples. In terms of language processing, it could mean that the structure was produced together with its lexical materials as one unit, much like that of prefabricated expressions which have a fixed, invariant structure and in which constituents do not vary in their distribution. Lexical substitution in these instances does not necessarily require the analysis of the entire sentence structure.

Indeed, rote memorization of linguistic material at the beginning of second language learning is not an uncommon strategy. Kate reported that she had learned by heart many sentences and expressions. Below is an example she gave:

- (14) ta shi na guo ren?
she/he be which country person
where is he/she from? / what's his/her nationality?.

Given the short length of the reading passages and small number of vocabulary items and sentences in the first 10 lessons, it was not impossible to memorize complete sentences and use them in roughly appropriate contexts.

The emergence of lexical morphemes marked the attainment of Stage Two in the acquisition hierarchy. At Stage Two, the learners are able to apply affixes which are read directly off the conceptual structure or the lexical entry of the word to which they are attached. While more sophisticated processing skills have been developed, Stage One features are still being produced, a "trailing" phenomenon that is common in interlanguage development (Larsen-Freeman & Long 1991). Typical Stage-One "trailers" in the data are routine-like utterances (15) (16):

- (15) (Wo) bu zhidao.
(I) not know
I don't know.
- (16) hen mang / bu mang
very busy/ not busy
I am busy. / I am not busy.

The only Stage-One feature conspicuously absent from the entire data corpus is the "single word" utterance. At no point were "single words" produced during the entire

observation period. The type of utterance, which constitutes a "single word", is defined as a self-initiated one-word utterance. A good example would be the first pair part of an adjacency pair, such as a question in (17), or a statement for confirmation in (18).

(17) A: Bi?
pen
Is that a pen? / Can I borrow or use that pen?

(18) A: (Pointing at a pen)
Bi.
pen
This is a pen.

Single words produced as replies to the questions and statements in the prior turn are not counted since they are often the default form in the discourse context, and are frequently produced by native speakers as well (19) (20).

(19) R: Wang laoshi jiang gushi ma?
Wang teacher tell story Q-par
Does teacher Wang tell stories?

Kate: Youshihou. (Kate, T8.1, #34)
sometimes

Sometimes.

(20) R: ...Zhengqi bu zhengqi?
tidy not tidy
... tidy?

Dave: oh zhengqi. (Dave, T4.2, #22)
oh tidy

Oh yes.

The absence of single word production might raise some questions about the proposed developmental hierarchy had the data been collected in the naturalistic environment where language use is motivated by communicative needs and transmission of meaning is of paramount importance. The time constraint imposed upon on-line speech processing and production is real, and consequently, the attention to form is diminished. One can only produce what one is able to under such circumstances. The natural speech data thus better represents the true state of one's second language development.

In interview situations, by contrast, the features which characterize natural speech production are compromised to a certain degree.⁷ Although language is produced on-line, time constraints are not exercised as strictly as in the natural setting. The focus of attention to meaning and form varies from task to task. In some cases, the communicative needs are imposed rather than self-initiated.

To a certain extent, the interview setting is not unlike that of a classroom where learners are trying to do their best and where interaction is regulated by features of institutional discourse.⁸ As single words and "broken" sentences are discouraged in the language classroom, the informants tried not to produce these in the interviews, either. It seems that the data-collection method did affect language behavior in some way.⁹

The claim that the lack of single-word production by the informants is in part an artifact of the data collection setting is partly supported by a one-word utterance not recorded on the tape. During the pre-interview greeting and chatting in week 29 (Interview 7), Sharon pointed at the window and said *yu* 'rain.' As it was not raining at that moment although the sky looked dark and menacing, and as the correct minimal form is *xiayu* 'descend-rain, raining' the researcher did not at first understand what she meant. The phrase *xiayu* 'raining' had been taught in class. In fact, Sharon had produced it in an early interview (Interview 5, T5.2). However, when the idea "it is raining" or "it is going to rain" was expressed spontaneously, a single word was produced. Unfortunately, such natural speech behavior was not often encountered during the observations themselves.

Some linguistic forms in Dave's first data set (Interview 1, week 5) might also be interpreted as single words. The following are typical examples (19) (20).

(Pointing at a person in the photo)

- (21) Ta + (en) laoshi ma? (Dave, T1.3, #18)
she+(en) teacher Q-par
Is she a teacher? / She your teacher?

⁷See Chapter 3 for a detailed critique and rationale.

⁸This mainly refers to the role relationship between the participants, the turn allocations, and the distribution of topics.

⁹Change of behavior could be observed of the informants before and after entering the room, before and after they sat down, before and after the tape-recorder was turned on, etc. The readiness to speak Chinese and the amount of Chinese readily produced differed at these junctures.

- (22) Ta+ (en)+ ni -de baba. (Dave, T1.1, #6)
he+ (en)+ you -GEN dad.
Is he your dad? / He your dad?

It could be argued that both utterances are made of single words (pronouns and lexical nouns in (21)) and phrases (possessive NP in (22)), and they are put together in a particular order. The outcome is not grammatical because the verb copula is missing. The meaning is made clear through gestures and visual materials (photos).

On the other hand, it is also possible to argue that (21) and (22) are "verbless sentences." The word or phrasal constituents separated by the pause are pragmatically connected to express a single meaning. Unlike Sharon's single word production *yu* 'rain,' the pronoun *ta* 'she/he' in (21) and (22) does not form a complete unit of meaning in the discourse context. Therefore, it is not a single word expressing the meaning of a complete sentence, but a constituent of a larger unit in which the copula, a semantically redundant element, is not present. This form of sentence in which the COP is missing is a common feature of interlanguage. It was reported in Meisel, Clahsen and Pienemann (1981), and was related to the variational features of interlanguage word order.

The absence of single word utterances in the data corpus of second language acquisition studies has been reported in Kawaguchi (1996) and Huter (1996). In another study (Johnston 1985), only one out of the 16 adult learners of English from Polish and Vietnamese backgrounds who served as the informants produced single words. All this means that the one-word stage could be very short in the second language acquisition process, especially in a formal learning situation. In order to capture one word utterances from a learner, one needs to either start data collection virtually from day one, or to "live" with the informants, both of which present considerable difficulties in actual practice.

In summary, the analysis of Kate's first data set has uncovered evidence of the initial stage phenomenon described in Processability Theory. The picture is now complete. The Chinese interlanguage data collected from the three informants over one academic year constitutes strong evidence in favor of the hypothesized hierarchy. Each stage in the hierarchy is supported by evidence, even though some stages are not clearly distinguishable in some samples. Table 7.4-2 is constructed by applying the usual mechanics of implicational scaling on the acquisition information presented in the previous chapter. The informants are identified by a letter. The number next to the letter refers to the interview session (e.g., K1 = Kate, Interview 1). The plus sign "+" refers to the presence of the feature(s) listed in the first column, and the minus sign "-" shows its absence. The slash means that no assessment of the feature in the samples could be made reliably.

The table demonstrates a strong implicational relationship of the linguistic features of the four stages. The presence of a form at a higher stage invariably implies the presence of the form(s) at a lower stage. The reverse is not true. Thus, the informants reached the first three stages in a progressive manner by Interview 3 (week 13). The only stage which remained unstable was Stage Four, where both plus and minus signs are present in this table of amalgamated data. A close examination of the table reveals the location of the instability: it is in Kate's samples.

Table 7.4-2. Implicational scale of grammatical morphemes

Stages	K1	S1	D1	D2	K2	S2	K3	S3	D3	K4	S4	D4	K5	S5	D5	K6	D6	K7	S7	D7	K8	S8	D8	K9	S9	D9
1	+	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
2	-	(+)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	(+)	+	+	+	+	+
3	-	-	-	-	(+)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4	-	-	-	-	-	-	-	+	+	+	+	+	-	-	+	-	+	-	+	+	-	(+)	(+)	-	-	(+)

7.5. Summary

The development of Chinese grammatical morphemes has been examined in the context of formal instruction on the one hand, and second language processing hierarchy on the other. The findings demonstrate that the development followed the sequence proposed in Processability Theory. The instruction constrained the acquisition in terms of the input it provided. It did not affect the timing or the overall sequence of the acquisition. What was acquired had been taught, but what had been taught was not always acquired.

The findings also show that the emergence of lexical morphemes is contingent upon lexical acquisition, categorial analysis, and the degree of complexity of form-function relationship. These factors also seemed to have contributed to learner variations and interlanguage "dialects." Indeed, the observed differences between the informants were found in the following areas: the degree of responsiveness to instruction, the degree of grammatical accuracy, and the functional range of language use. Kate, being an accuracy-oriented learner, took more time acquiring a form than Dave. Kate was also more restrictive in her interlanguage use. Structural and functional contexts for morpheme insertions were created often as the result of task demand or possible meaning conflict. Dave, on the other hand, was the most responsive of the three informants to instruction. He used newly taught grammatical structures consistently and spontaneously to express himself. Compared to Kate, he committed more grammatical errors (e.g., over-applications, mis-applications, verbless structures). Sharon seemed to be halfway between Kate and Dave in terms of the characteristics described above.

Finally, the data offers strong support for the developmental sequence proposed by Processability Theory. A clear implicational relationship exists among the grammatical morphemes, and this corresponds to the proposed processing hierarchy. Therefore, a processability-based acquisition pattern can be established for the eight grammatical morphemes of Chinese.

Chapter 8

Conclusion and Comment

The study presented in the preceding chapters has been carried out in the theoretical and analytical framework of Processability Theory. The theoretical perspective ensured both descriptive and explanatory adequacy regarding

- a) the acquisition process of eight Chinese grammatical morphemes, and
- b) the effect of formal instruction, especially the effect of the grammatical sequencing in the textbooks and syllabus, on the acquisition process.

At the same time, the developmental hierarchy hypothesized in Processability Theory was also tested.

As stated at the beginning, the key objective of the study was to document the developmental pattern of eight Chinese grammatical morphemes in the interlanguage of Chinese. Using distributional analysis and the set of acquisition criteria specified in Processability Theory, the data analysis focused on identifying the emergence point of each of the eight morphemes and on tracing their subsequent evolutionary process. The main findings of the analysis include the following.

- 1) The developmental process of some lexical morphemes, notably, *-de* (GEN) and *-de* (ATT), was contingent upon the analysis of lexical nouns by the learners. Deeper analysis resulted in more semantic features being added to the lexical entries of the noun, leading to functional expansions of *-de* (GEN) and *-de* (ATT) marking. (See Sections 6.1 and 6.2).
- 2) The development of lexical morphemes was also dependent upon the categorial analysis of lexical materials by the learner. Whether a lexical item was classified as an adjective or a stative verb by the learner affected the acquisition of the adjective suffix *-de* (ADJ). The data analysis in Section 6.3 demonstrated a positive correlation between the number of adjectives in the interlanguage lexicon of the learners and the speed with which the adjective suffix emerged. Lexical morphemes will not develop if the lexical material to which they are attached is not added to the IL lexicon.
- 3) The acquisition of a lexical morpheme is most efficient if the morpheme is introduced within a syntactic structure. A good example is *-de* (ATT), taught formally in the locative

NP structure. The locative NP provides a structural "anchor" on which the functional analysis of the morpheme can be carried out consistently and systematically (Section 6.2).

Given the developmental pattern of the grammatical morphemes as observed, the question arises as to how much of this pattern was influenced by formal instruction. The answer to the question is presented in the following.

4) Formal instruction in a foreign language setting, as was the case in the present study, provides opportunities for acquisition to take place by making accessible the target language material of which the learner had no a priori knowledge. The findings showed that the emergence point of every morpheme was always after instruction as the learners did not seem to receive comprehensible L2 input outside the classroom. However, instruction did not dictate acquisition. What was taught was not always learned or was not always learned immediately (see Sections 6.1 and 6.2).

5) Instruction did not have a uniform influence on the acquisition of every morpheme. Its degree of efficiency varied not only among the morphemes but also among the learners. It is perhaps not so much the instruction *per se*, but the learner's readiness to take advantage of the instruction, which contributed, to a certain extent, to the immediate or delayed acquisition of a given structure (Section 6.2).

6) Learner orientations were shown in the variation of acquisition patterns and response to instruction. The accuracy-oriented learner (Kate) preferred to "play it safe," holding back the structural and functional context for rule applications to avoid possible errors. Restrictive in the range of linguistic contexts being produced, the learner also experienced extensive delays in acquisition. The communication-oriented learner (Dave, and to a certain extent, Sharon), on the other hand, responded to instruction by actively using the newly learned forms to meet their expressive needs. He/she constantly created rule application contexts to the extent that over-generalizations tended to occur (Chapter 6). Instruction, in terms of providing opportunities for acquisition to take place, was effective with this type of learner.

7) The effect of instruction on acquisition is associated with language-internal and external factors. The form-function relationship of a structure, the processing-induced production strategy (e.g., avoidance), and the lexical acquisition and analysis, are some of the major factors contributing to the immediate and delayed response to instruction (Sections 6.2-6.3).

Finally, the adequacy of Processability Theory as a descriptive and explanatory framework for the developmental problem of SLA was tested in the course of the study. Of special interest was the question of whether the acquisition process of an analytic language type, namely Chinese, would follow the developmental sequence reflected in the abstract stages of processing hierarchy in Processability Theory. Eight Chinese grammatical morphemes were analyzed in LFG so that a developmental sequence was predicted in accordance to the processing hierarchy. Below are some of the findings.

8) The overall acquisition course of the eight morphemes followed the developmental stages proposed by Processability Theory (see Table 8.1, also Table 6.8-2):

Table 8.1. Developmental hierarchy

1	invariant forms
2	lexical morphemes
3	phrasal morphemes
4	inter-phrasal morphemes

Stage One phenomenon was not well represented in the samples of the informants, and some of the stages were not clearly distinguishable in the samples of two informants (Sharon and Dave, see Table 6.1-3). However, in the latter case, the two processing procedures / stages which emerged simultaneously were always adjacent to each other. There was not a single case in which a form at a higher stage was acquired before any form at a lower stage. In other words, developmental "skip" did not occur.

8) Compared to instruction, the hierarchy of L2 processing skills described in Processability Theory seemed to be more responsible for the developmental sequence of the eight grammatical morphemes under the study (see Tables 6.1-3 and 6.1-4). The learner only began to acquire a form at a point when the form was processable by him/her. Otherwise, acquisition was impervious to instruction.

9) "Bulk transfer" in potentially transferable cases (i.e., cases in which L1 and L2 share a similar functional range, e.g., the progressive and genitive marking) was not observed. Learning a second language entails not only acquiring linguistic means but also developing processing resources and skills to actually use the linguistic means in the target language. "Bulk transfer" was not possible due to varying degrees of processing

constraints during speech production, as well as varying levels of L2 processing skills of the learner at a particular point of the acquisition course.

The findings outlined above are consistent with a number of issues in the SLA literature. For example, the role of lexical learning in the development of L2 grammar has been documented in the literature. On the basis of the findings obtained from a grammaticality judgment test, Ard and Gass (1987:233) concluded that "what appears to be syntactic acquisition [should be] more appropriately described as lexical or semantic acquisition." The relationship between lexicon and syntax is also reflected in the syntactic theory of GB (Chomsky 1981a) and contemporary work on second language mental lexicon (Singleton 1999). The GB "Projection Principle" that "lexical information is syntactically represented" points explicitly to the syntactic possibilities contained in a word (Haegeman 1991, Jacobs 1995). This theoretical conceptualization of lexicon has prompted Cook (1988) to suggest that L2 input in the classroom should be increased because it provides learners with syntactic information about the words they are learning.

The processability perspective of SLA provides new insights into some old issues such as language transfer. Leaving aside the simplistic version of transfer based on Contrastive Analysis (see Ellis 1985a, Larsen-Freeman & Long 1991), the more theoretical conceptualization of transfer in the general framework of UG tackles the issue from the viewpoint of learnability and linguistic competence (Bley-Vroman 1989, White 1989b, Schwartz and Sprouse 1996). It has been suggested that the major linguistic categories contained in one's first language can be readily found in the second language and that the cognitive learning devices (UG/LAD) continue to function in the second language acquisition process. Therefore, second language acquisition does not start from zero, but is built upon the existing knowledge and system of one's L1.

Dealing with language development on the performance level, Pienemann (1999) argues that any suggestion of a full transfer of L1 grammatical system to L2 is not plausible because every single word or form in an L2 must be analyzed according to L2 rules. For example, a verb which permits two NP complements in one's L1 may only allow one NP and one PP in the L2. Learning a second language means building up an L2-specific processor to handle L2 grammatical operations at every level of analysis and production. Transfer (not "bulk transfer") often occurs as a strategy to compensate for the insufficient L2 knowledge during language production.

The processability position regarding L1 transfer is supported by findings of empirical studies. Applying X'-theory to the L2 data from learners of German from Korean, Turkish, Italian and Spanish-speaking backgrounds, Vainikka and Young-Scholten

(1996a) demonstrated that transfer of L1 VP headedness occurred only at the early VP stage, the first stage of syntactic development posited in the study. Learners inevitably switched the headedness to the correct, head-final value for German, and no transfer was observed for syntactic structures developed at later stages. Apparently, the transfer of L1 VP headedness was in part a function of under-developed lexical analysis, a conclusion drawn by Vainikka and Young-Scholten (1996a:7) themselves:

...only lexical projections constitute the L2 learner's initial stage; the development of functional projections is driven solely by the interaction of X'-Theory with the target-language input.

Håkansson's study (1994) showed a similar phenomenon. Swedish school pupils learning German failed to transfer the verb-second (V/2) rule to German in a translation task, even though both languages share the same rule. The present study showed that the informants initially did not use the genitive marker *-de* (GEN) in all the relevant contexts, although the functional range of the genitive marker in Chinese and English is quite similar. The functional similarity of the progressive marker between the two languages did not lead to immediate and uniform application of the marker in the Chinese progressive context, either. The under-developed lexical entry of the L2 nominals at the early stage of learning and the processing-related production and communication strategies were shown to be largely responsible for the non-applications. All this means that transfer as an explanation for SLA development is not very satisfactory.

The issue of the effect of formal instruction has been occupying the attention of SLA researchers for years. A large body of work devoted to this issue has attested to the following findings (see Freeman and Long 1991):

- a) formal instruction makes a difference to a vast majority of adult language learners as compared to naturalistic language acquisition in terms of the rate of acquisition and the level of grammaticality;
- b) the acquisition process is immutable to instruction. The L2 grammar does not develop the way it is taught;
- c) instruction has little or no lasting effect on particular structures.

The findings in a), i.e., the acceleration of the learning process and the increase in the accuracy of target language-like speech production, are certainly encouraging as they are two of the basic aims of instruction (Johnston 1997). However, due to the non-comparative research design of the study, and the lack of any naturalistic CSL data

available, the present study cannot confirm or disconfirm those research findings. There were observable differences among the three informants in both the rate of learning and the degree of accuracy of their interlanguage speech. Whether they were "faster" or "slower" than untutored learners, or whether they were "more" or "less" accurate than untutored learners, is a question which the present study is unable to answer. In a wider context of language learning (and, by extension, language instruction) in relation to other forms of "psycho-motor learning" (and the learner's whole educational profile) (Johnston 1997:131), the comparison could only be made with untutored learners with very similar backgrounds. Johnston (1997:134) pointed out that traditional terms such as "naturalistic" (untutored) and "formal" were behavioral descriptions which did not make a distinction between "input -- what is available to the learner -- and intake -- what he or she can actually process." What was important, he maintained, was not the learning setting itself but the level of control by the learner to "consciously direct his or her mental activities" or "a capacity for self-instruction" (Johnston 1997:132-134). His study on the ESL learners from Polish and Vietnamese L1 backgrounds showed that language instruction only promoted faster learning and more accurate target language speech with the learner who possessed these faculties (Johnston 1997).

With regard to b) and c) above, the present study does offer some evidence of support. In learning the genitive and attributive markers, the informants followed a process of gradually adding semantic features (agent, possession, human, location, attribute, etc.) to their interim *N-de* grammar. Apparently, this was not the way their lecturer and tutor taught them the genitive and attributive markings. Instruction did not always have an immediate effect on the acquisition of the structures. Some structures took a long time to emerge, and one never did in the interlanguage grammar of Kate (*-de* (ADJ)). As was found in the previous studies, instruction may produce temporary gains in terms of suppliance rate but not long term survival of the suppliance (Lightbown, Spada and Wallace 1980, Schumann 1979, Adamson and Kovac 1981, Ellis 1984b). This seemed to be the case with the total disappearance of the relative clause in the interlanguage of Kate (see Section 6.3). As Larsen-Freeman and Long (1991:308) correctly pointed out, "the lack of effect for instruction ... is probably due to the ... choice of items which were developmentally beyond the reach of the learners involved, i.e. to poor *timing* of instruction." This possibility, if stated differently, is precisely the central thesis of the teachability hypothesis (Pienemann 1984) and Processability Theory (Pienemann 1999).

Finally, the theory-data interface in research studies seems to be most productive because it yields results which are theoretically explicable and empirically testable. This is especially true in the search for developmental sequences in SLA. Purely data-driven research such as the Morpheme Order Studies (Dulay and Burt 1973, 1974), or some of

the CSL work (e.g., Shi 1998), not only lacks explanatory value but is also likely to produce spurious results. Too often in the data-driven studies, unmotivated findings are masked by the technicalities of elaborate statistics (e.g., Shi 1998) (Johnston 1998). A well-formulated language acquisition theory, such as Processability Theory, not only specifies the conceptual aspect of language acquisition, but also stipulates the type of data necessary for a particular kind of observation. The theory-data interface ensures the consistency of the research process as well as the research outcome.

As with every research project, the excitement goes in tandem with regrets. Some of the regrets in the present study have to do with the limitations beyond the control of the researcher, while others were accepted from the beginning for lack of better alternatives. Of the various weaknesses, two stand out in particular.

The first one is concerned with the environment in which the research was carried out. Ideally, SLA research of the kind undertaken in this study should be carried out in a naturalistic setting. Data obtained from a naturalistic environment would be closer to representing the true process of IL development. This was impossible due to logistical reasons. Given the research purpose of the present study, i.e., documenting language learning process in a formal setting, the environment was not such a big drawback. Unfortunately, there is no study investigating naturalistic second language acquisition of Chinese. It is therefore not feasible to confirm that the findings from the present study do represent the natural developmental sequence of the eight Chinese grammatical morphemes.

The data collection method is an area that may warrant critique. The rationale for choosing the task-based oral interview is given in Chapter 5. While a great number of grammatical items were successfully elicited with this method, some were missing, e.g., one-word production.¹ Although it is possible that the one-word stage had passed before the data collection started, the elicitation method with which the data was collected might have also contributed to the gap in the samples. Compared with conversation, the interview is structured and pre-planned. The informants have little choice, especially at the beginning, in determining the topic and the direction of the interview. Therefore, it is not certain whether in real communicative settings (e.g., a normal conversation), the informants would produce various kinds of linguistic structures at a given point as they did in the interviews. In other words, to what extent does the data represent the true state of the IL and to what extent is it an artifact of the elicitation method? Once more, the lack

¹Single word production refers to utterances in the first part of an adjacency pair, or any self-initiated output. Single word replies to questions occurred frequently in the data. They were natural responses in a "Question-Answer" adjacency pair for native speakers as well, and not counted as "single word" data.

of naturalistic Chinese language acquisition studies makes it impossible to answer these questions.

The limitations of the study can be viewed as suggestions for improvement, if possible, in future research. While many issues remain untouched and unsolved, the findings of this study have provided some preliminary information about the acquisition sequence of eight Chinese grammatical morphemes. This, in itself, may serve as a point of departure for further studies to confirm, disconfirm, and refine. While the findings may, in a tentative and experimental way, inform syllabus design and grammatical sequencing in pedagogical practice, more research along the same line, especially research in naturalistic settings, is needed before any formal pedagogical recommendations can be made with confidence.

References

- Adamson, H. C., & C. Kovac. (1981). Variation theory and second language acquisition: An analysis of Schumann's data. In D. Sankoff and H. Cedergren (eds.), *Variation Omnibus*. Linguistics Research, Edmonton.
- Anderson, J. R. (1992). *Second Language Learners' Acquisition of Grammatical Gender in Swedish*. Gothenburg monographs in linguistics 10: University of Gothenburg.
- Anderson, J. R. (1995). *Cognitive Psychology and its Implications*. New York: Freeman.
- Andersen, R., & Y. Shirai. (1996). The primacy of aspect in first and second language acquisition: The pidgin-creole connection. In W.C. Ritchie & T. K. Bhatia (eds.), *Handbook of Second Language Acquisition*. San Diego, CA: Academic Press.
- Ard, J., & S. Gass. (1987). Lexical constraints on syntactic acquisition. *Studies in Second Language Acquisition*, 9/1, 233-251.
- Bardovi-Harlig, K. (1992). The use of adverbials and natural order in the development of temporal expression. *IRAL*, 30, 299-320.
- Bardovi-Harlig, K. (1999). From morpheme studies to temporal semantics: Tense-aspect research in SLA. *Studies in Second Language Acquisition*, 21, 341-382.
- Bates, E., & B. MacWhinney. (1982). Functionalist approach to grammar. In E. Wanner & L. Gleitman (eds.), *Language Acquisition: The state of the art*. Cambridge: Cambridge University Press.
- Bates, E., & J. Elman. (1992). *Connectionism and the Study of Change*. CRL Technical Report 9002. February 1992. University of California, San Diego: Center for Research in Language.
- Bellugi, U. (1971). Simplification in children's language. In R. Huxley & E. Ingram (eds.), *Language Acquisition: Models and Methods*. New York: Academic Press.
- Beretta, A. (1991). The theory construction in SLA. *Studies in Second Language Acquisition*, 13, 493-511.
- Bever, T. (1970). The cognitive basis of linguistic structures. In Hayes (ed.), *Cognition and the Development of Language*. New York: Wiley.
- Bialystok, E. (1981). The role of conscious strategies in second language proficiency. *Modern Language Journal*, 65, 24-35.
- Bialystok, E. (1991). Metalinguistic dimensions of bilingual language proficiency. In E. Bialystok (ed.), *Language Processing in Bilingual Children*. Cambridge: Cambridge University Press.
- Bickerton, D. (1991). The pace of syntactic acquisition. *Proceedings of the Berkeley Linguistics Society*, 17, 173-221.
- Birdsong, D. (1989). *Metalinguistic Performance and Interlanguage Competence*. New York: Springer-Verlag.

- Birdsong, D. (1991). On the notion of "critical period" in UG/L2 theory: A response to Flynn and Manuel. In L. Eubank (ed.), *Point Counterpoint: Universal Grammar in the Second Language*. Amsterdam: John Benjamins.
- Bley-Vroman, R. (1989). What is the logical problem of foreign language learning? In S. Gass & J. Schachter (eds.), *Linguistic Perspectives on Second Language Acquisition*. Cambridge: Cambridge University Press.
- Bley-Vroman, R. (1990). The logical problem of foreign language learning. *Linguistic Analysis*, 20, 3-49.
- Bley-Vroman, R., & C. Hounig. (1988). Why do Chinese use few relative clauses in English? *University of Hawai'i Working Papers in ESL*, 7/2, 93-98.
- Bley-Vroman, R., S. Felix & G. Ioup. (1988). The accessibility of Universal Grammar in adult language learning. *Second Language Research*, 4, 1-32.
- Bloom, L., M. Lahey, L. Hood, K. Lifter & K. Fiess. (1980). Complex sentences: Acquisition of syntactic connectives and semantic relations they encode. *Journal of Child Language*, 7, 235-261.
- Bloom, P. (1990). Subjectless sentences in child language. *Linguistic Inquiry*, 21, 491-504.
- Bolander, M. (1988). Is there any order? On word order in Swedish learner language. *Journal of Multilingual and Multicultural Development*, 9, 97-113.
- Boss, B. (1996). German grammar for beginners -- the Teachability Hypothesis and its relevance to the classroom. In C. Arbones Sola, J. Rolin-Ianziti & R. Sussex (eds.), *Who's Afraid of Teaching Grammar. Papers in Language and Linguistics*, 1, 93-103.
- Bowerman, M. (1979). The acquisition of complex sentences. In P. Fletcher & M. Garman (eds.), *Language Acquisition*. Cambridge: Cambridge University Press.
- Bowerman, M. (1973). *Early Syntactic Development: A Cross-Linguistic Study with Special Reference to Finnish*. New York: Cambridge University Press.
- Braine, M. (1987). What is learned in acquiring word classes-A step toward an acquisition theory. In B. MacWhinney (ed.), *Mechanisms of Language Acquisition*. New York: Erlbaum.
- Bresnan, J. (1978). A realistic transformational grammar. In Halle, M., J. Bresnan & G. Miller. (eds.), *Linguistic Theory and Psychological Reality*. Cambridge, Mass.: The MIT Press.
- Bresnan, J. (1982a). *The Mental Representation of Grammatical Relations*. Cambridge, Mass.: MIT Press.
- Bresnan, J. (1982b). The passive in lexical theory. In J. Bresnan (ed.), *The Mental Representation of Grammatical Relations*. Cambridge, Mass.: MIT Press.
- Bresnan, J. & Kaplan, R. (1982). Introduction: Grammars as mental representations of language. In J. Bresnan (ed.), *The Mental Representation of Grammatical Relations*. Cambridge, Mass.: The MIT Press.

Brown, G., K.L. Currie, & J. Kenworthy. (1980). *Questions of Intonation*. Baltimore, MD.: Sage.

Brown, R. (1968). The development of *wh* questions in child speech. *Journal of Verbal Learning and Verbal Behavior*, 7, 277-290.

Brown, R. (1973). *A First Language. The Early Stages*. Cambridge, Mass.: Harvard University Press.

Brown, R., & C. Hanlon. (1970). Derivational complexity and order of acquisition in child speech. In J. R. Hayes (ed.), *Cognition and the Development of Language*. New York: Wiley.

Chao, Y-R. (1968). *A Grammar of Spoken Chinese*. Berkeley, CA: University of California Press.

Chao, Y-R. (1982). *Zhongguohua de Wenfa*. [A Grammar of Spoken Chinese]. HK: Chinese University Press.

Chomsky, C. (1969). *The Acquisition of syntax in children from 5 to 10*. Cambridge, Mass.: MIT Press.

Chomsky, N. (1965). *Aspects of the Theory of Syntax*. Cambridge, Mass.: MIT Press.

Chomsky, N. (1981a). *Lectures on Government and Binding*. Cambridge, Mass.: MIT Press.

Chomsky, N. (1981b). Principles and parameters in syntactic theory. In N. Hornstein and D. Lightfoot (eds.), *Explanations in Linguistics: The Logical Problem of Language Acquisition*. London: Longman.

Chomsky, N. (1986). *Knowledge of Language: Its Nature, Origin and Use*. New York: Praeger.

Clahsen, H. (1979). Syntax oder pproduktionsstrategien. Zum natürlichen Zweitspracherwerb der 'Gastarbeiter.' In R. Kloepfer (ed.), *Bildung und Ausbildung in der Romania*. München: W. Fink.

Clahsen, H. (1980). Psycholinguistic aspects of L2 acquisition. In S. Felix (ed.), *Second Language Development*. Tübingen: Narr.

Clahsen, H. (1984). The acquisition of German word order: A test case for cognitive approaches to second language acquisition. In R. Andersen (ed.), *Second Languages*. Mass.: Rowley.

Clahsen, H. (1986). Connecting theories of language processing and (second) language acquisition. In C. W. Pfaff (ed.), *First and Second Language Acquisition Processes*. Cambridge: Newbury House.

Clahsen, H. (1988a). Critical phases of grammar development. A study of the acquisition in children and adults. In P. Jordens, & J. Lalleman (eds.), *Language Development*. Dordrecht: Foris.

Clahsen, H. (1988b). Parameterized grammatical theory and language acquisition: A study of the acquisition of verb placement and inflection by children and adults. In S. Flynn and W.O. O'Neil (eds.), *Linguistic Theory in Second Language Acquisition*. Dordrecht: Kluwer.

- Clahsen, H. (1989). Constraints on parameter setting. A grammatical analysis of some acquisition stages in German child language. Manuscript. Düsseldorf.
- Clahsen, H. (1990). The comparative study of first and second language development. *Studies in Second Language Acquisition*, 12, 135-154.
- Clahsen, H. (1992). Learnability theory and the problem of development in language acquisition. In J. Weissenborn, H. Goodluck and T. Roeper (eds.), *Theoretical Issues in Language Acquisition: Continuity and Change*. Hillsdale, NJ.: Lawrence Erlbaum.
- Clahsen, H., & P. Muysken. (1986). The availability of Universal Grammar to adult and child learners: A study of the acquisition of German word order. *Second Language Research*, 2, 93-119.
- Clahsen, H., S. Eisenbeiss, & A. Vainikka. (1994). The seeds of structure: A syntactic analysis of the acquisition of case marking. In T. Hoekstra & B. Schwartz (eds.), *Language Acquisition Studies in Generative Grammar*. Philadelphia: John Benjamins.
- Clancy, P. (1985). The acquisition of Japanese. In D. I. Slobin (ed.), *The Cross-Linguistic Study of Language Acquisition*. Vol. 1. *The Data*. Hillsdale, NJ.: Erlbaum.
- Comrie, B. (1976). *Aspect*. New York: Cambridge University Press.
- Cook, V. (1991). *Chomsky's Universal Grammar: An Introduction*. Oxford: Blackwell.
- Cook, V. & M. Newson. (1996). *Chomsky's Universal Grammar: An Introduction*. Oxford: Blackwell.
- Coppetiers, R. (1987). Competence differences between native and fluent non-native speakers. *Language*, 63, 544-573.
- Corder, S. (1967). The significance of learners' errors. *International Review of Applied Linguistics*, V, 161-169.
- Corder, S. (1971). Idiosyncratic dialects and error analysis. *International Review of Applied Linguistics*, IX, 149-159.
- Corder, S. (1974). Error analysis. In J. Allen and S. Corder (eds.), *The Edinburgh Course in Applied Linguistics*, Vol. 3. Oxford: Oxford University Press.
- Crain, S. & M. Nakayama. (1987). Structure dependence in grammar formation. *Language*, 63/3, 522-543.
- Crookes, G. (1990). The utterance, and other basic units for second language discourse analysis. *Applied Linguistics*, 11, 183-199.
- Crookes, G., & S. Gass. (1993). *Tasks and Language Learning*. Clevedon: Multilingual Matters.
- Dagut, M., & B. Laufer. (1985). Avoidance of phrasal verbs - a case for contrastive analysis. *Studies in Second Language Acquisition*, 7/1, 73-80.
- Dale, P. (1976). *Language Development: Structure and Function*. Hinsdale, IL.: Dryden Press.

- de Villiers, J., & P. de Villiers. (1978). *Language Acquisition*. Cambridge, Mass.: Harvard University Press.
- Deprez, V. & A. Pierce. (1993). Negation and functional projections in early grammar. *Linguistic Inquiry*, 24, 25-67.
- Dobson, W. (1974). *A Dictionary of the Chinese Particles*. Toronto: University of Toronto.
- Dietrich, R., W. Klein, & C. Noyau. (1995). *The Acquisition of Temporality in a Second Language*. Amsterdam: Benjamins.
- Doi, T., & K. Yoshioka. (1987). Which grammatical structures should be taught when? Implications of the Piennemann-Johnston model for teaching Japanese as a foreign language. Paper presented at the 9th Hawai'i Association of Teachers of Japanese Language and Language Teaching.
- Duff, P. (1993). Tasks and interlanguage performance: An SLA research perspective. In G. Crookes and S. Gass (eds.), *Tasks and Language Learning*. Clevedon: Multilingual Matters.
- Dulay, H., & M. Burt. (1973). Should we teach children syntax? *Language Learning*, 23, 245-258.
- Dulay, H., & M. Burt. (1974). Natural sequences in child second language acquisition. *Language Learning*, 24, 37-53.
- Dulay, H., M. Burt, & S. Krashen. (1982). *Language Two*. New York: Oxford University Press.
- Dupe, T. (1998). Can card games promote the sustained use of LOTE between students? In L. Jansen & T. Liddicoat (eds.), *Lifting Practice*. Canberra: Australian National University.
- DuPlessis, J., D. Solin, L. Travis, & L. White. (1987). UG or not UG, That is the question: A reply to Clahsen and Muysken. *Second Language Research*, 3/1, 56-75.
- Ellis, R. (1984a). *Classroom Second Language Development*. Oxford: Pergamon Press.
- Ellis, R. (1984b). Can syntax be taught? A study of the effects of formal instruction on the acquisition of WH-questions in children. *Applied Linguistics*, 5/2, 138-155.
- Ellis, R. (1985a). *Understanding Second Language Acquisition*. Oxford: Oxford University Press.
- Ellis, R. (1985b). Sources of variability in interlanguage. *Applied Linguistics*, 6, 118-131.
- Ellis, R. (1987). Contextual variability in second language acquisition and the relevance for language teaching. In R. Ellis (ed.), *Second Language Acquisition in Context*. Englewood Cliffs, N.J.: Prentice Hall.
- Ellis, R. (1989). Are classroom and naturalistic acquisition the same? A study of the classroom acquisition of German word order rules. *Studies in Second Language Acquisition*, 11, 303-328.
- Engelkamp, J. (1974). *Psycholinguistik*. Munchen: Ullstein.

- Erbaugh, M. S. (1982). *Coming to Order: Natural Selection and the Origin of Syntax in the Mandarin-Speaking Child*. Unpublished Ph.D dissertation. Berkeley: University of California.
- Erbaugh, M. S. (1992). The acquisition of Mandarin. In D. Slobin (ed.), *The Cross-Linguistic Study of Language Acquisition*. Vol.3. Hillsdale, NJ.: Lawrence Erlbaum.
- Erreich, A. (1984). Learning how to ask: Patterns of inversion in *yes-no* questions and WH questions. *Journal of Child Language*, 11, 579-592.
- Eubank, L. (1986). *Formal Models of Language Learning and the Acquisition of German Word Order and Negation by Primary and Non-primary Language Learners*. Unpublished Ph.D dissertation. Austin: University of Texas.
- Eubank, L. (1987). The acquisition of German negation by formal language learners. In Van Patten, B. Dvorack, and J. Lee (eds.), *Foreign Language Learning: A Research Perspective*. New York: Newbury House/Harper and Row.
- Eubank, L. (1991a). Introduction: Universal Grammar in second language. In L. Eubank (ed.), *Point Counterpoint: Universal Grammar in the Second Language*. Amsterdam: John Benjamins.
- Eubank, L. (1991b). *Point Counterpoint: Universal Grammar in the Second Language*. Amsterdam: John Benjamins.
- Eubank, L. (1991c). Transfer of Universal Grammar: Reply to Jordens. In L. Eubank (ed.), *Point Counterpoint: Universal Grammar in the Second Language*. Amsterdam: John Benjamins.
- Faerch, C, & G. Kasper. (1984). Two ways of defining communication strategies. *Language Learning*, 34, 45-63.
- Fang, Y. (1996). *Shiyong Hanyu Yufa. [Functional Chinese Grammar]*. Beijing: Beijing Languages Institute Press.
- Fei, C. (1992). Shuo "de" [On "de"]. *Chinese Language Research*, 2.
- Felix, (1981a). The effect of formal instruction on second language acquisition. *Language Learning*, 31/1, 87-112.
- Felix, S. (1987). *Cognition and Language Growth*. Dordrecht: Foris.
- Felix, S. (1988). Universal Grammar in language acquisition. *Canadian Journal of Linguistics*, 33, 367-393.
- Felix, S. (1991). The accessibility of Universal Grammar in second language acquisition. In L. Eubank (ed.), *Point Counterpoint: Universal Grammar in the Second Language*. Amsterdam: John Benjamins.
- Felix, S., & W. Wiegand. (1991). Universal Grammar in the classroom: The effects of formal instruction on second language acquisition. *Second Language Research*, 7, 162-181.
- Flynn, S. (1988). Nature of development in L2 acquisition and implications for theories of language acquisition in general. In S. Flynn & W. O'Neill (eds.), *Linguistic Theory in Second Language Acquisition*. Dordrecht: Kluwer.

- Flynn, S. & I. Espinal. (1985). Head-initial/head-final parameter in adult Chinese L2 acquisition. *Second Language Research*, 1, 93-117.
- Fodor, J. A., T. Bever & M. Garrett. (1974). *The Psychology of Language*. New York: McGraw-Hill.
- Forster, K. (1979). Levels of processing and the structure of the language processor. In W. E. Cooper & E. C. T. Walker (eds.), *Sentence Processing: Psycholinguistic Studies Presented to Merrill Garrett*. Hillsdale, NJ.: LEA.
- Garman, M. (1990). *Psycholinguistics*. Cambridge: Cambridge University Press.
- Gass, S., & J. Ard, (1984). Second language acquisition and the ontology of language universals. In W. E. Rutherford (Ed.), *Language Universals and Second Language Acquisition*. Amsterdam: Benjamins.
- Giacomone Ramat, A., & E. Banfi. (1990). The acquisition of temporality: A second language perspective. *Folia Linguistica*, XXIV/3-4, 405-428.
- Gleitman, L. (1981). Maturational determinants of language growth. *Cognition*, 10, 115-126.
- Greenberg, J. (1966). Language Universals, with special reference to feature hierarchies. *Janua Linguarum*, Series Minor 59.
- Gregg, K. (1984). Krashen's Monitor and Occam's razor. *Applied Linguistics*, 5, 79-100.
- Gregg, K. (1989a). Second language acquisition theory: The case for a generative perspective. In S. Gass & J. Schachter (eds.), *Linguistic Perspectives on Second Language Acquisition*. Cambridge: Cambridge University Press.
- Gregg, K. (1989b). The variable competence model and why it isn't. *Applied Linguistics*, 11, 364-383.
- Gregg, K. (1992). UG and SLA theory: The story so far. Manuscript.
- Gregg, K. (1996). The logical and the developmental problems of second language acquisition. In W. Ritchie (ed.), *Handbook of Second Language Acquisition*. San Diego: Academic Press.
- Gui, S., & C. Ning. (1997). Yuyanxue yanjiu fangfa [The methodology of linguistic research]. *Waiyu Jiaoxue yu Yanjiu* [Foreign Language Teaching and Research], 3.
- Guilfoyle, E., & M. Noonan. (1992). Functional categories and language acquisition. *Canadian Journal of Linguistics*, 37, 241-273.
- Haegeman, L. (1991). *Introduction to Government and Binding Theory*. Oxford: Blackwell.
- Halle, M., J. Bresnan & G. Miller. (1978). *Linguistic Theory and Psychological Reality*. Cambridge: The MIT Press.
- Håkansson, G. (1994). Typological markedness in action in the classroom: Some observations on the acquisition of German in Swedish schools. Paper presented at EuroSLA, September.

- Håkansson, G. (1996). "Im Winter ich laufen Ski." Some observations on the acquisition of German in Swedish schools. Manuscript, University of Lund.
- Håkansson, G., & U. Nettelbladt. (1993). Developmental sequence in L1 (normal and impaired) and L2 acquisition of Swedish syntax. *International Journal of Applied Linguistics*, 3, 131-157.
- Håkansson, G., & U. Nettelbladt. (1996). Similarities between SL1 and L2 children. Evidence from the acquisition of Swedish word order. In J. Gilbert & C. Johnson (eds.), *Children's Language*, Vol. 9. NJ.: Lawrence Erlbaum.
- Halle, M., J. Bresnan & G. Miller. (1978). *Linguistic Theory and Psychological Reality*. Cambridge, Mass.: MIT Press.
- Hammarberg. (1996). Examining the processability theory: The case of adjective agreement in L2 Swedish. In E. Kellerman, B. Welters, & T. Bongaerts (eds.), *Toegepaste Taalwetenschap in Artikelen 55: EuroSLA 6. A Selection of Papers*, Nijmegen.
- Harrington, M. (1986). The T-unit as a measure of JSL oral proficiency. *Descriptive and Applied Linguistics* 19:49-56. Tokyo: International Christian University.
- Hatch, E. & A. Lazaraton. (1991). *The Research Manual*. Cambridge, Mass: Heinle & Heinle.
- Hawkins, R., & C. Y-h. Chan. (1997). The partial availability of Universal Grammar in second language acquisition: the "failed functional feature hypothesis." *Second Language Research*, 13/3, 187-266.
- Hawkins, R., R. Towell, & N. Bazergui. (1993). Universal Grammar and the acquisition of French verb movement by non-native speakers of English. *Second Language Research*, 9/3, 189-233.
- Hilles, S. (1986). Interlanguage and the pro-drop parameter. *Second Language Research*, 2, 33-52.
- Hilles, S. (1991). Access to Universal Grammar in second language acquisition. In L. Eubank (ed.), *Point Counterpoint: Universal Grammar in the Second Language*. Amsterdam: John Benjamins.
- Horrocks, G. (1987). *Generative Grammar*. London: Longman.
- Hudson, T. (1993). Nothing does not equal zero: Problems with applying developmental sequence findings to assessment and pedagogy. *Studies in Second Language Acquisition*, 15/4, 461-493.
- Huebner, T. (1983). *A Longitudinal Analysis of the Acquisition of English*. Ann Arbor: Karoma.
- Hulstijn, J. (1990). A comparison between information processing and the analysis/control approaches to language learning. *Language Learning*, 11, 30-45.
- Hulstijn, J. & E. Marchena. (1989). Avoidance: grammatical or semantic causes? *SiSLA*, 11, 241-255.
- Hunt, K. (1966). Recent measures in syntactic development. *Elementary English*, 43, 732-39.

- Huter, K. (1996). Atarashii no kuruma and other old friends. The acquisition of Japanese syntax. *Australian Review of Applied Linguistics*, 19/1, 39-60.
- Huter, K. (1998). *The Acquisition of Syntax and Morphology by Learners of Japanese as a Second Language*. Unpublished Ph.D dissertation. Canberra: the Australian National University.
- Hyltenstam, K. (1977). Implicational patterns in interlanguage syntax variation. *Language Learning*, 27/2, 383-411.
- Hyltenstam, K. (1978). Variation in interlanguage syntax. *Lund University Department of Linguistics Working Papers*, 18, 1-79.
- Hyltenstam, K. (1992). Non-native features of near-native speakers: On the ultimate attainment of childhood L2 learners. *Cognitive Processing in Bilinguals*, 351-368.
- Hymas, N. (1986). *Language Acquisition and the Theory of Parameters*. Boston: Reidel.
- Ingram, D., & D. Tyack. (1979). Inversion of subject NP and Aux in children's questions. *Journal of Psycholinguistic Research*, 8, 333-341.
- Jacobs, R. (1995). *English Syntax*. Cambridge: Cambridge University Press.
- Jaeggli, O., & K. Safir. (1987). The Null Subject Parameter and Parametric Theory. In O. Jaeggli & K. Safir (eds.), *The Null Subject Parameter*. Dordrecht: Reidel.
- Jansen, L. (1987). The development of word order in formal German second language acquisition. Paper presented at the workshop on Explaining Interlanguage Development. Melbourne: La Trobe University.
- Jansen, L. (1991). The development of word order in natural and formal German second language acquisition. *Australian Working Papers in Language Development*, 5, 1-42.
- Jansen, L. (2000). Second language acquisition: From theory to data. *Second Language Research*, 16/1, 27-43.
- Jiang, X. (1999). Di er yuyan xide de yanjiu fangfa. [The research methodology of second language acquisition]. *Yuyan Wenzhi Yingyong [Language, Writing, Use]*, 30/2, 31-37.
- Johnston, M. (1985). *Syntactic and Morphological Progressions in Learner English*. Canberra: Commonwealth Department of Immigration and Ethnic Affairs.
- Johnston, M. (1997). *Development and Variation in Learner Language*. Unpublished Ph.D dissertation. Canberra: the Australian National University.
- Jordens, P. (1988). The acquisition of word order in Dutch and German as L1 and L2. *Second Language Research*, 4/1, 41-65.
- Jordens, P. (1991). Linguistic knowledge in second language acquisition. In L. Eubank (ed.), *Point Counterpoint: Universal Grammar in the Second Language*. Amsterdam: John Benjamins.

- Kaplan, R. & J. Bresnan. (1982). Lexical-function grammar: A formal system for grammatical representation. In J. Bresnan (ed.), *The Mental Representation of Grammatical Relations*. Cambridge, Mass.: MIT Press.
- Kawaguchi, S. (1996). *Referential Choice by Native Speakers and Learners of Japanese*. MA Thesis. Canberra: the Australian National University.
- Kawaguchi, S. (1998). The acquisition of syntax and nominal ellipsis in JSL discourse. Manuscript. Macarthur: University of Western Sydney.
- Kean, M-L. (1988). Brain structures and linguistic capacity. In F. Newmeyer (ed.), *Linguistics: The Cambridge Survey*. Vol. 2: *Linguistic Theory: Extensions and Implications*. New York: Cambridge University Press.
- Kempen, G., & E. Hoenkamp, (1987). An incremental procedural grammar for sentence formulation. *Cognitive Science 11*: 201-258.
- Klein, W. (1991). Seven trivia of language acquisition. In L. Eubank (ed.), *Point Counterpoint: Universal Grammar in the Second Language*. Amsterdam: John Benjamins.
- Klein, W. (1993). The acquisition of temporality. In C. Perdue (ed.), *Adult language Acquisition: Cross-linguistic Perspectives*. Vol. 2. *The Results*. New York: Cambridge University Press.
- Klein, W. (1994). Learning how to express temporality in a second language. In A. Giacalone Ramat & M. Vedovelli (eds.), *Italiano: Lingua Seconda/Lingua Straniera*. Rome: Bulzoni.
- Kleinmann, H. (1977). Avoidance behaviour in adult second language acquisition. *Language Learning*, 27/1, 93-107.
- Kong, L. (1993). Ertong "le" zi ju de fazhan ji xiangguan wenti de taolun [On the development of "le" sentence in child language and related issues]. *Proceedings of the Third National Conference of Modern Linguistics*. Beijing: Language Press, 197-206.
- Kopcke, K-M. (1987). Der Erwerb morphologischer Ausdrucksmittel durch L2-Lerner am Beispiel der Personalflexion. *Zeitschrift für Sprachwissenschaft*, VI, 186-205.
- Krashen, S. (1977). Some issues relating to the Monitor Model. In H. Brown, C. Yorio, & R. Crymes (eds.), *On TESOL '77*. New York: Academic Press.
- Krashen, S. (1980). The input hypothesis. In J. Alatis (ed.), *Current Issues in Bilingual Education*. Washington D.C.: Georgetown University Press.
- Krashen, S. (1981). *Second Language Acquisition and Second Language Learning*. Oxford: Pergamon Press.
- Krashen, S. (1982). *Principles and Practice in Second Language Acquisition*. Oxford: Pergamon Press.
- Kratochvil, P. (1968). *The Chinese Language Today*. London: Hutchinson.
- Lahtinen, S. (1993). Om nominalfrasens struktur och feltyperna en (gul) bilen och det gula bilen i finska gymnasisters inlararevenska. [On noun phrase structure and the error types "en gul bilen" and "det gula bilen" in Finnish students' learning Swedish]. In V.

Muittari, & M. Rahkonen (eds.), *Svenskan i Finland 2*: 85-98. Meddelanden Fram Institutioned for Nordiska Sprak vid Jyvaskyla Universitet 9.

Larsen-Freeman, D. (1978). An ESL index of development. *TESOL Quarterly*, 12, 439-448.

Larsen-Freeman, D. (1983). Assessing global second language proficiency. In H. W. Seliger and M. H. Long (eds.): *Classroom Oriented Research in Second Language Acquisition*. Rowley, Mass.: Newbury House.

Larsen-Freeman, D., & M. Long. (1991). *An Introduction to Second Language Acquisition Research*. London: Longman.

Lenneberg, E. (1967). *Biological Foundations of Language*. New York: John Wiley.

Levelt, W. J. M. (1978). Skill theory and language teaching. *Studies in Second Language Acquisition*, 1, 53-70.

Levelt, W. J. M. (1981). The speaker's linearisation problem. *Philosophical Transactions*, Royal Society London. B295, 305-315.

Levelt, W. J. M. (1983). Monitoring and self-repair in speech. *Cognition*, 14, 41-104.

Levelt, W. J. M. (1989). *Speaking: From Intention to Articulation*. Cambridge, Mass.: MIT Press.

Li, C., & S. Thompson. (1981). *Mandarin Chinese: A Functional Reference Grammar*. Berkeley: University of California Press.

Liddicoat, T. (2001). *Talk-in-Interaction: Analysing Everyday Conversation*. Unpublished manuscript. Canberra: the Australian National University.

Lightbown, P. M., & N. Spada. (1990). Focus on form and corrective feedback in communicative language teaching: Effects on second language learning. *Studies in Second Language Acquisition*, 12/4, 429-448.

Lightbown, P. M., N. Spada., and R. Wallace. (1980). Some effects of instruction on child and adolescent ESL learners. In R. Scarcella and S. Krashen (eds.). *Research in Second Language Acquisition*. Rowley, Mass.: Newbury House.

Ling, Y., & M. Jia. (1991). "De" zi de fenhua. [The split of "de"]. *Yuyan Jiaoxue yu Yanjiu [Language Teaching and Research]*, 3, 104-114.

Liu, X., E. Deng & S. Liu. (1991). *Practical Chinese Reader*. Vols. 1 & 2. Beijing: Commercial Press.

Liu, X. (1999). Mai xiang 21 shiji de duiwai hanyu jiaoyu xueke lilun jianshe. *Beijing Yuyan Wenhua Daxue Lunwen Huibian* [The theory construction of Chinese as a Second Language in the 21st century. *Collection of Studies of Beijing Language and Culture University*]. Beijing: Beijing Language and Culture University Research Office.

Loban, W. (1966). *Language ability: Grades seven, eight and nine*. Washington, D.C.: Government Printing Office.

Long, M. (1985). A role for instruction in second language acquisition: Task-based language training. In K. Hyltenstam & M. Pienemann (eds.), *Modelling and Assessing Second Language Acquisition*. Clevedon: Multilingual Matters.

- Long, M. (1990). Maturational constraints on language development. *Studies in Second Language Acquisition*, 12/3, 251-286.
- Long, M. & C. Sato. (1984). Methodological issues in interlanguage studies: An interactionist perspective. In A. Davies, C. Criper, & A. Howatt, (eds.), *Interlanguage*. Edinburgh: Edinburgh University Press.
- Lu, S. (1981). *Xiandai Hanyu Babai Ci*. [Eight Hundred Words in Modern Chinese]. Beijing: Commercial Press.
- Lu, J. (1997). Peijia yufa lilun he duiwai Hanyu jiaoxue [The theory of valency and teaching Chinese as a second language]. *Shijie Hanyu Jiaoxue* [World Chinese Language Teaching], 39/1, 3-13.
- Lust, B. (1983). On the notion 'principal branching direction': A parameter in Universal Grammar. In S. Tavakolian (ed.), *Language Acquisition and Linguistic Theory*. Cambridge, Mass.: MIT Press.
- Lust, B. (1994). Functional projection of CP and phrase structure parameterization: An argument for the Strong Continuity Hypothesis. In B. Lust, M. Suner, and J. Whitman (eds.), *Syntactic Theory and First Language Acquisition: Cross-linguistic Perspectives*. Vol.1. Hillsdale, N.J.: Erlbaum.
- Ma, X. (1987). Beijing fangyanli de "zhe." *Fangyan* 1. ["Zhe" in Beijing dialect. *Dialects* 1].
- Macnamara, J. (1982). *Names for Things: A study of Child Language*. Cambridge, Mass.: Bradford Book / MIT Press.
- Maratsos, M. (1982). The child's construction of grammatical categories. In E. Wanner & M. Maratsos (eds.), *Linguistic Theory and Psychological Reality*. New York: Cambridge University Press.
- Maratsos, M., & M. Chalkley. (1981). The internal language of children's syntax: The ontogenesis and representation of syntactic categories. In K. Nelson (ed.), *Children's Language*. New York: Gardner Press.
- McLaughlin, B. (1987). *Theories of Second Language Learning*. London: Edward Arnold.
- McLaughlin, B., T. Rossman & B. McLeod (1983). Second language learning: An information-processing perspective. *Language Learning*, 33, 135-157.
- Meisel, J. (1980). *Linguistic simplification: A study of immigrant workers' speech and foreigner talk*. In S. W. Felix (Ed.), *Second Language Development*. Tübingen: Gunter Narr.
- Meisel, J. (1987). Reference to past events and actions in the development of natural language acquisition. In C. W. Pfaff (ed.), *First and Second Language Acquisition Processes*. Rowley, Mass.: Newbury House.
- Meisel, J. (1991). Principles of Universal Grammar and strategies of language learning: Some similarities and differences between first and second language acquisition. In L. Eubank (ed.), *Point Counterpoint: Universal Grammar in the Second Language*. Amsterdam: John Benjamins.

- Meisel, J. (1997). The acquisition of the syntax of negation in French and German: Contrasting first and second language development. *Second Language Research*, 13/3, 227-263.
- Meisel, J., H. Clahsen, & M. Pienemann. (1981). On determining developmental stages in Natural second language acquisition. *Studies in Second Language Acquisition*, 3, 109-135.
- Myles, F. (1995). Interaction between linguistic theory and language processing in SLA. *Second Language Research*, 11, 235-266.
- Norman, J. (1988). *Chinese*. Cambridge: Cambridge University Press.
- Nunan, D. (1997). *Research Methods in Language Learning*. Cambridge: Cambridge University Press.
- O'Grady, W. (1987). *Principles of Grammar and Learning*. Chicago: University of Chicago Press.
- O'Grady, W. (1991). *Categories and Case: The Sentence Structure of Korean*. Philadelphia: John Benjamins.
- O'Grady, W. (1997). *Syntactic Development*. Chicago: The University of Chicago Press.
- O'Grady, W., A. Peters, & D. Masterson. (1989). The transition from optional to required subjects. *Journal of Child Language*, 16, 513-529.
- O'Grady, W., M. Dobrovolsky, & M. Aronoff. (1989). *Contemporary Linguistics: An Introduction*. New York: St. Martin's Press.
- O'Malley, J. M., & A. U. Chamot. (1990). *Learning Strategies in Second Language Acquisition*. Cambridge: Cambridge University Press.
- Out of the mouths of babes. (no date). *The Nature of Things Series*. National Library of Australia: Cinemedia.
- Paradis, M. (1994). Neurolinguistic aspects of implicit and explicit memory: Implications for bilingualism and SLA. In N. Ellis (ed.), *Implicit and Explicit Learning of Languages*. London: Academic Press.
- Peoppel, D. & K. Wexler. (1993). The Full Competence Hypothesis of clause structure in early German. *Language*, 69, 1-33.
- Piaget, J. (1976). Biology and cognition. In B. Inhelder & H. Chipman (eds.), *Piaget and His School: A Reader in Developmental Psychology*. New York: Springer.
- Pica, T. (1984). Methods of morpheme quantification: Their effect on the interpretation of second language data. *Studies in Second Language Acquisition*, 6/1, 69-78.
- Pienemann, M. (1981). *Der Zweitspracherverb Ausländischer Arbeiterkinder*. Bonn: Bouvier.
- Pienemann, M. (1984). Psychological constraints on the teachability of languages. *Studies in Second Language Acquisition* 6: 186-214.

- Pienemann, M. (1987a). Book Review. *Studies in Second Language Acquisition*, 9/3, 363-367.
- Pienemann, M. (1987b). Psychological constraints on the teachability of languages. In Carol Pfaff (ed.), *First and Second Language Acquisition Processes*. New York: Newbury House.
- Pienemann, M. (1988). Determining the influence of instruction on L2 speech processing. In G. Kasper (ed.), *AILA Review 5: Classroom Research*, 40-72.
- Pienemann, M. (1989). Is language teachable? Psycholinguistic experiments and hypotheses. *Applied Linguistics* 10: 52-79.
- Pienemann, M. (1999). *Language Processing and Second Language Development: Processability Theory*. Amsterdam: Benjamins.
- Pienemann, M., & G. Håkansson. (1999). A unified approach toward the development of Swedish as L2: A processability account. *Studies in Second Language Acquisition*, 21/3: 383-420.
- Pienemann, M., & M. Johnston. (1987a). Towards an explanatory model of language acquisition. Paper given at the Interlanguage Conference. Melbourne: La Trobe University.
- Pienemann, M., & M. Johnston. (1987b). Factors influencing the development of language proficiency. In D. Nunan (ed.), *Applying Second Language Acquisition Research*. Adelaide: National Curriculum Resource Centre, Adult Migrant Education Program.
- Pienemann, M., & A. Mackay. (1993). An empirical study of children's ESL development and Rapid Profile. In P. MaKay (ed.), *ESL Development, Language and Literacy in Schools*, Vol. 2. National Languages and Literacy Institute of Australia.
- Pienemann, M., & M. Johnston, & G. Brindley. (1988). Constructing an acquisition-based procedure for second language assessment. *Studies in Second Language Acquisition*, 10/2: 217-244.
- Pinker, S. (1984). *Language Learnability and Language Development*. Cambridge, Mass.: Harvard University Press.
- Pinker, S. (1994). *The Language Instinct: How the Mind Creates Language*. New York: Morrow.
- Polio, C. (1995). Acquiring nothing? The use of zero pronouns by nonnative speakers of Chinese and the implications for the acquisition of nominal reference. *Studies in Second Language Acquisition*, 17, 353-377.
- Psathas, G. (1995). *Conversation Analysis: The Study of Talk-in-Interaction*. California: SAGE Publications, Inc.
- Qian, X. (1997). Riben liuxuesheng Hanyu quxiang puyu de xide shunxu. *Xhijie Hanyu Jiaoxue* 39/1, 94-101. [Acquisition order of Chinese directional complement by Japanese students. *World Chinese Language Teaching*]
- Qian, X. (1999). Hanwai yuyan duibi, bianwu fenxi, zhongjieyu he di er yuyan xide lilun cankao wenxian (1977-1998) [Bibliography: Contrastive analysis of Chinese and foreign languages, error analysis, interlanguage and second language acquisition theories

(1977-1998)]. In Q. Zhang & S. Wang (eds.), *Hanwai Yuyan: Duibi yu Pianwu Fenxi Lunwen Ji*. [Chinese and Foreign Languages: the Collection of Contrastive and Error Analysis Papers]. Beijing: Beijing University Press.

Radford, A. (1990). *Syntactic Theory and the Acquisition of English Syntax*. Oxford: Blackwell.

Radford, A. (1994). Tense and agreement variability in the child grammars of English. In B. Lust, M. Suner, and J. Whitman (eds.), *Syntactic Theory and First Language Acquisition: Cross-linguistic Perspectives*. Vol.1. Hillsdale, N.J.: Erlbaum.

Rahkonen, M. (1993). Huvudstatsfundamentet hos finska inlarare av svenska och svenska inlarare av finska. [The main clause foundation among Finnish learners of Swedish and Swedish learners of Finnish]. In V. Muittari & M. Rahkonen (eds.), *Svenskan i Finland 2*: 199-225. Meddellanden fram Institutionen for Nordiska Sprak vid Jyvaskyla Universitet 9.

Reber, A. (1987). The rise and (surprisingly rapid) fall of psycholinguistics. *Synthese*, 72, 325-339.

Rosenberg, A. (1986). Philosophy of science and the potentials for knowledge in the social sciences. In D. W. Fiske & R. A. Shweder (eds.), *Metatheory in Social Science: Pluralisms and Subjectivities*. Chicago: University of Chicago Press. 339-346.

Rumelhart, D., & J. McClelland. (1987). Learning the past tenses of English verbs: Implicit rule or parallel distributed processing. In B. MacWhinney (ed.), *Mechanisms of Language Acquisition*. Hillsdale, N.J.: Erlbaum.

Sacks, H., E. A. Schegloff & G. Jefferson. (1974). A simplest systematics for the organization of turn-taking for conversation. *Language*, 50, 696-735.

Salameh, E-K, G. Håkansson, & U. Nettelbladt. (forthcoming). The acquisition of Swedish as L2 in Arabic-speaking preschool children. Word order patterns and double definiteness. To appear in *Scandinavian Journal of Logopaedics and Phoniatics*.

Sato, C. (1985). *The Syntax of Conversation in Interlanguage Development*. Unpublished Ph.D. dissertation. Los Angeles: University of California.

Sato, C. (1988). Origins of complex syntax in interlanguage development. *Studies in Second Language Acquisition*, 10, 371-396.

Schachter, J. (1974). An error in error analysis. *Language Learning*, 24/2, 205-214.

Schachter, J. (1988). On the issue of completeness in second language acquisition. Paper presented at the 13th Annual Boston University Conference on Language Development.

Schachter, J. (1989). Testing a proposed universal. In S. Gass & J. Schachter (eds.), *Linguistic Perspectives on Second Language Acquisition*. Cambridge: Cambridge University Press.

Schachter, J. (1990). On the issue of completeness in second language acquisition. *Second Language Research*, 6/2, 93-124.

Schlesinger, I. M. (1982). *Steps to Language*. Hillsdale, N.J.: Erlbaum.

Schlesinger, I. M. (1988). The origin of relational categories. In Y. Levy, I. Schlesinger & M. Braine (eds.), *Categories and Processes in Language Acquisition*. Hillsdale, N.J.: Erlbaum.

Schmidt, R. (1992). Psychological mechanisms underlying second language fluency. *Studies in Second Language Acquisition*, 14, 357-385.

Schumann, J. (1979). The acquisition of English negation by speakers of Spanish: A review of the literature. In R. Andersen (ed.), *The Acquisition and Use of Spanish and English as First and Second Languages*. Washington, D.C.: TESOL.

Schumann, J. (1987). The expression of temporality in basilectal speech. *Studies in Second Language Acquisition*, 9, 21-41.

Schwartz, B. (1991). Conceptual and empirical evidence: A response to Meisel. In L. Eubank (ed.), *Point Counterpoint: Universal Grammar in the Second Language*. Amsterdam: John Benjamins.

Schwartz, B. (1992). Testing between UG-based and problem-solving models of L2A: Developmental sequence data. *Language Acquisition*, 2/1, 1-19.

Schwartz, B. & R. Sprouse. (1994). Word order and nominative case in non-native language acquisition: A longitudinal study of (L1 Turkish) German interlanguage. In T. Hoekstra & B. Schwartz (eds.), *Language Acquisition Studies in Generative Grammar: Papers in Honour of Kenneth Wexler from the 1991 GLOW Workshops*. Philadelphia: John Benjamins.

Schwartz, B. & R. Sprouse. (1996). L2 cognitive states and the Full Transfer/Full Access model. *Second Language Research*, 12, 40-72.

Scollon, R.T. (1974). *One Child's Language from One to Two: The Origins of Construction*. Unpublished Ph.D. dissertation. HI: University of Hawai'i at Manoa.

Seliger, H. (1989). Semantic constraints on the production of the English passive by Hebrew-English bilinguals. In H. Dechert & M. Raupach (eds.), *Transfer in Language Production*. Norwood, NJ: Ablex.

Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics*, 10, 209-231.

Selinker, L. (1985). *Understanding Second Language Acquisition*. Oxford: Oxford University Press.

Sells, P. (1985). *Lectures on Contemporary Syntactic Theories*. Stanford, CA: Center for the Study of Language and Information.

Shi, J. (1998). Waiguo liuxuesheng 22 lei xiandai hanyu jushi de xide shunxu yanjiu [The study of acquisition sequence of 22 modern Chinese sentence structures by foreign students in China. *Shijie Hanyu Jiaoxue* [World Chinese Language Teaching], 46/4, 77-98.

Shibatani, M. (1990). *The Languages of Japan*. Cambridge: Cambridge University Press.

Shimura, A. (1990). Testing the availability of Universal Grammar in second language acquisition: The governing category parameter and the proper antecedent parameter in Japanese as a second language. MA Thesis. HI: University of Hawai'i at Manoa.

- Singleton, D. (1999). *Exploring the Second Language Mental Lexicon*. Cambridge: Cambridge University Press.
- Slobin, D. I. (1973). Cognitive prerequisites for the development of grammar. In C. A. Ferguson & D. I. Slobin (eds.), *Studies of Child Language Development*. New York: Holt Rinehart and Winston.
- Slobin, D. I. (1977). Language change in childhood and in history. In J. Macnamara (ed.), *Language Learning and Thought*. New York: Academic Press.
- Slobin, D. (1985). *The Linguistic Study of Language Acquisition*. Vol. 1, *The Data*. Vol. 2, *Theoretical Issues*. Hillsdale, NJ.: Lawrence Erlbaum.
- Slobin, D. (1992). *The Linguistic Study of Language Acquisition*. Vol. 3. Hillsdale, NJ.: Lawrence Erlbaum
- Slobin, D. (1997). *The Linguistic Study of Language Acquisition*. Vol. 4. Hillsdale, NJ.: Lawrence Erlbaum.
- Slobin, D., & C. Welsh. (1973). Elicited imitation as a research tool in developmental psycholinguistics. In C. Ferguson and D. Slobin (eds.), *Studies of Child Language Development*. New York: Holt, Rinehart & Winston.
- Smith, C. (1983). A theory of aspectual class. *Language*, 59, 479-501.
- Snow, C. & C. Ferguson. (1977). *Talking to Children: Language Input and Acquisition*. Cambridge: Cambridge University Press.
- Stromswold, K. (1995). The acquisition of subject and object *wh*-questions. *Language Acquisition*, 4, 5-48.
- Sun, D. (1993). Waiguo xuesheng xiandai hanyu "le" de xide guocheng chubu fenxi [Preliminary analysis of the acquisition of modern Chinese "le" by foreign students]. *Yuyan Jiaoxue yu Yanjiu Language [Teaching and Research]*, 2, 65-75.
- Sun, D. (1999). Waiguo xuesheng hanyu tibiaoji "le" "zhe" "guo" xide qingkuang de kaocha [Investigation of the acquisition of aspect markers "le" "zhe" "guo" by foreign students]. *Beijing Yuyan Wenhua Daxue Lunwen Huibian [Collection of Studies of Beijing Language and Culture University]*. Beijing: Beijing Language and Culture University Research Office.
- Tarone, E. (1981). Some thoughts on the notion of communication strategy. *TESOL Quarterly*, 15, 285-295.
- Tarone, E. (1985). Variability in interlanguage use: A study of style-shifting in morphology and syntax. *Language Learning*, 35, 373-404.
- Teng, S-h. (1999). The acquisition of "le" in L2 Chinese. *Shijie Hanyu Jiaoxue*, 47/1, 56-63. [*World Chinese Language Teaching*]
- Tomaselli, A., & B. Schwartz. (1990). Analysing the acquisition stages of negation in L2 German: Support for UG in adult SLA. *Second Language Research*, 6/1, 1-38.
- Uziel, S. (1993). Resetting Universal Grammar parameters: Evidence from second language acquisition of subjacency and the empty category principle. *Second Language Research*, 9/1, 49-83.

- Vainikka, A., & M. Young-Scholten. (1994). Direct access to X'-theory: Evidence from Korean and Turkish adults learning German. In T. Hoekstra & B. Schwartz (eds.), *Language Acquisition Studies in Generative Grammar: Papers in Honour of Kenneth Wexler from the 1991 GLOW Workshops*. Philadelphia: John Benjamins.
- Vainikka, A., & M. Young-Scholten. (1996a). Gradual development of L2 phrase structure. *Second Language Research*, 12/1, 7-39.
- Vainikka, A., & M. Young-Scholten. (1996b). The early stages in adult L2 syntax: Additional evidence from Romance speakers. *Second Language Research*, 12/2, 140-176.
- Valian, V. (1991). Syntactic subjects in the early speech of American and Italian children. *Cognition*, 40, 21-81.
- Van Pattern, B. (1985). Processing strategies and morpheme acquisition. In F. Eckman, L. Bell, & D. Nelson (eds.), *Universals of Second Language Acquisition*. Rowley, Mass.: Newbury House.
- Viberg, A. (1991). En longitudinall av sprakutvecklingen. *Utvardering av skolforbeedelsegrupper i Rinkeby. Rapport 4*. Centre for Research on Bilingualism, Stockholm University.
- Vigliocco, G., B. Butterworth & M. Garrett. (1996). Subject-verb agreement in Spanish and English: Differences in the role of conceptual constraints. *Cognition*, 61, 261-298.
- Wang, J. (1997). "Bu" he "mei" fouding jiegou de xide guocheng [The acquisition process of negative structures with "bu" and "mei"]. *Shijie Hanyu Jiaoxue [World Chinese Language Teaching]*, 3, 92-100.
- Wang, J. (1999). Biao chayi bijiao de foding jiegou xide de fenhua guocheng [The acquisition of the negation of comparative structure]. *Beijing Yuyan Wenhua Daxue Lunwen Huibian*. [Collection of Studies of Beijing Language and Culture University]. Beijing: Beijing Language Culture University Research Office.
- Wen, Z. (1998). Biao shuxing fanchou-de "N1 (de) N2" jiegou-de yuyi fenxi [The semantic analysis of possessive "N1 (de) N2" structure]. *Shijie Hanyu Jiaoxue [World Chinese Language Teaching]*, 43/1, 34-39.
- Wen, Z. (1999). "N1 (de) N2" pianzheng jiegou zhong N1 yu N2 zhijian yuyi guanxi de jianding [The identification of the semantic relationships of N1 and N2 in the structure of "N1 (de) N2"]. *Yuwen Yanjiu [Chinese Language Research]*, 72/3, 22-27.
- Westmoreland, R. (1983). L2 German acquisition by instructed adults. Manuscript. HI: University of Hawai'i at Mano'a.
- White, L. (1982). The responsibility of grammatical theory to acquisitional data. In N. Hornstein and D. Lightfoot (eds.) *Explanation in Linguistics: The Logical Problem of Language Acquisition*. London: Longman.
- White, L. (1985). Is there a logical problem of second language acquisition? *TESL Canada* 2: 29-41.
- White, L. (1988). Island effects in second language acquisition. In S. Flynn & W. O'Neil (eds.), *Linguistic Theory in Second Language Acquisition*. Dordrecht: Kluwer.

White, L. (1989a). The adjacency condition on case assignment: Do L2 learners observe the Subset Principle? In S. M. Gass and J. Schachter (eds.), *Linguistic Perspectives on Second Language Acquisition*. Cambridge: Cambridge University Press.

White, L. (1989b). *Universal Grammar and Second Language Acquisition*. Amsterdam: John Benjamins.

White, L. (1990). Second language acquisition and Universal Grammar. *Studies in Second Language Acquisition*, 12, 121-134.

White, L., & F. Genesee. (1996). How native is non-native? The issue of ultimate attainment in adult second language acquisition. *Second Language Research*, 12, 233-265.

White, L., & A. Juffs. (1993). UG effects in two different contexts of non-native language acquisition. In The 1993 Canadian Linguistic Association Annual Conference Proceedings. *Toronto Working Papers in Linguistics*.

Willis, J. (1996). *Framework for Task-Based Learning*. London: Longman.

Xing, F. (1998). *Hanyu Yufaxue [Chinese Grammar]*. Changchun: Northeastern Normal University Press.

Xu, T. (1997). *Yuyan Lun. [On Language]*. Changchun: Northeastern Normal University Press.

Yamada, R. (1995). Shuangyinjie xingrongci zuo zuangyu qingkuang kaocha. [Investigation of disyllabic adjectives as adverbs]. *Shijie Hanyu Jiaoxue [World Chinese Language Teaching]*, 33/3, 27-33.

Yoshioka, K. & T. Doi. (1988). Testing the Pienemann-Johnston model with Japanese: A speech-processing view of the acquisition of particles and word order. Paper presented at the 8th Second Language Research Forum, University of Hawai'i at Mano'a. March 3-6.

Zhao, L. (1997). Liuxuesheng "le" de xide guocheng kaocha yu fenxi [The investigation and analysis of the acquisition of "le" by foreign students]. *Yuyan jiaoxue yu Yanjiu [Language Teaching and Research]*, 2, 113-124.

Zhu, D. (1983). Zizhi he zhuanzhi: Hanyu mingcihua biaoji "de, zhe, suo, zhi" de yufa gongneng he yuyi gongneng [Self-referring and other-referring: The grammatical function and semantic function of nominalizers "de, zhe, suo, zhi"]. *Fangyan 1 [Dialects 1]*.

Zhu, D. (1993). Cong fangyan he lishi kan zhuangtai xingrongci de mingcihua. [Nominalization of state adjectives from the perspective of dialects and history]. *Fangyan 2 [Dialects 2]*.

Zhu, D. (1998). *Yufa Jiangyi. [Lectures on Grammar]*. Beijing: Commercial Press.

Zobl, H., & J. Liceras. (1994). Functional categories and acquisition orders. *Language Learning*, 44, 159-180.

APPENDIX A

	A	B	C	D	E	F	G	H	I
1	date/task	subj/task	utterance	utterance No	utter type	f-context	S-type	WOScheme	Wostructure
2	date	k. task No	verbatim	1- n	productive	general, progressive	simple	SVO	NVN
3	task type				imitation	past,	main, subordinate		
4					ellipsis				

	J	K	L	M	N	O	P	Q	R	S
1	V-class	V-class	V-class	verbs	Q-word	Vc(p)	negator	prog	le	guo
2	verb 1	verb 2	verb 3	verbatim	question word	co-verb/prep		progressive	perfective	experiential
3								marker	marker	marker
4										

	T	U	V	W	X	Y	Z	AA	AB	AC
1	V-resultative	zhe	V-directional	classifier	plural	NP	de-possessi	de-Adj	de-VP	compound n
2	resultative	durative	directional	marker	marker	possessive	genitive	adj.suffix	VP relative clause	N + N
3	verb	marker	word			attributive	marker			
4										

	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1	de-clause	de-nominaliz	de-potential	de-post V adv	de-pre V adv	shi...de	ba	bei	sub/conj	notes
2	S relative clause	nominalizer	potential	V-COMP	adv.suffix	past marker	disposal	passive	subordinator	
3			marker			emphasizer	structure	structure	coordinator	
4										