

CHAPTER 1

SECOND LANGUAGE ACQUISITION RESEARCH: FROM THEORY FORMATION TO THEORY APPLICATION

Fethi Mansouri

This book¹ deals with second language acquisition research as a field of inquiry concerned with the processes underlying the development of second languages among non-native learners. The book's main focus is on the theoretical attempts at accounting for second language acquisition (SLA) where the focus is more on the mental, cognitive and psychological processes underpinning the learning process. Of course the linguistic structures being acquired will also constitute an integral part of any analyses of SLA as their structural and functional features tend to correlate with certain developmental outcomes. In fact, the key theoretical paradigm employed by most of the chapters in this book, namely Processability Theory (Pienemann, 1998) argues that the learners can produce only those target language linguistic forms, which their language processor (i.e. the learner language) can handle at a given point in time. In other words, the target language structures with their specific level of (grammatical) information marking and exchange are acquired – or in PT's language developmentally emerge- in an order that reflects their processing complexity. Thus, we increasingly see the interconnectedness of linguistic features and processing capacity among learners. It is because this interconnectedness is so fundamental to explaining SLA that learning theories are more and more inclined to employ formal theories of grammar to describe the target language structures. This is the case with PT which uses Lexical Functional Grammar (LFG) as a linguistic analytical framework.

Historical trends and developments in SLA research²

The scope and diversity of research into second language acquisition is so broad that it is well beyond the reach of this thematically defined volume. This

breadth and depth of SLA research touches both theory construction and theory testing or application (Doughty & Long, 2003). The theoretical dimension of SLA research was not always restricted to the developmental and cognitive aspect of the analysis. In fact, SLA theories and models have historically drawn from and relied upon linguistic and grammatical theories, such as Chomsky's Universal Grammar (cf. Ellis, 1994), and the many approaches to functional linguistics most notably Givon's (1979a) model and the subsequent research that combined SLA theories with functional linguistic models. The fact that independent linguistic theories could potentially be implemented into a theory of second language acquisition to explain the process of learning meant that the resulting predictions were significantly better formalised and thus easier to test and validate

Before discussing this book's key themes and objectives, it would be useful to outline very briefly the type of SLA research that has dominated the field for the past decades. In this context, it is necessary to review two strands of second language acquisition approaches that have greatly influenced the past two decades namely morpheme order studies and developmental studies.

Within the broad terms of morpheme order studies, second language learning was predicted to consist of the acquisition of the rules and structures of the target language in a gradual process over an extended period of time. Research carried out within this tradition attempted to describe the order of acquisition of certain morphemes and structures with the view to establishing a continuum of acquisition which can account for and predict the acquisition order of grammatical morphemes. Researchers within this tradition (e.g., Dulay et al., 1982) claim that learners acquire certain structures almost immediately as is the case with word order, whereas other structures such as grammatical agreement are invariably acquired later. Many studies of this kind were more interested in attempting to determine the order in which learners acquire the target language structures rather than the processes that allow learners to achieve such an acquisition order. The significance of this type of research, however, came to prominence when researchers in the context of first language acquisition (e.g., Brown, 1973; deVilliers & deVilliers, 1973) demonstrated that first language learners of English acquired a number of morphemes invariably in the same order. This suggested that first language acquisition is guided by a universal cognitive mechanism which must be responsible for the invariance of the order of morpheme acquisition as produced by various learners.

The question that followed from the above suggestions was whether there is a common universal order of acquisition for second language structures. Early research within morpheme order studies (Hakuta 1974; Larsen-Freeman 1975, Dulay & Burt 1973) focused on one major hypothesis stating that there is a kind of 'built-in-syllabus' in second language learners similar to that observed

in the context of first language acquisition. The findings of these early studies supported this hypothesis and argued for the possibility of the existence of a universal or natural order of acquisition of syntactic and morphological structures irrespective of the learners' first language background. Thus, the idea that first language acquisition follows the same path as second language acquisition was strongly put forward as the [L1 = L2] hypothesis (c.f., Ellis 1994). Of course, in light of recent advances in SLA research as exemplified with the developmentally moderated transfer hypothesis in Processability Theory, this hypothesis is longer universally accepted as an empirical certainty.

From a purely pedagogic perspective, however, and as Burt & Dulay (1980: 266) argued "the acquisition order studies could also provide practical guidance in the development of the curricula, materials and assessment instruments". Therefore, and by extension if a universal order is observed then it could potentially be used as the basis upon which curricula and course materials ought to be designed, since the universal order of acquisition reflects at least in part psychological reality. This approach was further developed in what became known as the 'natural' approach to second language teaching based on the natural order of the acquisition hierarchy obtained through a number of morpheme order studies such as those carried out by Krashen (1983). The major claim of these studies is the existence of a fixed order of morpheme acquisition that takes place regardless of the variables investigated (e.g., formal vs. informal learning; different L1 backgrounds; written vs. oral data; age). In other words, learners appear to follow a pre-determined universal order of acquisition of grammatical morphemes.

From a theoretical viewpoint, a serious criticism of morpheme order studies is their inadequacy to capture the developmental regularities in second language learners' output. Wode (1978) points out that morpheme order studies miss important phenomena in SLA such as learners' learning strategies. Such strategies can include avoidance of difficult L2 structures and forms as well as the influence of the learner's L1. Because morpheme order studies focus on the learners' production of target-like forms, they are unable to capture developmental aspects which are an essential part of the process of language acquisition.

Another problem with morpheme order studies was the fact that they are based on cross-sectional data rather than longitudinal data which meant that it was impossible to answer questions about how second languages are actually acquired or how individual variation among learners can be accounted for. This is especially crucial as Andersen (1991) puts it since "attention to individual variation is the key to understanding the process of second language acquisition" (Andersen, 1991:02).

Attempting to prove the inadequacy of morpheme order studies, Huebner (1979) argued that to discover developmental features and sequences of second language acquisition, one must look not only to occurrence of morphemes and forms in an obligatory context, but more importantly in contexts where these morphemes and forms would not be critical for successful communication. Language learning is systematic but also dynamic and undergoes continual and constant change. Variation in the learner language is the main indicator of change and progress from one developmental stage to another. In this regard, Huebner (1979) indicated that grammatical forms are produced by second language learners in one linguistic context, then in other linguistic contexts as these learners test and revise their own hypotheses about the target language. The interpretation of language acquisition as a linear process does not illustrate the roles assigned to different factors such as the formalised linguistic factor and the psychological factor. This task was more prominent in SLA studies carried out under the developmental umbrella.

Developmental studies differed from morpheme order studies in that they focused on the learning process and the learner's strategies rather than simply on the order of certain morphemes. The view taken by researchers working within the developmental approach is that while still learning the grammar of the target language, second language learners use forms which do not belong to either the second language or the native language. These forms were known as 'transformational forms' (Dulay et al., 1982). A number of other researchers employed the term 'developmental sequences' to refer to these same transitional constructions and the order in which they occur (Wode 1977, Meisel et al 1981).

The term 'developmental sequences' implies that language learners go through a number of implicational steps before moving to higher developmental stages on the acquisition hierarchy. These steps, more importantly, are not random but rather systematic. The changes, or variations, in the learner language are the result of a number of operations such as modification and generalisation which learners apply to linguistic structures as they gradually move forward along the developmental path.

A number of researchers (e.g., Hatch 1978a) found that errors observed in the transitional constructions produced by L2 learners do not always bear any relation to their L1. These errors can be intra-lingual in nature resulting from a developing system, rather than inter-lingual resulting from the learner's L1 interference. In other words, the learner's language should be analysed as a linguistic system in its own right rather than a distorted version of the target language system (c.f., Larsen-Freeman & Long 1991). Along the lines of the developmental approach, a number of researchers in the field of SLA research conducted investigations on the acquisition of morpho-syntax in a number of different target languages. Processability Theory, described succinctly by

Pienemann in chapter 2 in this book is such a theory that reflects recent insights into the process of second language learning.

Recent developments in SLA research

There is now a growing interest in second language acquisition (SLA) research that is driven as much by new interdisciplinary approaches to the field as it is by the practical needs of understanding language learning and performance in an increasingly inter-connected world. Intellectually, second language acquisition research is now a recognised independent field of academic inquiry that is concerned with cognitive, psychological, social and pragmatic aspects of second language development. Therefore, SLA research tends to be highly theoretical and experimental and as such lends itself well to the rigour of scientific research. It is in this context that the use of explicit and well articulated theories and concepts is increasingly seen as an essential research and 'thinking' tool for understanding and conducting SLA research.

The chapters included in this book report on the various technical and theoretical aspects of experimental SLA research across a number of typologically different languages. The book includes a detailed introduction and a general chapter outlining the key theoretical claims and methodological requirements underpinning this kind of SLA research. It will also relate Processability theory-related studies to the wider field of SLA research. Though the emphasis is on cross-linguistic experimental research undertaken within the parameters of Processability Theory, the book will nevertheless shed light on the nexus between bilingualism and theory-driven second language acquisition research.

Processability Theory (Pienemann 1998) is one such a theory that has been applied across a number of second languages. It is based on a universal hierarchy of processing procedures derived from the general architecture of the language processor. Processability theory has been tested against an array of data from the target languages English, Swedish, German, Chinese, Arabic and Japanese. As this book shows, the first step in any cross-linguistic testing is to relate a set of linguistic structures of the target language to the general hierarchy of processability and more specifically to the exchange of grammatical information involved in producing these structures. This exercise should yield a set of language-specific predictions for the sequence in which these structures will emerge in the learner language. In a second step this hypothesised sequence can be tested against empirical data from the acquisition of the chosen language.

The logic underlying processability theory is the following: at any stage of development the learner can produce and comprehend only those target language linguistic forms which the current state of the language processor (i.e.

the learner language) can handle. It is therefore crucial to understand the architecture of the language processor and the way in which it handles a second language. This enables one to predict the course of development of the target language linguistic forms in language production and comprehension across different languages.

The book's key themes and structure

The book's key objective is to present a snapshot of empirical studies in the second language acquisition research where both theory formation and theory application are integral elements. This has not always been a straightforward task as it is rather difficult to construct testable research methodologies for application for example in teaching intervention studies.

The book is still focussed on theory formation which is certainly important. The chapter by Pienemann in particular is a good case in point. However, and as the application of SLA research and its key theories becomes more appealing, it would be naïve to dismiss application studies as non-relevant within a book focussed on SLA research. The fact that SLA researchers have tended to be rather defensive about the potential of their research formulations and findings to teaching should not mean that there is no potential in SLA theory application. We can see advantages of PT-based optimal input that is developmentally ordered. Given these two interconnected agendas, this book is organised around two general sections: (a) theory construction and testing and (b) theoretical research on speech processing and bilingualism.

Theory construction and testing

Despite the emergence of clear theoretical paradigms in SLA research, as Pienemann argues in chapter two, we are still a long way from having a coherent comprehensive theory of SLA. This is despite the many attempts that are being made to tackle various aspects of such a theory. Pienemann's point is that to articulate a comprehensive theory of SLA is an enormously complex task that is beyond individual researchers. It was for this reason that Pienemann's processability theory was designed as a modular approach aimed specifically at explaining developmental schedules. In his chapter, Pienemann shows how processability theory can interface with other modules that are jointly capable of explaining a wider array of phenomena in SLA. Pienemann's chapter explores second language development within an LFG framework that exhibits psychological and typological plausibility. As with his seminal 1998 book, Pienemann's aim is to demonstrate that the interplay between constraints on processability, the re-ranking of Optimality Theory constraints that have to be

assumed for SLA and the L2 initial state cause some of the attested L1-L2 differences.

Along similar theoretical lines, Kawaguchi's chapter aims to explain the development of argument-function mapping at the interface of discourse-syntax in learning a second language, based on the Unmarked Alignment Hypothesis and the Lexical Mapping Hypothesis. These hypotheses are posited in the current extension of Processability Theory³. The Unmarked Alignment Hypothesis is based on the most harmonious mapping between thematic role, grammatical function and syntactic position. The Lexical Mapping Hypothesis is based on non-default mapping of thematic argument roles onto grammatical structure. Kawaguchi argues that the learning of new lexical features is necessary in order to perform higher-stage language-specific operations which are morpho-lexical in nature. As Kawaguchi shows, such this allows the speaker to make choices with respect to which argument will receive which degree of prominence in production. The successful performance of such morpho-lexical operations contributes to the characterization of the higher stages of learners' development. Kawaguchi's chapter reports on empirical research where these two hypotheses are applied to Japanese L2, and the structural outcomes at different developmental stages are predicted with LFG formalism. The analysis of a three-year longitudinal study shows that the results validate these hypotheses.

Theory construction as outlined above in particular by Pienemann in chapter two is often followed by theory-testing research that in some cases it contributes to the advancement of the theoretical approach being tested. Håkansson and Norrby's study reported in chapter four is such a case as they apply PT to written and oral Swedish L2 data. Håkansson and Norrby's hypothesis is that the hierarchy of processability predicted by PT guides both written and spoken learner production. The results reported in this book show that both learner groups developed the target structures as predicted by PT though some structures occurred more frequently in writing than in speaking. In Håkansson and Norrby's view, the results demonstrate that the planning time that is used in writing does not influence grammatical processability, though the lack of contexts for certain structures in speech suggests that time has an influence on language complexity.

Mansouri's study described in chapter five discusses the feasibility of accounting for intra-stage developmental sequences in second language development and their conceptual potential as additional explanatory tools in second language acquisition research. Mansouri discusses this phenomenon in the context of Arabic as a second language (ASL), focussing on the phenomenon of zero (null) and reduced making of definiteness within noun-phrase agreement structures. Based on the analysis and findings reported in this

study, it is argued that zero and reduced marking can be accounted for in terms of processing requirements and typological features (form-function mappings). Using PT as a conceptual framework, the study proposes a conceptual basis for extending Hypothesis Space as an additional explanatory module. This extension could be useful for dealing with intra-stage sequences where multiple structures with differing patterns of processing complexity and form-function mappings exist.

Still within the broad PT paradigm, Zhang's research on the acquisition of Chinese syntax incorporates discourse-pragmatic principles into the developmental approach to second language acquisition research. This has led to the formulation of the Topic Hypothesis which predicts the successive acquisition of L2 syntactic structures from a canonical order to a non-canonical. The key feature here is that the latter order deviates from the linearity principle of mapping between argument, functional and constituent structures. Zhang's findings support the Topic Hypothesis, showing an orderly developmental sequence as predicted by the hypothesis.

Dealing with a more applied matter within the PT paradigm, Keßler's chapter reports on a feasibility study of *Rapid Profile* as a tool for online-assessment of EFL learner language development. The study was motivated by the claim that *Rapid Profile* provides a valid and quick means of diagnosing EFL-development in formal settings. Keßler's study reveals an inter-rater-reliability of 85.7 per cent, and thus proves *Rapid Profile* to be both a valid and a feasible diagnostic tool for online-assessment. Additionally, the results imply important SLA-based implications for the EFL classroom.

The significance of studies such as Keßler's is that it shows that it is practically feasible to turn findings from second language acquisition research into a basis for language teaching and assessment. This is a theme that is bound to become more prominent within SLA circles as the pressure to link research to practice mounts on theorists and applied researchers alike. The following section of this chapter deals with two aspects of second language acquisition that are not too dissimilar from the chapters described thus far but nevertheless focus on two interconnected notions: bilingualism and speech processing.

Bilingualism and speech processing

Itani-Adams' chapter investigates the relationship between the development of lexicon and grammar in Japanese and English in a bilingual child (age 1;11 to 4;10). The research focuses on the relationship between verbs and the suffixation of morphemes, and the relationship between verbs and the semantic function of the arguments of the two languages. Itani-Adams' study found that regardless of the different input languages, the noun bootstrapped the bilingual

child into both languages. Overall, the findings from this study support the prediction of Processability Theory that the initial word order used by a language learner is the canonical order of the language. The results suggest that, for this bilingual child, Japanese and English each developed in a separate but a parallel manner.

Staying within bilingual research, Suarez and Goh's study investigated codification in short-term memory in bilinguals with different levels of English/Chinese dominance. The experiments manipulated phonological and visual features of words and examined their influence on the degree of semantic proactive interference (PI) in a short-term cued recall task. The results suggest that bilinguals process their two languages according to their language dominance. Particularly, Mixed and English dominant bilinguals showed evidence of phonological influence on PI, implicating phonological codification. There was also evidence of visual influences on PI for English dominant bilinguals, implicating visual codification. Chinese dominant bilinguals did not show any evidence of phonological and visual influences on semantic PI, which may suggest that they have a very integrated phonological, visual and semantic memory system.

Leaving bilingualism and ESL issues aside, Van den Noort, Bosch and Hugdahl's chapter discuss the processing of relative clauses in L1 research where subject relatives are reported to be easier to comprehend than object relatives. In this study, Van den Noort, Bosch and Hugdah test the hypothesis that object relatives cause a greater working memory load on twenty multilinguals, who were all native Dutch speakers (L1) and fluent in German (L2). Ten subjects started their free acquisition of Norwegian (L3) in the last 6 months, whereas ten others started their acquisition of Norwegian more than 3 years ago. Participants conducted a relative clause task in all languages, a reading span task in Norwegian (L3), and a number ordering task. The results show that differences in subject- and object relatives can only be found for participants, who are in an advanced stage of third language acquisition. Moreover, no significant correlations were found between the number ordering task, the reading span task (in L3), and the total comprehension score on the relative clause task in Dutch, German, and Norwegian. Van den Noort, Bosch and Hugdah's findings are in line with the SSIR theory of (foreign) language comprehension.

Dealing with speech processing and procedural features within an integrated theoretical framework, Kim and Kwon's study is inspired by three L2 developmental modules in procedural development, syntactic development, and morphological development. By integrating three separate modules into one, Kim and Kwon's study proposes a model called the Parallel Developmental Sequence (PDS) Model. The three modules from which the PDS Model is

derived are the English Developmental Sequence (Pienemann and Johnston, 1987), the Minimal Tree Hypothesis (Vainikka and Young-Scholten, 1998), and the PT (Pienemann, 1988). In essence, the PDS Model proposes that L2 development follows a series of parallel developmental stages sequentially. Each of these stages incorporates three different dimensions of sequential development: the procedural developmental sequence, the syntactic developmental sequence, and the unificational (morphological) developmental sequence. Each stage is operative through parallel activation, parallel connection, parallel strength, and synchronization by the logic of 'parallel connection' of the Parallel Distributed Processing Model. Therefore, the assumption of the PDS is that an L2 learner at a stage will activate the parallel mechanism and synchronize the three parallel systems to process rules in order to understand and produce language in that stage. The question then is whether or not the theoretically built sequence of parallel developmental stages does reflect the actual developmental stages of the L2 learner.

Conclusion

While this book has deliberately focussed on the process of language learning in its right, there is little doubt now that a more direct interaction with language teaching and assessment can be pursued more confidently. In fact, as is shown by the Pienemann's teachability hypothesis, the establishment of referential developmental points can have real purchase for grammar instruction and potentially language testing. This book coincides with a gradual shift in language teaching towards employing second language acquisition research as a relevant knowledge source for teaching practice and curriculum design (Lightbown, 1985, 2000; Long & Robinson, 1998). This is clearly evident in the growing number of empirical studies that attempt to test the educational benefits of specific design features in the curriculum, or certain teaching strategies inspired by and based on theoretical claims articulated within second language acquisition research (Mitchell, 2000; Macroy, 2000; Doughty & Williams, 1998). There is also a growing interaction between theoretical research in SLA and other relevant areas of academic inquiry, such as applied linguistics and foreign language assessment (c.f. Kramsch, 2000; Lightbown 1985; 2000; Long & Robinson, 1998).

Notes

¹ The edited volume is based on papers delivered at the 5th International Symposium on Processability, Bilingualism and Second Language Acquisition. The Symposium was held at Deakin University's Melbourne Campus, 26-28 September 2005.

² This section on the historical account of SLA draws largely on F. Mansouri, (2000), 'Grammatical Markedness and Information Processing in the Acquisition of Arabic as a Second Language'. LINCOM EUROPA Academic Publishers: Munchen, Germany, pp73-77.

³ Pienemann 1998, Pienemann, Di Biase & Kawaguchi, 2005

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