

INTRODUCTION: COGNITIVE PERSPECTIVES ON THE
ACQUISITION/LEARNING OF SECOND/FOREIGN
LANGUAGES

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Second language acquisition (SLA), a field of research of increasing interest around the world, has always been an interdisciplinary discipline, drawing especially on the fields of linguistics, psychology, education, sociology, and anthropology, both for the development of theory and for the choice of research methods. An approach to SLA of increasing importance internationally is the approach based on the area of psychology called cognitive science, which deals with the cognitive processes involved in the learning and performance of skills and activities, including, of course, the learning/acquisition and use of first and second languages (L1 and L2).

Many if not most researchers in the field consider SLA to include both *second* language acquisition - the acquisition of a new language in a country where it is spoken, whether in the classroom or simply by daily use - and *foreign* language learning - the learning of a new language in one's own country, usually in the classroom, with limited if any contact with native speakers. The bulk of the research in SLA is carried out with *second*-language acquirers in countries where massive immigration has led to the development of well-defined educational

Ilha do Desterro	Florianópolis	nº 35	p.007-015	jul./dez. 1998
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policies regarding second-language instruction and well-funded second-language programs in schools and universities. However, research with *foreign-language* learners also flourishes, even if on a smaller scale, in areas where there is sufficient investment in *foreign* language programs as well.

Although Brazil has received large groups of immigrants during certain periods of its history, this has not been a strong tendency of the last three decades - the period during which second-language instruction and research began to blossom in other countries. Nor does Brazil have a tradition of giving priority to foreign languages in school and university curricula. Foreign languages are still learned mainly in private language schools, most of which do not invest in research. Thus, SLA is not yet a well-established area of research in Brazil, although there are indications that globalism and Brazil's participation in Mercosul may spark some important changes. For example, there is a growing awareness of both the need for linguistic competence in Portuguese among foreign residents, evidenced by the recent government sanction of the newly developed national exam in Portuguese as a second language, and the need for competence in foreign languages among Brazilian students and professionals, which has led to pressure on the government by language professionals (such as those who attended the *I Encontro Nacional sobre o Ensino de Línguas Estrangeiras* in Florianópolis in 1996)) to develop a well-defined foreign-language teaching policy for the schools.

The limited amount of SLA research that has been carried out has been mostly on *foreign-language* learning, the greatest emphasis being on classroom research, especially from discourse and sociolinguistic perspectives, these being two relatively strong areas of research in Brazil. The relationship between cognition and SLA is an area which has so far attracted very few researchers in Brazil, and this special issue of *Ilha do Desterro* is an attempt to document and stimulate research in this new and exciting area.

The term *cognition* has been understood to mean slightly different things by different researchers in the field, and different interpretations of the term have led to different directions for research. Since we consider all of these directions to be playing important roles in the development of theory and/or the application of research findings in instruction and materials development, we have interpreted the term *cognition* in the broadest sense possible - as simply a mental activity or state of any sort - and intentionally included as broad a selection of papers as was possible, although naturally some important sub-areas have been omitted. The emphasis on empirical research was also intentional. Since cognitive approaches to SLA are in their infancy in Brazil, we wanted to stimulate first further empirical research in this area, leaving purely theoretical issues for a time when the field has reached greater maturity. We hope to have given a sufficient sampling of possible directions for research to have whetted the appetites of a few.

The papers could have been grouped or sequenced according to several different criteria, including subtopics within L2 cognition, type of research, etc., but any grouping schema devised would have resulted in overlap of topics. Therefore, we decided to organize the papers by L2 linguistic level or skill of investigation, with the following resulting sequence: (1) phonetics/phonology: papers by Flege and by Morris, which question the existence of a biologically determined critical period for L2 pronunciation; (2) morphology: papers by Koda, Takahashi and Fender and by Salaberry, investigating L2 morphological processing and development; (3) syntax: a paper by Ying on L2 syntactic processing; (4) lexicon: a paper by Ecke and Garrett on L2 lexical retrieval stages; (5) the four skills: a paper by Cohen on L2 processing strategies in listening, speaking, reading and writing; and (6) speaking: a paper by Fortkamp relating working memory to L2 oral fluency. The two book reviews also follow the theme of this issue, cognition and SLA: VanPatten's *Input processing and grammar instruction in second language acquisition* (1996), reviewed by Dutra, and Lantolf and

Appel's *Vygotskian approaches to second language research* (1994), reviewed by Gil.

Flege, through a review of studies of bilinguals' perception and production of vowels and consonants in their two languages, supports the hypothesis that difficulties often found in the pronunciation of late L2 learners may be due not so much to maturational constraints on perceptual or motoric abilities, but rather on their extended experience with the sounds of their L1. This experience may cause many late learners to perceive L2 sounds in terms of the phonetic categories of the L1, through a process Flege calls "interlingual identification." The result is that they ignore phonetic differences of the L2 sounds which would be irrelevant to the L1 categories and in many cases neglect to establish separate phonetic categories for these L2 sounds. He calls for further research evaluate the degree of bi-directional influence of the sounds of bilinguals' two languages.

Morris also investigates the validity of the Critical Period Hypothesis, through an empirical study of the L2 pronunciation of 19 advanced English-speaking learners of Spanish, as evaluated and compared to the pronunciation of 10 native speakers of Spanish by 12 native Spanish-speaking judges. Although all 19 L2 learners had begun learning Spanish after the age of 13, three were unanimously evaluated as native-like, and a number of others were similarly evaluated by some of the judges. Morris considers to be important aspects of his study the proficiency level and age of learning of his subjects and the fact that they were recorded during a language processing task rather than a reading task.

The two contributions in the area of morphology represent quite different, almost opposing points of view as to the importance of the L1 - the first one, by Koda, Takahashi and Fender, dealing with differences in the way L2 learners process English morphemes, depending on the L1; and the second one, by Salaberry, making a claim for the importance of general cognitive processes in the development of inflectional morphology, independent of the first and target languages involved.

Koda, Takahashi and Fender report on an experimental study showing the influence of print processing experience in the L1 on the morphological processing and awareness of English as a second language. Korean speakers, whose L1 is similar to English in being concatenating and alphabetic-syllabary, demonstrated more morphological awareness through more successful intraword componential analysis not dependent on syntactic analysis/awareness than Chinese speakers, whose L1 is different from English in being non-concatenating and logographic. In addition to the significant differences between the 2 groups, a significant correlation between vocabulary and reading comprehension proficiency and sensitivity to constraints of intraword morpheme concatenation only among the Koreans demonstrates the importance of the L1 for developing morphological awareness in L2.

Salaberry begins with the claim that general cognitive processes, rather than UG, may be responsible for guiding the development of L2 inflectional morphology. He reviews cross-linguistic empirical research (English-speaking learners of Portuguese, Spanish, and French plus speakers of various languages learning English) supporting two different hypotheses which support this claim - the lexical aspect hypothesis and the discourse hypothesis - and comes to the conclusion that the apparently conflicting results may be due mostly to differences in the learning environment of the subjects and differences in data collection and analysis procedures. He argues for the importance of taking these factors into consideration in the assessment of discrepancies among past empirical studies and of controlling for them in future research, especially through the use of complete replication studies.

Ying gives a minimalist account of the processing of syntactic reconstruction in English by Chinese learners. In spite of the logical problem of the acquisition of these structures by adult Chinese learners, hypothesized because of the lack of *wh*-movement in Chinese, he found that Chinese learners at low, mid and high proficiency levels have knowledge similar to that of native speakers of the potential ambiguity

of sentences with reconstruction. This knowledge was demonstrated by the fact that the Chinese learners, as the native speakers, interpreted the reflexive pronouns as referring to the matrix subject in sentences with a null context and as referring to the embedded subject in sentences with a disambiguating context. Both of these interpretations are claimed by Ying to demonstrate processing constrained by the Economy Principle, as proposed by Chomsky in his minimalist program.

Ecke and Garrett, in their investigation of FL tip-of-the-tongue states reported by beginning to high intermediate Mexican and Russian learners of English and U.S. American learners of German, provide further FL evidence for the two-stage models of speech production hypothesized in the literature for both L1 and L2 speakers. The FL findings in this study were similar to those of L1 studies in that subjects were frequently able to give the first sound or letter and number of syllables of the target word, indicating that they had managed to locate the "phonological address" or construct the "syllabic frame", but had not been able to make the link to the remaining form features or "fill in the frame". The FL findings of this study differed from previous L1 adult studies, however, but were similar to L1 studies of children, in that the middle and final sounds or letters were also frequently identified, indicating that in the vocabulary-learning stages of L1 or FL, greater attention is paid to form than in stages where the vocabulary sound representations and automatized retrieval procedures are well-established.

Cohen and Allison investigate the processing strategies, during listening, speaking, reading and writing tasks, of university-level English-speaking immersion students learning Spanish, French, and German. Delayed and immediate retrospective verbal report data provide evidence that immersion program students used more direct cognitive processing and less mental translation than non-immersion FL students, and that the mental translation the immersion students did carry out was apparently more selective - to help them remember complex structures and to help them organize thought or consolidate

comprehension. Immersion students' comments about lack of time for mental translation and about avoiding translation in order not to miss subsequent parts of the lecture indicate that the lesser use of mental translation of the immersion students probably makes their participation in the classroom more effective.

Fortkamp, in the only Brazilian paper among the eight, makes an innovative contribution to the study of working memory capacity, a concept considered by cognitive psychologists to be central to the understanding of human cognition, with her investigation of the relationship between this cognitive system and temporal variables of L2 speech production. Following the methodology of an already well-established area of cognitive psychology, her data consisted of the results of two versions of the working memory span test and a picture description and narrative task to elicit L2 speech. Although research in cognitive psychology has consistently shown that individuals vary in their working memory capacity and that these individual differences may predict and account for variation in the performance of real-world complex tasks, in this study no significant correlations were found between measures of working memory span and L2 speech production. Fortkamp accounts for these results by arguing that the span tests are not sensitive to the processes the learners in her study engaged in order to speak in the L2.

We believe we have included in this issue an interesting selection of eight high-quality papers, six of which report on recent empirical research and two which review empirical literature to make theoretical and methodological statements. These papers represent the diversity in the field of cognition in SLA in several aspects. In addition to dealing with four linguistic levels and the various L2 skills, they use a variety of research methods and represent various schools within the field of cognition.

The data of the studies reviewed by Flege consisted of either instrumental analysis of the vowels and consonants of bilingual speakers in one or both languages or native speaker perceptions of

these sounds, while Morris's data consisted of native speaker perceptions of the accent of his native and non-native subjects. Koda et al., as well as Ying, depended on paper-and-pencil tests to determine the L2 morphological and syntactic competence of their subjects. The studies reviewed by Salaberry used a variety of data-collection procedures to elicit verb inflection, including a diary study, oral interviews, guided text completion, written narratives, movie retelling, and a cloze test. Ecke et al. used structured cognitive diaries to collect cases of the tip-of-the-tongue phenomenon. Cohen et al. used verbal report to discover the processing strategies used by their subjects. Finally, Fortkamp used tightly controlled computer span tests to collect data about her subjects' working memory capacity and a narrative task to evaluate their fluency.

Cognition consists basically of mental representation and process, so views of what each consists of vary. Flege and Morris both work within a controversy which has been spurring research for three decades - the existence or not of a critical period for language. Flege's intention is to discover the type of phonetic mental representation responsible for bilinguals' pronunciation, while Morris is more interested in the result - if the accent is native-like or not. Koda et al. examines both the morphological processing abilities of their ESL subjects and their awareness of morphological structure, thus dealing with both process and representation. Salaberry brings up the controversy of whether language acquisition depends more on general cognitive abilities or UG, coming to a conclusion shared by many, that the acquisition of inflectional morphology has little to do with UG. Ying deals with syntax, which is more easily attributable to UG, and gives a Chomskyan minimalist account of syntactic processing as indication of L2 knowledge acquired without the benefit of similar L1 structures. Ecke et al. work within a prolific area of research - lexical retrieval - and provide FL evidence for two-stage models of lexical production, also a popular hypothesis in recent years. Cohen et al. work within the field of cognitive processing strategies, also a quite prolific area in recent

years. Finally, Forkamp works within the experimental psychometric correlational approach to working memory capacity, much more common in L1 research than in L2 and more common in reading research than speaking.

What seems almost conspicuous in its absence is work on the implicit/explicit distinction, one of the most common topics in SLA cognition in the last fifteen years. Also, while we managed to include papers on both processing and development of morphology, the papers on syntax and the lexicon deal only with processing, development having been left out. While Koda et al.'s paper touches on the problem of awareness of morphological structure, there are no papers going more deeply into the attention and awareness controversy. Other topics which have generated considerable discussion in the field but which are absent from this collection of articles are schema theory, restructuring, connectionism, parallel distributed processing, and other theoretical bases. Interest in these topics may be waning in the area as a whole, however, the former two having possibly exhausted discussion and the latter two requiring more computer expertise than that of the average SLA researcher. All in all, we hope to have given a well-rounded view of the field of cognitive perspectives on the learning and acquisition of second and foreign languages, and hope that some of our readers will develop the same enthusiasm that we have for continuing research in the area.