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Learned attention and blocking

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Naturalistic SLA tends to stabilize at levels short of nativelike ability. At its most extreme this can present itself as a “Basic Variety” of interlanguage which, although sufficient for everyday communicative purposes, predominantly comprises just nouns, verbs, and adverbs, with closed-class items, in particular grammatical morphemes and prepositions, failing to be put to full nativelike use. Various explanations have been proposed for this limited attainment of adults compared with children, including critical periods for language acquisition, sociocultural differences, motivational differences, and restricted input. Alternative accounts emphasize the associative learning phenomena of learned attention, blocking, and transfer. A number of theories of SLA incorporate notions of learned attention (Schmidt, 2001), for example the competition model (Macwhinney, 1987) and the associative-cognitive CREED (Ellis, 2006c).

Associative learning theory documents a range of effects of transfer and inhibition that shift learners’ attention to input as a result of prior experience. Kruschke (2005, 2006) describes the phenomenon of blocking. Associating a particular stimulus A with a particular outcome X makes it

more difficult to learn that cue B (subsequently paired with the same outcome) is also a good predictor. Thus, for example, if a pigeon learns that a conditioned stimulus (e.g., a light) is a reliable predictor of an unconditioned stimulus (e.g., the onset of some painful stimulus such as a shock), then it will not become conditioned to or learn that any other conditioned stimulus predicts the unconditioned stimulus (e.g., that a bell predicts the onset of the shock in the same way the light did). Once the animal learns one reliable association with the conditioned stimulus, this essentially blocks further associations. Blocking is an effect of learned attention (Mackintosh, 1975). It is a highly robust and widespread phenomenon that occurs across animal and human learning.

Ellis (2006b) reviews blocking in second language acquisition. There are many situations in natural language in which cues are redundant and thus—as a consequence of blocking—might be less readily learned. If L1 experience has led a learner to look elsewhere for cues to interpretation, he or she might use these cues where available in the L2; the principles of associative learning predict that this reliance on L1 cues will be to the detriment of learning other cues that might also be relevant. For example, L1-derived knowledge that there are reliable lexical cues to temporal reference (words like *yesterday*, *gestern*, *hier*, *ayer*) might block the acquisition of verb tense morphology from analysis of utterances such as *yesterday I walked* or *hier nous sommes allés au cinéma* “yesterday we went to the movies.” Given that it is not uncommon in natural language for grammatical cues to be foreshadowed by more salient lexical and discourse cues like this, SLA thus seems to be a problem space that might be particularly susceptible to learned attention effects such as blocking and overshadowing.

Ellis and Sagarra (2010b) explored learned attention in two experiments. The first demonstrated short-term instructional sequence effects in adults learning temporal reference in Latin using the standard blocking experimental paradigm (Kruschke, 2006) but with linguistic content relating to temporal reference in a small set of Latin phrases. In Experiment 1, previous experience with adverbial cues blocked the acquisition of verbal

tense morphology, and, in contrast, early experience with tense blocked later learning of adverbs. Experiment 2 demonstrated long-term transfer effects: native speakers of Chinese languages, which do not exhibit verb tense morphology, failed to acquire inflectional cues when adverbial and verbal cues are equally available. These latter findings suggest a long-term attention to language, a processing bias affecting subsequent cue learning that comes from a lifetime of prior L1 usage.

Ellis and Sagarra (2011) replicated and extended these investigations where the participants had to learn a more complicated morphological paradigm. In Experiment 1, salient adverbs were better learned than less salient verb inflections, early experience of adverbial cues blocked the acquisition of verbal morphology, and contrariwise, but to a lesser degree than in Ellis and Sagarra (2010b), early experience of tense reduced later learning of adverbs. Experiment 2 demonstrated long-term transfer: native speakers of Chinese (no tense morphology) were less able than native speakers of Spanish or Russian (rich morphology) to acquire inflectional cues from the same language experience where adverbial and verbal cues were equally available. Learned attention to tense morphology in Latin was continuous rather than discrete, ordered with regard first language: Chinese < English < Russian < Spanish. A meta-analysis of the combined results of Ellis and Sagarra (2010b, 2011) separated out positive and negative learned attention effects: the average effect size for entrenchment was large (+1.23), that for blocking was moderate (-0.52).

Ellis and Sagarra (2010a) demonstrate that such effects extend to the sentence processing strategies of third- and eighth-semester English-Spanish FL learners reading sentences in Spanish containing lexical (adverb) and morphological (verbal inflection) cues to temporal reference. They also show how instructional practices that manipulate learner attention to morphological cues, either in time by means of pre-exposure, or in space by means of typographical enhancement, increase attention to inflections thus to overcome reliance upon adverbial cues.

The findings of such experiments reinforce the possibility that the limited attainment of adult

second and foreign language learning follows general principles of associative learning. Adult FL acquirers are limited in working memory and time on task, and they have attentional biases to language. They know that temporal adverbs are more reliable than non-salient and ambiguous verbal inflections and that they can usually satisfice (a cognitive strategy that attempts to meet criteria for adequacy, rather than to identify an optimal solution) and get their message across by lexical means alone—however ungrammatical, the Basic Variety is communicatively effective. An understanding of associative learning theory illuminates both the rationality of L1 fluency and the apparent irrationalities of fragile L2 acquisition and fossilization (Ellis, 2006a, 2006b).

See also: attention, automaticity, frequency effects, inhibitory control, priming, statistical learning

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Learning disabilities and second (foreign) language learning

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Since the 1960s, foreign language educators have described students who struggle with second language (L2) learning (Dinklage, 1971; Pimsleur, Sundland, and McIntyre, 1964). Likewise, since the 1980s special educators in the learning disabilities (LD) field have noted that some students

classified as LD who have difficulties with their native language (L1), especially in the areas of reading and writing, may have difficulties with L2 learning (see Gajar, 1987). Though both fields had addressed the issue separately, it was not until Sparks and Ganschow examined relationships between L1 and L2 learning and presented their Linguistic Coding Differences Hypothesis (LCDH) (Sparks, Ganschow, and Pohlman, 1989) that discussions started across the disciplines. Their research has shown that students, LD or otherwise, who have L1 learning problems have difficulty with L2 learning.

First, a brief review of the LD concept is provided. Then, research is reviewed that summarizes findings on: a) LD and L2 learning problems; b) college students with LD and L2 learning; c) problems with the diagnosis of a “disability” for L2 learning; and d) teaching L2s to students with language learning problems.

Review of the LD concept

Students classified as learning disabled (LD) are those who exhibit severe academic difficulties in reading, mathematics, and/or written language (including spelling). However, since the term was introduced in 1963, LD has been the most contentious and contradictory of the disabilities, primarily because of the failure to develop a valid definition for LD and empirically based diagnostic criteria that are used consistently by professionals in the field (Kavale, 1998). Since the late 1970s, LD has been based on the idea that a student’s achievement in reading, mathematics, and/or written language measured by scores on standardized tests should be consistent with his/her “potential,” or score on a standardized intelligence (IQ) test. This practice is called the discrepancy concept, the idea that a discrepancy between the IQ score and academic achievement scores is evidence of LD. However, research has falsified the use of IQ-achievement discrepancy for identifying LD on theoretical, empirical, and psychometric grounds (see Dombrowski, Kamphaus and Reynolds, 2004). Because of the problems with definition and evidence which shows that discrepancy fails to identify students with learning problems that are