(Not) Acquiring Meaning in a Second Language: Are Input Deficits Key?

Languages are diverse in their lexicons as well as their grammar and sound systems. For instance, English labels a ball on a table and a handle on a door as *on* while Dutch labels them separately (*aan* vs. *op*) and Spanish groups both with an apple in a bowl (*en*) (Bowerman, 1996). Languages also vary in how many color terms they use to divide up the spectrum, what distinctions are drawn among drinking vessels, and the meaning of body part terms, among others. These differences are not easily mastered by second language (L2) learners. They often use words in non-native ways even after many years of L2 immersion (Malt & Sloman, 2003).

The challenge for the L2 learner entails acquiring lexical categories that may only partially overlap L1 categories, may be sub-sets or supersets of L1 categories, or may cross-cut them (using entirely different semantic dimensions). In lab studies of artificial category learning, learning one set of categories followed by learning a cross-cutting set produces large costs in speed and accuracy of categorization and perseverative errors (e.g., Kruschke, 1996). This suggests that entrenchment in an initial set of categories interferes with encoding alternative groupings of the same entities. In lexical network terms, once the network settles into a stable configuration of links between word forms and elements of meaning, remapping may become difficult.

Yet, paradoxically, within the L1, language users easily master words having complex relations among them. For instance, *cup* both overlaps with *mug* and can be used to encompass mugs; *pet* and *wildlife* crosscut *feline* and *canine*. L1 learners acquire and maintain many such terms.

So, is the difficulty with mastering L2 meanings inherent in the nature of the lexical network, or is it due to differences in how L1 and L2 are acquired? Young L1 learners see many examples of word-referent pairs, attend to acquiring word meanings, and have metalinguistic knowledge that meanings should be contrastive. These learning features are typically absent in L2 instruction and are often absent in adult immersion contexts as well.

The current study was designed to discriminate between the possibility that learning difficulty is due to fundamental characteristics of lexical networks and the possibility that it is due to insufficient input and attention to the input. It further investigated whether metalinguistic knowledge that L2 meanings can differ is crucial to successful learning. We used a domain where word meanings cross-cut each other in the L1 and to-be-learned language. We gave participants intensive L2 word-referent pairing exposure and tested their ability to define the L2 words, label exposed instances, and generalize to new instances. Further, half the participants were told simply to learn the L2 labels and half were told that meanings may differ from L1.

Method

Participants. Thirty-one native English speakers without substantial knowledge of another language participated.

Stimuli. Stimuli were designed to have meanings cross-cutting the meanings of English words for them. Training stimuli were videos illustrating five novel verbs for actions of standing or walking with an object. The actions are labeled as *carry* or *hold* in English. In many Asian languages and in our lab version, these actions are labeled according to the manner of the object being in contact with the person (e.g., cupped in one or both palms vs. held snug against the front or side of the body), regardless of whether the action is stationary or moving (see Saji & Imai, 2013). Each of the five novel verbs was shown once as stationary and once with forward movement with each of four objects (= 8 instances per verb; 40 videos total). Test stimuli were new instances of the same five verbs (with four new objects per verb and modest variations in placement), each shown once as stationary and once with movement for each object.

Procedure. Participants received instructions simply to either “learn labels” or “figure out meanings” of the verbs, and the latter group was also told meanings may differ from English. They first viewed all training stimuli with labels once, then wrote what they thought each label

meant. They then attempted to choose the label for each stimulus and received feedback with the correct label. They then wrote again what they thought each label meant. Last, they saw each generalization stimulus and chose a label for it.

Results.

The Figure Out Meanings group completed the study significantly faster than the Learn Labels group (M = 20 minutes vs. M = 35 minutes, $p < .02$). They also made their choices in the generalization phase significantly faster than the Learn Labels group (mean of 2.93 sec vs. 3.61 sec per trial, $p < .05$). (Choice times were not measured in the training phase.)

The Figure Out Meanings group also showed an edge in producing definitions that referred in some way to contact with the body in both the first and second round of definitions (first round: 87% vs 77%; second round: 93% vs. 81%), and in producing definitions that captured the specific intended meaning (first round: 62% vs. 51%; second round: 71% vs. 62%). However, these differences were not significant. (A few participants in each group did persist in defining the terms largely as carrying vs. holding, demonstrating some challenge in moving away from entrenched meanings.)

With five labels, chance performance on choices would be 20%. Despite the differences just discussed, both groups performed at high and similar levels of accuracy in their choices (in training with feedback, Figure Out Meaning = 81% correct and Learn Labels = 78% correct; in generalization, Figure Out Meaning = 80% correct and Learn Labels = 85% correct.)

Discussion.

High levels of choice performance indicate that most learners can readily pick up on new dimensions of word meaning that cross-cut their familiar L1 meanings. Success in the current task context is likely due to (a) viewing many instances of word-referent pairings in succession, fostering abstraction of commonalities per word and identification of contrasts among the words; and (b) attention dedicated to the learning task and not to other tasks that may be more important in real-world contexts. As such, the results point to input conditions rather than inherent conditions of lexical networks as a critical limiting factor in L2 word learning.

The similar choice performance between groups indicates that learners can do well even without prior knowledge that they might need to attend to different dimensions. The speed differences suggest, though, that metacognitive knowledge may facilitate such learning.

Although the current results suggest that learners can shift to new meanings with suitable input, an open question is whether such shifts will be accompanied by alterations to the L1 word representations. Some prior research points to the possibility that L2 attainment does exert an influence on the L1 lexical network (e.g., Pavlenko & Jarvis, 2002). If so, it will be of interest to pinpoint how properties of lexical networks interact with input in maintaining representations in the two-language case.

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