Statement of Research Interests

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My research investigates how people learn to use language to convey information about perceived events. This research investigates language learning in both children and adults, with the goal of understanding how children and adults differ in their language learning competencies and language learning strategies. A better understanding of these differences could allow for the creation of better techniques for training adults to use a second language. As part of this general goal of understanding how people learn to represent events in language, my research also examines the nature of event representations in nonlinguistic cognition. A better understanding of the mapping between event representations in language and in nonlinguistic cognition could allow for a better understanding of why some aspects of language learning are relatively easy (because they can be directly mapped onto nonlinguistic cognitive representations) and why some aspects of language learning are very difficult (because no such direct mappings are possible).

As may be expected given this broad research focus, I am currently pursuing a number of independent lines of research. One line of research examines how both children and adults learn the meanings of verbs, and how this learning of verbs differs from the learning of nouns. Research with children (e.g., Kersten & Smith, 2002; Kersten, Smith, & Yoshida, 2006) has revealed that verb learning is dependent upon prior learning of nouns, whereas the learning of nouns proceeds independently of the learning of verbs. In particular, children learning verbs were found to focus their attention on actions only when those actions were carried out by familiar objects with known labels. When actions were carried out by unfamiliar objects, children attended as much to the static characteristics of those objects as to the actions. In contrast, children learning nouns focused their attention on objects regardless of the nature of the actions that they carried out. There are two possible explanations for these verb learning results. First, children may attend to unfamiliar objects when learning verbs because the same verbs can have different meanings in the context of different objects (e.g., compare “the sprinter ran” vs. “the engine ran”). Thus, knowledge of an object and the types of actions it is capable of may be prerequisite to understanding the meaning of a verb used in the context of that object. Second, early noun learning may instill in children a general tendency to focus on novel objects in a word learning situation. Thus, children’s attention may be drawn to novel objects not only when learning nouns but also when learning verbs. Children may thus only be able to focus exclusively on actions in the context of verb learning when the objects carrying out those actions have already been associated with nouns. Current research is investigating these two hypotheses for our prior verb learning results.

Research with adults (Kersten, 1998a; Kersten, 1998b; Kersten, 2003; Kersten & Billman, 1995) has provided evidence consistent with the second above hypothesis that people tend to associate with verbs information that has not already been associated with nouns. Interestingly, this research has revealed that the information that people associate with nouns is not limited to static object information, but also includes certain types of
motion. In particular, adults have been found to associate nouns with what I call intrinsic motions, or the motions of an object defined with respect to the object itself. An example comes from human locomotion, in which the legs move in a pendular fashion with respect to the hip, and the arms move in a pendular fashion with respect to the shoulder. Although people tend to associate nouns with this type of motion information, my research has revealed a tendency to associate verbs with a different type of motion, namely extrinsic motions, or the motions of an object with respect to some external reference point such as another object. Examples come from the meanings of verbs such as enter, exit, ascend, and approach. I explain these results in terms of a division of labor between nouns and verbs in the representation of motion. In particular, children may learn at an early age that particular objects are associated with particular intrinsic motions. Children eventually learn to associate these objects (and their associated intrinsic motions) with nouns. When children subsequently learn verbs, there is a tendency to focus on information that has not already been associated with nouns, encouraging children to focus on extrinsic motions.

A second line of research, carried out in collaboration with Julie Earles, investigates the nature of noun and verb representations using a memory paradigm. Previous studies (Earles & Kersten, 2000; Earles, Kersten, Turner, & McMullen, 1999) have revealed that verbs are more difficult to recall than are nouns, especially for older adults. We are currently investigating the reasons for this greater difficulty in remembering verbs. Our hypothesis is that verbs are more difficult to remember because the meanings of verbs are different in different contexts, most notably in the contexts of different nouns (see also Kersten & Smith, 2002, described above). Because the context at retrieval may be different from the context at encoding, the meaning of a verb that comes to mind at retrieval may be different from the one that comes to mind at encoding, making it difficult to determine that one has seen the verb before. We have been investigating this hypothesis using a recognition memory paradigm (e.g., Kersten & Earles, 2004; Earles & Kersten, submitted). In particular, we present participants with noun-verb pairs (e.g., the sprinter ran) and ask them to remember either the noun or the verb from each pair. We later test them on memory for each of these words (e.g., ran), either in the context of the same word with which it was previously paired (e.g., sprinter), or in the context of a different word (e.g., engine). We have found that memory for verbs is significantly impaired when a verb is accompanied by different nouns at encoding and at retrieval. In contrast, memory for nouns is relatively unaffected by the presence or absence of the same verb at encoding and at retrieval. This finding is consistent with the hypothesis that verbs are dependent upon nouns for their meanings, and thus differ in meaning in the context of different nouns, whereas nouns mean roughly the same thing regardless of the verb that accompanies them.

A third line of research investigates how adults learn to describe events in a second language. This research has been testing one hypothesis for why adults have so much difficulty successfully acquiring a second language, namely the “Less is More” hypothesis of Elissa Newport (1990). According to this hypothesis, the reduced working memory capacity of children relative to adults actually results in better language learning by forcing children to focus on small chunks of language. Adults, on the other hand, can
remember larger chunks of language, allowing them to memorize useful expressions in a foreign language (e.g., “Where is the bathroom?”), but making it difficult for them to extract the lower-level meaning elements from which those expressions are constructed. Adults are thus limited to the set of phrases that they have acquired, and are unable to recombine the lower level elements from which those phrases are constructed to express novel meanings. If this hypothesis is correct, one may predict that adults will learn a language better if they are forced to focus on small chunks of language rather than being allowed to learn entire phrases. We have tested this prediction using a miniature artificial language learning paradigm (see Kersten & Earles, 2001). One group of adults was presented immediately with complete “sentences” from this language, whereas a second group was presented initially only with individual words from the language. This second group was subsequently presented with incrementally longer chunks of language until ultimately they were hearing the same sentences that the other group heard all along. The group that was initially forced to focus on small chunks of language showed better ultimate learning of the word meanings and morphology of that language, consistent with the “Less is More” hypothesis. We are currently investigating whether starting small benefits the acquisition of a natural language with more complex grammar, namely French (Chin & Kersten, in press).

Finally, a fourth line of research (or, more correctly, set of lines of research) examines the nature of event representations in nonlinguistic cognition. One such line of research examines event category representations, and how these relate to event representations in language (Kersten, Goldstone, & Schaffert, 1998; Kersten & Billman, 1992; Kersten & Billman, 1997). For example, Kersten & Billman (1997) found that, when learning unlabeled event categories, people formed categories around multiple, correlated attributes of an event, such as the appearance of the actors in the event, the paths of those actors with respect to each other; and the result of an interaction between those two actors. Such unlabeled event categories differ dramatically from the meanings of verbs, which typically convey only one or a small number of attributes of an event. For example, the verb “collide” conveys only that two objects move into contact with one another, regardless of the nature of the objects involved or the outcome of the interaction. Thus, verb meanings seem to differ dramatically from unlabeled event categories. In contrast, nouns seem to map straightforwardly onto unlabeled object categories. The lack of a straightforward mapping of verbs onto nonlinguistic event categories suggests a reason why verbs are learned later than nouns in a variety of different languages and cultures (see also Goldstone & Kersten, 2003). A second line of research on this general topic examines the nonlinguistic representation of self-performed and other-performed actions, as revealed by a memory paradigm (Earles & Kersten, 1998; 1999; 2002; Earles, Kersten, Más, & Miccio, 2004; Kersten, Earles, Curtayne, & Lane, 2008; Earles, Kersten, Curtayne, & Perle, 2008; Kersten & Earles, in press). This research has again revealed the lack of a straightforward mapping between verbs and nonlinguistic representations. In particular, this research has provided evidence that people are able to retrieve representations of previously performed and observed events, but are unable to remember the specific verbs that were used to describe these events.
These first two lines of research investigating the relation between linguistic and nonlinguistic event representations have focused on influences of nonlinguistic event representations on verb learning and memory. A final line of research (Kersten, Meissner, Lechuga, Schwartz, Albrechtsen, & Iglesias, in press) examines influences of linguistic representations of events on nonlinguistic cognition, as suggested by the Whorfian hypothesis. In particular, it examines whether the prominence assigned to particular event attributes in one’s native language influences the extent to which one attends to those attributes in a nonlinguistic context. This hypothesis is being tested by presenting English speakers and Spanish speakers with an event category learning task. English and Spanish differ in the extent to which they emphasize the manner of motion of an object, or the way in which an object moves around (e.g., running vs. hopping). In particular, this information is prominently labeled by a large number of English verbs, whereas it is often not mentioned in Spanish. Thus, to test for influences of language on nonlinguistic cognition, English and Spanish speakers have been presented with a category learning task in which manner of motion is the attribute that allows one to discriminate among the categories. Consistent with the Whorfian hypothesis, English speakers have been found to perform better at this category discrimination, despite the fact that the manners of motion are novel and thus cannot be mapped directly onto the words in one’s native language. English and Spanish speakers have been found to perform no differently at learning a category discrimination in terms of the path of an object, an attribute that is prominently marked in both languages. This combination of findings suggests that English speakers learn to attend to manner of motion as a result of their English language learning experience in which that attribute is relevant. Research is currently underway to investigate the generality of this influence of language on cognition.

References


Earles, J.L., & Kersten, A.W. (submitted). Effects of semantic context on memory for verbs, basic-level nouns, and superordinate nouns.


