

Commentary on Merriman and Bowman

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"When I use a word, it means just what I choose it to mean -- neither more nor less."

-- Humpty Dumpty speaking to Alice in "Through the Looking Glass" by Lewis Carroll.

### MAKING WORDS MAKE SENSE

This *Monograph* makes a major contribution to our understanding of a crucial aspect of the transition from infancy to childhood -- the transition in which the child learns to make sense of the vast system of categories formalized in every human language. When faced with the task of deciphering a complex code, one always looks for a Rosetta Stone. In the area of word learning, Markman has suggested that the child's Rosetta Stone for word learning might well be the notion of Mutual Exclusivity. But Markman's proposal is not the only one in the field. Other rich and compelling ways of viewing the process of conceptual development focus on the roles of hierarchies, contrasts, strategies, competitions, innate predispositions, regularity in the input, and parental guidance. In a masterful fashion, Merriman and Bowman guide the reader through this bewildering forest of ideas, paying close attention to the signposts marked out by the empirical facts. Having laid down this rich conceptual analysis, they then go on to present three of the most carefully designed studies to be found in this literature. Their *Monograph* stands as the most clear-sighted view of this area of child development that has yet been published. It contributes in significant ways to one of the most important current discussions in the field.

The problem of Mutual Exclusivity is no new issue to philosophical and linguistic discussions of word meaning. That great rational philosopher, Humpty-Dumpty, elucidated parts of this problem when he declared that, when it comes to dealing with words, one simply has to show them who is to be master. In a sense the various currents feeding into the Mutual Exclusivity bias all represent attempts to gain Humpty-Dumpty-like mastery over the possible meanings of words. However, for the young child, this "take control" approach to language does not come so easily. The toddler is a trusting creature who tends to treat parents as the source of all wisdom. The child would prefer to simply use words the way that parents do. In fact, Merriman and Bowman argue that this may indeed be what happens at first. Yet, eventually, the Serpent of Error intrudes on the trusting relation between children and their parents. Sooner or later, children realize that there is some mismatch between what the parent intended and what they thought the parent intended. The problem is that it is hard for the child to know exactly how the parent intends for each word to be used. Parents do not provide instructions on how to use the words they teach. Nor do words come equipped with their own instructions. Not even the most cautious parent can foresee all the ways that a new word will be interpreted. Thus, inevitably, the child has to adopt an active stance in the task of word learning. Children must begin to find limits that shape the possible ways in which they can interpret new words. Where the parent's limits fail, children have to learn to set their own limits.

And this is where Mutual Exclusivity (ME) fits in. Merriman and Bowman argue convincingly that the Mutual Exclusivity bias does not govern the toddler's first attempts at word learning. Instead, it grows slowly over time. Merriman and Bowman define the bias in a few simple words as a disposition "to keep the set of referents of one word from overlapping with those of others." They are quite careful never to speak of this bias or disposition as a "constraint." Although it may not be the case that an inexhaustible array of hypotheses drives children into the waiting arms of a strong inborn ME constraint, one still needs to provide some alternative account of how children home in on the correct relations, while avoiding the myriad possible wrong interpretations of words. Here Merriman and Bowman opt for the most reasonable alternative. Rather than relying on a strong early ME constraint, they choose to emphasize the conservative nature of the young child's approach to word learning. They point out that, without this conservatism, a child who knows only two words would use them as if they were *yin* and *yang*, dividing up the universe between the Light and the Dark. Of course, nothing of the sort happens. Some early words have wide ranges of reference; others have narrow scopes. But the same can be said for adult word meanings. It is true that some parent psycholinguists, such as Mervis or Leopold, have detected large numbers of overgeneralizations in the speech of their children. But many of these overgeneralizations can be traced to inconsistencies in the adult input. Still other parent psycholinguists, such as Macnamara and MacWhinney, have found that their children picked up new words with a startlingly small number of overgeneralization errors. In such cases, it appears that the input was clear and consistent. In general, the child seems to be adept at mirroring the statistical configuration of the input. Thus, there seems to be good empirical support for the view of the child as a conservative word learner.

Merriman and Bowman never tell us exactly how it is that the toddler manages to maintain a conservative interpretation of the input. However, it would seem that their analysis is most consistent with some instance-based model of word learning. In a model of this type, the extension of each word is precisely the set of objects for which the child has actual empirical evidence that a word was used. According to this view, the child's memory for the referent of a new word could be extremely detailed. Hearing the word "cookies" used when the mother is transferring some newly baked cookies into a cookie jar, the child could initially form an association between "cookies" and the act of transfer, the presence of a cookie jar, the shapes of the cookies, the heat coming from the oven door and the smell of the cookies. Subsequent uses of the word "cookies" would eliminate much of this episodic detail, leaving a core nominal referent. One might argue that expecting a toddler to have this kind of veridical memory for instances may be asking too much. But one must remember that, although the toddler's memory may not be sharply categorized, it is nonetheless extremely flexible. According to this view, the most likely way that a child could avoid building cognition on top of the ME constraint would be to build cognition on top of a powerful memory.

### **Disambiguation, Correction, and Rejection**

The most remarkable contribution of the Merriman and Bowman *Monograph* is the evidence it provides for the development of the ME constraint during the third year. Merriman and Bowman do an excellent job of turning the argument for an innate ME bias on its head. Having shown that the young child can learn without relying on this bias, they then go on to show how important the bias is for the older child. There are two arguments here. The empirical argument focuses on a set of three strategies the child can use to maintain Mutual Exclusivity when confronted with a new name. These are the strategies of *disambiguation*, *correction*, and *rejection*. Merriman and Bowman distinguish a subcase of correction which they call *restriction*. However, because it is fairly difficult to separate restriction from correction in actual practice, it may be easier at

first glance to think of the two strategies as involving a single basic process. The core contribution of both the analytic and empirical work in this *Monograph* is the construction of a clear understanding of how the child uses these three strategies when confronted with new words. Consider the case of a child who knows the word "cup," but does not know the word "demitasse." If a child is using the ME bias, this is what we would expect to find.

1. Disambiguation. When the child sees both a demitasse and a prototypical cup and is asked to bring "the demitasse," she will bring the demitasse.
2. Correction. When the child is told that a particular cup is a "demitasse," she will decide that it is wrong to call it a "cup."
3. Rejection. When the child is told that a particular cup is a "demitasse," she will respond, "No, cup."

### **Why do children develop these strategies?**

Each of these three strategies can be seen as serving a useful purpose in acquisition, quite apart from their possible role in enforcing Mutual Exclusivity. The disambiguation strategy provides the child with a good guess about what a new word might mean. As a child's vocabulary increases, it becomes increasingly likely that disambiguation will be useful, since there are fewer and fewer objects without names. The rejection strategy functions most effectively as a way of requesting disambiguation from the parent. If the child says "no, cup," the parent can go on and explain to the child how a demitasse differs from other cups.

Of these three strategies, the correction strategy is the most important. Correction works to prune back overgeneralizations that may have occurred during the process of word learning. For the younger child, the rich episodic basis for words may block their excessive overgeneralization. But, for the older child, it may become increasingly costly to maintain such an episodic database. If the child can properly coordinate the correction strategy with other strategies that support the construction of subordinate and superordinate classes, it may not be necessary to continue to maintain the full set of referents underlying each word. A child should not apply the correction strategy to "demitasse" and "cup," unless it is clear that "demitasse" is not subordinate to "cup" or vice versa. However, if there is no evidence for subordinate or superordinate relations, the child can proceed to correct the referential scope of the word "cup."

### **Competition versus Strategy**

The general view that Merriman and Bowman are developing is one that I find quite convincing. As the child grows older, the linguistic problems he is confronting become more complex. The child develops more complex ways of dealing with these problems. However, it seems to me that these additional strategies must be viewed as overlays upon a basic process of lexical acquisition that is working against a backdrop of competitions between words for references. Competition is not a linguistic constraint, but a basic characteristic of the human information-processing system. Competition makes it so that, if a referent is repeatedly called a "demitasse," the association between the word and the referent will grow in strength. This allows it to compete successfully in the relevant instances with the word "cup." Merriman and Bowman fault the Competition Model approach for not providing an explanation for the development of the correction strategy in three- and four-year-olds. But it seems to me that the correction strategy is entirely compatible with the attempt to minimize competition between forms envisaged by the

Competition Model. Merriman and Bowman are correct in claiming that this is a strategy and not an inborn constraint. However, it seems to me that use of the correction strategy can be directly motivated by competition between words. How might this work? Consider what happens during a particular experiment in which a child may acquire episodic information that links the word "demitasse" to a small teacup. The new form "demitasse" is a very precise word with an extremely limited semantic range. The old form "cup," on the other hand, is a fairly general word with a much broader semantic range. The information-processing framework of the Competition Model specifies that, when a specific accurate match competes against a less specific match, the more specific match will dominate, if it is accurate. Thus specificity would bar application of "cup" as a name for the demitasse during the episode of learning. However, the Competition Model would assume that this particular effect would fade over time outside the domain of the experiment. When the child confronts a new demitasse in a second radically different situation, the word "demitasse" will compete with the word "cup." If the adult again provides the name "demitasse," the child will be further induced to carve out part of the territory of the word "cup" for the new word "demitasse." The Competition Model claim is that the "correction" made during the course of these experiences is permanent only to the degree that it is further supported by later experiences.

### **Whither the ME bias?**

Merriman and Bowman show how the Mutual Exclusivity bias has analogs in areas as diverse as drawing and counting. I much agree that basic cognitive principles such as the Mutual Exclusivity constraint should have an impact throughout cognition. The extension of the concept across such domains will certainly be an interesting fallout from this line of research. However, I doubt that Mutual Exclusivity itself will be able to support generalizations of this type. The notion of Mutual Exclusivity has served a useful function as a rallying point motivating studies of conceptual developments during the transition from infancy to childhood. However, As Merriman and Bowman have shown, Mutual Exclusivity is not a fundamental constraint, but a set of learned assumptions that allow us to more quickly process new words and new relations. It is time now for the study of Mutual Exclusivity to give way to a more detailed process-based account of early word learning. At the same time, any more detailed model must continue to provide us with an understanding of the ways in which the child, like Humpty-Dumpty, learns to control the world, rather than to be controlled by it.