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Learning from infants' first verbs

Commentary on Naigles, Hoff and Vear

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Across the centuries, people have been fascinated with infants' first words. This fascination is not a special characteristic of parents of young children, developmental psychologists or psycholinguistics. Instead, this fascination is widespread, and infants' first words can serve as entry points to heated discussions of topics as far ranging as innate knowledge, the nature of intelligence, and the development of national character.

Thanks to the writings of the Greek historian Herodotus, we can trace the fascination with infants' first words to the time of Psammetichus, an Egyptian pharoah who reigned in the 7th century BC. According to legend, Psammetichus held firmly to the belief that the Egyptians were the most ancient peoples in the world, but this was disputed hotly by the Phrygians, who argued that in fact they were the originals. To settle this dispute (and to claim the Egyptian people their rightful place), Psammetichus developed a passionate interest in infants' first words, a passion that stemmed from a desire to discover the origin of human language and that led him to conduct the first known experiment on language development in children. Apparently, he somehow managed to bring two newborn infants to a shepherd, living alone amongst his flock of sheep. The protocol for this proto-experiment was simple and clear: It was the shephard's responsibility to feed and care for the infants, to make sure that they heard absolutely no human language, and to wait patiently and listen carefully for the infants' first words. The hypothesis was equally clear: he reasoned that in the absence of any linguistic input, the first word uttered by these infants would reveal which language was the origin of all human languages. As it turned out, the shepherd reported that the first word uttered by the children was "becos", a word they uttered repeatedly and excitedly with their arms outstretched. When

Psammetichus learned that “becos” was the Phrygian word for bread, he accepted for the first time that Phrygian, and not Egyptian, was the original language of humankind.

In the 21st century, our interest in infants’ first words remains strong, but stems from a different source. We are no longer consumed with discovering which language is the lingua franca of humankind, but instead with what infants’ first words can reveal about the nature of the human mind and how it is shaped by experience.

In their monograph, Naigles, Hoff and Vear (2009) provide an outstanding example of how a careful analysis of infants’ first words, and especially their first verbs, can inform current theories and debates in language acquisition. Focusing on eight infants, ranging from 16 to 20 months at the start of the investigation, the monograph traces each infant’s first uses of their earliest acquired verbs. The diary records, compiled with the apparently tireless support of the infants’ mothers, offer a rich depiction of the pragmatic, semantic and syntactic properties of infants’ early verb productions. Infants’ productions, and the contexts in which they occur, then serve as an empirical base against which competing hypotheses about the flexibility and productivity of infants’ early-acquired verbs can be tested.

Richly descriptive. This monograph fills an important niche. In essence, it represents the first of what we might call a ‘focused diary design’. It provides an important counterpoint to more traditional diary studies, illustrating that the diary of any one child, no matter how comprehensive, cannot tell us everything we need to know. After all, although the eight children included in this monograph were drawn from a rather homogenous population (e.g., raised in middle to upper-middle class families by majority culture, stay-at-home mothers) and although even within this population they represent the midrange along a continuum of approaches to language acquisition (e.g., those who produced too much or too little were excluded), their diaries nonetheless vary considerably, revealing a range of distinct approaches to early verb learning. Importantly, then, this richly descriptive monograph serves as a resource to which we can turn to later to pursue a host of questions.

Diary data *guided by* and *applied to* theory. Another outstanding feature of this monograph is its strong commitment to theory. The data were guided by, and then applied to theory. In addition, the monograph offers insight into the tight coupling between method and coding on the one hand, and theory and interpretation on the other.

Central tendencies and individual differences. The analyses of these eight diaries not only uncover developmental patterns within the group as a whole, but also identify potential individual differences. This underscores the importance of bearing in mind that not all children go about the process of language production in the same way. An analysis of group patterns and means offers evidence of the central tendencies, but beneath the surface, it is often possible to discern different individual styles (Bloom, 1973; Nelson, 1973). Attending to these individual differences is instructive, and in the case of this monograph, it permits the authors to describe different developmental paths. It also underscore that although human children may approach the task of language acquisition with a universal set of linguistic competences, these alone do not determine the child's path of toward production. This path is also shaped by linguistic characteristics of the input (e.g., Greek vs. English), the amount of input (rich vs. sparse), and personalities of the individual child (cautious vs. intrepid) (Gleitman & Fisher, 2005; Gleitman, Cassidy, Papafragou, Nappa, & Trueswell, 2005; Huttenlocher, Vasilyeva, Cymmerman, & Levine, 2002; Waxman & Lidz, 2006).

The matters of 'abstractness' and 'flexibility'.

The decision to focus on first ten uses was motivated by the goal of identifying the breadth of children's first representations of verb use and verb meaning. This is a key question, because there is currently considerable controversy over the breadth or abstractness of infants' early verb meanings and applications. For example, if an infant produces the verb *wave* in the context of a flag-waving event, what can we say about her representation? Does she construe the verb narrowly, applying it to flag-waving events only? Does she construe it too abstractly, applying it to any and all events that involve moving one's hand while grasping an object? The authors of the monograph approached this question directly, bringing the toddlers' productions to bear on key theoretical perspectives (Fisher, 1996; Hirsch-Pasek & Golinkoff, 2006; Lidz & Gleitman, 2004; Lieven, Behrens, Speares, Tomasello, 2003; Naigles, 2002; Tomasello, 2000; Waxman & Lidz, 2006).

In addition to recording each infant's first 10 uses of a series of verbs, the mothers and and researchers also worked together to record the range of utterances in which the newly-produced verbs appeared and the range of situations to which they were applied. The decision to focus on the conditions under which the verb was produced also is motivated by theory. At issue here is the question of flexibility of verb use. Of course, although it is no simple matter to operationalize flexibility, especially with utterances as short as those produced by these very young children, the authors were careful to guide their decisions by theory.

Another strength of the analysis is the authors' efforts to tease apart several (potentially) distinct elements of flexibility (e.g., pragmatic flexibility, semantic flexibility, grammatical flexibility). But there is a wrinkle in this analysis because the kinds of grammatical frames in which a verb can occur are not unrelated to their semantics (Fisher 1996, 2002; Gleitman, 1990; Lidz, Gleitman, & Gleitman, 2004). As a result, it is important to bear in mind that measures of semantic and grammatical flexibility are, of necessity, not independent.

Although focusing on flexibility and abstractness of early verb use is an important advance, at the same time, it raises several thorny questions of its own. Chief among them, does the child's flexibility of verb use, as measured here, really reveal the abstractness of the underlying grammar? It might, but at this point, and based on the current data, we cannot rule a strong alternative hypothesis: that in using verbs flexibly, children are merely mirroring the input to which they have been exposed (that is, the various frames in which they have heard these very verbs in the ambient language). After all, if children have indeed been actively processing the input language for more than a year, then by the time they produce their first verbs, they would have heard each of these verbs in many different frames. As a result, we might *expec*t them to be flexible even in their first 10 uses. To resolve this important matter, it will be important to search for and analyze children's errors.

What this suggests is that although carefully cataloguing infants' first ten uses is an important step, it may not take us far enough. The first 10 uses may prove to be too blunt an instrument to resolve some of the finely-honed questions of early language acquisition. Still, this first step certainly takes us far enough to see where we should step next.

Opening the door to new research endeavors. Certainly, this monograph opens the door to several creative lines of additional research. For example, it highlights the importance of analyzing the input to young children, even before they produce their first verbs, and provides guideposts for the kinds of input analyses that are most likely to bear fruit. It also sets the stage for a careful analysis of how the view we obtain from diary studies and language production in general, relates to the view that we obtain from more standard experimental work based on language comprehension.

In addition, the monograph makes clear the importance of a more comprehensive analysis, looking beyond the first 10 uses of these early-produced verbs. How can we best characterize the trajectory of these verbs? Do children exhibit a steep increase, or explosion, in flexibility or abstractness, or is development characterized by a deepening reliance on the early-acquired frames? Finally, it will be important to pursue focused diary studies of infants acquiring languages other than English, focusing especially on languages that differ in theory-relevant ways.

The strongest signature for a 'classic-in-the making' is not whether the work answers all of our questions, but whether it offers to carry us forward in our inquiries. There is no doubt that when considering the contribution of Naigles, Hoff and Vear, the answer is 'yes'. Thanks to their monograph, we can move beyond asking whether young children are capable of learning verbs. Clearly they are. We can also move beyond asking whether they are capable of representing language and grammar in an abstract or flexible fashion. Apparently they can. Instead, we can now move forward to pinpoint the conditions that best support the acquisition of abstract knowledge and the use of flexible representations, to identify how early in development this abstract knowledge becomes evident, and to discover how quickly it is apprehended when young children encounter a new verb.

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