FLEXIBILITY IN THE SEMANTICS AND SYNTAX OF CHILDREN’S EARLY VERB USE

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Objects are boring; they just sit there. Events and actions are where the action is—literally. That is why it is so puzzling that probably 90% of all of the work done on children’s early word learning focuses on nouns, and why the current monograph on children’s acquisition of verbs is so welcome.

IN PRAISE OF VERBS

Linguistic communication almost always concerns events, actions, or states of affairs. Declaratives or informatives invite the listener to attend to some event, action, or state of affairs, and imperatives or directives enjoin the listener to do something to bring about a desired action or state of affairs. Thus, even when young children are using object labels as single word utterances, from the point of view of the communicative intention as a whole there is almost always some underlying event or action at issue. When the infant exclaims “Airplane!” she is exhorting her mother to attend to it or to notice its presence, and when the infant requests “Juice!” she is rousing her mother into action to satisfy her desire. One could argue that the appropriate gloss of such utterances is something along the lines of “Look at the airplane!” (or “The airplane is there!”) and “Get me some juice!” The action or state of affairs intended, and its corresponding verb, is implicit; the utterance is what has been called a holophrase.

The one potential exception is naming objects. But naming objects is actually a kind of metalinguistic speech act. It is not using language but rather “mentioning” it, mostly teaching it. Western, middle-class parents do this with some regularity with their children, and their children learn the names and then show off by using them in return. But in many other cultures the pedagogical or demonstrative naming of objects is a very rare type of speech act and plays very little role in the acquisition of language.
And even in Western, middle-class culture parents only rarely explicitly teach words other than object labels. With verbs and other types of words, children must in almost all cases learn them within the ongoing flow of social interaction and discourse—on their own, so to speak—based on their understanding of the intentional actions of others in the social interaction. For example, young children are able to infer the referent action of a novel verb even when they hear it only as a directive to act or as an anticipation of an impending action even if they never actually see the referent action at all—based on the adult’s accompanying behavior and context (Tomasello, 1992, 1995, 2001). This social–cognitive complexity in the acquisition process is another reason why the acquisition of verbs is so interesting.

From a semantic point of view, events and their corresponding verbs are also much more complex conceptually than objects and their corresponding nouns (setting aside for the moment nouns for other kinds of referents, as children’s early nouns are mostly used for concrete objects). Even the very earliest verbs that children learn and use vary in whether they are causative or not (e.g., give vs. have), in whether they designate results or not (e.g., clean the table vs. wipe the table), in whether they designate manner of motion or not (e.g., roll vs. move), in whether they are defined by a particular objects or not (e.g., hammer vs. hit), in whether they are about specific bodily movements or more abstract changes of state (e.g., lick, involving specific movements of the tongue, vs. cut, involving very different actions depending on what is cut, from the lawn to a finger)—not to mention all of the different aspects of actions that may be designated grammatically (ongoing events vs. completed events vs. impending events vs. past events vs. future events, etc.). Indeed, Gentner (1982) famously stressed that in many cases it is difficult to know how to conceptually “package” the ongoing flow of experience into discrete events, as referred to by verbs, at all.

Further in this direction is the fact that events and verbs always involve one or more participants, typically designated linguistically by nouns and not in any way “given” by the phenomenal event itself (indeed, some verbs can be used so as to highlight different participants on different occasions of use, e.g., John broke the vase, with two participants indicated, vs. The vase broke, with only one indicated). And so, in a sense, events incorporate objects but not the reverse. And this is the final way in which verbs are especially important and interesting in the study of child language acquisition. As stressed by researchers from all theoretical backgrounds (e.g., Pinker, 1989; Tomasello, 1992), verbs have as part of their very meaning the participants involved (paraphrasing William Blake’s famous observation, if there is dancing there must be a dancer). This makes the acquisition of verbs already a step on the way to grammatical competence, as the learning of verbs involves the kind of verb–argument (event–participant) structures that form the backbone of mature sentence structure.
It is thus for all of these reasons that the current monograph is so welcome in the field. Verbs are arguably the most complex and important type of word in early language development, and they have been sorely neglected (see the papers in Hirsh-Pasek & Golinkoff, 2006; Tomasello & Merriman, 1995, for some notable exceptions).

IN PRAISE OF THE DIARY METHOD

Researchers in other areas of developmental psychology sometimes puzzle over the use of parent diaries in the study of language acquisition. But there are very good reasons for the use of this method, and the current monograph involves the innovative extension of using multiple parent–child pairs.

The basic problem is that children talk too much. A child is awake and talking around 10 hr/day, 7 days/week, but the normal sampling regime in language acquisition research is a maximum of one of those 70 hr/week. This is a sample of 1–2% of what the child says. The reason researchers do not sample more is because it takes from 10 to 20 hr to transcribe 1 hr of taped conversation. But, despite this good practical reason, this 1–2% sample is inherently limited, potentially biased in all the ways that small samples may be biased in all scientific inquiry, and it very likely misses completely most low-frequency phenomena. And so, for example, it has been quantitatively demonstrated that with a small sample estimating the age at which the child acquires low-frequency linguistic items or structure is highly unreliable (Rowland & Fletcher, 2006; Tomasello & Stahl, 2004).

Diaries have their own limitations of course. Most obviously, they prototypically involve only one child—limiting external validity—and parents are not trained scientific observers. But with the collection of multiple diaries of comparable children—again, an innovation of the current study—the first problem is to some degree overcome. And, in terms of the limitations of parents as observers, it has been established by researchers using the MacArthur Communicative Development Inventory (a paper-and-pencil assessment of children’s vocabulary filled out by parents) that parents are actually highly reliable at recording their child’s overt behaviors (Fenson et al., 1994). This is especially true if parents are directed what to look for. And the current study did an especially good job of this by focusing parents’ attention on a smallish number of specific verbs that their children might be using.

Finally, there is one further advantage to diaries that is often not stressed. Because the parent is recording basically everything (of some designated focal phenomena), one can conclude with reasonable certainty
when the child does not do something, which can never be concluded with small- or even medium-sized samples. In the study of language acquisition, this is often important since one of the key issues is the degree to which children use their early language flexibly and productively, and to determine that we must know not only what they have done but also what they might have done but did not. And indeed, the current monograph is concerned precisely with the issues of flexibility and productivity, and so the diary method is especially appropriate.

FLEXIBILITY IN EARLY VERB USE

The data of the current monograph provide us with by far the most complete, quantitative picture in the literature of how English-speaking children learn and use their early verbs. Within the limitations of the diary method (including the fact that the researchers focused parents on a subset of 34 preselected target verbs), we now have at our disposal a vast and important array of new facts.

Flexibility in Verb Use: Pragmatics and Semantics

Parents kept the diary until they had recorded 10 actual instances of use of each targeted verb, that is, 10 utterances containing the verb in question. Across all of the verbs used by all of the children, the average time it took for the 10 instances to be produced by the child was a bit over 1 month. Pragmatically, the children used about half of their verbs either as commands or as descriptions only; the other half were used in both functions. Foreshadowing an issue that will come up later with regard to syntax, we do not know in which of these instances children heard their parents using the verb in both pragmatic functions, and so we do not know if children are simply following the adult use or doing something more creative in using these pragmatic functions with particular verbs. And because there are no experiments in the literature addressing this question, we simply do not know.

From the point of view of semantics, the current monograph found that the children used their newly acquired verbs relatively flexibly from relatively early. This fact was not a foregone conclusion. Although research has shown that children use their object labels in fairly flexible ways from early on (Harris, Barrett, Jones, & Brookes, 1988), a number of different naturalistic observations have provided examples of young children using verbs and other types of words in more context bound ways for some time (e.g., Gopnik, 1988; Tomasello, 1992). But it has never been clear whether those are unrepresentative examples or whether they might reflect some more systematic difference with object labels.
In the current study, children did not confine their use of verbs to a single, narrowly defined action type; they used almost 40% of their verbs to refer to different action types (e.g., a person coming vs. a TV show coming)—and this number would undoubtedly be higher if “different action type” had been defined more loosely. These new uses occurred, on average, after about four uses of the verb in question. And children quite often used their verbs for different actors and patients of these actions as well (whether these were lexically realized or not). Thus, for something around three quarters of their verbs, children referred to events involving different actors on different occasions, and about the same proportion were used to refer to events involving different patients of the actions. In both cases, the new actors and/or patients occurred after around three uses of the verb in question. Although we cannot be sure if the children are following adult usage or are being more creative in their semantic extensions in all cases, other diary studies in the past have noted many cases of creative extensions to novel referents (e.g., Bowerman, 1982).

Given that children use much of their early language in recurrent social situations and routines, these percentages seem fairly high, and they would seem to refute any proposal that children are inflexible in their early use of verbs to refer to events and actions in the world. One might ask how this flexibility compares with children’s early use of object labels, but the answer is that we do not know because we do not have quite such detailed data in this case. There are some diary studies (especially Dromi, 1987) that have focused on the acquisition of object labels in enough detail to provide some relevant data for comparison, but since the two types of word are so different semantically, it is difficult to think how such a comparison could be done quantitatively. In any case, the general conclusion would seem to be that English-speaking children use both their early nouns and their early verbs in reasonably flexible ways to refer to all kinds of objects and events in the world.

This having been said, it is unclear that—despite the literature review in the current monograph—anyone espousing any theory of word learning would predict that children in the second half of their 2nd year of life would still be using any kinds of words in highly context bound ways. Virtually all of the proposals for early context bound use have focused on the first half of the 2nd year of life or even earlier.

**Flexibility in Verb Use: Syntax**

The most contentious issue in the monograph is children’s flexibility and productivity in using their early verbs syntactically. We deal first with the issue of flexibility, which, in the current context, means children using their verbs in syntactically diverse contexts. In the following section, we will
deal with the issue of productivity, which, in the current context, means children using their verbs in syntactic contexts that go beyond those in which they have heard them being used. Productivity is an especially contentious issue as it involves the degree to which young children’s language is underlain by abstract, lexically general, linguistic categories and constructions (rules). But the two issues are tied together; hence, let us first sort them out a bit.

Several authors, including ourselves, have proposed that children do not have innate and abstract grammatical categories that apply equally across all words as part of their beginning linguistic competence—the basic Chomskian proposal. Instead, much of their early grammatical competence revolves around specific verbs or other items such as pronouns (Lieven, Pine, & Baldwin, 1997; Tomasello, 1992, 2000, 2003). Thus, children begin with lexically specific constructions—some of which have been called verb island constructions because they revolve around verbs—with only local, lexically specific abstractions. In this theory, if the young child says “Doggie kiss me,” the item-based construction involved might be something like kisser KISS kissee, without reference to such verb-general things as agents and patients, much less subjects and objects. With this item-based construction, the child could learn a new object label and immediately use it as either “kisser” or “kissee” productively, without hearing others do this, based on an understanding of all the items involved. But what she could not do is to learn a new verb, say hug, and immediately make an analogy to kiss and use it with a “hugger” and a “hugee” without having heard others do it. Each lexically specific construction is a structural island.

The evidence for this proposal comes from both naturalistic observations and experiments. Many studies of natural samples of children’s early language show restricted use of words and lexically specific schemas (e.g., Lieven, Behrens, Speares, & Tomasello, 2003; Lieven et al., 1997), and this restricted use has been taken to reflect a relative lack of lexically general categories and constructions that can be used totally productively. But most comparable to the current data is Tomasello’s (1992) original diary study. In that study there were two basic findings relevant to issues of verb flexibility and productivity.

The first was that the majority of this diary child’s early verbs were used in fairly simple sentence frames, often only one frame per verb, and different verbs most often had different frames—suggesting that they were each an island and not very flexible. These are the data that the current monograph addresses, and, as noted by the authors, the data of the two diary studies are generally very comparable, once one adopts the same coding criteria for both. The outcome is the story of a glass either half empty or half full, depending on one’s perspective. Here is a quick summary of the
relevant data from the current monograph (based on the diaries of the eight children that were fully analyzed).

- Of the few verbs the children used at 18 months, only 15% were used in more than one sentence frame. At 20 months, 44% of the children’s verbs were used in more than one sentence frame. At 24 months, 55% of the children’s verbs were used in more than one sentence frame.

- Across the entire period of diary collection, children used 31% of their verbs with more than one lexically expressed subject, and 43% of their verbs with more than one lexically expressed object.

- Across the entire period of diary collection, children used only 16% of their verbs with more than one morphological form (e.g., present or past tense).

- Of the transitive verbs that children used over the course of the study, 35% were used with both subject and object lexically expressed (56% were used as one word utterances or with only one argument expressed).

- Of the intransitive verbs that children used over the course of the study, 30% were used with the subject lexically expressed (53% were used as one word utterances).

- From the perspective of the sentence frames, at 24 months of age, three of the eight children did not have a single frame that they used with five verbs or more, one child had one such frame, and four children had three to five such frames.

Whether one considers this syntactic flexibility or not depends on one’s point of view. The authors of the current monograph—taking as background general claims of lexical specificity in early grammars—think it is pretty flexible.

But the alternative interpretation of these kinds of data by proponents of lexical specificity has typically used as background the expectation that children’s language is structured by a set of abstract syntactic categories and constructions that apply across all relevant lexical items equally. In this context, one wonders why children use about one third of their transitive and intransitive verbs with all of the syntactically required arguments, but the other two thirds without. And why do children at around 2 years of age still use almost half of their verbs in only one sentence frame? And why are there so few sentence frames used across multiple verbs? From this perspective, although children show some flexibility, it does not look even
remotely like all of their utterances derive from a set of preexisting, abstract, lexically neutral, syntactic categories, and rules.

Underlying this disagreement about flexibility is really the issue of productivity. In the verb island hypothesis, children may be as flexible as you like in their use of particular verbs in syntactic frames and morphological paradigms—so long as they have heard all of these uses in the language around them. With each verb, they learn various ways of talking from the discourse interactions they have with adults—that is, for each verb separately. And so, in Tomasello’s (1992) diary, a paradigm example is cut versus draw. Cut was used by Tomasello’s child in only one basic sentence frame, whereas draw (learned at about the same time and having somewhat similar semantics) was used in many different ones. The general explanation is that, for whatever reason, the child either heard or attended to many different syntactic uses of draw, but not so for cut. Thus, flexibility of use for a particular verb is purely a function of the language the child has heard and attended to with that verb, along with her motivation for speaking about these kinds of events.

And so flexibility with particular verbs does not signal lexically general productivity across all verbs, unless one has evidence that the flexibility is due to a child’s creative generalization and not simply to a reproduction of adult flexibility with each particular verb individually. Children will become productive in all kinds of ways at some point—including across verbs and constructions—it is just that initially they are not. This is important because it speaks to process. If children begin lexically based and become more productive only gradually, then the likelihood is that the process is not one of activating innate syntactic categories and rules, but rather one of constructing ever more general syntactic categories and rules on the basis of general cognitive processes (e.g., statistical learning, analogy) and input from mature language users.

PRODUCTIVITY IN EARLY VERB USE

Syntactic productivity is thus the key theoretical issue. Indeed, in the first draft of this monograph (which we reviewed) the entire focus was on productivity. The theoretical reason for this derives mainly from Chomsky’s poverty of the stimulus argument. If from the beginning children go beyond the language they have heard in creative and productive ways, this suggests that they have preexisting abstract categories and schemas (or rules) that generate their early language. This is the argument that the authors tried to make in the first draft. But the reviewers simply noted that without any data about what language the children had heard, one can talk about flexibility but not about productivity. One cannot say that children are
going beyond what they have heard if one does not know what they have heard. That syntactic productivity is indeed the issue these authors wish to push is evident in their quote near the end of the monograph:

These findings are more consistent with the generativist view of child language acquisition (e.g., Chomsky, 1981; Gleitman & Fisher, 2002) than with the positions that children are conservative language users and that 2-year-olds do not have abstract syntax (e.g., Goldberg, 1998; Lieven, 2006; Tomasello, 2000). (p. 107)²

But, to reiterate, in the original verb island formulation, as well as in other item-based approaches, children are syntactically productive—but only in limited ways constrained within their item-based constructions. Thus, as alluded to above, from as early as they are combining words, if one teaches a child a novel noun in an experiment (e.g., the wug), they immediately stick it into the syntactic slot of many of their existing verbs and predicate terms straightaway, saying such productive things as “Wug gone” and “Find wug”—even though they have never before heard wug combined with any other word (Tomasello, Akhtar, & Rekau, 1997). Early in development most sentence frames are structured by verbs (like gone and find), each of which fills new words into its argument slots freely and productively. Hence, children are productive with their language in some ways from near the beginning of multiword speech.

It is just that transfer of structure across verb island constructions does not happen as the result of the pregiven and abstract categories of formal linguistics but develops as a result of both what the child hears and her developing generalizations across initially very low-scope schemas. This is illustrated by another analysis performed in Tomasello’s (1992) diary study. The logic was this. Suppose the child learned one of her verbs in a full transitive construction, for example, saying many things of the form $x$ FIND $y$.

If this construction was fully abstract and verb general, one would expect to see her using other verbs in the same frame pretty soon after, that is, given the opportunity to do so. But that is not what the data showed. If one looked at the development of the sentence frames used with a particular verb across time, the child added grammatical complexity only gradually and incrementally for each verb separately. It almost never happened that a verb that was at one point used in a simple sentence frame all of a sudden was used in a more complex one, for example, based on some kind of transfer from another verb that had recently been used in this more complex frame. The summary statement was as follows: By far the best predictor of this child’s use of a given verb on a given day was not her use of other verbs on that same day, but rather her use of that same verb on immediately preceding days. Hence, the evidence here was that the overall developmental pattern suggested initial syntactic independence for each verb.
No comparable analysis was performed on individual children in the current study. The analyses of the individual children (displayed in Figures 11–19) basically showed the following. In terms of the number of sentence frames used with each verb (flexibility), across time two children showed U-shaped development (Heather, Elaine); two children showed a several month period with no flexibility followed by a relatively rapid increase in flexibility (Carl, Sam); and the other four children showed relatively quick flexibility early on. This kind of analysis does not look for any kind of transfer across sentence frames. In another recent study, based on samples of children’s speech (not on a thorough diary), Ninio (2006) claims to find such transfer. But herein lies the rub. Even in this case one cannot claim anything about transfer or productivity if one does not know what language the children have heard, or how their other cognitive abilities are developing. Hence, it could be that once a child’s parents hear her using transitive sentences with one verb, this encourages them to use transitive sentences more often, or more saliently, with other verbs. Or perhaps the child’s working memory is expanding during this time, making the individual acquisition of more complex verb island constructions possible for the first time.

The fundamental point is that one cannot investigate productivity directly without knowing the language the child has heard. Researchers have therefore considered it of special importance when children overgeneralize and say things like “She giggled me” (Bowerman, 1982)—on the assumption that this sentence must be generated by a productive schema, as the child would never have heard such a sentence with that verb in their everyday linguistic environment (these productive errors usually do not occur before age 3 years; Pinker, 1989). The other approach is, of course, experiments. We and others have performed literally dozens of experiments in which we teach children a novel verb (e.g., *tamming*) in various ways and see if they then use it in existing constructions like the transitive or intransitive or passive—when given multiple opportunities and motivation to do so. The outcome, as the authors of the monograph note, is that children younger than 2.5–3 years of age show very little productivity with newly learned novel verbs—even though older children show much productivity with these same verbs learned in these same ways (see Tomasello, 2000, 2003, for reviews).

The authors of the current monograph focus their critique only on the production experiments, but we and others have also done similar experiments tapping the child’s comprehension (e.g., to see if children can understand who is doing what to whom in “The dog is tamming the cat”) (e.g., Akhtar & Tomasello, 1997; Chan, Lieven, & Tomasello, 2009; Dittmar, Abbot-Smith, Lieven, & Tomasello, 2008a), as well as structural priming experiments using familiar English verbs (e.g., Savage, Lieven, Theakston,
Tomasello, 2003). In all of these paradigms we are testing for productivity across verb island constructions in the absence of relevant input—suggesting the existence of abstract, verb-general schemas—but in all cases the finding is of very little syntactic productivity before about 2.5–3 years of age. The current authors focus instead on a recent preferential looking study with English-speaking children by Gertner, Fisher, and Eisengart (2006), supposedly showing syntactic productivity in children under 2 years of age. Leaving aside the question of how to interpret the results of a looking discrimination in terms of the nature of underlying representations, that study used a training technique before the children entered the experiment that taught them key aspects of the construction (i.e., it used the same actors and associated nouns in both training and testing in the same semantic roles). When German-speaking children were tested without such an initial training period, they did not show any syntactic productivity at this young age (Dittmar, Abbot-Smith, Lieven, & Tomasello, 2008b). And so it seems very clear, to us at least, that the experimental data show a consistent lack of syntactic productivity in young children across several different methodologies, in both comprehension and production, using both novel and familiar verbs. One can always criticize experiments as not being ecologically valid, but in this case there are many different methodologies involved.

The main point is that there is no evidence in the current monograph for syntactic productivity in 1- and 2-year-old children—in the sense of generalizing across verbs to create verb-general syntactic constructions—because we do not know what language they have heard being used around them, and there is no other indirect evidence either. Children are flexible from the beginning, as they learn from adults multiple frames for a given verb. And they are productive in the limited sense that they can freely substitute participants for one another in the syntactic slots of each verb-specific syntactic frame individually, thus creating schemas such as $x \text{FIND} y$. But based on Tomasello’s (1992) longitudinal analysis failing to find transfer across verbs, and on the extensive experimental literature in which children remain conservative with their syntactic constructions for some time, our own conclusion is that the grammatical organization underlying children’s early linguistic competence is not abstract and rule-based, but rather is concrete and item-based—leading to highly constrained productivity.

Perhaps one reason for the slow buildup of productivity in young children’s early syntax is that to make generalizations across such things as verb island constructions children must make complex analogies between complex structures (e.g., aligning agents with agents and patients with patients in utterances with different transitive verbs). The age at which they seem to do this most readily in nonlinguistic domains corresponds fairly well with the age at which they seem to be doing it with their language (see Gentner &
Markman, 1997). And it is perhaps worth noting as well that psycholinguistic research has shown that even adults’ representations of argument structures are still fairly closely tied to specific lexical items (e.g., Trueswell & Tanenhaus, 1994).

CONCLUSION

The current monograph is extremely valuable and advances the field significantly in multiple ways. By exploiting the level of detail and thoroughness of the diary method—and then employing it across multiple children—the authors were able to collect data on children’s early acquisition of verbs that enabled all kinds of quantitative assessments simply not possible in other kinds of studies. We now know new and important facts about children’s semantic flexibility with verbs in early development that will help us to better formulate theories of lexical development that are inclusive of all word types. And we now know new and important facts about children’s syntactic flexibility with verbs that will help us to formulate better theories of how children come to generate and grammatically structure their early multiword productions. And although we have been critical in this commentary about the claims of certain kinds of syntactic productivity in the current data set—we actually believe that that is impossible without experiments—nevertheless, as the authors point out in several places, flexibility is a precondition for productivity, and so the investigation of children’s flexibility is a very important first step in figuring out how children ultimately construct their abstract syntactic constructions.

NOTES

1. The authors’ selection of verbs to focus on is well justified, except for the exclusion of three fairly important early verbs, make, do, and have.

2. Although on p. 109 we get the somewhat contradictory: “One position consistent with our data is that abstract grammatical categories are learned from the input, but the process of learning begins early, before speech production at all or before production of the relevant linguistic frame or construction.”

References


