THE SOCIAL-PRAGMATIC THEORY OF WORD LEARNING[1]

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Abstract

Some researchers have tried to explain early word learning via garden-variety learning processes and others by invoking linguistically specific "constraints" that help children to narrow down the referential possibilities. The social-pragmatic approach to word learning argues that children do not need specifically linguistic constraints to learn words, but rather what they need are flexible and powerful social-cognitive skills that allow them to understand the communicative intentions of others in a wide variety of interactive situations. A series of seven word learning studies demonstrate something of the range of communicative situations in which children can learn new words. These situations include many non-ostensive contexts in which no one is intentionally teaching the child a new word and the intended referent is not perceptually present at the time of the new word's introduction. Language acquisition in general, and word learning in particular, is best seen as a special case of cultural learning in which children attempt to discern adults' intentions toward their intentions toward things in the world.

Keywords: Word Learning, Lexical Development, Pragmatics, Intentionality

1. The social-pragmatic theory of word learning

In the modern study of child language acquisition, there are three basic theories about how young children learn new words. Perhaps surprisingly, two of them have nothing to do with pragmatics or communication. The first, which may be called garden-variety learning theory, holds that learning words is no different from learning anything else; it is all done with associations (Smith 2000). The second is called constraints theory, and it proposes that in addition to garden-variety learning children also must draw upon *a priori* word learning constraints (or principles) to help them narrow down the basically infinite referential possibilities of any unknown word (Markman 1989, 1992). In both of these theories, the basic process is that children 'map' a novel word onto their perceptual world - with the person speaking this novel word, and her reasons for speaking it, considered irrelevant.

The third theory is social-pragmatic theory, and it holds that the process of word learning is inherently and thoroughly social (Bruner 1983; Tomasello 1992a, 2000). Of course some garden-variety learning processes are involved. But these learning processes

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take on a different form when children learn words or other cultural conventions from other persons; they take the form of cultural learning in which children attempt to determine the adult's intentions (including communicative intentions) as they are learning from her (Tomasello 1999). And of course these learning processes must in some sense be constrained. But dedicated word learning constraints are not needed since the process may be adequately constrained by the interactive structure of the culturally conventional joint attentional activities in which children participate (given the social-cognitive skills of intention-reading that enable children to participate in these cultural activities intersubjectively). Briefly said, the potential word meanings children consider in any given situation are constrained to just those that are 'relevant' to the communicative situation at hand, as it is intentionally understood.

In this paper, I would like to assess the adequacy of these three theories with respect to three fundamental questions about children's word learning. The first question is simply: What is a linguistic symbol? The second question is: Why do children begin to learn language at the age that they do and not at some other age? The third question is: What are the learning processes involved? These questions have been chosen, it must be admitted, to illustrate the advantages of the social-pragmatic theory. But it is nevertheless true that any theory that cannot answer adequately such fundamental questions as these cannot be taken seriously as a theory of word learning - or as a theory of any other aspect of children's language development.

2. The theories

Most people think it died with Behaviorism, but associative learning theory lives on. Smith (2000) has argued that the essence of word learning is *associating* sounds with salient aspects of perceptual experience. She has demonstrated in a number of experiments that children quite often will assume that the meaning of a novel word is the most 'salient' aspect of the current nonlinguistic context. For example, Samuelson and Smith (1998) presented two-year old children with three objects, one at a time, each of which they dropped down a chute. The experimenter and child then moved to a special location where they played with a fourth object. They then moved back to the original location and (after a brief distraction) looked at all four objects inside a box, and the experimenter said "There's a gazzer in there". On the basis of this experience, most of the children thought that the gazzer was the one they played with at the special location. Samuelson and Smith argued that the children were associating the novel word, *gazzer*, with the most salient possible referent in this situation.

But two recent studies suggest a different interpretation of this result. First, in a direct replication and extension of this study, Diesendruck et al. (in press) reasoned that salience in this situation was determined by children's social-pragmatic reasoning. To illustrate this, they compared a situation similar to that of Samuelson and Smith with another situation in which the experimenter accidentally dropped an object so that it rolled over to the same special location (where again they then played with it). Diesendruck et al. predicted that in this situation children would not infer that the experimenter's subsequent reference to the gazzer was aimed at the object played with in the special location because in this situation there was no good pragmatic reason for why the adult

should be singling out this object - since it ended up in the new location only accidentally, and so was not treated in any special ways intentionally (see Carpenter, Akhtar, & Tomasello 1998, for evidence that children of this age distinguish intentional from accidental action). And this is exactly what they found. Children did not think there was anything special about the accidentally dropped object, and so they did not preferentially assign the novel label to it. The point is that in both studies - i.e., Samuelson and Smith and Diesendruck et al. - an object was made more salient, if salience is thought of as an objective property of an entity, and so from Samuelson and Smith's point of view the children should have singled out the object played with in the special location in both studies. But children were not blindly drawn to the 'salient' object in the Diesendruck et al. study because the accidentally dropped object was not especially salient from an intentional point of view. The most plausible interpretation of these findings is thus that in both studies the children were actively attempting to determine the adult's communicative intentions when she used the new word.

The second study is that of Moore, Angelopoulos, and Bennett (1999). They directly pitted objective salience against a relevant social cue (adult gaze direction). In the key experimental condition, an adult looked at and labeled one toy ("Look! A modi!") while *another* toy was made objectively more salient (by being lit up) at the same time. The salience did capture the children's attention (they looked over at the toy that was lit up), but this salience did not determine their pragmatic inferences about the meaning of the new word. In a subsequent comprehension test in which they were asked to retrieve the modi, 24-month-old children consistently chose the object that the adult had been looking at instead of the one that was lit up (and that indeed had captured their attention at the moment the new word was said). So, at least by 24 months of age, gaze direction as an indication of adult attention and communicative intentions wins out over 'objective salience' in this type of word learning situation

Constraints theory also has basically nothing to say about the findings of either the Diesendruck et al. or Moore et al. study because it does not consider in a systematic way social-pragmatic cues such as gaze direction, intentionality, and other cues to be elaborated below. Constraints theory has focused almost exclusively on the question of why young children do not get lost in a sea of hypotheses, why they do not think that a novel word might potentially refer to a part of the target object or its color or some activity it is engaged in. To solve this problem of 'referential indeterminacy', constraints theorists have proposed that young children come to the word learning process equipped with certain biases about potential word meanings (Markman 1989, 1992). It is important to emphasize that the theory is not that young children perceive the world in certain ways or find certain things especially salient, but rather that children assume certain kinds of connections between language and the world. For example, virtually all constraints theorists have proposed that initially young children assume that unknown words refer to whole objects (the whole object constraint). Some other prominent constraints (principles) that have been proposed to account for children's early word learning are; (1) extendibility ("Words extend to other referents") and (2) categorical scope ("Words extend to basic level categories") (see, e.g., Golinkoff et al. 1994).

The problem is that if children took these constraints seriously they would not learn the majority of word types in their language - many of which children do, as a point of fact, learn quite early. For instance, if children took seriously the whole object constraint, they

would have a very difficult time learning verbs, adjectives, prepositions, and many nonprototypical nouns like *breakfast, party,* and *park.* If they took the principal of extendibility seriously they could never learn proper names such as *Daddy, Jeffrey,* and *Mickey Mouse,* which are used to refer to single individuals. And if they took the principal of categorical scope seriously they would not learn pronouns such as *I, you*, and *it,* which extend well beyond basic level object categories. The point is that not only would possession of these hypothesized word learning principles not help the child to learn words other than object labels (common nouns), they would in fact be a positive hindrance to their learning of all other word types. The simple fact is that constraints theory was created by looking at some facts about the learning of common nouns, and positing these facts (e.g., that many children prefer object names early in development) as universal, *a priori* constraints - with no attention to other types of words or to social-pragmatic processes that might serve to constrain children's early word learning.

Overall, then, garden-variety learning is clearly insufficient as a theory of word learning because it does not account for the social-pragmatic reasoning that children employ as they attempt to determine adults' referential intentions. Constraints theory is insufficient because it does not do this either, and moreover, there is basically no way to specify ahead of time all of the different kinds of referents that someone might intend to indicate for language learning children (as would need to be done for a comprehensive theory of word learning constraints that included all types of words). The solution, in my view, is to conceptualize language acquisition as one instance of a more general process of cultural learning (Tomasello 1999, 2000). In learning a new word children are using their social-pragmatic and social-cognitive skills to determine people's communicative intentions, and there are no shortcuts to this. An especially good way to illustrate this point is to focus on our three central questions: What is a symbol? Why one year of age? What are the learning processes involved?

3. What is a symbol?

Perhaps it is a bit impolite to say it, but I will say it. The fundamental problem with garden-variety learning theory and constraints theory is that neither one of them knows what a linguistic symbol is. Both of these theories either implicitly or explicitly hold that a linguistic symbol is simply a sound (or possibly a hand sign) that "stands for" something in the world. What it means for one thing to stand for another is never really addressed. That is why the two theories are stuck on 18th century associationistic learning theory (with or without the constraints); a symbolic relationship is simply one more version of a garden-variety associative relationship.

If we look at children's earliest comprehension and production of real-live linguistic utterances, however, we see that there is something very special going on (and it is not the deployment of special 'word learning constraints'). The situation is this. The child encounters an adult making funny noises at her. What is she to make of this odd behavior? If she understands the other person as an intentional being, she will attempt to determine the purpose for which that person is making these funny noises. Given that the child has previous experience in interpreting the adult's nonlinguistically expressed communicative intentions - as the adult points to things for her, shows her things, etc.- one possibility is

that the adult is making these funny noises in an attempt to communicate with her. That having been decided, to determine precisely what the adult is attempting to communicate to her with some novel sound/word in particular (almost always embedded in a longer utterance), the child must now determine, first, the adult's overall communicative intention and, then, the particular way or ways that the new word in particular is contributing to that communicative intention.

This is not a process of association. This is a process of establishing joint attention, and it relies on intention reading - and indeed a special form of intention reading at that (Tomasello 1999, 2000). It requires the child to understand not just the adult's intentions to some outside entity but rather his intentions toward her (the child's) attention to some outside entity - that is, his communicative intentions. The child must understand that the adult intends for her (the child) to share attention with her to some outside entity (Tomasello 1998). Perhaps surprisingly, this commonplace of pragmatic theory is mostly not appreciated by child language researchers, especially theorists of word learning who mostly focus only on ostensive object labelling - i.e., the adult stopping what she is doing and deliberately teaching the child a new word. Consequently, they mostly ignore the great variety of pragmatic circumstances in which young children hear other persons using novel words, and so they underestimate the variety of different types of inferences about communicative intentions that must be employed (see below).

For the child to now make a novel word her own - by learning not just to comprehend it but to produce it as well - she must engage in a somewhat unique form of social (cultural) learning. To imitatively learn a novel intentional behavior in general, the child must identify with the demonstrator - put herself in the demonstrator's cognitive shoes - and then behave as he does toward some outside entity; for example, an adult kicks a ball and the child follows suit. To imitatively learn a novel *communicative* behavior, however, the child must first recognize that the adult's intentional behavior is indirect. The adult's intention is not toward an outside entity directly, but rather it is toward the child's attentional state toward an outside entity. When the child now wants to imitatively learn this new communicative behavior, she must reverse roles with the adult. She must direct a communicative behavior (e.g., linguistic symbol) to the adult in the same way the adult has previously directed the 'same' communicative behavior to her. In other places, I have called this 'role reversal imitation' and it is a unique feature of the acquisition of cultural behaviors that are primarily communicative in function (Tomasello 1999).

This is what a linguistic symbol is. It is a noise (or other behavior) that two or more individuals use with one another to direct one another's attention and thereby to share attention - and they both know this is what they are doing. If you do not have this, then you may have something like a dog knowing that the sound " dinner " means that food is coming, but you do not have an intersubjectively understood linguistic symbol used to follow into, direct, and share attention with other persons. Until theorists of word learning understand this, their theories will be hopeless in the most fundamental way.

4. Why one year of age?

Perhaps surprisingly, neither garden-variety learning theory nor constraints theory has a concrete proposal for why language acquisition begins when it does. Could it be due to

associative learning? The problem here is that human infants are very good at associative learning from very early in development - as demonstrated by the research of Haith, Rovee-Collier, and many others (see Haith & Benson 1997) - and so, by this theory, language development should begin at an earlier age than it does. Could it be due to some word learning constraints or principles that emerge at the appropriate age? The problem here is that there is no independent way to observe or measure constraints; they are inferred from the child's linguistic behavior, after the fact. And so there is no way to observe a constraint in a language independent way and then use that to predict the onset of language (this is why Smith, 2000, refers to word learning constraints and principles as "skyhooks"). And so the two major mechanisms proposed for word learning by non-social theorists - association learning and constraints/principles - have no answer to the question of why the first language use emerges precisely when it does near the beginning of the child's second year of life.

Social-pragmatic theory has an answer to this question. Language acquisition begins when it does because it depends on a more fundamental skill, namely, the ability to share attention with other human beings - which emerges in nonlinguistic form near the end of the first year of life. Thus, many different studies have found that children begin to develop joint attentional skills at around 9 to 12 months of age, including such things as following the gaze direction and gestures of adults, imitating adult actions on objects, and directing adult attention to outside objects using various kinds of gestural signals (see Tomasello 1995a, for a review).   Most children also show their first signs of comprehending language at this same age, with the first linguistic productions coming soon after (Fenson et al. 1994). Most importantly, in a recent longitudinal study Carpenter, Nagell, and Tomasello (1998) found that children's comprehension and production of language correlated highly with their skills of joint attentional engagement with their mothers, in which they used all of their skills to engage with their mothers in relatively extended bouts of attention directing and sharing. Regression analyses found that roughly half of the variability in the sizes of infants' word comprehension and production vocabularies was predicted by one factor alone: The amount of time (and style with which) infants spent in joint attentional interaction with their mothers during a 10-minute observation session.

The reason that linguistic skills are so highly correlated with joint attentional skills is that language is nothing more than another type - albeit a very special type - of joint attentional skill; people use language to influence and manipulate one another's attention. Linguistic symbols are special means of attention manipulation in a number of ways, most of these emanating from their social-conventional-historical nature - which differentiates them from gaze following, pointing, and other nonlinguistic joint attentional skills. The social-conventional nature of linguistic symbols means that children can only learn them in interaction with other persons, and the fact that their function is to manipulate the attention of others means that their communicative significance can only be learned by entering into an intersubjective (joint attentional) state with a mature language user - which thus makes joint attentional skills a genuine prerequisite for the acquisition and use of linguistic symbols. Joint attentional skills themselves emerge when they do at around 9 to 12 months of age for several complicated reasons, mostly involving infants' dawning understanding of other persons as intentional agents and their ability to 'simulate' the experiences of others on analogy with their own experience (see Tomasello 1999, for the

details of this hypothesis).

The essential point in the current context is simply that language is of a piece with other joint attentional skills, and indeed these other skills serve as a kind of "crane" for language acquisition - not as a skyhook out of nowhere, but as a crane firmly grounded in basic human social and cognitive functions. The failure to appreciate language as a social-pragmatic-intersubjective skill has prevented non-social language acquisition theorists from giving a principled reason why language emerges when it does.

5. What are the learning processes involved?

It happens with some frequency in Western middle-class culture that an adult holds up or points to an object while telling the child its name. The social dimensions of this process are manifest: The child must somehow determine which aspect of the situation the adult wants her to focus her attention on. Despite the potential complexities of this ostensive learning situation - as analyzed by Wittgenstein (1953) and Quine (1960), for example - this case is nevertheless *relatively* simple because such things as visually following gaze direction and pointing gestures are so basic for infants. It turns out, however, that in many cultures of the world adults do not engage in this kind of naming game with young children (Brown in press). Moreover, even in Western middle-class culture adults do not frequently use this naming game with words other than object labels. For example, they use verbs most often to regulate or anticipate children's behavior, not to name actions for them; indeed it would seem bizarre if an adult were to exclaim to the child: "Look, this is an instance of putting (or giving or taking)." (Tomasello & Kruger 1992). Instead, children hear many verbs mostly as the adult directs their behavior in such utterances as "Put your toys away" while pointing to the toybox. It is clear that in such cases, the social-pragmatic cues that might indicate the adult's intended referent for the child (i.e., the action of putting) are much more subtle, complex, and variegated than in the ostensive object naming context, and indeed they change in fundamental ways from situation to situation: The adult requests for the child to eat her peas by directing the spoon at her face, requests that the child give her something by holding out her hand, and requests that the toys be put away by pointing to the destination desired. There is thus no standardized "original naming game" for verbs as there is for object labels for some children (Tomasello 1995b). The situation only gets more complex if we bring in other types of words such as prepositions (Tomasello 1987).

Recently a number of studies have demonstrated experimentally that young children can learn new words in a variety of complex social-interactive situations. They learn new words not just when adults stop and name objects for them, but also in the ongoing flow of social interaction in which both they and the adult are trying to do things. In none of these cases can the child count on the adult following into her already established focus of attention, but rather she must adapt to the adult's focus of attention. For example, Baldwin (1991, 1993) taught 19-month-old infants new words in two new situations. In one situation the adult followed into the infant's focus of attention, and, as in other studies, they learned the new word quite well - better than in any other condition in fact. But the adult also successfully taught the infants new words in a situation in which they looked at and labeled an object the child was not looking at, thus requiring the child to look up and then determine the adult's attentional focus.

Another series of studies demonstrate the same point but even more dramatically. In all of the studies there were situations in which an adult talked to a child as they engaged together in various games, with novel words being introduced as naturally as possible into the ongoing flow of the game. In all cases there were multiple potential referents available; that is, there were multiple novel referents for which the child had no existing means of linguistic expression and the novel word was introduced in a single type of linguistic context. Various social-pragmatic cues to the adult's intended referent were provided in different studies to see if children were sensitive to them. The studies were designed so that none of the well-known word learning constraints that various investigators have proposed would be helpful to the child in distinguishing among possible referents. The studies were also designed so that eye gaze direction was never diagnostic of the adult's referential intention. In all studies the children ranged from 18 to 24 months of age, and in all cases the majority of children learned the novel words in either comprehension or production or both (and better than in various control conditions).

Here are seven different situations in which 18 to 24 month old children learned new words with some facility. In each case, the original study (cited in each case) gives all the details of control conditions and the like.

°   In the context of a finding game, an adult announced her intentions to "find the toma" and then searched in a row of buckets all containing novel objects. Sometimes she found it in the first bucket searched. Sometimes, however, she had to search longer, rejecting unwanted objects by scowling at them and replacing them in their buckets until she found the one she wanted. Children learned the new word for the object the adult intended to find (indicated by a smile and termination of search) *regardless of whether or how many objects were rejected during the search process* (Tomasello & Barton 1994; Tomasello, Strossberg, & Akhtar 1996).

°   Also in the context of a finding game, an adult had the child find four different objects in four different hiding places, one of which was a very distinctive toy barn. Once the child had learned which objects went with which places, the adult announced her intention to "find the gazzer". She then went to the toy barn, but it turned out to be "locked". She thus frowned at the barn and then proceeded to another hiding place saying "Lets see what else we can find" (taking out an object with a smile). Later, children demonstrated that they had learned "gazzer" for the object they knew the experimenter wanted in the barn *even though they had not seen the object after they heard the new word, and even though the adult had frowned at the barn and smiled at a distractor object* (Akhtar & Tomasello 1996; Tomasello et al. 1996).

°   An adult set up a script with the child in which a novel action was performed always and only with a particular toy character (e.g., Big Bird on a swing, with other character-action pairings demonstrated as well). She then picked up Big Bird and announced "Let's meek Big Bird", but the swing was nowhere to be found - so the action was not performed. Later, using a different character, children demonstrated their understanding of the new verb *even though they had never seen the referent action performed after the novel verb was introduced* (Akhtar &

Tomasello 1996).

° An adult announced her intention to "dax Mickey Mouse" and then proceeded to perform one action accidentally and another intentionally (or sometimes in reverse order). Children learned the word for the intentional and not the accidental action *regardless of which came first in the sequence* (Tomasello & Barton 1994).

° A child, her mother, and an experimenter played together with three novel objects. The mother then left the room. A fourth object was brought out and the child and experimenter played with it, noting the mother's absence. When the mother returned to the room, she looked at the four objects together and exclaimed "Oh look! A modi! A modi!" Understanding that the mother would not be excited about the objects she had already played with previously, but that she very well might be excited about the object she was seeing for the first time, children learned the new word for the object the mother had not seen previously (Akhtar, Carpenter, & Tomasello 1996).

° An adult introduced the child to a curved pipe, down which objects could be thrown to great effect. In one condition she first threw one novel object down, and then another, and then announced "Now, modi" as she threw another novel object down. In this condition children thought modi was the name of that object. In another condition the adult took out a novel object and first did one thing with it, and then another thing, and then announced "Now, modi" as she threw it down the pipe. In this condition children thought modi was the name of the action of throwing objects down a pipe. The common element is that in each case the child assumed that the adult was talking about the entity, either object or action, that was new in the communicative situation (Tomasello & Akhtar 1995).

° An adult played a merri-go-round game with a child several times. They then moved on to do something else. The adult then returned to the merri-go-round. As she did so, in one condition she readied the merri-go-round for play, then held out a novel object to the child while alternating gaze between child and merri-go-round, saying "Widgit, Jason.". In this case, the children thought that widgit was a request for her to use the new toy with the merri-go-round. In the other condition the adult did not ready the merri-go-round for play and did not gaze alternate to the apparatus, but instead simply held out the novel object to the child and said "Jason, widget." while alternating gaze between object and child. In this case, children thought that widgit was the name of the object, not the action associated with the merri-go-round (Tomasello & Akhtar 1995).

Although any one of these studies might be explained in other ways, when they are considered as a group the most plausible explanation is that by the time they are 18 to 24 months of age children have developed a deep and flexible understanding of other persons as intentional beings, and so they are quite skillful at determining the adult's communicative intentions in a wide variety of relatively novel communicative situations - assuming that they can find some way to understand these situations as joint attentional

scenes. Their assumption that the adult's language is relevant to their ongoing social and instrumental activities is simply the natural expression of this intentional understanding. Thus, in several of these studies, the child had to first understand that we are playing a finding game. Giving this intentional understanding (and a few details of the game itself), the child could then infer that when the adult frowned at an object that was not the one she was not seeking - unless the frown came when the adult was trying unsuccessfully to open the toy barn containing the desired toy, in which case the frown meant frustration at not being able to obtain the intended toy inside the barn. The point is that the adult's specific behaviors such as a smile or a frown are not sufficient by themselves to indicate for the child the adult's intended referent. But in a mutually understood joint attentional scene, they may be.

Children rely on these same basic processes of intention reading in social contexts to learn many other cultural activities such as the use of tools and participation in interactive games (Nelson 1996). Of course these processes take on a somewhat special form in language learning, but the basics are identical. The acquisition of language, including word learning, is therefore best seen as one instance of the general process of cultural learning (Tomasello 1999).

6. Symbols and constructions

One final point is important. Words, individual linguistic symbols, are abstractions. The language learner hears and produces only utterances. The learner, and in the same way the linguist, may distinguish within the utterance elements that are performing certain sub-functions in the utterance. And so another dimension of the word learning process that has been badly neglected is the process by which young children decompose the communicative function of an entire utterance into functional sub-units. There are some theorists - beginning with Brown (1973) and continuing with Gleitman (1990) and Bloom (2000) - who have pointed out that the syntactic context of a word is often very helpful, and sometimes partially determinative, of a word's meaning. But none of these theorists has recognized that what is going on is a functional analysis of an entire communicative intention, and that to even get started in the process of learning a new word's meaning the child must understand something of the adult's overall communicative intention as expressed in the utterance as a whole.

To illustrate, let us suppose that a child sees an adult use a stapler and understand that his goal is to staple together two pieces of paper. In some cases, the child may understand also that the goal/function of placing the papers inside the stapler's jaws is to align them with the stapling mechanism inside the stapler, and that the goal/function of pressing down on the stapler is to eject the staple through the two papers - with both of these sub-actions being in the service of the overall goal/function of attaching the two sheets of paper. To the extent that the child does not understand the sub-functions and their relation to the overall goal, she will be lost when she encounters some new stapler, for example, one whose stapling mechanism works differently (e.g., does not require pressing down). Only to the extent that the child understands the contributions being made by the sub-functions, and perhaps their interrelations, will she be able to adapt to this new situation creatively (e.g., adjusting her behavior to effect the same outcome with the new

stapling mechanism).

The comparable linguistic example is that the child hears an adult say "I stapled your papers" and comprehends not only the utterance and its overall communicative intention, but also, for example, the word *stapled* and its communicative sub-function in the utterance (the contribution it is making to the utterance as a whole), along with the phrase *your papers* and its communicative sub-function in the utterance - with *your* serving a sub-function within that phrase. Again, only if the child performs some 'functionally based distributional analysis' of this type will she be able in the future to use these linguistic elements creatively in novel utterances (Tomasello 1992b, 1999). In some sense, this is what it means to know, to have mastery of, a word.

One implication of this perspective is that we should not separate the study of word learning from the study of grammatical development. Formal theories of language structure use mathematics as their primary metaphor and so characterize language in terms of meaningful lexical items and meaningless, abstract syntactic rules (Pinker 1999). This makes lexicon and grammar seem like two completely different creatures. But a more functionally based view of language sees only form and function (signifier and signified), and language forms come in many shapes and sizes - from relatively small entities like words and morphemes to relatively large entities like phrases and sentence-level constructions (Langacker 1987, 1991). In this perspective, words and grammar are simply at two ends of the same semiotic continuum (see papers in Tomasello 1998 in press, for other similar perspectives).

And so word learning is actually only one part of a very complex set of processes by means of which children learn to use linguistic forms and their conventionally intended meanings. Word learning may have some special properties as words are, by all accounts, a special unit of language structure. But viewing the acquisition of words as a series of mini-linguistics lessons and the acquisition of grammar as a totally abstract and rule-governed process without connections to adult linguistic models is inaccurate and unproductive. One of the challenges in future research is thus to integrate the different theoretical accounts of how children learn the many and diverse linguistic structures - including both words and grammatical constructions - that they hear around them.

7. Conclusion

It is thus no exaggeration to say - and this particularly fitting in the current forum - that modern theories of word learning are mostly inadequate because they do not appreciate sufficiently the social-pragmatic dimension of language acquisition in general or of word learning in particular. Sad to say, most theorists have thought very little about what gives linguistic symbols their special qualities, and so they have persisted with associationistic theories that have changed very little in the past few centuries. If, on the other hand, we begin our analyses with the communicative intentions expressed in whole utterances and then seek to determine how young children 'slice and dice' these utterances into their functional sub-components, we at least have a chance of asking the right questions. Without pragmatics and communicative intentions, it's all just noise.

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