How words have content: an explanatory hypothesis based on developmental psychology

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Accepted 25 February 2001

Keywords: Lexical meaning; Symbol; Reference; Intentionality; Semantic externalism; Bruner; Tomasello

1. Introduction. Symbolic functioning and its explanation

1.1. Symbolic functioning

There are (at least) four kinds of symbolic functioning which enter into both adult and children’s language:

(a) The basic symbolic functioning involved in illocutionary acts (e.g. actions of requesting, demanding, asking for information, warning, or asserting);
(b) A basic symbolic functioning of terms related directly to content rather than to performing illocutionary actions. Such content appears in what illocutionary actions are about, e.g. a request may be about dogs, or catching, or drinking. Dictionary entries reflect this kind of symbolic functioning, but the functioning is not identical to the entries (or at least I will so argue);
(c) A less basic symbolic functioning by which one uses noun phrases, with their basic symbolic functioning regarding content, to refer to particular (or generic) things or actions;

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Another non-basic symbolic functioning by which one uses the symbolic functioning of terms and of noun phrases in accord with semantical-syntactical symbols so as to produce the symbolic functioning of sentences.

Of these four, (a) is as basic for the symbolic functioning of language as (b), or even more so, but they have different purposes: (a) aims at performing an illocutionary act like asserting or requesting, whereas (b) aims at providing the content which such an act is about. Because of their difference in purpose, (a) and (b) usually occur together in all speech, including children’s earliest words. People perform an illocutionary act because of a goal of some particular type, and the content-related functioning of symbols enables the act to be about a particular thing, e.g. an assertion or request can be about some particular content because the latter is supplied by content-related symbolic functioning.

Although (b) as described here involves a certain kind of action, Austin classified it as a locutionary rather than illocutionary act. Another difference between (a) and (b) is that conventions governing terms play a greater role in (b) than in (a). Although illocutionary acts may be performed by means of verbs which conventionally refer to illocutionary acts (e.g. “I assert that p,” or “I request that p”), using such verbs does not always produce a performance of the related illocutionary act, nor are these verbs even the standard means for performing such acts. In contrast, using a term is not only the standard way to bring its symbolic functioning in regard to content into play, but also always brings that functioning into play. On the grounds given in the past two paragraphs, I conclude that the symbolic functioning in (b) is quite distinct from that in (a).

In this paper I focus on (b), the symbolic functioning of terms in regard to content, and develop an explanatory model for it. I view this project as a different approach to traditional philosophical questions about the nature of lexical meaning. These questions have become confused, in my opinion, and need to replaced by a clearer question. My account for (b) is based on studies and theories in developmental psychology. Because (b) always occurs in conjunction with (a), not only in children’s language but also in language generally, one needs to separate (b)-type factors from (a)-type ones, but this is easily done on two bases, their distinct purposes, and as we will see later, distributional factors. The latter also provide a more subtle prerequisite for the present study, that of separating out terms within the stream of discourse.

1 Bates et al. (1979) in Ochs and Schieffelin (1979) argue that children perform illocutionary acts before they use language. The notion of “basic” is construed here in relation to an overall explanatory theory of how to fit these types of symbolic functioning together, and may well be controversial. In some phenomena of language, however, all four may be bound together with none appearing any more basic than the others.

2 I am indebted to Michael Tomasello for discussions which led me to this position. Earlier I (1993, ch. 1) had argued that certain recent philosophers were confused about what an explanatory theory of meaning is. Also, in moving away from talk of lexical meaning, I am in good company (e.g. Wittgenstein, Austin, and Quine, all of whom rejected traditional questions about meaning).

3 Though developmental psychology provides entities and mechanisms for (b), it is not used to support the distinction of (b) from (a), which instead was supported on grounds given in these past two paragraphs.
1.2. The contrast of specificatory and explanatory theories

The present paper aims at an explanatory theory, rather than a specificatory one, for the symbolic functioning of terms in regard to content. Specificatory theories aim at describing a range of phenomena in a systematic way, often so that predictions are possible. For example, in the history of astronomy, the Ptolemaic theory specified the paths of heavenly bodies on the assumption that we are at the center of the universe, and all the other bodies are circling us. The cause of their motion was not part of the theory, so that it was not an explanatory theory. As the Ptolemaic tradition developed, the theory was adjusted to deal with the regressions of the planets. This was done by modifying specifications for the paths of the planets by using epicycles, eccentrics, and equants. As the additions grew, most Ptolemaic astronomers came to view their theory as purely specificatory (as a calculational device) rather than as indicative of what really underlies movements in the sky.

Explanatory theories, in contrast, seek the underlying entities, structures, and mechanisms which constitute or produce the phenomenon to be explained. Copernican and Keplerian theories offered simpler paths of planetary motion, but still did not explain well the cause of the movements. Newton, however, did so by his laws of motion and gravitation. The ideal in science is to arrive at a theory that is both explanatory and specificatory for the relevant set of phenomena, but in moving toward this goal, theories with various degrees of specificatory and explanatory content arise.

In regard to the symbolic functioning of a particular term in a language, a specificatory theory might state just what that term symbolizes. This could be done without discussing the mechanisms of symbolization, but rather by using the result of such mechanisms: for instance, one might specify the symbolic functioning of the term “elephant” in regard to content by describing what this functioning picks out. Such use of a result of symbolizing leaves one in the dark as to its causes. In contrast, an explanatory theory for the symbolic functioning of terms would lay out the entities and mechanisms by which terms function as symbols to produce such results. My focus here is on an explanatory theory for the (b)-type functioning of symbols in regard to content. This requires laying out the underlying entities and their interactions which constitute such functioning. Because the account I develop for content-related symbolic functioning is quite brief, I refer to it as an explanatory theory.

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4 Cf. my (1993, ch. 1) for more development of the contrast of explanatory theories to specificatory theories.
5 The theory of explanation used here is not the hypothetico-deductive model, but rather that of Harre (1961), Dretske (1981), and Aronson (1984).
6 Although Newton did not explain what gravitation was, he nevertheless used it in explaining planetary motion. Einstein later provided the explanation for gravitation by his theory that mass affects the curvature of space.
7 One might also give specificatory accounts for the symbolic functioning of all the terms in a language, or of all the sentences in a language: Davidson (1967) aimed at the latter goal, but mistakenly took this goal to concern an explanatory theory. Another possible specificatory theory of the symbolic functioning of terms, often sought by psychologists, would describe the structure of the content that is symbolized by terms. Again, this could be done without discussing the underlying causes that constitute or produce the symbolic functioning.
model rather than a theory, but it offers hypotheses, based on developmental psychology, for the entities and mechanisms that underlie such symbolic functioning.

2. The Bruner–Tomasello tradition in developmental psycholinguistics: models for language learning and for the content-related symbolic functioning of terms

Although developmental psycholinguistics focuses on children’s acquisition of their first language, such study cannot be conducted apart from hypotheses bearing on the symbolic functioning of terms. In fact, many developmental psychologists (e.g. Karmiloff-Smith, 1992) view their work as illuminating general psycholinguistic mechanisms, and not just those of children. The developmental studies I appeal to here are in a tradition stemming from Jerome Bruner’s work in the 1970s, and especially including work by Michael Tomasello and Katherine Nelson, though on one important point to be mentioned later, Nelson differs from the former two. Scholars in this tradition take the symbolic functioning of terms to depend on social and cultural factors as well as the physical surroundings. My intent here is to develop, on the basis of this developmental research, an explanatory model for basic symbolic functioning in regard to content. The model I will propose is, in my opinion, either implicit in their theories and experimental approach, or at least strongly supported by their work.

According to the Bruner–Tomasello tradition, children acquire language on the basis of background abilities, tendencies, skills, and knowledge, five of which I describe here.8 The first four are emphasized in Bruner (1983), and many or all of them are used by other developmentalists.9

(1) Knowledge about goals: infants know about goal-directed activity, and use their cognitive processing ability to produce actions as means to goals the child wants.10 In addition, children often know the purposes of their caregivers.

(2) Social and communicative inclinations: children are naturally inclined to respond to the human voice and face, and an enormous amount of their activity during the first year and a half is social and communicative.

The factors in (1) and (2) combine so that children use their abilities regarding means–end relations to promote and improve their interactions with others.

(3) Joint attention and its precursors: infants learn by 1 year of age to follow the gaze of an adult to an object, and to check back to see if the adult is attending to the same thing she is. “Joint attention,” as the phrase is used in the literature,
is usually (though not always) taken to require not merely that a child and adult attend to the same thing, but also that each recognize the attention is shared.\textsuperscript{11} Such sharing is enjoyed in itself by children, and also used as a means to further goals.\textsuperscript{12}

Another important factor for first language learning concerns

(4) \textit{Knowledge about routines}: children know a great deal about routine interactions they have with adults, e.g. routines of washing, dressing, eating meals, changing diapers, and playing games. For such routines, called “formats” by Bruner, children know thoroughly the sequence of events, including turn taking, means–end relations, and the roles and goals of participants.\textsuperscript{13} Also, the roles may be reversible.

Point (4) is important not only because of the detailed knowledge which the child has about routine interactions, but also because such interactions are the main ingredients in \textit{events} or \textit{scenes} which the child knows early and well. What are especially salient to children in such routines are functional features, things and actions that produce results in the routine.\textsuperscript{14}

That functional features are the child’s first handle for grasping a referent for a term does not imply that the child takes a term like “ball” to refer simply to \textit{whatever} has such functional features. Even though children may first learn a term on the basis of functional features of its referent, later uses do not require the presence of such features, because the child also learns perceptual features that go with the functional ones.\textsuperscript{15} Nor are the relevant functional and perceptual features sufficient by themselves for children to apply a term. Frank Keil (1989) has shown that children in grade school often require in addition some deeper level features (called “core” features by some psychologists). For instance, Keil asked children in kindergarten and in fourth grade what fits the following description: an animal whose outside appearance and behaviors were those of a raccoon, but whose insides were those of a skunk, and whose parents and offspring were skunks. The kindergartners tended toward raccoon, and the fourth graders toward skunk.

\textsuperscript{13} Bruner (1983, pp. 120–121; 132) and Tomasello (1992) hold that all of children’s first words come from uses in such routines, but later on, children are also quite capable of learning words from non-routine interactions (cf. Carpenter et al. 1998, p. 28).
\textsuperscript{14} This focus on functional features comes from Katherine Nelson’s (1974, 1985, p. 66) functional core model for the meaning of children’s early words, which claims that children form early concepts mostly for things that do interesting actions (e.g. balls, cars, dogs), and do so on the basis of experience with objects in functional situations, e.g. “ball” refers to something that people throw, catch, bounce, and roll. Later she (1996, pp. 227–230; cf. also Nelson in Scholnick, 1983) emphasized that functional contributions are made to events which the child knows. Unlike Bruner and Tomasello, Nelson (1983, 1985, 1996) gives important roles in her theories to internal mental representations like concepts and scripts. Though I agree that some such internal entities exist, I prefer, on methodological grounds (cf. Section 5.1 below), not to include them as the main explanation of symbolic functioning. Nevertheless, Nelson’s theory is similar to theirs in regard to (1) through (5), and in taking reference to events or their ingredients to underlie the symbolic functioning of children’s early words.
The last background ability and tendency which is important for children’s learning of language is

(5) Children tend to imitate adults, and to use imitation to accomplish their purposes.

This ability and tendency is well known in the literature (e.g. Piaget, 1962, Vygotsky, 1978), and present, though not emphasized, in Bruner (1983). Tomasello (1990; cf. also Tomasello et al., 1993b) follows Vygotsky in taking imitation to be important for children’s learning of their culture, including their language. Indicative of the importance of imitation, according to Tomasello, is the holophrastic nature of children’s first utterances. Holophrases are a single linguistic symbol (often with a specific intonational contour) used to express a specific communicative intention. Children develop holophrases by imitating an adult’s salient linguistic expressions and orderings. In doing this, the child is imitating an adult’s means and end, so that the child uses the same means to obtain the same end.16 Children are able to do this because they understand another person’s goals, actions used as means to the goals, and the results of those actions. Thus children are not blindly imitating adult language, but instead engage in problem solving which uses imitation as a means. In contrast, chimpanzees usually do not imitate a combination of means and end even when they see it demonstrated as successful, and instead try various approaches to achieving an end, rather than the successful one they observed. 17

Bruner and Tomasello have found mechanisms based on abilities (1) through (5) for first language acquisition which are far more powerful than any method of ostension. The problem with ostension is that it always leaves a wide range of possible referents covered by the pointing, because it produces merely a line of sight on which many things are located, and whatever is located at a single point on the line has many aspects and features. Therefore, to disambiguate pointing, it looks as though one must make use of descriptive terms which pick out the intended features. Doing this, however, is impossible for a child learning her first words. Therefore, the mechanisms of first language acquisition described in the Bruner–Tomasello tradition fill a critical gap.

Bruner and Tomasello make somewhat different applications of features (1)–(5) to language learning. Bruner emphasizes attentional (and joint attentional) interactions which are not involved in the practical necessities of everyday life, and which typically are repeated over many months. In contrast, Tomasello (1999, p. 112) investigates the “flow of social interaction” in everyday life by a diary study of his daughter’s early verbs. He also studies interactions of mothers and children, and children’s learning of new words in the context of experiments. In what follows, I

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16 This treatment of holophrases is based on Tomasello and Brooks (1999).
17 The last two sentences are based on Call and Carpenter (2000), who discuss the differences between children and chimpanzees in regard to imitation, and also make proposals for clarifying diverse factors connected with imitation. The importance of imitation for language is also shown by general linguistic studies, e.g. a person learns the sounds of his dialect by imitation, and in the same way learns collocations (particular ways of expressing something which are consistently used in a language, to the exclusion of other grammatically permissible ways of saying the same thing).
describe the application of (1)–(5) to examples of children learning words, first in Bruner’s account, and then in Tomasello’s.

Bruner (1983, 73 ff) describes a path for the development of joint attention over several months. When the child is four months old, the mother establishes a format in which she points out objects and asks “Where’s that?” and “What’s that?” Next, the child learns pointing, at first to focus his own attention, but later also to direct the parent’s attention. Then the child uses non-standard expressions to direct attention (e.g. “da” or “ghee”), and later uses variants of standard words, “apoo” for “apple,” “boe” for “bird,” which yet later are replaced by more standard words.

Bruner’s main point regarding this path of development is that an interaction (that of sharing attention) remains constant while the means used to produce it develop. The early questions amounted to place holders within the format into which the child could later put symbolic answers like pointing or giving a name. Very early on, however, the child learned his mother’s purposes in the interaction: she was trying to get him engaged in answering questions, and to direct his attention to things in the surroundings. When the child learns to direct attention to apples (or pictures of them) by using the term “apoo,” he thereby demonstrates his know-how concerning the basic content-related symbolic functioning of that term.

Tomasello (1992, p. 208) also views children as learning the symbolic functioning of terms by figuring out an adult’s purposes, and doing so on the basis of the child’s abilities (1) through (5). His approach differs from Bruner’s, however, in focusing, in a diary-study of his daughter’s first verbs, on practical everyday situations in which a child’s language develops. I will take up some examples of his daughter’s early words, and attempt to describe her method of acquisition of them, with the goal of clarifying the role of abilities (1) through (5), and of finding mechanisms underlying symbolic functioning.

Tomasello viewed his daughter’s early words as coming from routines in which the word was a focal point. For instance,

T [Tomasello’s daughter, Travis] is engaged in an activity and the parent comments “You’re drawing” or asks “Are you sweeping?” (1992, p. 205).

In these cases, the child learns the word by discerning the parents’ intention to use salient words, “drawing” and “sweeping,” to direct her attention to her present activity, and comment on it. Whereas the parents use “drawing” and “sweeping” in assertions or questions, Travis’ first uses of them do not involve questions. She instead uses them either to make a request or to accompany her activity (the latter is unclear as to whether it involves assertion; cf. Tomasello, 1992, pp. 338, 340). Thus Travis to some extent disengages the content-related symbolic functioning of these verbs from the parent’s illocutionary acts.

Travis also learned early words from her parents’ comments on states or activities of other persons or objects, e.g. “It’s gone” or “She’s singing.” Besides the cases

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18 Though Tomasello’s experimental studies on children’s acquisition of language are helpful for my present purposes, I found his (1992) diary study especially suggestive of mechanisms.
where the parents’ use of a word can function ostensively, i.e. to direct the child’s attention to a referent that is present, Travis also learned words from non-ostensive situations of two kinds. First, ones in which a parent asks about her intentions or desires, e.g. (from Tomasello, 1992, pp. 205–207) the parent asks “Do you want more?” or “Do you need to pee-pee?” Secondly, situations in which the parents make requests of Travis or of another individual, e.g. “Catch!” and then throw her a ball, or “Get it!” after she rolled the ball away, or “Stay!” said to the dogs.

How does a child manage to understand the basic content-related symbolic functioning of a term like “more” in “Do you want more?” The child knows the routine of being fed, a sequence of conditions, actions, goals, and results. A short version of it might include the following: she is put in a high chair, has a bowl of cereal put in front of her, has a parent take a spoonful and bring it to the child’s mouth, she eats it, then receives another spoonful, etc., until the meal ends. Also in this sequence are utterances of words, and intermittent attention to what the other participant is doing, and mutual attention to some actions and utterances. Last but not least, goals are also embedded in the event, including the child’s goal of eating, and the parent’s goal of feeding the child. In pursuing the latter goal, the parent asks “Do you want more?” The child may either show signs of refusal, or approval, or may simply acquiesce in eating more. After this question and the child’s responses occur a number of times, the child will have accumulated information about the question and her responses in the routine, and especially, about their results. If the child exhibits refusal, the feeding is likely to end, at least soon, perhaps after stronger refusals. If the child shows agreement, then the child gets an additional quantity of food, until the question is repeated and the child shows refusal (or the parent stops on his own). When she understands that agreement with the parent who asks “Do you want more?” results in additional food, the child can make a practical supposition: a use of “more” in the feeding routine indicates additional food is forthcoming, dependent upon the child’s response. For the child to use the term “More!” herself, she must still take the word as indicative of the availability of additional food, but also take into account the different roles of herself and her parents: thus her use of “more” is a request rather than an offer. But in either illocutionary act, “more” directs attention to an additional quantity of the relevant stuff (this is the (b)-type functioning in regard to content).

The example just discussed is relevant to a certain objection to my separating (b)-type symbolic functioning from the (a)-type in children’s language. The objection is based on the use of holophrases in children’s early talk, which combine the two kinds of functioning in a single package. If such combination makes it impossible to separate out the content-related symbolic functioning from the illocutionary variety, then I will be unable to use children’s early language as a source for an account of (b)-type symbolic functioning. Related to this question about separating (a)-type and (b)-type functions is one about separating terms from the holophrases in which

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19 An interesting feature of the role of the parents’ question “Do you want more?” is that although literally it is a question about the child’s wants, in the situation it functions as an offer of more. I (2000) discuss this elsewhere.
they appear. Fortunately for my present purposes, speakers of a language are able to separate out terms from holophrases, and (b)-type functioning from (a)-type. Such separation is shown by distributional factors, i.e. the same term appears in different constructions, and the same (a)-type functioning appears with different (b)-type functioning, and the same (b)-type functioning appears with different (a)-type functions.\textsuperscript{20} Such distributional factors appear not only in adult language, but also in children’s early language. The separation of terms appears as soon as a term is used by the child in more than one construction. The separation of content-related symbolic functioning from a particular illocutionary action appears as soon as the child uses a term with the same content-related functioning but with an illocutionary force different from that of her earlier use of the term (whether in understanding parental talk from which she learned the term, or in her own utterances). For instance, even though Travis learned “more” from her parents’ use of it in a question, she uses it in a request. Also, her first uses of “sweeping” and “drawing” (cf. Tomasello, 1992, pp. 205, 338, 340) were simply as accompaniments to her actions, whereas she learned them from her parents’ assertions or questions. Although I take a child’s ability to use the same content-related symbolic functioning with a variety of illocutionary speech acts, or to use the same illocutionary act (e.g. requesting) with a variety of content-related symbols, to indicate the separability of (a)-type and (b)-type symbolic functioning, this norm for separability does not require that either factor could exist by itself. For instance, color and shape fit this norm, even if neither could exist separate from the other. A more suggestive parallel, perhaps, would be sodium: it is a distinct chemical element, but it is unlikely to exist separately in nature because it is so reactive. In an analogous way, illocutionary acts are unlikely to exist by themselves because they interact with content, i.e. people use them to talk about particular matters that concern them.

These examples from Travis show that she separated the two types of symbolic functioning at an early age. For my purposes, it does not matter at what age children make the separation; the important point is that (a) and (b) are different types of symbolic functioning, both of which are needed for language. Given this difference, one can find different aspects relating to each type of functioning in a child’s holophrases. Thus “more” contributes to performing an illocutionary act of requesting, and also contributes a content (an added quantity of what the child had been eating) about which the request is made. For our present purposes, we are interested in understanding the workings of the symbolic functioning in regard to content.

Consider next the child’s learning of the symbolic functioning of the term “catch.” The child probably first sees older children and adults throwing and catching a ball. He also observes a parent saying “Catch!” and throwing the ball to a child, and he can also observe successes and failures in the game on the basis of reactions to them.

\textsuperscript{20} I would like to thank Elena Lieven for first suggesting this use of distributional factors to me. Not only can children use the same illocutionary act with different content-related symbols, but they also use illocutionary acts before they use content-related symbols at all, according to Bates et al. (1979). Such use gives added support for the view that in a child’s early use of illocutionary acts, they are not identified with content-related symbolization.
e.g. if the child catches it, the parent says approvingly “You caught it!” or a player who fails to catch it may look disappointed. To make the connection of the action of catching to the utterance of “catch,” which is crucial to the content-related symbolic functioning of the term, the child has to engage in problem solving based on the goal that he figured out for the game, the location of the utterance of “Catch!” in relation to the success or failure in fulfilling the goal, and the actions and reactions of the players which indicate success or failure. The child’s answer to the problem might be something like this: the parent’s utterance of “Catch!” is a request that the addressee perform a certain kind of grasping with his hands of the thrown ball. Of course, this is a verbal expression of the solution, which the child cannot make. What the child must have instead of such verbally expressed “knowledge that” (which I will refer to as “explicit knowledge” because it can be expressed verbally) is some kind of “know-how.” This “know-how” about early words includes two kinds of factors, the illocutionary force of making a request, plus the particular content. The latter, in the present example, involves a grasping with one’s hands of a thrown ball.

Another interesting pair of examples of non-ostensive learning of terms involved Travis’ learning words from her parents’ commands to their dogs, e.g. “Move!” or “Stay!” (cf. Tomasello, 1992, p. 218). The learning situation was non-ostensive in that the child had to understand the use of the words as referring to a particular future ingredient in the event, which the parent intends the dogs to do. Consider the case of “Stay!” The sequence in the event as known by Travis is this: the dogs want to go somewhere other than where they are; they receive the command “Stay!”; they stay where they are. She also understands that this command (unlike “Move!”) has the result that the dogs stay; this aspect concerns the basic symbolic functioning in regard to content, as contrasted to the illocutionary act of giving a command. She also understands her parents’ goal in giving the command and the results of the command. This distinction between an agent’s goal in an action and the results of the action can help in learning the referential function of a term, as Call and Carpenter (2000) suggest. For instance, suppose an adult says “Stay!” to the dogs but they nevertheless move outside the car; then the adult says “No” to the dogs, and grabs them and puts them back inside the car, and again says “Stay!” In observing this situation, a child can see the adult’s dissatisfaction with the dogs’ initial reaction to “Stay!” (i.e. the adult’s goal in the action of commanding “Stay!” was not satisfied by the dogs’ action of leaving the car). Thus the child grasps the difference between the adult’s goal in uttering “Stay!” and the results of that utterance, and this aids the child in understanding the referential intent expressed by using “Stay!” in this situation. Perhaps on the second issuance of the command, the dogs obey and the adult shows satisfaction with their behavior. The child can then see what kind of behavior satisfies the adult’s goal in uttering the command. From this, the child can view the command as causing (when things go right) the behavior of the dogs, and expect that her use of the command will cause the same behavior.

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21 Travis’ use of “Stay” and “Move” appears to be a case where she uses the same illocutionary force but with opposing content, thereby indicating her separate control over b-type and a-type symbolic functioning.
In all of these cases where the child seems first to understand the parent’s use of a term, and then go on to use it herself, a special kind of imitation is present which Tomasello (1998) calls “role reversal imitation.” This involves the child switching from having others use a term to direct her attention, to her using the term to direct the attention of others (or vice versa). This is not the only kind of flexibility needed for a child to have control of the symbolic functioning of a term. Both Nelson (1996, ch. 8) and Tomasello (1992, pp. 43, 196, fn 3) require in addition that the child should be able to use a term to direct attention in similar ways in various events and not just the one in which she first learned it.

2.1. Generalization of how first words are learned in routine interactions

A general picture of the mechanisms and structures underlying a child’s early word acquisition involves the following four steps:

1. The child engages in following the gaze of others, and in joint attention. (I take the latter to be needed for communication in that the communicators must be aware that they are communicating.)

2. The child knows a sequence of conditions, actions, and results in a routine event, and also the goals of the participants (or their goals insofar as they have roles) in the events.

3. The child understands how utterances in the event connect to goals in it, e.g., goals are known by the child for routines of feeding and playing catch, and the child knows how the parents’ utterances (e.g. “Do you want more?” or “catch”) relate to such goals.

4. The child understands how utterances in the event connect to results e.g. the child learns that saying “more” results in his getting more, saying “stay” results in the dogs staying where they are, and saying “catch” usually results in someone trying to catch.

On the basis of these steps, the child forms knowledge and expectations about the symbolic functioning of a certain word as the salient part of the parent’s utterance. If a child understands a parent’s goal in using an utterance, and the results of that utterance, the child may use the utterance to obtain the same goal for herself. Such symbolic functioning of an utterance includes both the a-type and the b-type, but our focus is on the latter, which involves focusing the child’s attention on a particular aspect of the routine event.

On this picture of children’s early acquisition of the symbolic content of terms, infants have substantial knowledge and reasoning, including what appear to be hypotheses about goals and results. Is having such knowledge consistent with the child’s lack of language? I think so, and support my view by distinguishing know-how from knowing that, and by explaining how a child might acquire his very first terms without having to make hypotheses about them.

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22 Cf. my (1991) on the need for monitoring a communication channel.
The knowledge and reasoning of a pre-verbal child must be a matter of know-how rather than knowing that (or explicit knowledge), because the latter requires words for its formulation. The child knows how certain actions, goals, and results fit into routines, and this includes knowing the results of actions, and whether goals are obtained or not. None of these need require a verbal understanding, but instead are part of the child’s familiarity with the event: for example, a child observes her parents feeding her, and giving orders to the dogs, and she observes actions producing results (e.g. the feeding gets food into her mouth; the command “Stay!” makes the dogs stay). She observes a whole event, and has knowledge about how its important ingredients relate to one another, especially about how actions aim at goals and have results. To acquire a new word, a child has to extend this know-how to include the action of using a word to produce a result.

In learning early words, the child is engaging in solving a problem, which could be described from two angles: the problem of discerning the speaker’s communicative intention, and the problem of connecting the speaker’s words with the child’s prior knowledge of the routine event. Talk about discerning communicative intentions gives the impression that one has to make a hypothesis about an entity, the intention, which underlies and causes an external action, uttering a word or sentence, e.g. the child is to hypothesize that the parent’s saying of “Do you want more?” makes an offer of an added quantity of what the child is eating. This makes it look like the child is using abduction, or reasoning to the best explanation, to discern the intention which underlies and causes the parent’s use of “Do you want more?” There are two problems, however, in taking the child to use abduction in this way. First, abduction is usually taken to require verbal hypotheses, which cannot be formed in regard to one’s first words. Second, in abduction, one uses imagination to devise kinds of entities or relations which have not been explicit in experience, whereas in a routine interaction, the child comes to know the attention-directing function of terms from their role in that interaction, and thus from experience, rather than imagination. This way of learning the symbolic functioning of terms shifts our focus from the speaker’s intentions to the question of how the child connects her prior knowledge of the routine event to the speaker’s utterance.

Consider a child’s thought process in coming to understand the phrase “Do you want more?” as used in a routine to make an offer of more food. To understand this phrase, a child needs to fit it in with her already existing know-how about meals and about offers of food in them. Whereas earlier a child might have seen the parent’s action of bringing a spoonful of food up to the child’s mouth, and viewed it as an offer of food, later the child comes to view an utterance in the meal context of “more” with a questioning tone also as such an offer. Viewed in this way, the acquisition of “more” looks less like hypothesis formation, and more like adding a new means for doing things one had done before. Moreover, children observe the

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23 Fodor (1998) used a version of this problem to argue that one cannot learn the meaning of a new term by induction. He takes induction to require hypotheses, which in turn require already grasping the meaning of a term. Contrary to Fodor’s position, I propose that children acquire new words by some sort of induction (in that it is learning from repeated experience), but without making hypotheses.
parents’ use of the word, and pick up on what parents repeatedly say and do (cf. Tomasello, 1992). In learning how the term “more” functions in a routine, a child is in fact discerning the parent’s communicative intention, but is doing so by understanding the routine, rather than by forming an explicit hypothesis about the intention.

What may make children’s reasoning about new terms look like hypothesis formation are their reasonable expectations about what the term will direct attention to in the future. Supporting the reasonableness of the expectation is the child’s know-how about the routine and the function of the word in it. This know-how leads the child to expect the term to function to direct attention to the same sort of thing in the future, e.g. she expects uses of “more” to direct attention to an additional quantity of something. This expectation, born of experience, functions like a practical hypothesis about what a term will do in interactions, but lacks the status of explicit knowledge which an explicit hypothesis would have.

Even if the general picture just given is correct for children’s acquisition of the basic symbolic functioning of terms in regard to content, a problem still remains about how to explain children’s overextension and underextension of terms. Empirical evidence shows children’s early grasp of terms is often imprecise, and in need of further refinement. One way of remedying such imprecision is by corrections from parents or other care givers. Such corrections are likely to involve contrasts of the symbolic content of one term to that of other terms. For instance, a child might learn the reference of “catch” in relation to contrasting actions like throwing or kicking or getting the ball: e.g. suppose a child gets the parent’s intention wrong and kicks the ball when he was requested to throw it; the parent may say “Don’t kick it, pick it up and throw it!” Even apart from corrections, contrasts of related contents help children acquire correct extensions for terms. An elaborate example of contrasts is given by Tomasello (1999, p. 120). These concerned nine ways of asking for objects which T used to mark important distinctions. Here I note five of them: asking to have it (generic); asking to have it back (after you took it from her); asking someone to share it (use it along with you); asking to use it (use it by herself, and then return it to you); asking to keep it (when you were threatening to take it away). A child learns how to deal with these contrasts in interactions with caregivers, e.g. one child is told to share a toy with another, or to give it back to another. The contrasts of these verbs affect the child’s interactions in ways that are important to her, and parents are likely to enforce their requests with actions (e.g. for “back,” taking the toy from one child and handing it back to another from whom it was just taken).

One outcome of focusing on examples of verbs, as in Tomasello (1992), is that a question does not arise about how the child manages to distinguish general terms, or common names for things, from proper names that refer to a particular individual. Because verbs (e.g. “stay” or “catch”) are predicates, it is obvious that the child takes the term to direct attention to a kind of action, rather than taking it to be a proper name of an action qua individual event at a certain time and place.

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24 Also of help to children in refining the symbolic functioning of verbs are adverbs or verb particles which aid in indicating that a verb is not merely an action or a manner-of-motion verb, but entails an end state (“again” in “wake again” and “up” in “eat up”). On this, cf. Wittek (1998).
3. An explanatory model for the basic symbolic functioning of terms in regard to content

According to the developmental view presented above, the child first learns the symbolic functioning of a term on the basis of its being used in a routine context where it contributes both to performing an illocutionary act and to directing a person’s attention to a certain kind of thing or action that the illocutionary act is about. The attention directing aspect in this functioning is referential in that the hearer is referred to some particular ingredient in the event (cf. Tomasello, 1998). If the child is able to use the term in relation to other events, and for both directing the attention of others and having her own attention directed, then she has acquired the ability to use the term as a symbol. Since attention directing to an ingredient in events is a psychological activity, the content-related symbolic functioning of terms is fundamentally psychological in nature. At first the child shares in the adult’s directing of attention by sharing mutual attention, and through this develops her own ability to use words to direct attention (this path of development is Vygotskian, 1978).

Besides being psychological, the content-related symbolic functioning of terms is also social, not only in regard to children’s learning of symbols in interactions with other people, but also in regard to the basic nature of the symbols themselves, i.e. they are symbols because of their role in practices or conventions of a society.25 In addition to being social and psychological, the symbolic functioning of terms also gives an important role to physical world contexts: ingredients in physical world events are what terms direct attention to, so that the content-related symbolic functioning of a term is attention directing to kinds of things or actions.

These features of the basic symbolic functioning of terms in regard to content are the basis for the following description of what children know when they know such functioning:

1. Children know the basic symbolic functioning of a term in regard to content when they are able to use it in relation to a variety of events both to direct the attention of others to a certain kind of action or thing (which is an ingredient in events that the child is familiar with), and to understand others using the term to direct attention in the same way.

This knowledge is know-how: the child knows how to use a term to direct attention in a certain way, and to have his attention similarly directed by it. This is not theoretical knowledge, either of the attention-directing power of terms, or of descriptions of that to which attention is directed. Because children’s knowledge of terms is practical know-how, rather than explicit knowledge, they must apply the term on some basis other than deductive procedures (such as necessary and sufficient conditions).

25 Such societal conventions require a social origin in the successful use of a symbol to communicate between people. Since a discussion of possible origins for conventions is not the subject of this paper, I refer the reader to David Lewis (1969).
Children’s know-how concerning the content-related symbolic functioning of terms is about the attention-directing force of terms. Is that attention-directing force identical with the symbolic functioning of terms in regard to content? I think so, but an important qualification is needed: such attention-directing force is present in a term in virtue of the role assigned to the term in a societal practice. The attention-directing force is not present in the term considered merely as a physical object, as shown by homonyms in a language, and by the presence of the same term qua physical object in different languages, but with different attention directing forces. In addition, role reversal imitation (by which a child can learn a term directing her own attention, and then go on to use it to direct the attention of others) would not be possible without a social basis for the term’s symbolic functioning: a societal practice of using the term to direct attention in a certain way supports the usability of the term for directing the attention of others. Therefore, a social practice underlying the attention-directing force of terms is needed. The resulting explanatory model for the symbolic functioning of terms in regard to basic content is

T 2. The basic symbolic functioning of a term in regard to content consists in the force it has in a society of language users for directing attention to a certain kind of thing or action in certain contexts. Such force exists within a societal practice of using the term in a certain way.

A child has to learn what kind of thing or action a term (as used by a society) directs attention to, and what kinds of contexts it fits into, on the basis of her interactions with others. Such learning produces know-how and expectations about the term’s attention-directing force.

(T 2) includes the features mentioned earlier as important for the content-related symbolic functioning of terms: it is psychological, social, and involves relations to things in physical world contexts. Such symbolic functioning is constituted by societal practices of using terms to direct attention to kinds of actions or things. Thus the content expressed by symbols involves relations between society, users of terms, and ingredients (actions or things or features) in events. Children first learn terms that direct attention to ingredients in events with which they are familiar, but once the terms are learned, they can be used to direct attention outside of routines.

The (T 2) model provides a basis for explaining why the content-related symbolic functioning of terms is perspectival and based on purposes. People, with their interests, needs, and purposes, are the source of attention directing, and thus introduce perspectives on the scene or event. The perspectives result in dividing up or slicing the event in one way rather than another. This feature of (T 2) is important to human language and thought, both generally and in regard to the “packaging problem” for verbs (cf. Tomasello, 1992, 1999). The latter problem concerns the fact that verbs may include a wide range of features of an event (e.g. they may simply describe a motion, or a change of state, or may include causality or the manner of acting). Because people can take different perspectives on the same situation they can develop a wide range of symbols which pick out different aspects of (or kinds of ingredients in) events.
(T 2) takes content-related symbolic functioning itself to be a non-verbal entity in that it is not constituted by a list of descriptions, but instead by a certain practice of attention directing. One might tell someone else the meaning of a term by means of words, but in that case one describes the result of the attention directing, i.e. what it directs attention to. One could also inform others about this result by showing samples or a picture of the kind to which attention is directed — there are many ways to specify the content-related symbolic functioning of a term, which task is different from that of explaining its nature. Because children can acquire terms by understanding their function in a routine interaction, they can learn first words, ones that do not depend on previous knowledge of other words.

4. Clarifications of (T 2) in response to objections

Obviously, (T 2) is only a start toward a theory of the content-related symbolic functioning of terms — it needs further development. Here, I briefly discuss four objections which may aid in that development.

Objection 1: a person’s separation from his linguistic society does not entail that he loses the ability to handle the content-related symbolic functioning of his words. Therefore, such functioning is not an external matter, but rather resides in an individual’s memory.26

Reply to objection (1): the distinction between (T 1) and (T 2) answers this objection: knowledge of symbolic functioning is stored in one’s memory, as is knowledge of the physical or social world, but the symbolic functioning itself depends on societal practices and on the physical context, and thus exists outside of any particular individual. Moreover, just as the physical world can change, thereby changing one’s formerly true beliefs into false ones, so also practices of using symbols in a certain way can change, with similar results for one’s former knowledge of them. A Rip Van Winkle who slept through the twentieth century would have awakened in 2000 with many false beliefs, not just about transportation (how long does it take to go from coast to coast in the USA?), but also about the content-related symbolic functioning of words, e.g. “mouse” or “gay.” Historical linguistics shows not only that the content-related functioning of terms changes over time, but also that entire languages do so (e.g. the Indo-European languages evolved from a single language). The only way to make sense of such change is to give primacy in an explanation of symbols to the actions and practices of a society, rather than to the memory of individuals, even all individuals, in a society.

I use a reductio argument in support of this. The premise to be reduced to absurdity is

(i) The memories of all the individuals of a society of language users is the absolute foundation on which linguistic meaning is based.

26 I would like to thank Eileen Way for suggesting this objection as a way of clarifying my view, and Changsin Lee for helpful criticism of an earlier version of my reply to it.
It does not matter how these memories exist in the society members, whether as the same memory in each member, or as a range of memories that vary somewhat, as long as the memories result in communication of the same content. Then suppose that a would-be linguistic innovator comes along, and wishes to use a term in a new way, with a content different from that produced by the memories of the individuals in the society. He could not do so, because, *ex hypothesi*, the memories of all individuals in the society of language users fixes the meaning of the term, thereby excluding any content different from that contained in those memories. Contrary to this, words often come to be used with new meanings which had not been present before. For example, terms like “gay” and “mouse” in the twentieth century acquired new meanings. Innovators used these terms in new ways, and society picked up on the new uses. Therefore, (i) must be rejected. The memories of all the people in the society using the term are not an absolute foundation for determining symbolic functioning. Instead, people can intentionally use terms in new ways and gain societal acceptance for the new usage. Therefore, the content-related symbolic functioning of terms must *at root* be a matter of *societal interactions*, so that *societal memory* plays a secondary role in regard to such content, that of recording the interactions. But if societal memory is not the ultimate basis for lexical meaning, it is even less likely that the memories of individuals are such a basis. Of course, after one learns a societal practice, one needs to remember it in order to follow it in the future, but such memory is based on the practice.

Objection 2: just because people learn something in a certain way, it does not follow that they always deal with it in that same way. Therefore, from the fact that children learn the basic content-related symbolic functioning of a term as attention directing to an event or an ingredient in event (either for directing their own or others’ attention), it does not follow that symbols will continue to function in that same way for them. But if they function differently than as described by (T 2), then it is not a general explanatory model, but rather one that applies only to children while they are learning their first words.

Reply to objection 2: I agree that from the mere fact that children’s early knowledge of the basic content-related symbolic functioning of terms concerns a certain kind of attention directing, it does not follow that their knowledge of such symbolic functioning will always be of this same type. This point, however, does not require one to restrict (T 2) to children’s language, and to reject it as an explanatory hypothesis for content-related symbolic functioning in adult language. Such restricted application for (T 2) needs some support which ought to include descriptions of replacement explanatory hypotheses for (T 2) in adult language, and consideration of the relative fruitfulness of (T 2) and the alternatives.

Objection 3: the attention-directing mechanism in the developmental theory that was used as a basis for (T 1) and (T 2) is not precise because it offers no algorithm for figuring out the reference of an utterance of a term on the basis of a child’s inclinations to imitate and her knowledge of the routine, the goals, and interactions of the participants.

Reply to objection 3: no algorithm is offered because that would be appropriate to a deductive reasoning procedure, whereas the discerning of reference of a term in a routine interaction is not such, as argued earlier.
Objection 4: lists of features are important for meaning, as shown by dictionaries, which use them to give meanings. Putnam took our ability to tell meanings to others as very important:

The fact that one can acquire the use of an indefinite number of new words, and on the basis of simple ”statements of what they mean,” is an amazing fact: it is the fact, I repeat, on which semantic theory rests. (Putnam, 1970 in Schwartz, 1977, p. 114).

How can one reconcile the importance of lists of features for meaning if one holds (T2), according to which content-related symbolic functioning is a societal practice of attention directing, and not a list of features?

Reply to objection 4: (T2) aims at explaining the basic nature of content-related symbolic functioning, rather than at specifying such functioning for a particular term. When we tell people the meaning of a term by a statement about features, we are specifying its symbolic functioning in regard to content, rather than explaining the basic nature of such functioning. One can specify things by describing their results, e.g. a pressure gauge, or a thermometer, uses the results of a phenomenon in order to specify a value for it. Similarly, we inform others about a societal practice of attention directing by telling them the results of the practice, i.e. by describing the object which the practice picks out. Therefore, even though knowing the meaning of a term is a matter of knowing how to engage in a societal practice of using the term to direct attention to certain kinds of things, the results of that practice can be used to specify which practice it is.

5. Theoretical payoffs of (T2)

The value of (T2) appears in its providing bases for treating traditional problems about linguistic meaning. I have grouped several such issues under three headings: Intentionality, Metaphysics of meaning, and Necessary and sufficient conditions.

5.1. Intentionality

The term “Intentionality” is used in two ways, for purposiveness, and for aboutness. The developmental psychology underlying (T2) links these two in regard to children’s acquisition of language. Their understanding of purposiveness is an important means to their learning aboutness: they understand goals in routine interactions, and come to see uses of words as contributing toward goals by having certain results, and in particular, they see a word as directing attention to a kind of ingredient in the interaction.

How is it that language is about things? This traditional question is central to understanding the nature of language, and (T2) provides at least part of an answer: a term is about a thing or action by being used in a societal practice of directing attention to the thing or action. This answer is in the spirit of Wittgenstein’s language-game view, but the latter was notoriously imprecise and undeveloped. (T2),
in contrast, is constructed as a general component in an established empirical theory in developmental psychology. Especially important factors in the empirical theory are the use of attention directing as a mechanism for picking out a part of an event, and the five aptitudes (cf. Section 2 above) of children which underlie their ability to learn practices of attention directing.

The account of intentionality (aboutness) in (T 2) is preferable, in my opinion, to explanations based on the aboutness of concepts or ideas, according to which concepts by nature are about things, and words acquire intentionality by being associated with a concept. Such accounts of aboutness go back at least to Locke, Berkeley, and Hume, and more recently appear in Ogden and Richards (1946) and Fodor (1998). I agree that some mental entities and processes are important for the content-related symbolic functioning of terms, but explaining such functioning mainly on the basis of concepts involves several problems.

A Moliere-type problem arises when one introduces concepts as internal symbols which are to explain how terms function as external symbols. Consider Moliere’s famous example: a sleeping pill makes you sleep because it has a hidden dormitive power. This appears parallel to the following: a term functions symbolically because of the hidden symbolic power of an associated concept. Such explanations are not useless — it may be true and important that an intrinsic feature of the pill makes you sleep, as contrasted to one’s trust of the doctor who prescribes the pill. For the parallel case of concepts, it is undoubtedly true that there are some intrinsic features of the human mind that enable it to understand and use meanings. Nevertheless there are three problems in acquiescing, at this stage of the development of psycholinguistics, in concepts as the main explanation of the symbolic functioning of terms. First, to encapsulate all mental abilities needed for language within the referent of the term “concept” seems like an oversimplification, especially when compared to the developmental approach discussed earlier, which lists several important psychological ingredients in language ability. Secondly, if one identifies the meanings of terms with concepts, then one appears to assume that such meanings exist wholly inside of heads because that is where concepts are generally taken to be (perhaps some take such a location as definitional for concepts). An assumption that meanings of terms are wholly inside of heads, however, runs contrary to the empirical studies of the Bruner–Tomasello tradition. These studies take the basic content-related functioning of symbols to be social and relational, involving many things that are not inside of heads (e.g. society, physical world contexts, events, and ingredients in events). Even if one were to reject all the work in the Bruner–Tomasello tradition, it would still be a mistake to assume a priori that meanings are wholly inside of heads, because questions about the nature and location of meanings are empirical. Thirdly, the question of what it is about concepts that explains their aboutness needs (eventually) to be answered if concepts are to explain the aboutness of words. Since words are representations outside of minds, it seems methodologically preferable first to study the more accessible external factors as they relate to aboutness, before postulating a hidden internal factor as the main explanation of aboutness for terms. Moreover, a focus on concepts in an explanation of the symbolic functioning of terms is likely to lead to a neglect of the roles of society and the
physical world in such functioning, and to viewing communication merely as a use one makes of language, rather than a basic source from which it springs.

5.2. Metaphysics of meaning

(T 2) assigns a metaphysical nature to meanings in that it takes terms to have content-related symbolic functioning in virtue of certain societal practices of attention directing to kinds of things. Meanings exist, then, as a particular type of societal practice. Such practices or conventions are abstract but naturalistic entities. We experience the practices and the attention directing, and also the ingredients in these, e.g. speakers and hearers, and objects and actions to which attention is directed. This naturalism contrasts to many twentieth-century philosophical approaches to meaning, especially formalistic ones, which appeal to non-naturalistic entities, e.g., functions of possible worlds, or Fregean senses, which Frege took to exist in a third realm distinct from the physical and the mental. Another way in which many formal theories treat meanings as less than naturalistic is by taking them to be context free. Contrary to this, (T 2) takes the basic content-related symbolic functioning of terms to depend on contexts, in that the practice of attention directing is to things in certain kinds of contexts. This allows the possibility of contexts for which the symbolic functioning of a term is not fixed, thereby allowing “open texture” for meanings, which will be discussed below.

Several prominent twentieth-century philosophers reject some traditional questions about the metaphysics of meanings, e.g. Wittgenstein, Austin, Quine, and Davidson. Davidson (1967) rejected metaphysical theories of meaning on the grounds that they contribute nothing to showing how meanings of sentences depend upon meanings of terms. Elsewhere I (1998) argue against this view by showing how (T 2) helps to explain how sentential meaning depends on that of terms. In his truth-conditional semantics, Davidson (1977) attempted to avoid metaphysics for meanings by taking the referential meaning of terms and phrases to be derivative from the truth conditions of sentences. Meanings and references which are entirely derived from the truth conditions of sentences, however, are indeterminate according to a famous argument of Putnam (1981). His argument is based on keeping the same truth conditions for all sentences in a language while systematically rearranging the references of terms. On this basis, Putnam concluded to a version of anti-realism (the view that knowledge is not about nature as it really is, independently of us, but instead about an inseparable blend of nature and our contributions to categories). Putnam’s argument, however, supposes the truth of the premise that all meanings and references of terms in a language are derived from the truth conditions of sentences. This premise assumes an unwarranted primacy for the illocutionary act of assertion, by taking all content-related symbolic functioning to be derivative from asserted sentences (which are the source of truth conditions). Contrary to this assumption, developmental research shows that the illocutionary act of requesting is at least as basic as assertion to children’s language. In addition, both kinds of symbolic functioning, that involving content and that involving illocutionary acts, are present in children’s language, and the empirical studies give no indication that either is wholly derived from the other, despite their association in language use.
One traditional metaphysical view of meaning was the “referential theory,” which took the meaning of a term to be what it refers to, e.g. “Fido” means Fido, and “dog” means dogs. One obvious problem in this theory is that “Fido” and “dog” retain their meanings even if their referents cease existing. I doubt that anyone now holds the referential theory, but many scholars (e.g. Putnam, 1975; Fodor, 1998) view the things that terms refer to as important to the terms’ meanings, though their explanations of this importance are arguably underdeveloped.27 The importance of the reference of terms, however, is explained by (T 2) in a simple but strong way: the referent of a term is what the term directs attention to within a certain societal practice. Whereas the traditional referential theory took lexical meaning to be the referent itself, (T 2) instead takes meaning to be a societal practice of directing attention to a certain kind of thing. Such a practice does not require the existence of that kind of thing. Nevertheless, in order to learn how to use terms which refer to kinds of things, one must first learn some terms that refer to kinds that exist in events with which one is familiar.

A late twentieth-century development in the metaphysics of symbolic functioning is semantic externalism, which I define as follows:

The content expressed by a symbol is constituted in part by factors external to a person using the symbol; in particular, it depends not just on what is inside people’s heads, but also on societal practices and the physical surroundings.

This view derives from work of Putnam (1970 in 1977; 1973 in 1977; 1975) in which he argued against taking the symbolic functioning of terms to depend only on what is inside of heads. Neither Putnam nor other advocates of semantic externalism, however, have developed an explanatory model for it, but (T 2) is such a model: it lays out the way in which terms have a power, based in a societal practice, to direct attention to features of things in contexts. Such symbolic functioning involves relations of society and things (or actions), just as semantic externalism requires.

The semantic externalism of (T 2) is compatible with its assigning important roles in symbolic functioning to psychological factors, namely, intentions in the sense of purposes, and attention directing. Neither of these is a purely internal psychological entity. Purposes show up in a person’s actions and reactions within a routine event, and attention directing is done by physical actions of using words or other symbols in relation to the context. Thus the important psychological factors in (T 2) are public, social, and to a large extent, physical.

By including relations to the environment, the metaphysics of symbolic functioning according to (T 2) are closely related to the “situated action” approach to artificial intelligence. The latter takes intelligent behavior to be a function of a thing’s interactions with its environment, as contrasted to resulting from a program containing,

27 Putnam (1975) took the sociality and indexicality of natural kind terms to be important to their referential functioning, but neither he nor his followers developed explanatory models for either of these features. Fodor’s (1998) view has no explanation of how concepts connect to appropriate entities in the external world except to say that the latter cause the former; he offers no details of the causality, or of how it yields reference.
independently of the environment, all information needed to produce such behavior. The explanation in (T 2) for symbolic functioning is interactionist in taking content to derive from relations to society and to the physical world. This amounts to "situated symbolic functioning," which runs contrary to taking concepts inside of heads as containing all that is needed for the symbolic functioning of terms. In this way, (T 2) also explains the stability of symbols as resulting from societal practices, as contrasted to resulting from concepts representing the essences of referents.

5.3. Necessary and sufficient conditions

Although traditional accounts of meaning often take necessary and sufficient conditions to be important, Wittgenstein (1953) and Putnam (1970 in 1977) argued strongly against this position. (T 2) makes no use of such conditions, or of any list of features, but instead takes symbolic content to be fixed by a practice of attention directing. When a child first learns a term (e.g. "ball") he undoubtedly uses features (e.g. it bounces, it can be thrown) of the object to which his attention is directed, but he need not have words for the features, and need not even be aware he is using the features. This appears parallel to our use of facial features to pick out individuals without being aware of how we do this, or perhaps even of what features we use.

The necessary and sufficient condition view of meanings runs contrary to Waismann’s (1968) notion of “open texture.” The latter takes there to be contexts for which the lexical meaning of a term is not fixed. For example, consider his story of a cat which grows to the size of a house, and then returns to its previous size: is it a cat? He argued that the meaning of the term “cat” provided no definite answer to this question. From this it follows that the term has neither necessary and sufficient conditions, nor an associated function across all possible worlds. (T 2) leads one to expect open texture, and explains it by treating meaning as fixed by referential relations to actual world events and contexts, insofar as the referent of a term is picked out of a routine event in which the child participates. If one considers applying a term to a new context that differs greatly from those in which it had been applied, the relevant societal practice may be indeterminate for the new context.

Knowledge of necessary and sufficient conditions contrasts strongly to implicit knowledge, which is often used to describe our knowledge of linguistic matters. (T 2) provides an explanation of the nature of this implicitness: know-how, as contrasted to knowing that, underlies our use of terms, and this implies no need for a user of a term to have explicit knowledge about either necessary and sufficient conditions or about any list of features of referent of the term.

6. Conclusion

An explanatory model for the basic symbolic functioning of terms in regard to content has been developed on the basis of the Bruner–Tomasello approach to developmental psycholinguistics. On this model, a term functions symbolically in virtue of a societal practice of using the term to direct attention to a certain kind of action
or feature within an event. Such social practices of attention directing involve nothing but naturalistic entities which are public and open to observation. Within such practices, perspectives and purposes play a natural role: people devise symbols they need or want, and in doing so, they slice events in various ways. The social practices also supply stability for content-related symbolic functioning even when the borders of natural things are sloppy.

Acknowledgements

An earlier version of this paper was presented on 11 April 2000, at the Max Planck Institute for Evolutionary Psychology in Leipzig. Michael Tomasello deserves special thanks not only for comments then, but also for giving me guidance in developmental psycholinguistics over several years. In addition, I am grateful to others at the institute for stimulating and helpful comments on my paper, and for numerous discussions of related issues during my sabbatical: among these are Heike Behrens, Josep Call, Malinda Carpenter, Ewa Dabrowska, Holger Diessel, Orin Gensler, Michael Israel, Elena Lieven, Mark Siebel, and Angelika Wittek. I would also like to thank Eileen Way and Changsin Lee for comments on other drafts. In addition, I am grateful to the Max Planck Institute and to the State University of New York at Binghamton for support of my sabbatical research and writing.

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