7

Children's developing understanding that words have conventional meanings and objects have conventional functions emerges in parent-child activity and conversation. Drawing on family conversations in everyday settings, the chapter explores an apparent paradox between a global analysis of conventionality as stable shared knowledge and a local notion of conventions as flexibly negotiated in activity.

Conventionality in Family Conversations About Everyday Objects

Maureen A. Callanan, Deborah R. Siegel, Megan R. Luce

Conventionality is central to theories of the development of language and thought. There is, however, some ambiguity in how conventionality is understood. Conventional meanings must be stable enough at a global level so that one can assume that others in the community know them, yet flexible enough that new meanings can be negotiated in the context of individual conversations. Paradoxically, then, *conventionality* sometimes refers to stable shared meanings (or even stodginess), while at other times it signifies flexible and arbitrary meanings, understood in context and modified as needed. This paradox must be carefully considered if we are to achieve clarity about how conventionality figures in children's developing understanding of language and action.

We discuss these contradictory senses of the term *conventional*, raising two key goals. First, we focus on how children develop an understanding of conventionality and of the conventional meanings used in their community. Developmental studies have investigated at what age children use the principle of conventionality (Clark, 1993; Diesendruck, 2005). Our goal is to ask more directly how this understanding comes about. The second, and related, goal is to focus on the actual social settings where shared meanings are negotiated and understood. Ironically, while conventionality focuses on shared meaning, it has been analyzed largely as a concept that is held in the mind of the individual who is attempting to understand and learn conventions (but see, e.g., Clark & Wong, 2002).



We first explore the paradox of stability and flexibility, as well as the developmental and sociocultural contexts in which children learn about conventionality. Next, we explore parent-child conversations, looking for clues about how parents may guide children in learning conventional word meanings and in learning that words are conventional. We then turn to a focus on parent-child conversations about artifact functions, looking for signs of how children are guided in understanding conventional functions of objects. Finally, we conclude by discussing the potential of our sociocultural and developmental approach for resolving the paradox between stable and flexible versions of conventionality.

Paradoxical Definitions of Conventionality: Stability and Flexibility

To delve more deeply into the apparent contradiction between stability and flexibility of conventional meaning, it is important to turn to Lewis's (1969/ 2002) classic philosophical analysis of convention as a solution to a class of problems of coordination. Lewis's insight is that conventions emerge when a number of individuals are motivated to coordinate their actions. He argues that conventions involve not understanding of a general rule but an ability to predict what others will do in a situation so that smooth coordination can result. He offers an example of two people planning to meet in a public place but who are unsure of exactly where to find each other. A single prior meeting can be enough, in Lewis's view, to lead the individuals to a prediction about a potential spot, and a successful prediction makes that location even more likely for the next prediction. Relatively few multiple meetings in the same spot can lead to an understanding of a conventional meeting place. Lewis talks about our knowledge of conventions as "knowledge confined to particular instances, taken one at a time" (p. 64). He argues that people use precedent and inferences based on knowledge about others' intentions to make these predictions.

Following Lewis's analysis, conventionality implies both shared (and somewhat stable) mutual knowledge and negotiation in local conversation and action. For example, a parent and child may agree to call a block a "car" in a particular play activity (Rakoczy, Tomasello, & Striano, 2005), even though that is different from the communitywide conventional meaning for the word. Very likely there is a continuum of conventional meanings, ranging from widespread conventions that are accepted by a whole community (perhaps reified in laws) to momentary agreed-on meanings. An example from the stable end of the continuum would be laws, such as driving on the right-hand side of the street. At the other extreme would be a conventional meaning that is decided on just for the purpose of a particular conversation or activity, such as using a penny as a pawn for a chess game when one pawn is missing (Bloom, 1996).

Between conventions as laws and conventions as momentary agreements are several steps along the continuum. Relatively close to the global

end of the continuum, for example, would be a shift that happens within a community based on adoption of one person's innovative action. For example, a news story discussed one Iowa woman's serendipitous discovery that "red hots" candies could be used instead of cinnamon in an apple pie (Edge, 2004). The woman's friends liked the pie, and more and more people in the community began using red hots until this became a regional favorite version of apple pie. Another example, closer to the local end of the continuum, is a case where a family adopts a novel meaning suggested by a young child. For example, presumably because she was told that her mother ate chicken at a particular business dinner, a child dubbed the next business dinner as a "chicken meeting," and the name stuck within the family. While this phrase would not be understood outside the family, it was a convention (and a convenient shorthand term) that the family used for many years. Our sense is that conventional meanings can fall anywhere along this continuum and that the likely position on the continuum varies depending on a combination of type of content or cultural norms (or both) regarding that type of content (e.g., see Schieffelin & Ochs, 1983).

A number of recent perspectives on representations of word meaning are consistent with this view. For example, Murphy (1997) argues that many words are polysemous and that the most parsimonious model of semantic knowledge is one that postulates a single core meaning along with subtle variations in meaning that are created and understood in particular contexts. Furthermore, some theorists have argued that the local agreements are far more crucial than global ones in determining the understanding of meaning (Barr, 2004). Thus, the appearance of common knowledge may emerge as a result of many local negotiations of meaning.

If meanings are so flexible, one might ask whether there is any meaning that would be considered unconventional. We would argue that it is difficult to characterize a meaning as conventional or unconventional except from the point of view of a particular individual. The same action or meaning that is conventional for one person is unconventional for another. Consider, for example, an English person using the word *boot* in the United States to refer to the trunk of a car. Or consider the many cases where norms of politeness are inadvertently violated by visitors to a community. Behaving in ways that are perfectly conventional in one's own community can be perceived by others as rude at worst and unconventional at best; examples are talking too much or too little, interrupting others' turns at talk, or being too passive. Given the relative nature of conventionality, then, meanings that violate local expectations will be seen as unconventional by those in the setting.

Developmental and Sociocultural Perspectives on Conventionality

A key issue is how it is that children come to understand conventional meanings and to understand that there can be multiple conventional meanings for

one word or artifact. Much of the literature on children's understanding of conventional meanings investigates the developmental time course of children's understanding of conventionality. Clark's (1993) principle of conventionality is argued to be a crucial piece of the early development of language understanding. Even in infancy, there is evidence that children have some understanding of the idea that people use the same words for the same objects (Henderson & Graham, 2005).

Our focus is on how these developmental changes may be supported or influenced by parents' conversations with children. We consider the possibility that parents' guidance may change from talk about what to call or how to use a particular thing (with younger children) to much more reciprocal negotiation of meaning (with older children). There are a number of ways that parents may provide subtle cues about conventional meanings, such as the use of generic language (Gelman, Coley, Rosengren, Hartman, & Pappas, 1998) as a way to mark for children that the immediate situation has importance beyond this one conversation. Also, Henderson and Sabbagh's work (2005) shows that parents sometimes give children subtle cues that a particular meaning should be considered conventional, whereas a different meaning may be idiosyncratic and not relevant to other people.

Ironically, much of the research on conventionality has largely ignored the notion that conventions are determined within local conversations. Hence, our second main theoretical issue addresses how conventionality comes to be understood within the social contexts of everyday life. Because conventions are based in attempts to coordinate behavior in individual interactions (Lewis, 2002), one would expect to find a great deal of variation in conventions across communities. Building on the sociocultural theories of Rogoff (2003) and others, we would argue that it is likely that children do not have a goal of learning conventions for their own sake. Children's goals are more likely to center around becoming part of the social group within which they are living. Learning conventions is part of communicating efficiently and becoming more like the group. There is evidence that parents may have a goal of teaching children the conventional (or correct) way to do things, however. And the importance of this goal may vary across different cultural communities.

Conventionality in Words

Conventionality is at the center of communication. For communication to be effective, there must be a referential symbol system that is shared among speakers (Lewis, 1969). We argue that this system necessarily includes both stable and flexible elements that work together to facilitate successful communication in global and local contexts.

Stability in Word Meaning. There is a sense in which word meanings have to show cross-situational stability. Once speakers agree on which arbitrary sounds should conventionally link with which referents, people can-

not change the word used for a given referent and expect others to understand their meaning. These conventions offer speakers a way to establish mutual understanding and a reasonable assumption that certain word forms will remain consistent over time (Clark, 1993).

Clark and Wong (2002) posit that understanding the conventional nature of words is a necessary precondition for children to begin using language and argue that children recognize the conventional nature of words in the very early stages of their language production (Clark, 1993). Recent studies on children's understanding of conventionality are beginning to illuminate ways that children attend to aspects of conventionality in communicative contexts. Young children begin symbol learning by accepting both gestures and verbalizations as referents, but by about two years old, children come to prefer words to gestures as referential symbols (Namy & Waxman, 1998; Woodward & Hoyne, 1999). Words come to hold a privileged place in communication, possibly because children begin to understand their conventional nature.

In addition, older children believe that there are some kinds of information about words that most speakers should know. Diesendruck and Markson (2001) demonstrated that three-year-olds assumed that people share knowledge of novel object labels but not of novel facts about objects. In Henderson and Graham's study (2005), two-year-olds appreciated that knowledge of object labels, but not individuals' preferences for objects, is assumed to be shared knowledge. Diesendruck (2005) provides evidence that three-to four-year-olds seem to understand that common nouns are generally known by speakers of the same language, whereas proper nouns are not. In determining which referents speakers are labeling, children seem to use information about aspects of conventionality and speakers' knowledge of words.

Research from the sociocultural tradition suggests that children's cognitive development is integrally tied to social practices and involves active participation of both adults and children (Lave & Wenger, 1991; Rogoff, 2003; Vygotsky, 1978). Based on this premise, we look to parent-child conversations and interactions as an important source of children's early learning (Callanan & Jipson, 2001).

Parents, as more knowledgeable members of the community, are in a position to communicate to children what the "correct" words are and may convey to children the need to conform to the conventions of the larger linguistic community. We may also ask whether the ways parents communicate with young children might guide their understanding that words are conventional in the stable sense. In a number of studies of young children playing with toys and reading books with parents, we found that parents provided information about conventionality as they naturally engaged in playing with and labeling objects (Callanan & Sabbagh, 2004; Luce & Callanan, 2006). Parents sometimes explicitly conveyed the conventional nature of words to children by pointing out that people call objects by certain names, as in, "That's called a radiator" (e.g., see Gelman, 2003, and Gelman, Coley, Rosengren, Hartman, & Pappas, 1998, for discussions of generic language).

More often, parents convey information about the conventionality of labels in more subtle ways. The parents in our studies often engaged in searching for the most appropriate label for an object—for example, "Is that a bucket loader?" "I think it's either a seal or a sea lion." These statements might suggest to children that there are stable, inflexible conventional labels that are shared among people and that one must strive to use the correct word. From this kind of conversation, parents may guide children toward an understanding of words as conventional symbols.

Flexibility in Word Meanings. Whereas word meanings must be relatively stable over time for effective communication, on the local conversational level, word meanings can be negotiated to reach mutual understanding. Within conversational contexts, speakers are likely to assume that others will use the conventional words, but speakers can agree to use an unconventional word as long as mutual understanding is achieved. For example, a parent and child may come to call a pacifier "num num," or in a given conversation they might refer to a toy with an idiosyncratic name (for example, referring to a plastic seal as "dogfish"). Indeed, the stability assumed in theories of conventionality might be somewhat of an illusion because words can be used and understood flexibly over time and across contexts (see Murphy, 1997).

The need to establish shared meaning is not solely to conform to conventions, but also for the purpose of communicating. Sociopragmatic views of language development (e.g., Akhtar & Tomasello, 2000) argue that children's task is not to abstract meanings from sounds, but to use the social communicative context to figure out what a speaker is talking about and doing. The more a person understands another's intentions, the more effectively he or she communicates. This is apparent in numerous studies where parents tune in to subtleties in children's intentions when communicating and modify their word choice based on knowledge about the child (e.g., Masur, 1997; Wales, Colman, & Pattison, 1983). Parents may often interpret their child's idiosyncratic utterance ("want num num") as expressing the intention for another adult ("she wants her pacifier"). In contrast, lack of shared experience or knowledge of children's meanings makes communication much more difficult (e.g., Tizard & Hughes, 1984). In short, communicating is a process in which speakers must align their word meanings to achieve understanding. Vygotsky (1987) states that "word meaning develops. When the child first learns a new word, the development of its meaning is not completed but has only begun" (p. 170).

Recent studies demonstrate that children are sensitive to contextual factors that influence the use of conventional labels. Bilingual Hebrew–English-speaking three-year-olds expected a monolingual Hebrew speaker to know the Hebrew names for common objects but not the English names (Diesendruck, 2005). The acceptance of words as conventional also depends on whether the speaker is a valid and informed member of the linguistic community (Sabbagh & Baldwin, 2001). When an adult speaker labeled an object and expressed

uncertainty about this novel label, three- and four-year-old children were less likely to learn the novel word than when the label was presented with certainty. This suggests that young children are sensitive to the knowledge status of speakers when determining whether a novel word is likely to be conventional.

Conventions are contingent on the context and goals of the activity in which they are used. In our studies, parents often labeled the same object with different words and often provided additional information that clarified their connection—for example, "This is a beluga. It's a kind of whale" (Callanan & Sabbagh, 2004). Parents often negotiated what to call an object—for example, "I think this is a seal or a sea lion" or "He is either a shark or a dolphin." Beginning around the age of two years, children were often active participants in this negotiation. This activity may guide children toward an understanding of the flexible nature of conventionality: although there are stable word forms that are likely to be used, two people can agree to use a different word for a given referent.

The degree to which parents allow for negotiation of word choice may be culturally variable. Whereas Western mothers may accept young children's early utterances as valid ("num num" for pacifier; "chicken meeting" for business dinner), adults in other cultures may not be as likely to accept or acknowledge the young child's idiosyncratic words or incorrect attempts at producing conventional words (e.g., Schieffelin & Ochs, 1983). There are perhaps limits to what kinds of utterances parents will accept. If a child calls the family dog "book," the child will likely be corrected, with the word *book* being rejected as a conventional label for the dog.

We observed differences in parents' negotiations of names with one- to two-year-old children in three toy contexts: toy vehicles, a baby doll and doll clothing, and a set of plastic sea creatures (Callanan & Sabbagh, 2004). With the doll and clothing, parents and children focused on talk about dressing and feeding the doll. With the toy trucks and cars, talk focused on driving the vehicles. In contrast, with the sea creatures, which also seemed to be the context where the parents were most unfamiliar with the labels, we found more focus on naming the animals and figuring out what kind of animal each was. Overall, 75 percent of the parents used more label negotiation when talking about the sea creatures than in the other contexts, suggesting that the perceived goal of the activity plays a role in the extent to which conventionality of language is highlighted. Whether parents see the activity as being about teaching the names of objects (as with the sea creature toys) or about using language to communicate about another activity (as with the dressing dolls and driving vehicles) may affect how strongly conventionality might be conveyed in conversation.

Rather than forming a stable representation of the conventional label for each particular object, children may pick up cues about the need to attend to a variety of situational and conversational factors when deciding what an object is called. Understanding conventionality may be a process carried out in interactions with other speakers, especially parents. We will

return to this idea; first, we turn to an analysis of the stability and flexibility of conventional meanings of artifacts.

Conventionality in Artifacts

Conventionality has mainly been discussed in the language literature but we argue, in line with Lewis (1969), that such a notion can also be extended to other tools, notably people's understanding of human-made artifacts. To date, two theoretical approaches have been quite prominent in exploring people's conceptions of artifacts: essentialism and activity theory. Research in an essentialist framework holds that the identity of a kind is understood in terms of core or essential features (Gelman, 2003; Medin & Ortony, 1989). On the other hand, Vygotsky's insights (1978) about the importance of objects as tools for thought shift focus from the object itself to its place as a component of a culturally embedded activity system. Similar arguments can also be found in the fields of archaeology and material culture, where there has been a shift from the study of "lifeless objects" to the acknowledgment of artifacts' complex social nature and sociocultural embeddedness (Lemonnier, 1986). Based on the work of Vygotsky, Leont'ev (1981) expanded the notion of tools in activity and argued that artifacts must be understood and studied not as stand-alone objects but as part of an activity with motives and goals (see also Engeström, 1999). Pulling from activity theory, we examine the conventional nature of artifacts, the phenomena of stability and flexibility in artifact concepts, and children's developing notion of these complex objects.

Stability of Artifact Meanings. As with language, conventional meanings for artifacts are generally viewed as somewhat stable. Essentialism approaches focus on the stability of an artifact's function, usually based on the intention of the designer (German & Johnson, 2002; Kelemen, 1999: Matan & Carey, 2001) and the core features of kinds. While individuals may not explicitly know the core features (or essence) of a kind, this approach posits that people have a belief in their existence (Medin & Ortony, 1989). One could, for example, change the outward appearance of a dog and it would still be seen as a dog because it retains its essence (Keil, 1989). Instead of a biological or chemical essence, artifacts' essences are seen as social and psychological (Keil, 1989). Researchers taking the design stance approach (appropriated from Dennett, 1987) propose that we understand an artifact in terms of the function intended by the inventor (Bloom, 1996; German & Johnson, 2002; Kelemen, 1999; Matan & Carey, 2001).

We argue that although artifacts are typically used in line with the inventor's intentions, this is not necessarily what is core to people's understanding of these objects. Emphasizing the inventor's intention seems to ironically ignore the social and cultural nature of these objects by assuming that they carry meaning in isolation from the larger activity system where they are experienced. In contrast, activity theory views artifact concepts as stable because they are tools involved in shared cultural practices (Lave & Wenger, 1991;

Leont'ev, 1981, Rogoff, 2003). Within a community of practice, there tends to be regularity in the activities of the members (also called *habitus* by Bourdieu, 1977), leading to a shared, or conventional, meaning for the artifact.

We argue that in everyday parent-child interactions, children learn the functions of artifacts by observing and participating in actions with those objects (Siegel & Callanan, in press). How might they learn that these meanings go beyond the immediate context and can be generalized to others in the community and other artifacts of that kind? Parents may verbally or nonverbally suggest to their children that there is a stable or conventionally accepted use for a given artifact. For instance, parents may use generic phrases to refer to an artifact in the immediate context, as in, "A hammer is for fixing things" (Gelman et al., 1998). They may also emphasize certain uses for an artifact and correct the child's unconventional use, thereby suggesting to the child that there is a correct or conventional way to use it.

Based on these ideas, we observed parent-child conversations and interactions involving artifacts at the Children's Discovery Museum of San Jose. Observations centered on prototypes for a geometry-focused exhibition called Secrets of Circles. Two exhibits using light-pen technology allowed visitors to draw circles on a light-reflective table, where the drawings would fade after a few seconds. One of the tools available was a compass. We asked how parents might convey to children, both verbally and nonverbally, that this object has a conventional function. We coded parents' references to conventional functions through verbal use of generic phrases (for example, "A compass is for drawing circles"), more subtle references to a conventional function ("You're supposed to do this with it" while drawing), as well as clear nonverbal demonstrations of the "correct" function (drawing a circle by holding one leg of the compass still and rotating the other around in a smooth motion). For unconventional functions, we coded both verbal references to unconventional uses (for example, "You can write your name with it"), as well as modeling of idiosyncratic uses. Parents were more likely to talk about and use the compass conventionally (64 percent of families) than unconventionally (34 percent of families), suggesting that parents may take advantage of everyday interactions to inform children about the conventional functions of unfamiliar objects.

Flexibility in Artifact Meaning. Artifact and word meanings gain utility from being sufficiently stable for a community to share a common understanding. Due to their physical nature, artifact meanings may be more constrained than those of words, but a closer look at local interactions reveals variation and flexibility in artifact meaning and use. Thus, artifacts, like words, may merely give the illusion of having stability in meaning, highlighting the tension between stability in meaning at one end of the continuum (the community level) and variation at another end of the continuum (the local level).

Flexibility in artifact meaning can be noted across communities and across time within one community; even a single individual may think about multiple conventional meanings for the same artifact depending on

the activity or context. Within a community, Bourdieu (1977) has suggested that the statistical regularities in our actions and conceptions result in social consensus and that members perceive this shared meaning as objective or as fact. This may result in an illusion of stability as well as objectivity.

Recognition of the inherent flexibility in artifact meanings is often apparent in humor. For example, in the film The Gods Must Be Crazy, a Coke bottle drops from an airplane into the Kalahari desert, and a small group who sees this event treats the bottle as a sacred object that must be returned to the gods. Di Yanni and Kelemen (2005), taking the design stance, suggest that the humor in the film comes from the idea that this use of a Coke bottle is invalid, differing as it does from the inventor's intention. Following Bourdieu, we would argue instead that while this use is unconventional in our culture, it is a valid and conventional meaning within the fictional Kalahari community depicted in the film. Similarly, Western culture's meanings for a number of objects and activities might engender humor (or even anger) in members of other cultural groups. Perhaps it would be amusing to Indian women, for example, that nose rings are seen as a sign of rebellion and counterculture among adolescents in the United States, given that they are a common adornment with a variety of shared meanings used by women in India.

If artifact functions are understood in terms of shared agreement by a community, they must also be understood to change with the evolving needs and activities of the community, taking on new functions or different meanings as the community changes. Siegel and Callanan (2006) found that when one person was described as using an artifact differently than the designer intended, it did not change people's conception of the artifact. However, when many people were described as using it in a new way, participants were more likely to depart from its designed function and report that the object's true function was the alternative one. Hence, meanings may be stable and robust in the face of deviations from the norm, yet as the community's use of an artifact changes, so may people's reasoning about these objects. Dennett (1987) also discusses the idea of an artifact adopted by a different culture for a new purpose and poses the philosophical question of when the artifact's meaning shifts to a new conventional meaning. There is no clear answer to this question, but we would argue that rather than an overall shift in inherent meaning of the object, there are variations in meaning depending on the perspective of the person using the artifact.

Furthermore, an individual may use an artifact in different ways, depending on the goal and context of the activity. We investigated how children might learn about artifacts' shifting meanings depending on the context. In the same study of circle-drawing museum exhibits already noted, we compared parents' talk and behavior around two different exhibits that included a compass. One context (the Round Table) contained a number of different ways of using the light pens to draw circles, including a spinning disk where

one could hold the light pen in one spot and create a circle. In the second context (the Compass Table), only compasses were available, including a large, fixed compass that afforded only moving one arm around to draw a circle. We found that parents were more likely to talk about and use the compasses conventionally at the Compass Table (79 percent of families) than at the Round Table (56 percent of families). This suggests that children may sometimes encounter different information about meanings and functions of artifacts, depending on the larger activity context. In another study, Siegel and Szechter (2006) found that adults talk about the same photographs differently in a photo album versus in a museum setting. Again, conceptions of artifacts seem to vary depending on the context or activity.

The notion of flexibility in the meaning of artifacts is consistent with the sociocultural approach we have adopted (Vygotsky, 1978; Wertsch, 1998). Activity theory and sociocultural theory emphasize that objects are dynamic and variable in meaning. As an artifact is encountered in different contexts and is used for different purposes, it becomes part of a different activity system with its own motives and goals. These changes occur at the local level of activity, resulting in variability in meaning across settings. But these changes also manifest at the community level, with the apparently stable concept slowly evolving. As with the social pragmatic view of language, the meaning is not in the object itself, but in its use by members of the community during meaningful activities.

Local to Global: Development of Conventionality Within Activity and Conversation

We have argued that conventions, and the conventional meanings of both words and artifacts, are simultaneously defined by both their stability in meaning and their variability in meaning. Yet it is not clear how a stable concept might result from a variety of local negotiations of meaning. We suggest that stability, or more accurately the illusion of stability, apparent at the community or global level rises out of local interaction and negotiation.

Work originating with Lewis's analysis (1969) has claimed that members within a community, through their participation in local-level interactions, build a common knowledge or a mutual understanding. More recently, researchers have questioned the need for common knowledge in the creation of stable conventional meanings (Barr, 2004).

Malt and Sloman (2004) examined links between local and global meaning, finding that when an object label is introduced into a conversation, adult conversational partners establish precedents for how to name the object. The chosen name is subsequently carried into future conversations, with new partners establishing a coordination equilibrium or stable conventional word throughout the entire linguistic community. Similarly, Barr (2004) suggests that conventions emerge not from individuals' attempting

to explicitly match the global stable convention in their community, but from local interactions where individuals negotiate meaning in the conversation at hand with the collective goal of coordinating perspectives and actions. This view therefore argues against the necessity for any explicit global representation of community behavior or conventions in forming a stable convention (though Barr, 2004, does suggest that meta knowledge of or reflection on emerging conventions may play a role).

Barr demonstrated with computer simulations that global conventions are best adhered to when individuals adjusted their behavior based on local rather than global communitywide information. Thus, "common knowledge is not necessary for the emergence of symbolic conventions. . . . Instead . . . semantic representations are coordinated through use; that is, as a by-product of individual attempts at coordination among speakers and listeners which are distributed over time and across the language community" (Barr, 2004, p. 939). What seem like stable global conventions at the community level may actually be flexible negotiations that are carried out among speakers across time and contexts. In this view, people (including children) do not need to strategize, reason about, or call to mind a representation of global common knowledge (or conventions). This approach questions Clark and Wong's idea (2002) that young children need to develop knowledge of conventionality in order to begin learning language.

Sociocultural perspectives suggest that conventionality is not something that exists independent of people in communicative interactions. It is not something that is discovered; rather, it is played out in communicative interactions. We suggest that this relationship between local-level interactions and global-level conventions can be applied to both word meanings and artifact concepts. There is a great deal of evidence that children are motivated to participate in the practices of their community from an early age (Rogoff, 2003; Tomasello, Carpenter, Call, Behne, & Moll, 2005). Furthermore, infants seem to perceive human action as goal oriented as early as six months (Woodward, 1998), and by eighteen months, they imitate the intended goals of others rather than an accidental action (Meltzoff, 1995). Children not only learn what the goals of others' actions are, they also learn the means to achieve those goals through imitative learning (Tomasello, 1999). In children's early experiences, they will perhaps internalize the practices and meanings of their community through interaction with more competent community members, especially parents. As children grow and participate in multiple communities, they appropriate their own meanings, as well as gain more experience with the meanings being used by people who interact with them. There is evidence in our data that parents are sensitive to the age of the child in the ways that they communicate about conventional meanings and that the focus on conventional meanings may be stronger as children get older.

New conventional meanings are constantly being negotiated at the same time that children are becoming familiar with the currently shared conventional meanings. We argue that it is not the case that children have a conventionality principle or acquire the conventional meanings; rather, conventionality is a process that constantly takes place within local activity. This should not be seen as a stagelike process toward a single set of conventional meanings, but more of a dynamic, slowly evolving, and constantly changing set of patterns of meaning. Lewis (1969) distinguishes people using conventions from those of us who study the use of conventions: "We who *do* generalize . . . in order to give a general description of that convention" (pp. 64–65). He argues that it is perhaps those who look from outside who see a stable general rule, more than the people who are in the midst of coordinating their actions. As children engage with members of their communities, they negotiate meaning of words and artifacts. We suggest that by doing this, children are both helping to create interpersonal understanding and participating in the ongoing process of evolving cultural meanings.

References

- Akhtar, N., & Tomasello, M. (2000). The social nature of words and word learning. In R. M. Golinkoff et al. (Eds.), *Becoming a word learner: A debate on lexical acquisition* (pp. 115–135). New York: Oxford University Press.
- Barr, D. J. (2004). Establishing conventional communication systems: Is common knowledge necessary? *Cognitive Science*, 28, 937–962.
- Bloom, P. (1996). Intention, history, and artifact concepts. Cognition, 60, 1–29.
- Bourdieu, P. (1977). Outline of a theory of practice. Cambridge: Cambridge University Press. Callanan, M. A., & Jipson, J. L. (2001). Explanatory conversations and young children's developing scientific literacy. In K. S. Crowley & D. Christian (Eds.), Designing for science: Implications from everyday, classroom, and professional settings (pp. 21–49). Mahwah, NJ: Erlbaum.
- Callanan, M., & Sabbagh, M. (2004). Multiple labels for objects in conversations with young children: Parents' language and children's developing expectations about word meanings. *Developmental Psychology*, 40, 746–763.
- Clark, E. V. (1993). *The lexicon in acquisition*. Cambridge: Cambridge University Press. Clark, E. V., & Wong, A. D. (2002). Pragmatic directions about language use: Offers of words and relations. *Language in Society*, *31*, 181–212.
- Dennett, D.C. (1987). The intentional stance. Cambridge, MA: MIT Press.
- Diesendruck, G. (2005). The principles of conventionality and contrast in word learning: An empirical examination. *Developmental Psychology*, 41, 451–463.
- Diesendruck, G., & Markson, L. (2001). Children's avoidance of lexical overlap: A pragmatic account. *Developmental Psychology*, 37, 630–641.
- Di Yanni, C., & Kelemen, D. (2005). *Using a bad tool with good intention: How preschoolers weigh physical and intentional cues when learning about artifacts.* Unpublished manuscript. Edge, J. T. (2004). *Apple pie: An American story.* New York: Putnam.
- Engeström, Y. (1999). Activity theory and individual and social transformation. In Y. Engeström, R. Miettinnen, & R. Punamaki (Eds.), *Perspectives on activity theory*. Cambridge: Cambridge University Press.
- Gelman, S. A. (2003). The essential child: Origins of essentialism in everyday thought. New York: Oxford University Press.
- Gelman, S. A., Coley, J. D., Rosengren, K., Hartman, E., & Pappas, T. (1998). Beyond labeling: The role of parental input in the acquisition of richly structured categories. *Monographs of the Society for Research in Child Development*, Serial No. 253, Vol. 63, No. 1.

- German, T. P., & Johnson, S. C. (2002). Function and the origins of the design. *Journal of Cognition and Development*, 3, 279–300.
- Henderson, A., & Graham, S. A. (2005). Two-year-olds' appreciation of the shared nature of novel object labels. *Journal of Cognition and Development*, *6*, 381–402.
- Henderson, A.M.E., & Sabbagh, M. A. (2005, April). *Parents are sensitive to their own knowledge when providing novel object labels to preschoolers.* Poster presented at the biennial meetings of the Society for Research in Child Development, Atlanta, GA.
- Keil, F. C. (1989). Concepts, kinds, and cognitive development. Cambridge: Cambridge University Press.
- Kelemen, D. (1999). The scope of teleological thinking in preschool children. *Cognition*, 70, 241–272.
- Lave, J., & Wenger, E. (1991). Situated learning: Legitimate peripheral participation. Cambridge: Cambridge University Press.
- Lemonnier, P. (1986). The study of material culture today: Toward an anthropology of technical systems. *Journal of Anthropological Archaeology*, 5, 147–186.
- Leont'ev, A. N. (1981). The problem of activity in psychology. In J. V. Wertsch (Ed.), *The concept of activity in Soviet psychology*. Armonk, NY: M. E. Sharpe.
- Lewis, D. K. (2002). Convention: A philosophical study. Cambridge, MA: Harvard University Press. (Original work published 1969.)
- Luce, M. R., & Callanan, M. A. (2006). Parents' object labeling: Links to conventionality of word meaning.
- Malt, B., & Sloman, S. (2004). Conversation and convention: Enduring influences on name choice for common objects. *Memory and Cognition*, 32, 1346–1354.
- Masur, E. F. (1997). Maternal labeling of novel and familiar objects: Implications for children's development of lexical constraints. *Journal of Child Language*, 24, 427–439.
- Matan, A., & Carey, S. (2001). Developmental changes within the core of artifact concepts. *Cognition*, 78, 1–26.
- Medin, D., & Ortony, A. (1989). Psychological essentialism. In S. Voosniadou & A. Ortony (Eds.), Similarity and analogical reasoning (pp. 179–195). Cambridge: Cambridge University Press.
- Meltzoff, A. N. (1995). Understanding the intention of others: Re-enactment of intended acts by 18-month-old children. *Developmental Psychology*, *31*(5), 838–850.
- Murphy, G. L. (1997). Polysemy and the creation of novel word meanings. In T. B. Ward, S. M. Smith, & J. Vaid (Eds.), *Creative thought: An investigation of conceptual structures and processes* (pp. 235–265). Washington, DC: American Psychological Association.
- Namy, L. L., & Waxman, S. R. (2002). Patterns of spontaneous production of novel words and gestures within an experimental setting in children ages 1;6 and 2;2. *Journal of Child Language*, 29, 911–921.
- Namy, L. L., & Waxman, S. R. (1998). Words and gestures: Infants' interpretations of different forms of symbolic reference. *Child Development*, 69, 295–308.
- Rakoczy, H., Tomasello, M., & Striano, T. (2005). On tools and toys: How children learn to act on and pretend with "virgin objects." *Developmental Science*, 8(1), 57–73.
- Rogoff, B. (2003). *The cultural nature of human development*. New York: Oxford University Press.
- Sabbagh, M., & Baldwin, D. (2001). Learning words from knowledgeable versus ignorant speakers: Links between preschoolers' theory of mind and semantic development. *Child Development*, 72, 1054–1070.
- Schieffelin, B. B., & Ochs, E. (1983). A cultural perspective on the transition from prelinguistic to linguistic communication. In R. M. Golinkoff (Ed.), *The transition from prelinguistic to linguistic communication* (pp. 115–131). Mahwah, NJ: Erlbaum.
- Siegel, D. R., & Callanan, M. A. (in press). Artifacts as conventional objects. Journal of Cognition and Development.

- Siegel, D. R., & Szechter, L. E (2006). *Are photographs snapshots or works of art?* Poster presented at the Jean Piaget Society, Baltimore, MD.
- Tizard, B., & Hughes, M. (1984). Young children learning. Cambridge, MA: Harvard University Press.
- Tomasello, M. (1999). The cultural ecology of young children's interactions with objects and artifacts. In R.F.E. Winograd, & W. Hirst (Eds.), *Ecological approaches to cognition: Essays in honor of Ulric Neisser*. Mahwah, NJ: Erlbaum.
- Tomasello, M., Carpenter, M., Call, J., Behne, T., & Moll, H. (2005). Understanding and sharing intentions: The origin of cultural cognition. *Behavioral and Brain Sciences*, 28, 675–735.
- Vygotsky, L. S. (1978). Mind in society: The development of higher mental processes. Cambridge, MA: Harvard University Press.
- Vygotsky, L. S. (1987) Thinking and speech. In R. W. Rieber & A. S. Carton (Eds.) and N. Minick (Trans.), *The collected works of L. S. Vygotsky* (Vol. 1). New York: Plenum Press.
- Wales, R., Colman, M., & Pattison, P. (1983). How a thing is called—A study of mothers' and children's naming. *Journal of Experimental Child Psychology*, 36, 1–17.
- Wertsch, J. V. (1998). Mind as action. New York: Oxford University Press.
- Woodward, A. L. (1998). Infants selectively encode the goal object of an actor's reach. *Cognition*, 69, 1–34.
- Woodward, A. L., & Hoyne, K. L. (1999). Infants' learning about words and sounds in relation to objects. *Child Development*, 70, 65–77.

MAUREEN A. CALLANAN is professor of psychology at the University of California, Santa Cruz. She studies children's language and cognitive development in the context of family conversation and activity.

DEBORAH R. SIEGEL is a doctoral student in psychology at the University of California, Santa Cruz. She is interested in adults' and children's developing understanding and use of artifacts in a social context.

MEGAN R. LUCE is a doctoral student in psychology at the University of California, Santa Cruz. She is interested in the development of children's language and scientific thinking through everyday interactions with parents.