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Things Are What They Do: Katherine Nelson’s Functional Approach to Language and Cognition

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This article attempts to summarize Katherine Nelson’s theoretical and empirical contributions to the ontogenetic study of language and cognition. Nelson’s approach has consistently emphasized the function of language and linguistic concepts in children’s larger conceptual and social lives and, conversely, how children’s emerging understanding of the function of linguistic symbols in larger conceptual and social structures makes language acquisition possible in the first place. This approach has led to an especially fruitful body of theoretical and empirical work.

Suppose a Martian landed on Earth, came across a traffic light, and wanted to know what it was. The Martian could observe its blinking colored lights, open it up and inspect the electrical wiring and light bulbs inside, and she could even examine it with an EEG or MEG to measure the amount of electrical activity in its various subcomponents. However, to know what a traffic light is, the Martian will at some point need to know about traffic. That is, she will need to know about what the traffic light does, including such things as why people drive vehicles in the ways that they do and why this activity needs to be regulated in the ways that it is. Said still another way, the Martian will need to know what functions the traffic light serves in the larger cultural activities and events in which it is embedded.

Consistently throughout her scientific career, Katherine Nelson has argued that a human concept, especially a linguistically encoded concept, is similar to a traffic light—an artifact made by human beings for human purposes. It is, thus, similar to all artifacts, defined by its function in a more encompassing conceptual system.
adapted to patterns of events and sociocultural activities in the human world. However, Nelson’s consistency of focus has actually evolved through three periods in which she emphasized, in turn, the crucial role of (a) function (e.g., Nelson, 1974), (b) events (e.g., Nelson, 1985, 1986), and (c) culture (e.g., Nelson, 1996). The theoretical progression embodied in these three perspectives has resulted in an ever-more articulated account of many aspects of human cognitive development, but Nelson has paid special attention at all times to the complex and changing relations of language and cognition. In this article, I will try to explicate Nelson’s approach to language and cognitive development by working through—briefly and in turn—each of these three perspectives.

**FUNCTION**

It has been known since Plato that the common sense view of concept formation has a logical problem. The common sense view holds that people form concepts simply by noticing similarities among things and thereby extracting some commonality, which constitutes the concept. The problem is that any given set of things has innumerable many similarities, and the concept-forming individual encounters these exemplars one at a time over time without any guidance about what to pay attention to. Therefore, when encountering the initial potential exemplars of a concept, the individual must already know what is the dimension of similarity to which he or she must attend or else he or she will become lost in the maze of possibilities at the outset. The point is that a totally bottom-up approach in which an individual person looks for similarities in a totally naive and unstructured way simply cannot work. It founders on the logical problem of circularity, because the concept to be formed must be implicitly presupposed if the individual is to focus his or her attention appropriately in its encounters with the initial potential exemplars.

The solution to this logical problem is to get some top-down processes working in concert with bottom-up processes. For example, Barsalou (1988) documented that people can form concepts based on goals, including ad hoc, temporary goals. Thus, a concept of “things to take on a picnic” would include such diverse items as fruit, a blanket, and a bottle opener, which all make sense because, and only because, people want to do certain kinds of things on picnics. More generally, Murphy and Medin (1985) argued that it is in terms of implicit theories that people form the vast majority of their concepts because such theories provide reasons for underlying similarities among exemplars. People’s theories about the way things work tell them what to pay attention to and thus form the basis of the concept. Thus, a traffic light is a mechanical device that directs traffic in certain ways for certain purposes, and to decide if a particular thing in the world—for example, a device observed at intersections on Mars—is or is not a traffic light requires some judgements based on what this device does and how it does it.
Katherine Nelson saw all of this in the early 1970s. In her article in *Psychological Review* (Nelson, 1974) she proposed that children’s first linguistic concepts derived in a straightforward manner from their already formed prelinguistic concepts. These prelinguistic concepts derived from children’s understanding of what one can do with an object and what that object can do. This formed the functional core of the concept, whereas perceptual features were used to identify instances of the concept subsequently. In Nelson’s extended example, she proposed that for children “ball” indicates things you can roll or bounce (among other things), and one could reliably identify balls by their round shape. Even in this early formulation, children’s concepts were not conceptualized just in terms of the child’s own actions (à la Piaget) but in terms of the functional relations the object had to other things in the environment as well.

This hypothesis made two major predictions. The first was that children’s early word meanings would be based on function rather than form. A plethora of studies by Nelson and many other researchers tested this hypothesis, although sometimes with an incomplete understanding of the theory (see Nelson 1985, 1996, for thorough reviews). Some studies looked for word meanings based on functions the child could not possibly understand, and others took as evidence against the theory the fact that children notice new instances of a concept on the basis of perceptual features—when, in fact, the theory only claimed that functional features were the core of the concept. More recently, solid evidence for this proposal has come from a series of studies in which Kemler Nelson and colleagues (e.g., Kemler Nelson, Russell, Duke, & Jones, 2000) taught 2-year-old children novel names for novel artifacts that have novel functions—with these functions being related causally to perceptible aspects of the objects’ physical structure. These researchers then investigated how children extended these names to new objects and found that, given only minimal experience with the new objects, children generalize the names in accordance with the objects’ functions. Kemler Nelson et al. (2000) concluded that “two-year-olds name by function when they can make sense of the relation between the appearances and functions of artifacts” (p. 1271).

This aspect of the theory has also been upheld by the theoretical work of Mandler (2000) who argued that something is defined most fundamentally by what it does (e.g., a traffic light or a dog), with perceptual features serving an identifying function only. Based on a variety of her own studies as well as those of others, Mandler concluded that such conceptual categories are very different from the simple perceptual categories often studied in infants and nonhuman animals:

Infants as young as 3 months of age form perceptual prototypes of objects … [by] pulling out the main factors or principle components being presented … Crucially, forming these kinds of perceptual categories or prototypes occurs without attention or intention and does not require conceptualization. Conceptual categorization, on the other hand, is concerned with setting up kinds, that is, with formulating what sorts
of things dogs or tables are … This is a fundamental human capacity that differs from
the ability to tell one thing apart from another … As [infants] begin to encounter ani-
mals, vehicles, furniture, utensils, and so forth, they must form some idea of the
meaning of these things, in particular characterizing the roles they play in events. The
core of concept construction insofar as objects are concerned is characterizing what
they do or what is done to them. (pp. 7–8)

The second prediction of the functional core hypothesis was that the child’s early
linguistic concepts were initially so bound up with functional knowledge that he or
she would have trouble decontextualizing them for use in new situations. This hy-
pothesis has also suffered from some misunderstandings. For example, Barrett, Har-
riss, and Chasin (1991) found that children soon after their first birthdays generalize
many of their earlier linguistic concepts beyond the initial learning contexts. How-
ever, these generalizations only concern the assimilation of novel objects to existing
object concepts on the basis of perceptual similarity, which is not relevant to the issue
of whether children can use their early words inside different functionally defined
events. The fact is that Nelson’s hypothesis that early words are “event bound” has
never really been tested appropriately (i.e., with some reasonably rich definition of
event), and indeed there are a multitude of observations that many of children’s early
words are event bound (e.g., Barrett, 1983). In any case, this feature of the theory is
not inviolable, as Nelson (1996) herself clearly stated; children can in some cases
generalize their concepts to novel events on the basis of only a few, or even just one,
instance—if their event knowledge is of the right type.

Nelson went on to apply the very rich notion of function in a number of other cre-
ative ways, mostly involving the communicative or discourse function of linguistic
concepts. First, Nelson’s (1973) well-known analysis of individual differences in
early language relied crucially on the notion of communicative function. In this case,
Nelson proposed that some children generalize and understand the communicative
function of words to be mainly referential, so they use them most often to simply
name things. Other children come to understand the main function of words as ex-
pressive, so they use them most often to direct the attention or behavior of others. Al-
though subsequent research has shown that these two types are not mutually exclu-
sive—some children have nearly equal numbers of words used in each of these
functions—it is still the case that there are children at each end of the continuum, and
research into the reasons for their distinctive uses of language has yielded interesting
insights into the nature of individual differences of language acquisition in general
(for reviews, see Bates, Bretherton, & Snyder, 1988; Nelson, 1981; Shore, 1995).

In another well-known application of the theory, Nelson (1976) looked at chil-
dren’s early acquisition of adjectives. She identified three discourse functions in
the way that children used words that adults would call adjectives: (a) as predic-
tions in utterances such as “This is big,” (b) as modifiers in utterances such as “The
big boy hit me,” and (c) as classificatory modifiers in utterances such as “The baby
most interesting findings of this study was that 1- to 2-year-old children used different sets of specific words for these different functions. When Nelson looked at the independently coded words used in each of these three communicative functions, she found that more than 80% of the predications used by the less linguistically advanced children involved temporary states of objects or animate beings (e.g., broken, hurt). Only the more advanced children predicated a more diverse set of adjectives such as size, color, or descriptive properties. In contrast, children’s modificational uses of adjectives mostly concerned descriptive properties (e.g., big, little) or evaluative properties (e.g., pretty, bad) from the beginning. For any given child there was little overlap in the specific words used in these three functions, Nelson proposed that young children do not have a single class of adjectives, but rather they have three classes. The words are in classes depending on what they do communicatively. Similarly, and more recently, Pine and Lieven (1997) reported that young children use the definite and indefinite articles a and the with completely different sets of nouns.

Along the same lines, Nelson, Hampson, and Shaw (1993) looked more deeply into the well-known finding that English speaking children’s early vocabularies are dominated by nouns. Once again, they looked more carefully at the specific words used and found some surprises. Specifically, they found that only about half of them were the prototypes that most theorists had in mind; that is, basic-level object categories (BLOCs) such as dog and chair—things you can hold or bump into. Just as frequent were nominals that did not refer to such tangible things (XBLOCs) such as breakfast, kitchen, plastic, kiss, toy, lunch, light, park, doctor, night, and party. This observation is significant because many theorists (e.g., Gentner, 1982) have claimed that the noun bias results from the fact that nouns indicate concrete objects, and concrete objects are more readily isolated and identified than actions and relations. This would not seem to hold for XBLOCs. Nelson’s observations in this regard thus serve, once again, to focus our attention on the specifics on how different pieces of language function for young children—for example, to categorize objects, as in BLOCs, or to identify events, locations, and so forth, as in XBLOCs—even when they are from the same category in adult language.

As another part of this investigation (and treated in more detail by Nelson, 1995), Nelson identified a number of words in children’s early vocabularies that could be used as either nouns or verbs. These so-called dual-category words included such common things as bite, kiss, drink, walk, hug, help, and call. Many children use some of these words for both functions, and most current theories of word learning and language development, or both, have basically no account of how they could do this, because they are based on the idea that children use form,
and not function, as the starting point for category formation. Nelson’s account was, quite simply, that young children often understand in context the different function being played by a given word (e.g., to refer or to predicate), and so in an important sense, the activity of drinking is a different concept from the thing being drunk, despite the fact that they are often associated with the same phonological sequence. In this case, it is hard to know how children could do this at all—how they could learn the two different meanings of drink—if function were not at the foundation of their linguistic representations.

Finally, Levy and Nelson (1994) investigated children’s early acquisition of causal and temporal words, which most theories of lexical acquisition simply ignore. Examining children’s earliest uses of such terms as because, tomorrow, today, morning, pretty soon, yesterday, and now, they found that children only use these terms in relatively formulaic phrases and for the same functions that their parents use them for. Thus, they hypothesized that in this case children’s production of linguistic items preceded their comprehension, in the sense that their earliest uses were bound to specific discourse contexts and did not display adult-like flexibility of use. These words served discourse functions only, and a fully adult-like understanding awaits children’s encounters with these words in a fuller range of functional contexts.

Even this brief account of this small subset of Nelson’s empirical studies demonstrates that some aspects of early language acquisition can only be explained with explicit reference to the notion of function—both in the sense that underlying concepts have a functional core and in the sense that linguistic categories are formed on the basis of communicative–discourse function. These are both ideas on the cutting edge of current thinking about the relation of language to cognitive development (e.g., see the recent work of Slobin, 1991; Bowerman, 1993, on “thinking for speaking”; and Tomasello, 1992a, 1999, on grammatical category formation as “functionally based distributional analysis”).

EVENTS

In the 1970s, Nelson discovered the theoretical construct of script, as developed by her Yale colleagues Roger Schank and Robert Abelson (1977; and also similar work by Fillmore and others on cognitive frames). As conceptual systems, scripts and frames provide an especially powerful top-down organizational component to human cognition. For example, if someone says, “Yesterday, I flew to New York,” we do not believe that they flapped their arms and propelled themselves through the air, but rather the word flew invokes our commercial airline script. On the basis of invoking this script, we infer implicitly and automatically that the speaker bought a ticket, traveled to an airport, interacted with flight attendants, ate some tasteless snacks (and perhaps a tasteless meal), and so forth. Scripts and frames thus focus on cognitive organization in terms of events—rather than the object...
concepts that have so long dominated discussion in cognitive science—and provide a very powerful instrument for making inferences about the world on the basis of limited information.

Nelson (1985) applied the script concept to children’s early cognitive development and meshed it with her notion of function. She posited that children’s early cognition is organized most fundamentally in terms of events. Events include Piagetian sensory–motor actions, but importantly they include the social and cultural activities in which children participate as well. Thus, children fundamentally conceive their experience in terms of not only kissing and kicking, but also having breakfast and taking a bath. Events thus come in many shapes and sizes and so children’s event representations do as well, with the commonality that all event representations are organized as sequences of actions or changes of state. Object concepts are derivative, in this sense, in the sense that they must be extracted from these early event representations. It is important to emphasize that we are talking here not about the perception of objects and events but about their conceptualization (see the previous Mandler quotation). This point has been misunderstood by a number of Nelson’s critics (see Nelson, 1985, 1996).

Following the lead of de Saussure (1916/1959), Nelson distinguished in these event representations a syntagmatic and a paradigmatic dimension. The sequential aspect of an event is its syntagmatics, the way the different participants in an event relate to one another spatially, temporally, and causally—thus forming the basis for a judgement about an element’s function. For example, spoons and cereal relate to one another in specific ways in a breakfast script; spoons are used to pick up and transport things to the mouth and cereal is something to be transported to the mouth and eaten. The paradigmatics of an event concern the way that entities may substitute for one another in the various participant roles defined by an event; that is, things other than spoons may be used to transport food to the mouth and things other than cereal may be eaten. It is easy to see that the functional dimension of concept formation that Nelson focused on in her earlier work emerged naturally from the interplay between the syntagmatic and paradigmatic aspects of learning about events and their participant roles. In her words, “Balls are things that can play a specific functional role in a certain type of event. Something that looks like a ball but cannot fit into a ‘ball event’ is not a proper member of the paradigmatic set of balls” (Nelson, 1985, p. 182).

This is actually quite a novel proposal. Classically, concepts are formed on the basis of similarity and possibly other types of associations. In Nelson’s account, children learn within events certain kinds of syntagmatic relations—and this is one dimension of cognitive organization—and then, the paradigmatic dimension enables them to also form relations of substitutability in events. Concepts formed on the basis of substitutability in events are called slot-filler categories, and they had been scarcely recognized before Nelson. This account is especially useful in explaining how young children form superordinate categories, such things as food and furniture
in which members share little in common perceptually. Food consists simply of those items that play a certain role in children’s breakfast, lunch, and dinner scripts.

In an especially well-known study, Lucariello, Kyratzis, and Nelson (1992) asked preschool children of various ages to provide specific items for five superordinate categories: food, clothes, animals, furniture, and tools. The first three of these in particular were hypothesized to have slot-filler structure because of their participation in salient events in children’s lives, and indeed, it was found that the basis for each of these categories for young children was the similar events in which its exemplars participated. There was also evidence that the older children formed these categories on the basis of more different types of events than younger children. Subsequent research has shown that children can form both syntagmatic and paradigmatic categories from their initial event representations (see Nelson, 1996, for a review).

Nelson is one of the only theorists of children’s language development who has gone onto focus on the nature of children’s lexical development later in the preschool period (the one major exception being Anglin, 1977, 1983). Briefly, the idea is that by establishing lexical fields of similar terms, children construct relations such as synonymy, antonymy, and hyponymy (hierarchical relations). The establishment of these relations makes possible “the manipulation of language terms without reference to situational context” (Nelson, 1985, p. 214); that is, children establish lexical relations among words, “unencumbered by all of the syntagmatic entailments of the conceptual system” (Nelson, 1985, p. 214). Establishing these kinds of abstract relations enables children to, among other things, perform in adult-like ways in explicit verbal classification tasks as they approach school age. It is only at this point that Nelson is willing to say that children have “a system of semantic relations that is purely symbolic and semiautonomous, that is, it can operate independently of the conceptual system” (Nelson, 1985, p. 214). Strong evidence for this proposal was recently supplied by Sell (1992). In a study of children ranging in age from 2 to 10 years, she found that the youngest children seemed to possess mainly categories based in specific events. The slightly older children (5–6 years of age) possessed, in addition, slot-filler categories based on participant roles in whole classes of events. It was only the oldest, school-aged children, who possessed fully taxonomic conceptual categories independent of specific events and event types.

With respect to the grammatical structure of language, Tomasello (1992a) used Nelson’s event-based model to explicate some aspects of children’s early multiword productions. The hypothesis was that the basic structure of children’s earliest multiword utterances is provided by verbs. The defining feature of verbs is of course the dynamic and sequential nature of their underlying conceptualizations; they refer to events and states of affairs. Moreover, the meaning of a verb perforce includes participant roles such as agent and patient as an integral component. For example, the meaning of the verb *give* includes the giver, the thing given, and the person given to as they engage in certain activities. Children’s understanding and
use of verbs, as event concepts, thus provides the structural backbone for their complex syntagmatic constructions, and paradigmatic categories of participants gain their significance in terms of the roles they play in these events.

Subsequent work on children’s grammatical development has established two additional facts consistent with Nelson’s general account. First, these early event–verb concepts are, to a large degree, context specific rather than general—so-called verb island organization (Tomasello, 1992a, 2000). Thus, English-speaking children learn many verb-island-type structures with open nominal slots; for example, X loves Y, X hates Y, X laughs, X cries, Y got broken, Y opened, and Y gave X to Z. Children’s syntagmatic categories are thus such things as hitter, kisser, thing hit, thing kissed, and then later perhaps more general roles such as agent and patient. Second, children form paradigmatic linguistic categories of nouns earlier than verbs (Tomasello, Akhtar, Dodson, & Rekau, 1997), presumably because nominal terms substitute paradigmatically for one another more freely in children’s utterances than do verbs. Thus, the formation of linguistic categories—both syntagmatic categories such as agent and patient and paradigmatic categories such as noun and verb—can be seen in the same basic terms as the formation of nonlinguistic (or semantic) categories. This is an important, and hitherto not often recognized, application of Nelson’s theory to the study of children’s language development.

For unknown reasons, cognitive scientists of all types have focused the vast majority of their attention on Linnéa hierarchies of object categories. Nelson—along with a few others such as Mandler (2000) and Gentner, Rattermann, Markman, and Kotovsky (1995)—however, has drawn our attention to the dynamic dimensions of human cognitive organization. This emphasis has opened up a number of new avenues of research that depend explicitly on the notion of event representations—perhaps most significantly the work on children’s early memory and personal narratives as illustrated by many of the other articles in this issue (e.g., Fivush & Vasudeva, 2002/this issue; Hudson, 2002/this issue; Bauer, Wenner, & Kroupina, 2002/this issue), as well as by Nelson’s own influential work on “narratives from the crib” (Nelson, 1989). Whether event representations should be seen as foundational for all aspects of human cognitive and linguistic development in the way Nelson proposed is a question for future research and theoretical discussion.

**CULTURE**

Implicit in all of Nelson’s work, from the earliest publications, has been the insight that most of the activities that structure the immature person’s life are recurrent cultural scripts and patterns. In her more recent work, this was fully explicit. With regard to word learning, for example, Nelson (1992) recently emphasized the role
played by what she calls “contexted relevance.” The idea is that children’s understand ing of novel pieces of language depends crucially on their understanding of how that piece of language fits in with is relevant to the ongoing social–communic ative interaction in its particular social–cultural context (see also Tomasello, 1992b, 2001).

However, it was with her discovery of Donald (1991), resulting in her 1996 book, that Nelson’s focus on culture became fully explicit. In Donald’s theory, the primate mind in general is characterized by the perception of events, in episodic form tied to particular situations. At some point in evolution, human beings also began to represent the world mimetically, that is, to depict things and situations for others or the self through concrete actions as in gesture, dance, games, theater, and social ritual, and simple linguistic symbols. This later gave way to the mythic mind in that humans represent the world via narrative, and indeed the narrative motive to share experience of significant events with others is seen as the driving force behind the emergence of language in its modern form. Finally, theoretic representation involves the representation of information in external media such as books, pictures, maps, and explicit cultural models (e.g., scientific theories). The modern mind is a hybrid mind because it employs all four of these representational modalities.

Nelson (1996) attempted to construct an account of human cognitive ontogeny that paralleled Donald’s (1991) phylogenetic–historical account, without, of course, falling into any naive form of recapitulationism. The general outline is as follows:

- Infancy (0–1.5 years) = episodic
- Early childhood (1.5–4 years) = mimetic
- Middle childhood (4–10 years) = narrative
- Adolescence (10 years–adult) = theoretic

With specific reference to language, the thesis is that before 4 years of age, children’s language is based on episodic and mimetic representations, and so it is not truly symbolic and representational. That is, young children use language to direct and cajole, comment and question, request and exclaim, but they do not use it to represent the world explicitly as they will later when they, for example, report on a trip to the beach. Of course in one sense the language of 2-year-olds is symbolic and representational—“ball” is certainly a symbol for the real object—but it is symbolic in the sense of Karmiloff-Smith’s (1992) procedural level of representation, and not in the sense of a more explicit, declarative level. Early language (e.g., that of 2-year-olds) occurs in the context of mimetic, and not narrative, activities, and so it is not fully representational:

Language … is used in, as part of, and in conjunction with [cultural] activities, and not primarily as a medium of conveying knowledge from one person to another. Its
primary use is pragmatic, not symbolic … Language uses in these shared activities help to mark them, to move them forward, but language is not initially used to represent them as such in the child’s cognitive or communicative productions. (Nelson, 1996, p. 91)

The representational use of language is thus explicitly identified with narrative. Before they can engage in narrative discourse, children use language in the context of sensory–motor and mimetic activities, in effect letting those activities do much of the talking. On the other hand, when older children report on some event in which they have previously participated, the only representational medium is language, and it does virtually all of the representational work. Said another way, 2-year-olds are mostly communicating within the event in which they are currently participating—from inside the event, as it were. Five-year-olds sometimes communicate about events that are not ongoing—from an outside perspective—even expressing their own current attitude to that event. Older children thus use language not just to participate in and influence events, but also to depict them and comment on them for others linguistically.

The limited functions of early child language also result in children’s inability to entertain multiple representations of an event simultaneously. That is, 3-year-olds can update or even build a mental representation (MREP) of an event on the basis of someone else’s linguistic description, but they cannot consider simultaneously their own MREP of an event and the different representation of that event by another person as it is expressed linguistically. Older children are able to compare and contrast their own and another person’s representations of an event because they now have made a clear distinction between MREPs and linguistic representations.

At this point, then, children will have developed basic skills in using linguistic LREPs [linguistic representations] to build novel MREPs that are different from those they have constructed from their own direct experience, and they will be able to move back and forth between their own basic event MREPs, the linguistic LREPs of those representations, and the linguistic LREPs of other people, whose representation of an event may differ from their own. (Nelson, 1996, p. 130)

The basic picture is that before 4 years of age, children use language “inside” socially shared events, but after that age they can also use language to depict and comment on these events for others—or, conversely, to comprehend the events linguistically expressed by others and relate them to their own MREPs.

The process driving this developmental progression is dialogue with more-or-less mature members of the culture, who possess hybrid minds incorporating all types of MREPs and cultural knowledge of events, and who thus react to the child’s linguistic productions in ways that assume an adult conception of the
world and culture. In true Vygotskian fashion, the external and interpersonal dialogue is internalized, and at the same time it is differentiated from and coordinated with the child’s MREPs based on his or her own direct experience. What opens up for the child at this point is the whole world of culture that is expressed exclusively in linguistic form: from stories and myths to history and science. Interestingly, this process may influence children’s social cognition directly as well. For example, children may notice discrepancies between their own use of words and that of others, they may come to comprehend mental state terms in the language, and they may experience direct instruction from adults on how to understand others. The reason that children fail false-belief tasks before 4 years of age—to address a currently hot topic—is simply that they cannot entertain simultaneously their own MREP of an event and another person’s linguistic representation of that same event (Nelson, 1996).

One of the most distinctive characteristics of Nelson’s approach to language acquisition and its relation to cognitive development is thus the contention that much of importance happens at older ages. In the lexicon, children are working well into school age at establishing semantic fields and the various kinds of interrelations among the lexical concepts in them. Moreover, children’s emerging narrative skills, which also reach the critical point near school age, lead to new relations between linguistic and conceptual representations and to new ways for the child to conceptualize the mental states and prepositional attitudes of other persons. Virtually no other theorist has such a consistent and coherent account of linguistic and cognitive development that spans such an extended period of ontogenetic time.

Any theory attempting to cover such a broad sweep of developmental phenomena will perforce be lacking in detail in some areas, and Nelson’s is no exception. Thus, most theorists think it a bit misleading to say that before 4 years of age children’s language is pragmatic and not symbolic and representational. To be consistent, Nelson might say that the language of 2- and 3-year-olds is representational in a mimetic sense; that is, it is used to represent different aspects of events as they are lived out. Following this ontogenetically, narrative is distinctive not because it is representational, but rather because it represents such complex and “distanced” content. Narrative allows discourse interactants to focus on some participant as it moves through a string of events over extended periods of time, and the narrator can take an outside perspective on that string of events to express his or her current attitude. Narrative is a special form of linguistic representation, but it is not the only form.

Moreover, Nelson had no detailed account of how interaction with other people leads children to understand language as a representational medium. That is, children’s differentiation of the linguistic representations of others from their own MREPs may be seen as part and parcel of their developing “theory of mind,” and so it is likely that the same social constructional processes are involved in the two cases. In this regard Nelson might have focused on the kinds of discourse interac-
tions in which much work must be done to achieve a meeting of minds. To list the most obvious kinds may include the following:

1. Different words are used for the same phenomenon in different discourse circumstances (e.g., *doggie, toy, Spot, or thing*).
2. Different grammatical constructions are used depending on the partner’s knowledge and expectations (e.g., the same event is described with an active or passive utterance depending on the previously established topic of speaker and interlocutor).
3. When others do not understand their language, children must reflect on the communication process and what went wrong (e.g., when queried “What?” they must decide whether and how to reformulate their utterance depending on what caused the miscommunication).

It is these kinds of interactive phenomena in which children directly confront different perspectives on the world and are forced to examine how language works if they are to connect these perspectives (Tomasello, 1999).

**CONCLUSIONS**

In the world after Piaget, students of cognitive development have turned increasingly in one of two directions. The first is neo-nativism, in that those aspects of human cognition not dependent on specific experiences are investigated, catalogued, and related to subsequent developments. The second is cultural psychology, in which other aspects of human cognition—perhaps especially the Vygotskian “higher” psychological functions—are investigated as they emerge from children’s interactions with adults and cultural artifacts in the socially shared events that comprise their daily lives. The main problem with each of these approaches is that it ignores the other. Neo-nativism mostly does not take into account the fact that organisms inherit their environments as much as they inherit their genomes, and that such important cognitive functions as language require for their ontogeny a specific set of environmental experiences. Cultural psychology, at least in its most radical form, focuses only on social–cultural experiences, often with little concern for the kinds of individual cognitive skills that enable children to participate meaningfully in cultural activities in the first place.

The strength of Nelson’s theoretical approach is that it attempts to do justice to both of these points of view. Although clearly not comfortable with any form of simplistic nativism, Nelson explicitly recognized that human infants develop a number of cognitive skills reflecting their primate heritage (e.g., event perception), and they do this essentially on the basis of their own experience. On the other hand, language and other cultural skills could only have evolved socially, and children can only learn
these skills through social interaction. The result is a hybrid mind, à la Donald, that both retains its foundation in individual experience, but then learns new things through participation in culture and language. Nelson was able to bridge the sometimes considerable gap between straight cognitivists and culturalists because she focused on events as the foundational experiential units, and events that can be used to characterize both individual experience and the social activities in which children acquire the majority of their cultural skills (see also Tomasello, 1999).

Overall, Nelson’s empirical and theoretical work is among the most important in the study of language and cognitive development. This is mainly because it provides an event-based, socially-based counterpoint to the excessive focus on individuals and objects that characterizes many neo-Piagetian and neo-nativist approaches, and indeed it incorporates these approaches to some extent, without slipping into any excessive forms of social constructivism. Nelson’s work is thus among the most important on the current scene in helping us to understand how people proceed ontogenetically from the individually based cognition characteristic of primates in general to the kinds of collective cognition, embodied in language and other cultural artifacts, that characterizes mature Homo sapiens.

REFERENCES


