

REVIEW

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KATHERINE NELSON. *Young minds in social worlds: Experience, meaning, and memory*. Cambridge, MA: Harvard University Press, 2007. Pp. 303. ISBN 0-674-02335-8.

To everything there is a season, a time for every purpose under the sun.

For forty years, Katherine Nelson has urged developmental psychologists to recognize children not as organisms of disembodied cognition, but rather as whole children who develop in a contextually rich and socially infused environment (e.g. Nelson, 1985). In this well-written and important book, Nelson offers a broad view of development couched in her version of a dynamic systems model. With the rise in prominence of systems-based theories of development, Nelson's SEASON may have come. Building on the backs of theorists like Donald, Vygotsky and Wernicke, Nelson argues that children's worldviews are not simply primitive adult versions, but rather qualitatively different than adults'. As they journey from the private world of infancy into their role as citizens in a community of people, the drive towards meaning-making and social connection continuously shapes more mature representations and cognitive abilities. The goal of developmental psychology, in this context, is to better understand the way in which children's representations and behaviors change as they progress through this journey.

Nelson's experiential model of development is sweeping, offering an account of early language acquisition, memory (autobiographical, episodic, semantic, etc.), theory of mind and development of self as central aspects of child development. The framework starts in infancy, where she introduces the child as living in a world that is private and inaccessible to others. The goal of early development is to increase shared meaning, and to move towards full cultural participation. The model outlines four major developmental phases as children progress from intrapersonal experience to interpersonal culture. In each of these phases, they increasingly 'tune' their behavior and cognition to the social adults surrounding them. The first of these phases is the development of AFFECTIVE COMMUNICATION, when infants experience their first social communication. Typically, establishing joint attention or the emergence of imitation are the markers of this milestone. Joint attention demonstrates that infants have begun forming communicative relationships with other people, while imitation is a sign that infants have made connections between another person's body and their own. With both joint attention and imitation, infants start to shift away from their egocentric perspective and adopt a more social stance.

The development of MIMETIC COGNITION marks the second of Nelson's phases. Mimetic cognition consists of exchanging social knowledge, typically marked with the beginnings of language. Here, language refers only to replication of parental language. For example, parents often label objects in the environment for their children ('Wow! Look at the doggie!'), and children practice this knowledge by repeating the labels ('Doggie!'). Throughout this phase, children increase their productive vocabulary and are eventually able to use the labels without adult prompting. For the first time the child is able to communicate intentionally and has voluntary control over the transmission of his or her experiences. Thus, mimetic cognition serves as a way for children to express their private thoughts and to share these with the adults who are closest to them.

Next, Nelson posits that children begin to master language as a SYMBOLIC SYSTEM. Children in this phase continue to develop memory, have honed their language system and are able to use grammar and complex sentence structures. These developments enable children to communicate effectively with groups, particularly peers, widening their social network. Importantly, peer groups increase a child's social network and offer a setting in which children can engage in pretend play. In pretend play, children MUST use symbols in lieu of the actual referent. For example, children in this phase might use a shoe as a phone and label it as such while understanding that a shoe is not a phone. Additionally, increased memory means that children might remember that a shoe can represent a phone in subsequent play sessions. Symbolic use joins with memory development to increase children's social sphere.

Finally, in the last phase, preschoolers are able to enter into a particular culture through a complete understanding of SHARED MEANING. Here, children have a theory of mind, allowing them to view the world both objectively and from another point of view. This skill contributes to sophisticated narration, as the child is able to tell stories from other perspectives, or even from other time periods. Critically, the advanced language and memory skills associated with this phase enable children to position themselves within time and culture. That is, children become aware of history and traditions, broadening opportunities for social interactions. This last phase marks a child's entrance into a culture of shared meaning and prepares them for entry into school.

In sum, Nelson suggests that developmental phases are built upon one another and are driven by children's desire to be meaningful and relational. Importantly, each of these phases is interlocked in development. That is, language develops around the same time as locomotion and the development of complex speech is inextricably tied to memory development. The phases are meant to encompass development of the whole child. What motivates progress through the phases? Nelson suggests that it is

COMPARISON, a construct not unlike Gentner's use of ANALOGY (Gentner, Bowdle & Wolff, 2001). For instance, Nelson suggests that children beginning to learn language are able to compare their speech with an adult's use of words. By noting the discrepancies, children modify their own language. Thus, comparison emerges as an important mechanism that drives the model. As Nelson suggests, development is like 'a climb up a rocky slope, where each resting place offers a chance to view the immediate ground and the surround ahead. The path ahead, when it can be glimpsed, is attractive and enticing for most children, who proceed on to the next place. The higher slopes would not exist without the ground below, and all the possibilities inherent in the prior phases of consciousness are present in each succeeding phase' (Nelson, 2007: 248).

In many ways, Nelson provides perspective on constructs in child development that are similar to those emerging in current systems theories for social development. For example, Bronfenbrenner's multifaceted, contextually based model has become the standard in the study of childcare, adolescents, aggression and prevention among others (Bronfenbrenner, 1977, 1986; Lerner, Theokas & Bobeck, 2005). These models demonstrate how children's propensities interact within multiple contexts over time to explain the effects of childcare on child outcomes or the ways in which parenting is related to social and peer relations. These models also tend to be more ecologically sound because, rather than isolating one variable as the catalyst for cause, they embrace the fuller complexity of human behavior.

Broad systems theories are not yet widely used in cognitive psychology, despite superb theoretical outlines for such theories by Thelen & Smith (1994) among others. Such theories are particularly rare in the language acquisition literature. By way of example, the Emergentist Coalition Model (ECM; Hollich *et al.*, 2000; see also Waxman, 2004) recognizes that language acquisition cannot be explained through appeal to only linguistic input, core knowledge or even social intent. Rather, the child uses multiple cues, such as perceptual, social and grammatical, that are differentially weighted across development to account for the learning of words and grammar. Nelson rightly argues that a full description of language as well as other cognitive development will need to do more than acknowledge different interactive sources of knowledge, but will also need to carefully chart individual growth over time and identify a mechanism for the interaction of different areas of development (see Hoff, 2006). Nelson's appeal is part of a new wave of theories that is gaining ground in developmental science. She asks that we go beyond lab science and embrace a science of learning in context.

By creating a new systems account for language development and cognition, Nelson's theory updates perspectives that have dominated the

field for decades. For example, Piagetian constructivism is fitted with a social base to form the cornerstone of her model. Further, though deeply influenced by Vygotsky's socially construed theory of general development, Nelson pushes us to move from the idea of social internalization to a model that stresses progressive social sharing – a kind of social EXTERNALIZATION. Development is fundamentally social and collaborative, where 'collaborative construction is not an instruction for how to achieve teaching or learning (as was Vygotsky's model of scaffolding, which it incorporates) but a description of how human learning takes place' (Nelson, 2007: 266).

Like other systems theories, Nelson's model of development has methodological consequences that psychologists should take seriously. First, studies of development need to be more sensitive to cultural differences. If the ultimate goal of children is to become social participants in their respective culture, we cannot adequately understand each aspect of development unless we look cross-culturally. Second, longitudinal studies must replace the typical snapshots of development. In order to represent the extended process of becoming social, data must be collected with multiple measures and at multiple points for each child. Trajectories in development become more important than a point in time and growth curves become the analytic strategy of choice. Third, Nelson's theory joins those of Bates & MacWhinney (1979) by stressing the importance of individual differences and language development, a perspective she has championed for many years. Rather than relying only on blanch norms, she points to several examples where children's individual differences lead to different pathways in development (e.g. emergence of crawling, proficiency in sorting activities). This approach treats variability as data rather than as error. While these are not new ideas – even in the area of language development (see Hoff, 2006; Bates & MacWhinney, 1979), they are crucial messages in a field dominated by core theories.

The theory Nelson presents is comprehensive and current. It builds on her prior work and offers a much-needed broad framework for development. Yet, it is not without its problems. First, as with many systems theory models, it suffers from offering a broad narrative that is somewhat light on the specifics. We call this the impressionist painting problem. Second, in its critique of the current crop of core knowledge theories, it fails to find productive ways in which some of the tenets of systems models might be compatible or even subsume aspects of core knowledge. We call this the myopic vision problem.

The impressionistic painting problem

Broad strokes paint a beautiful picture from afar, but tend to blanch details in ways that prevent the formation of testable hypotheses. These blurred

details come in several forms, such as the operational definitions of the constructs, the mechanisms that allow for interaction between the domains of development, and definitions of critical evidence that would enable scientists to affirm the theory. This problem surfaces often throughout the book. For example, we are told that the child is driven to make sense of the world and to build relationships with others. But what does it mean to make sense or to form relationships? In what ways can we operationally define MAKING SENSE as it changes over the course of the first five years? Is responding to perceptual salience and moving objects ‘making sense’ for the infant, but not for the toddler? How would we know if a child made sense of his environment or whether he treated a social partner as perceptually or relationally interesting? And when does a construct like common ground, which seems to be established in infancy, morph into the kind of intentional joint attention that appears later (see for a review Tomasello, Carpenter & Liszkowski, 2007)? What prompts that change? At this point in the development of the theory, the constructs have ecological validity, but are not richly defined or developed.

Similarly, we know little about how the interaction between domains unfolds. We are told, for example, that language is central to the development of perspective that underlies the theory of mind. There is at least a viable debate, however, about HOW language affects theory of mind (e.g. de Villiers, 2005; Lohmann & Tomasello, 2003), and this literature suggests not just any language experience will do. One position holds that only the language of sentence complements supports an increase in theory of mind. For example, a sentence complement ‘Lucy thinks the moon is made of green cheese’ may be true, although the embedded sentence ‘the moon is made of green cheese’ is false. The child must understand which sentence can be true to represent false beliefs (de Villiers & de Villiers, 2000). The interaction between domains as a catalyst for change is a critical insight in Nelson’s theory, but the reader is left speculating about just how these interactions are realized. At present the descriptions of interaction and even of a mechanism like comparison are so unspecified that they are ambiguous. We simply need more detail.

Finally, systems theories often suffer from the criticism that anything can be accounted for post hoc, or that there are so many possible pathways to any development that it is hard to determine the critical evidence that might refute the theory. Though these theories are becoming increasingly sophisticated (e.g. Elman, Bates, Johnson, Karmiloff-Smith, Parisi, & Plunkett, 1996; Lerner *et al.*, 2005; Thelen & Smith, 1994) they are at particular risk when the variables are not well defined. Nelson’s model shares this risk. It tells a beautiful story in broad strokes that leaves the viewer deeply satisfied and the scientist wanting more.

The myopic vision problem

Most curious in Nelson's account is her repudiation of the core knowledge framework for development that she criticizes as non-developmental, devoid of relevance in context and socially blind (e.g. Baillargeon, 2004; Carey & Spelke, 1996; Spelke, 1994). She notes: 'developmental psychologists typically describe [cultural knowledge] as though it arose spontaneously within the heads of children who were independently observing the world around them' (p. 236). Furthermore, Nelson argues that processes of development, 'with their interdependencies and interconnectedness, argue strongly against the modularity view of development and strongly for a social, pragmatic view in which children use their emerging biologically enabled skills (locomotor, categorical, verbal, imitative, gestural, playful, memorial) to advance their experience and find and share its meaning with others' (p. 116). Though the attack on core knowledge accounts is not new (see Thelen & Smith, 1994), it is interesting for several reasons. First, it is unclear how infants would know to process the relevant from the irrelevant information were there no STARTING POINTS in development. That is, how do children come to form object concepts if nothing is there and how might they form a representation of social objects were there no objects? How might infants learn to compare the difference in the internal and external were there no guidelines restricting the elements of comparison? Although it is possible to recruit Lois Bloom's (1993) talk of RELEVANCE in this respect, Nelson leaves us with the assumptions that infants can find meaning and detect relationships from the start. One nice solution to the problem is to assume that infants are prepared to notice or maybe even represent some aspects of the environment that will start them on their way. Such a view is not incompatible with a systems or contextually rich account of development. The two philosophical positions can co-exist, and indeed systems theories encourage us not to be theoretically myopic.

Second, Nelson overstates the weaknesses in core theory by suggesting that in these theories the worldview of the child is THE SAME as that of the adult. Yet the most prominent core theorists, like Spelke (1994; 1998; 2003), Baillargeon (2004) and Carey & Spelke (1996), to name a few, argue that there is room for development. By way of example, Spelke (1998) argues that infants have systematic knowledge in the four domains of physics, psychology, number and geometry. Namely, young infants make inferences about hidden motions of objects with regard to the principles of cohesion, continuity and contact. These principles, as well as the core knowledge, grow and are enriched by learning about the characteristics of objects. Children are equipped to view a world of objects, but they too move towards a more adult conception of the physical world.

Indeed, Nelson does not even fully examine the consequences of her theory of change with respect to children's development. She argues against a more universal core knowledge model, clearly articulating that children will have individual differences. But as development becomes infused with culture, does her theory also suggest that children from different cultures will think differently? Even if Nelson were moderately Whorfian in these regards, she would agree that there are some cornerstones in development that are shared across the species. Thus, the irony of Nelson's position is that core knowledge theories can be somewhat subsumed within systems theory.

One final point is that the clash between domain general systems theories and the often domain specific, core knowledge theories may be pointing to a wider paradigm shift within developmental psychology. Increasingly, we are coming to understand that developmental outcomes are not simple, but rather complex behaviors that unfold within a rich context. As our science becomes more sophisticated and our methodology supports this new lens, we can ask how children's knowledge and behavior changes over time and can better identify the many sources of variability that contribute to this change. Simple laboratory studies of language growth at one point in time, outside of the context of social or physical development represents the dominant paradigm that Nelson argues against. A systems theory in which language is embedded in a social, cognitive and physical context is the new wave. We suspect that as these two paradigms confront one another, the strongest developmental solution will come from science at the midpoint. Research like that conducted by Tomasello (2003) offers a superb example of lab-based science that is supported by contextual hypotheses and that is also studied in more meaningful contexts. It is in these studies that we might find a rapprochement between the lab and the world, between focused core knowledge research and big science.

Conclusion

In her new book, Katherine Nelson introduces us to a child who is more social than Piaget's child, more extraverted than Vygotsky's and more a generalist than a specialist. The Nelson child has grown over the last forty years into one who can operate within the broader culture of systems based science – into one who is propelled through life by a quest for meaning and a desire to maintain the cultural relationships that will make her a cognitively and socially rich participant in the culture at large.

Does this child advance the field? Only the future can tell. Nelson does offer us an example of a broad view of developmental psychology that is consistent with a current review of the literature and with a budding paradigm shift in the field (see Overton, 2006). At the very least, *Young minds in*

social worlds is a refreshing alternative to the dominant themes in the field and a challenge for each of us to rethink our positions. At the most, Nelson and her child offer a new narrative for understanding development in ways that take cross-cultural and cross-disciplinary data seriously as it tries to understand the whole child in context. Both the skeptic and the enthusiast will find this book a stimulating read that is worth the effort.

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Reviewed by SARAH ROSEBERRY,
TILBE GÖKSUN and KATHY HIRSH-PASEK
Temple University