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Getting beyond the “convenience sample” in research on early cognitive development

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Abstract

Research on the early development of fundamental cognitive and language capacities has focused almost exclusively on infants from middle-class families, excluding children living in poverty who may experience less cognitive stimulation in the first years of life. Ignoring such differences limits our ability to discover the potentially powerful contributions of environmental support to the ontogeny of cognitive and language abilities.

Arnett (2008) blames the narrowness of American behavioral research on a philosophy of science that focuses on universals in human cognitive and social psychology, ignoring variability and the factors that contribute to differences among people. Henrich et al. share the concern that researchers in these areas simply assume their findings are universal, but suggest that studies with children may provide more convincing evidence. I do not think that developmental psychologists should be let off the hook so easily. If the WEIRD sample that is studied so extensively in psychological research with adults consists of a privileged subset of 5% of the world's population, then the children represented in the burgeoning literatures on “core knowledge” (Spelke & Kinzler 2007) and early language acquisition (Fernald & Marchman 2006) are drawn from an even smaller sliver of affluent and highly educated families. Parents with the time, resources, and motivation to bring their infant to participate in a developmental study at a university laboratory are demographically even less diverse than the college students who predominate in studies with adults.

Why does this matter? Because differences in socioeconomic status (SES) are robustly associated with the quantity and quality of early cognitive stimulation available to infants, and early cognitive stimulation really does matter. Sixty years of developmental research show that parenting practices in infancy mediate links between SES and long-term cognitive outcomes (Milner, 1951; Hoff 2003). Yet the hundreds of experiments in recent years exploring basic cognitive capacities at younger and younger ages have almost all focused on middle-class participants. At the 2010 International Conference on Infant Studies, fewer than 1% of the 1,000 research presentations reported including participants from disadvantaged families, although 20–40% of U.S. children are growing up in poverty (Wight et al. 2010).

If the same studies conducted in all those university research centers were also run with infants in the lower-income neighborhoods that are often just a few miles from campus, the results would likely be different. We know, for example, that the development of spatial abilities presumed to be species-specific is compromised in low-SES children, who have less opportunity to exercise spatial skills than do high-SES children who have access to toys, puzzles, bikes, and the freedom to explore a safe neighborhood (Levine et al. 2005). Yet developmental textbooks abound with claims about how “infants’ awareness of physical principles is evident at 3 months,” or how “infants use knowledge of phonotactics to segment words by 7.5 months.” Such statements may be true of the particular infants

observed in the particular studies cited, but the results are often framed more broadly, as if these specific ages characterize human infants universally and differences in early experience are simply irrelevant. Would it matter if we discovered that these age-specific developmental milestones are in fact only characteristic of infants in middle-class families? If we found that infants living in poverty are actually one or several months slower than higher-SES infants to show evidence of “core knowledge of spatial relations” or “speech segmentation ability”? It should matter, because to ignore such differences is to ignore the potential role of environmental support in the ontogeny of these critical capacities.

In our longitudinal research on the early development of fluency in language understanding, we find robust relations between verbal processing speed in infancy and long-term outcomes in both high-SES English-learning children and low-SES Spanish-learning children. In both groups, infants who are faster in speech processing at 18 months are more advanced on later cognitive and language measures (Fernald et al. 2006; Hurtado et al. 2007). But the differences in performance between these groups are stunning. By 18 months, we find that low-SES children are already substantially slower in processing speed and vocabulary growth; and by the age of 5 years, we see the gap in developmental measures found in numerous studies since the 1960s (Ramey & Ramey 2004). This inconvenient truth forced us to reevaluate the assumption that our earlier research with children of affluent families licensed broad conclusions about the “speech processing abilities of 18- to 36-month-olds” in general, given that perfectly healthy 18- to 36-month-olds from low-income families in the neighboring community performed so differently on the same tasks.

But these findings also led us to ask a question we had previously ignored: Could it be that differences in early experience with language contribute to the variability observed in children’s efficiency in real-time processing? It turns out that early practice with language is influential in the development of fluency in understanding. In a study with low-SES families, we found that those children whose mothers talked with them more learned vocabulary more quickly – and they also made more rapid gains in processing speed (Hurtado et al. 2008). These results suggest that child-directed talk not only enables faster learning of new vocabulary – it also sharpens the processing skills used in real-time interpretation of familiar words in unfamiliar contexts, with cascading advantages for subsequent learning. By examining variability both within and between groups of children who differ in their early experience with language, we gained insight into common developmental trajectories of lexical growth in relation to increasing processing efficiency, and also discovered environmental factors that may enable some children to progress more rapidly than others.

Pinker (1994) once declared that “to a scientist interested in how complex biological systems work, differences between individuals are so boring!” In fact, many biologists these days are keenly interested in environmental influences on expression of the genetic code during early development and the resulting phenotypic differences (Gottlieb 2007; Zhang & Meaney 2010). New research on prenatal programming shows that fast- or slow-growth trajectories set before birth have long-term developmental consequences for health and vulnerability (Coe & Lubach 2008). Developmental psychologists can now also address important questions about the crucial influence of early postnatal experience on cognition and language. But to do so we need to extend beyond the WEIRD “convenience samples” we have traditionally relied on, to examine trajectories of growth in broader populations of children living in more diverse circumstances.

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