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New Cerebrum: Socioeconomic Status and the Brain

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What do Warren Buffet, Barack Obama, and Ella Fitzgerald have in common? They are among the large number of people who have overcome disadvantaged backgrounds—even homelessness—to become accomplished, world-famous individuals. Yet, they also beat the odds, according to recent research that shows children who grow up facing economic, educational, and social obstacles tend to have lower cognitive function, and are not nearly as likely to become financial gurus, U.S. presidents, or queens of jazz.

That’s part of the message of “[Rich Man, Poor Man: Socioeconomic Adversity and Brain Development](#),” the featured *Cerebrum* article for May. Written by Kimberly G. Noble, M.D., Ph.D., an assistant professor of pediatrics at Columbia University, the article follows her own career path studying socioeconomic status (SES), first as a graduate student with colleagues such as Martha Farah at the University of Pennsylvania and later in her own lab at Columbia. It also traces almost all of the research on the subject over the last 20 years.

Noble began her career helping recruit kindergarten through middle-school age children from socioeconomically diverse families for tests designed to measure language, executive function, visuospatial skills, and memory—core systems supported by distinct brain circuits that are related to SES. “At any one age, of course, some children perform dramatically better than others,” she writes. “We set out to determine the extent to which such disparities in performance could be explained by differences in SES.” The answer, Farah’s team found, was “to a large extent.”

Children from higher SES homes performed better on most cognitive skills than children from lower SES

homes—although the disparities were not uniform. “Across studies, we found the largest SES disparities in language skills, with more modest differences in ch memory and executive-function abilities,” she writes. Later groundbreaking rese s looking at even younger children revealed that large differences in language and vident before two years of age.

Even more startling was a study o occupation and income associated with higher- power brain waves in frontal brai both children and adults linked SES factors to hippocampal size (critical for me Early exposure to music, learning a second language, enhanced nutrition, and all play a role in a child’s brain development, suggests Noble. Included in the st Children from disadvantaged homes tend to hear fewer words—an estimated 30 mi ge three than their higher-SES counterparts.

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So how do we close the gap? Small, intensive early childhood programs have proved to be useful, but scaling up such programs is a formidable challenge, Noble writes. Since “highly educated parents tend to invest far more time playing with, talking to, and teaching their children, and parenting style has been cited as the single most important factor in explaining the SES gap in cognitive development,” Noble believes economically disadvantaged parents need to be brought into the loop on the critical role they play.

And it’s somewhat heartbreaking to read that a mere \$4,000 increase to a disadvantaged family’s earnings in the first two years of a child’s life leads to remarkable differences in that child’s adult circumstances. Noble concludes by writing: “Many leading social scientists and neuroscientists believe that policies that reduce family poverty would have meaningful effects on early caregiving and reductions in family stress, ultimately improving children’s brain functioning and promoting the cognitive and socio-emotional development that is so critical for children to succeed and to lead healthy, productive lives.” Amen.

–Bill Glovin

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