How poverty may affect memory

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Working memory, how we actively hold and manipulate information in our mind, is a cognitive skill used on a daily basis. How effectively working memory performs, however, is not as universal as one may think. In an open access article published in the *Journal of Cognition and Development* titled "Working Memory Differences Between Children Living in Rural and Urban Poverty", author Michele Tine investigated whether working memory of children living in rural poverty is distinct from the working memory profiles of children in urban poverty. Both verbal and visuospatial tests were given to discern how memory deficits compared.

For this study, sixth grade students were selected to participate, broken into four categories: low-income rural, low-income urban, high-income rural, and high-income urban. Children were categorized as low income if their family income was below the national median family income of $50,033, attend a school in which at least 75% of students qualify for free or reduced-price lunch, and the student themselves qualified for free lunches. Participants were categorized as urban if the school they attended served an "urbanized area" as defined by the U.S. Census Bureau: was located in a county with a population of more than 200,000 and had an average enrollment per grade level at the secondary level of more than 300 students.

The results clearly suggest that school-aged low-SES (socioeconomic status) children exhibit both verbal and visuospatial working memory deficits, possibly due to increased levels of stress. Children in urban poverty showed symmetric working memory weaknesses, while children

in rural poverty had worse visuospatial working memory than verbal working memory. The low-SES urban children had poorer verbal working memory than the low-SES rural children, possibly due to increased exposure to noise pollution, suggests Tine. The results also revealed that high-SES rural and urban children show near-identical verbal and visuospatial working memory. "These results suggest that living in a rural vs. urban area is associated with working memory for low-SES, but not high-SES children" says Tine. Tine explains that this novel finding aligns with previous work showing that among low-SES children environmental factors account for the majority of variance in cognitive ability, while genes account for little variance. In high-income children the opposite is true. For high-income children, genes account for the majority of variance.

Opportunities for further research on the topic are prevalent. Working memory differences could be, in part, due to language differences that exist between the two samples. Additionally, the majority of low-income rural samples identified as Caucasian, while the majority of the low-income urban sample identified as a racial minority. Working memory differences may be attributed to different racial identities or stereotype threat. Moving forward, Tine points out, "we need to think about ways that low-income rural and urban children can overcome their specific working memory difficulties so they can optimize their learning on these academic tasks". Download the full free access article here.

More information: Michele Tine, "Working Memory Differences Between Children Living in Rural and Urban Poverty," *Journal of Cognition and Development*, Volume 15, Issue 4, 2014, DOI: 10.1080/15248372.2013.797906

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