

Poor Concentration: Poverty Reduces Brainpower Needed for Navigating Other Areas of Life

Aug. 29, 2013 — Poverty and all its related concerns require so much mental energy that the poor have less remaining brainpower to devote to other areas of life, according to research based at Princeton University. As a result, people of limited means are more likely to make mistakes and bad decisions that may be amplified by -- and perpetuate -- their financial woes.

Published in the journal *Science*, the study presents a unique perspective regarding the causes of persistent poverty. The researchers suggest that being poor may keep a person from concentrating on the very avenues that would lead them out of poverty. A person's cognitive function is diminished by the constant and all-consuming effort of coping with the immediate effects of having little money, such as scrounging to pay bills and cut costs. Thusly, a person is left with fewer "mental resources" to focus on complicated, indirectly related matters such as education, job training and even managing their time.

In a series of experiments, the researchers found that pressing financial concerns had an immediate impact on the ability of low-income individuals to perform on common cognitive and logic tests. On average, a person preoccupied with money problems exhibited a drop in cognitive function similar to a 13-point dip in IQ, or the loss of an entire night's sleep.

But when their concerns were benign, low-income individuals performed competently, at a similar level to people who were well off, said corresponding author Jiaying Zhao, who conducted the study as a doctoral student in the lab of co-author Eldar Shafir, Princeton's William Stewart Tod Professor of Psychology and Public Affairs. Zhao and Shafir worked with Anandi Mani, an associate professor of economics at the University of Warwick in Britain, and Sendhil Mullainathan, a Harvard University economics professor.

"These pressures create a salient concern in the mind and draw mental resources to the problem itself. That means we are unable to focus on other things in life that need our attention," said Zhao, who is now an assistant professor of psychology at the University of British Columbia.

"Previous views of poverty have blamed poverty on personal failings, or an environment that is not conducive to success," she said. "We're arguing that the lack of financial resources itself can lead to impaired cognitive function. The very condition of not having enough can actually be a cause of poverty."

The mental tax that poverty can put on the brain is distinct from stress, Shafir explained. Stress is a person's response to various outside pressures that -- according to studies of arousal and performance -- can actually enhance a person's functioning, he said. In the *Science* study, Shafir and his colleagues instead describe an immediate rather than chronic preoccupation with limited resources that can be a detriment to unrelated yet still important tasks.

"Stress itself doesn't predict that people can't perform well -- they may do better up to a point," Shafir said. "A person in poverty might be at the high part of the performance curve when it comes to a specific task and, in fact, we show that they do well on the problem at hand. But they don't have leftover bandwidth to devote to other tasks. The poor are often highly effective at focusing on and dealing with pressing problems. It's the other tasks where they perform poorly."

The fallout of neglecting other areas of life may loom larger for a person just scraping by, Shafir said. Late fees tacked on to a forgotten rent payment, a job lost because of poor time-management -- these make a tight money situation worse. And as people get poorer, they tend to make difficult and often costly decisions that further perpetuate their hardship, Shafir said. He and Mullainathan were co-authors on a 2012 *Science* paper that reported a higher likelihood of poor people to engage in behaviors that reinforce the conditions of poverty, such as excessive borrowing.

"They can make the same mistakes, but the outcomes of errors are more dear," Shafir said. "So, if you live in poverty, you're more error prone and errors cost you more dearly -- it's hard to find a way out."

The first set of experiments took place in a New Jersey mall between 2010 and 2011 with roughly 400 subjects chosen at random. Their median annual income was around \$70,000 and the lowest income was around \$20,000. The researchers created scenarios wherein subjects had to ponder how they would solve financial problems, for example, whether they would handle a sudden car repair by paying in full, borrowing money or putting the repairs off. Participants were assigned either an "easy" or "hard" scenario in which the cost was low or high -- such as \$150 or \$1,500 for the car repair. While participants pondered these scenarios, they performed common fluid-intelligence and cognition tests.

Subjects were divided into a "poor" group and a "rich" group based on their income. The study showed that when the scenarios were easy -- the financial problems not too severe -- the poor and rich performed equally well on the cognitive tests. But when they thought about the hard scenarios, people at the lower end of the income scale performed significantly worse on both cognitive tests, while the rich participants were unfazed.

To better gauge the influence of poverty in natural contexts, between 2010 and 2011 the researchers also tested 464 sugarcane farmers in India who rely on the annual harvest for at least 60 percent of their income. Because sugarcane harvests occur once a year, these are farmers who find themselves rich after harvest and poor before it. Each farmer was given the same tests before and after the harvest, and performed better on both tests post-harvest compared to pre-harvest.

The cognitive effect of poverty the researchers found relates to the more general influence of "scarcity" on cognition, which is the larger focus of Shafir's research group. Scarcity in this case relates to any deficit -- be it in money, time, social ties or even calories -- that people experience in trying to meet their needs. Scarcity consumes "mental bandwidth" that would otherwise go to other concerns in life, Zhao said.

"These findings fit in with our story of how scarcity captures attention. It consumes your mental bandwidth," Zhao said. "Just asking a poor person to think about hypothetical financial problems reduces mental bandwidth. This is an acute, immediate impact, and has implications for scarcity of resources of any kind."

"We documented similar effects among people who are not otherwise poor, but on whom we imposed scarce resources," Shafir added. "It's not about being a poor person -- it's about living in poverty."

Many types of scarcity are temporary and often discretionary, said Shafir, who is co-author with Mullainathan of the book, "Scarcity: Why Having Too Little Means So Much," to be published in September. For instance, a person pressed for time can reschedule appointments, cancel something or even decide to take on less.

"When you're poor you can't say, 'I've had enough, I'm not going to be poor anymore.' Or, 'Forget it, I just won't give my kids dinner, or pay rent this month.' Poverty imposes a much stronger load that's not optional and in very many cases is long lasting," Shafir said. "It's not a choice you're making -- you're just reduced to few options. This is not something you see with many other types of scarcity."

The researchers suggest that services for the poor should accommodate the dominance that poverty has on a person's time and thinking. Such steps would include simpler aid forms and more guidance in receiving assistance, or training and educational programs structured to be more forgiving of unexpected absences, so that a person who has stumbled can more easily try again.

"You want to design a context that is more scarcity proof," said Shafir, noting that better-off people have access to regular support in their daily lives, be it a computer reminder, a personal assistant, a housecleaner or a babysitter.

"There's very little you can do with time to get more money, but a lot you can do with money to get more time," Shafir said. "The poor, who our research suggests are bound to make more mistakes and pay more dearly for errors, inhabit contexts often not designed to help."