

# Poverty saps mental capacity to deal with complex tasks, say scientists

Study suggests being preoccupied with money problems is equivalent to loss of 13 IQ points or losing a night's sleep



The strain of poverty may mean people are more likely to make bad decisions that exacerbate their financial problems. Photograph: Dan Kitwood/Getty Images

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Thursday 29 August 2013 19.00 BST

Poor people spend so much mental energy on the immediate problems of paying bills and cutting costs that they are left with less capacity to deal with other complex but important tasks, including education, training or managing their time, suggests research published on Thursday.

The cognitive deficit of being preoccupied with money problems was equivalent to a loss of 13 IQ points, losing an entire night's sleep or being a chronic alcoholic, according to the study. The authors say this could explain why poorer people are more likely to make mistakes or bad decisions that exacerbate their financial difficulties.

Anandi Mani, a research fellow at the Centre for Competitive Advantage in the Global Economy at the University of Warwick, one of the four authors of the study, said the findings also suggest how small interventions or "nudges" at appropriate moments to help poor people access services and resources could help them break out of the poverty trap. Writing in the journal *Science*, Mani said previous research has found that poor people use less preventive health care, do not stick to drug regimens, are tardier and less likely to keep appointments, are less productive workers, less attentive parents, and worse managers of their finances. "The question we therefore wanted to address is, is that a cause of poverty or a consequence of poverty?"

She said the team of researchers, which included economists and psychologists in the UK and the US, wanted to test a hypothesis: "The state of worrying where your next meal is going to come from - you have uncertain income or you have more expenses than you can manage and you have to juggle all these things and constantly being pre-occupied about putting out these fires - takes up so much of your mental bandwidth, that you have less in terms of cognitive capacity to deal with things which may not be as urgent as your immediate emergency, but which are, nevertheless, important for your benefit in the medium or longer term."

To test their idea, the team carried out two sets of studies.

In the first they approached around 400 people at random in a shopping mall in New Jersey and asked them to think about how they might solve a financial problem.

Volunteers were given an "easy" scenario, where the cost of a car repair was around \$150, and a "hard" scenario, where the repair would cost more like \$1,500.

While they thought about this, the volunteers took part in puzzle-based IQ tests and tasks that measured their attention.

The researchers compared the change in performance in the tests for rich and poor people across the two scenarios, with rich and poor defined as being either side of the median US household income of \$70,000 per year.

In the second study, the team carried out IQ and attention tests on 464 sugar cane farmers in Tamil Nadu in India during cyclical conditions of relative wealth and poverty. Because of the long crop cycle for sugar cane, farmers tend to be poor just before a harvest and relatively well off a few weeks after the harvest, when they have received their annual crop earnings.

In the shopping mall experiment, rich and poor people performed equally well on the "easy" scenario.

But poorer people performed much worse on the "hard" scenario - their average IQ was 13 points lower when they were thinking about serious financial troubles.

"That's the difference in IQ between a person who is a normal adult versus a chronic alcoholic," said Mani. "In terms of age, it's like an average 45-year old as opposed to an average 60-year-old. In terms of sleep loss, [the immediate impact of the mall study] is like losing a full night of sleep."

For the Indian farmers there was a similar but smaller effect.

"What we did is look at the same people the month before and the month after the harvest, and what we see is that IQ goes up, cognitive control, or errors, goes way down, and response times go way down," said Sendhil Mullainathan, a professor of economics at Harvard University and a co-author of the study. "The effect here is about two-thirds

of the size of the effect found in the mall study - it's at least nine or 10 IQ points, just between these months."Between these two studies, you both see the mechanism at work, and you see that, in the real world, these effects are enormous.In their study, the researchers controlled for possible mitigating factors such as stress, quality of nutrition, available time and also the fact that people can sometimes get better at cognitive tests once they have tried them out a few times.

Mullainathan added that "the results are not suggesting that the poor as people have less cognitive capacity but that anyone experiencing poverty would have less capacity. I realise this is basic but it is such an easy mistake to make in interpreting the conclusion."

Jennifer Wild, a clinical psychologist at the University of Oxford, who was not involved in the study, said the latest results were novel because, previously, researchers "may have thought that environmental conditions, such as lower levels of education, explained the link between poverty and poorer performance on some tasks of intelligence compared to the rich."

She added that a limitation of the study was that the researchers had not studied how the financial questions in the shopping mall scenario had affected the emotional states of the participants. The \$1,500 amount in the "hard" scenario may have failed to influence the cognitive processing of participants with higher incomes because it might have been too low to be meaningful to them, she said.

"The figure of \$1,500 may have led to anxiety in low income participants, which could have influenced their performance. The study failed to look at affective state. How much anxiety did the imagined scenarios create and were their differences in how anxious high and low income participants felt, which could explain there differences in performance?"

Mani said that the results of the study had implications for policymakers. "When we think of poor people and design policies and programmes to help them, we are only particularly cognizant of the fact that they have less material resources," she said. "I think that programmes don't often appreciate that they're also, precisely because of poverty, a bit challenged in terms of the mental resources and attention that they have. To the extent that we want to make anti-poverty programmes effective, we want to design them in a way that is mindful of that."

This could mean helping poorer high school students fill in application forms for financial aid rather than leaving them to do it by themselves. Rather than assuming that many of the poor are not taking advantage of beneficial schemes through lack of motivation or interest, said Mani, help with "small nudges at the right time and limiting the amount of cognitive load that become barriers to them enrolling in the programme could make a big difference."

Other kinds of help could include sending text reminders to take pills or deposit money for a specific savings goal they have, said Mani. "When they have 20 things that are

grabbing their attention, which seem very urgent, to remind them of something that's important at the right time, that's also an effective strategy."