

# Study examines decision-making deficits in older adults

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We often read or hear stories about older adults being conned out of their life savings, but are older individuals really more susceptible to fraud than younger adults? And, if so, how exactly does aging affect judgment and decision-making abilities?

Recent work led by University of Iowa neuroscientist Natalie Denburg, Ph.D., suggests that for a significant number of older adults, measurable neuropsychological deficits do seem to lead to poor decision-making and an increased vulnerability to fraud. The findings also suggest that these individuals may experience disproportionate aging of a brain region critical for decision-making.

"Our research suggests that elders who fall prey to fraudulent advertising are not simply gullible, depressed, lonely or less intelligent. Rather, it is truly more of a medical or neurological problem," said Denburg, who is an assistant professor of neurology in the UI Roy J. and Lucille A. Carver College of Medicine. "Our work sheds new light on this problem and perhaps may lead to a way to identify people at risk of being deceived."

Being able to identify how aging affects judgment and decision-making abilities could have broad societal implications. How to combat deceptive advertising targeted at older individuals -- some of whom appear to be particularly vulnerable to fraud -- is one important area of concern. In addition, older age is a time when individuals often are faced with many critical life decisions, including health care and housing

choices, investment of retirement income, and allocation of personal wealth.

"By simply identifying a person as potentially vulnerable to fraud, family members can be more vigilant and can implement measures to protect the older adult," Denburg said. "In addition, a conservator or family member could be involved in transactions involving large amounts of money."

Denburg's most recent study, published Dec. 2007 in the *Annals of the New York Academy of Sciences*, shows that 35 to 40 percent of a test group of 80 healthy older adults with no apparent neurological deficits have poor decision-making abilities as tested in a laboratory experiment known as the Iowa Gambling Task (IGT). The IGT is a computerized decision-making test where participants draw cards from different decks with the aim of maximizing their winnings. Some of the decks yield good results in aggregate, while others yield poor outcomes.

Following the poor decision-makers through several additional tests, the researchers found that in addition to the poor performance on the IGT, this subgroup of older adults also were more likely to fall prey to deceptive advertising.

Using a set of real advertisements that had been deemed misleading by the Federal Trade Commission and several counterpart, non-deceptive advertisements, the study showed that the poor decision-makers are much less able to spot inconsistencies and pick up on deceptive messages than good decision-makers. Poor decision-makers also were more likely to indicate an intention to buy the article advertised in the misleading advertisement. In contrast, there was no difference in comprehension of non-deceptive advertisements between the two groups of older adults.

The researchers also measured the amount of palm sweating for each

participant as they performed the Iowa Gambling Task. Bodily (or autonomic) responses, like sweating, have been shown to play an important role in decision-making. When these responses are absent or abnormal, then decision-making also is affected.

Good decision-makers display different anticipatory responses (amount of sweating) prior to a good or a bad choice, which appears to help them discriminate between the two options. In contrast, the older adults with poor decision-making abilities did not sweat more or less when deciding between a good or bad choice.

Another group of patients who perform poorly on the IGT and have abnormal bodily responses to the test are individuals with acquired damage to the ventromedial prefrontal cortex (VMPC) -- an area of the brain that appears to be critical for good decision-making.

"Our hypothesis is that older poor decision-makers have deficits in their prefrontal cortex," Denburg explained. "The next element of our study will be to complete structural and functional brain-imaging studies to see if we can identify differences between poor decision-makers and good decision-makers either in brain structure or in how the brain functions during decision-making tasks."

The team already is conducting structural imaging tests, and Denburg has just received a three-year, \$100,000 grant from the Dana Foundation to do functional imaging studies.

Preliminary analysis of the structural imaging data suggests there are physical differences between the brains of poor decision-makers and those of the good decision-makers.

Understanding the neurological basis for impaired decision-making could also suggest potential medications that might help. Some studies

have suggested that altering neurotransmitter levels may affect decision-making ability. However, Denburg notes that this approach is speculative at this time.

Source: University of Iowa

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