Research Translation

A Neuropsychological Test of Belief and Doubt:
Damage to Ventromedial Prefrontal Cortex Increases Credulity for Misleading Advertising

WHY SOME OLDER ADULTS ARE MORE VULNERABLE TO FALSE ADVERTISING AND SCAMS.

Many of us have had the experience of working with a client who insists that he is about to receive a large pay out from a business deal or a windfall from a Nigerian prince. No amount of talking or reasoning can sway them from this firmly held belief. Even when you point out facts that should raise doubts in their minds, they persist. Researchers have long believed that older adults are more susceptible to fraud and deception and a recent study finds a possible clue in the brain to explain these clients' convictions. In a study by researchers at the University of Iowa and featured in Frontiers in Neuroscience[1], the participants with damage to a central area of the brain, known as the ventromedial prefrontal cortex (vmPFC), were nearly one and a half times more likely to (1) believe in false advertising and, (2) have the intent to make actual purchases of misleadingly advertised product(s) than a control group of normal participants. The vmPFC is one of the areas of the brain known to degenerate with increased age.

METHOD

A total of 49 persons participated in the study; eighteen with damage to the vmPFC, an area in the central part of the brain and focus of this study; 21 with damage to other areas of the brain; and 10 persons without damage (the control group). Participants viewed ads that one might see in a magazine or newspaper. Half of the ads included information that should induce doubting on the part of the reader. For example, an advertisement for a pain reliever describes the product as "a natural pain reliever that provides relief from headaches 'without the side effects of over-the-counter pain relievers.'" A disclaimer at the end counters the statement by noting, "*This product can cause nausea in some consumers when taken regularly.*" The other half of the ads had no such disclaimer, making them more believable.

Two critical questions were asked as part of the study: (1) *what do you believe to be true about the product?* And (2) *how likely are you to purchase the product?*

RESULTS

The results of the study indicate that patients with damage to the vmPFC tend to (1) believe misleading advertisements, and (2) tend to show a higher interest in purchasing the product, even when a disclaimer was attached.

Applying the findings to real-life situations, people with damage to the vmPFC:

- are more vulnerable to fraud schemes or financial scams
- have "compartmentalized minds" where discordant ideas are able to be held in mutual agreement
- are prone to believe their own assertions even in the face of contradictory evidence
- lack the ability to detect signals that normally steer people away from inappropriate decisions

In summary, the authors suggest that damage to the vmPFC, which helps to regulate doubt versus belief processes, may result in an increase in a person's vulnerability to be deceived.

IMPLICATIONS FOR PRACTICE

Because age-related degeneration of the vmPFC is common, older adults may be disproportionately vulnerable to scams and frauds. Professionals working with individuals who display behaviors described above should consider the possibility that the person has damage to the vmPFC. The person should be considered vulnerable to exploitation. If damage is suspected, professionals should consult neuropsychological expertise. Where vmPFC damage is confirmed, intervention strategies that are based on rationality (e.g., reasoning with the person, showing them evidence of their poor choice) will not be successful. Instead, protective interventions (e.g., taking control of assets) may be required.

Our research translations highlight key points of aging- and abuse-related research articles for use by practitioners working with older adults. Visit the National Center on Elder Abuse website and click Library for more information on research **www.ncea.aoa.gov**.

[1] Asp, E., Manzel, K., Koestner, B., Cole, C. A., Denburg, N. L., & Tranel, D. (2012). A neuropsychological test of belief and doubt: damage to ventromedial prefrontal cortex increases credulity for misleading advertising. Front Neurosci, 6, 100. doi: 10.3389/fnins.2012.00100