



# HEIGHTENED EMOTIONAL STATES INCREASE SUSCEPTIBILITY TO FRAUD IN OLDER ADULTS

By Katharina Kircanski, Stanford University, Nanna Notthoff, Stanford University, Doug Shadel, AARP Washington, Gary Mottola, FINRA Investor Education Foundation, Laura L. Carstensen, Stanford University, Ian H. Gotlib, Stanford University

## POLICY ISSUE

Perpetrators of financial fraud often attempt to evoke strong emotions in their potential victims (AARP, 2009). In fact, researchers have found that emotions characterized by high levels of arousal, such as excitement and anger, engender risky decision making relative to low-arousal emotions (e.g., Lerner & Keltner, 2000; Slovic et al., 2005). Importantly, older adults are disproportionately targeted by fraud (AARP, 1999, 2003, 2011; FINRA Investor Education Foundation, 2013), and theory in lifespan development suggests that older adults are particularly susceptible to the effects of high-arousal emotions on decision making (Carstensen, Mikels, & Mather, 2006). We do not know, however, whether these effects are specific to positive or negative emotions.

## STUDYING EMOTIONAL AROUSAL AND FRAUD SUSCEPTIBILITY IN THE LABORATORY

In this study, we examined whether inducing high-arousal positive and high-arousal negative emotions in the laboratory increases susceptibility to fraud. Participants were *older adults* (ages 65 to 85) and *younger adults* (ages 30 to 40). We developed a laboratory task in which we induced different types of emotional arousal in the participants and then assessed their responses to misleading advertisements.

The three different emotional arousal groups were: *excitement* (high-arousal positive emotion), *anger* (high-arousal negative emotion), and *neutral* (low arousal). Data from a total of 139 participants (71 older adults, 68 younger adults) were included in the analyses.

To induce different types of emotional arousal, we administered to participants modified versions of the Monetary Incentive Delay (MID) task (Knutson et al., 2000). An overview of the task is presented in Figure 1. In the standard MID task, a participant views on a computer screen a series of monetary cues. Each cue signals the possibility of winning or losing money (e.g., +\$5.00). After each cue, a target (star) appears briefly on the computer screen. In order to win or avoid losing the amount of money that has just been shown in the cue, the participant must respond to the target by quickly pressing the spacebar. After each cue-target combination, the participant receives feedback indicating whether he or she responded quickly enough (“Hit!”) or not (“Miss!”) to win, or avoid losing, as specified by that particular cue.

Figure 1. Overview of the MID task.



In this study, the MID task was administered in 8 separate blocks (i.e., phases), and we rigged the blocks in order to induce different types of emotional arousal. Specifically, participants in the excitement group initially lost a large amount of money, and then gradually won money, over the course of each block. In contrast, participants in the anger group initially won a large amount of money, and then gradually lost money, over the course of each block. Participants in the neutral group won or lost only very small amounts of money throughout each block. The overall amount of money participants won in the task was designed to be equal across groups. At the end of each block, all participants rated their current emotional experience on two continuous scales (how positive or negative they felt, and how aroused they felt). The terms used in these scales were initially defined for participants; for example, arousal was described to participants as a continuum from not at all aroused (e.g., relaxed, calm, dull) to extremely aroused (e.g., stimulated, frenzied, jittery).

After each of the 8 blocks of the MID task, participants viewed one of 8 different advertisements that previously had been designated by the Federal Trade Commission (FTC) as misleading (FTC, 1991; FTC Bureau of Consumer Protection, 1998; see Asp et al., 2012). For example, one advertisement inaccurately claimed that an automotive product would improve fuel economy by a substantial amount, and another advertisement claimed that special diet pills removed fat content from food. For each advertisement, participants were asked to rate on a 7-point scale the

degree to which they believed a specific aspect of the content (*advertisement credulity*) and the likelihood that they would purchase the advertised item if cost were not a consideration (*purchase intention*) (Asp et al., 2012). The use of these two scales allowed us to examine the relation between advertisement credulity and purchase intention in both older and younger adults.

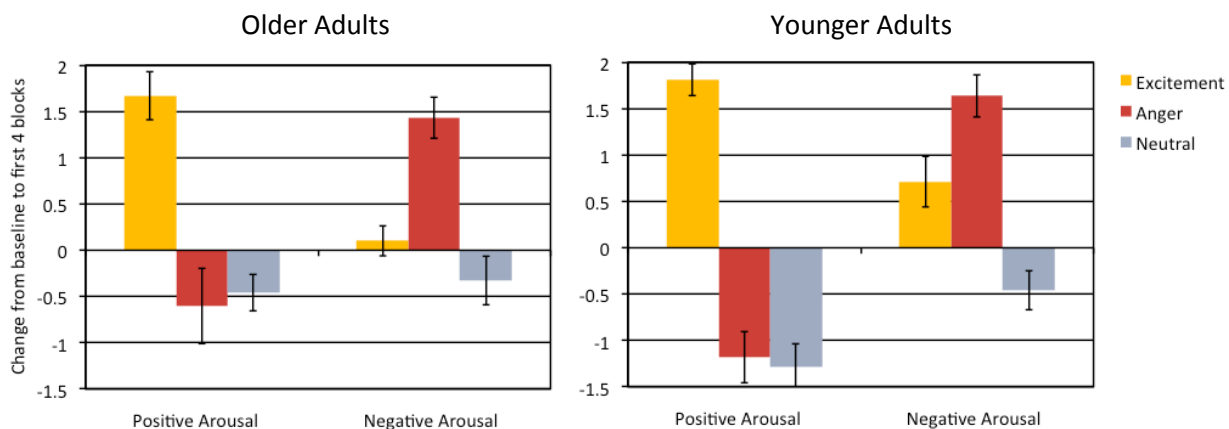
We examined the effects of both emotional arousal (excitement, anger, neutral) and age (older adults, younger adults) on ratings of advertisement credulity and purchase intention. We included in the analyses only those participants who responded to the emotion inductions as intended. We also controlled for baseline variables (e.g., cognitive ability) that, across groups, were associated with advertisement ratings. Finally, the analyses focused on the first 4 blocks (i.e., the first half) of the MID task when participants reported the highest levels of emotional arousal.

## FINDINGS

### High-arousal positive and negative emotions can be induced in the laboratory.

As shown in Figure 2, both older adults (left panel) and younger adults (right panel) responded to the emotion inductions. As expected, in both older and younger adults, the excitement group reported higher levels of positive arousal than did the anger and neutral groups ( $ps < .001$ ), and the anger group reported higher levels of negative arousal than did the excitement and neutral groups ( $ps < .01$ ).

Figure 2. Ratings of emotional arousal in older and younger adults.

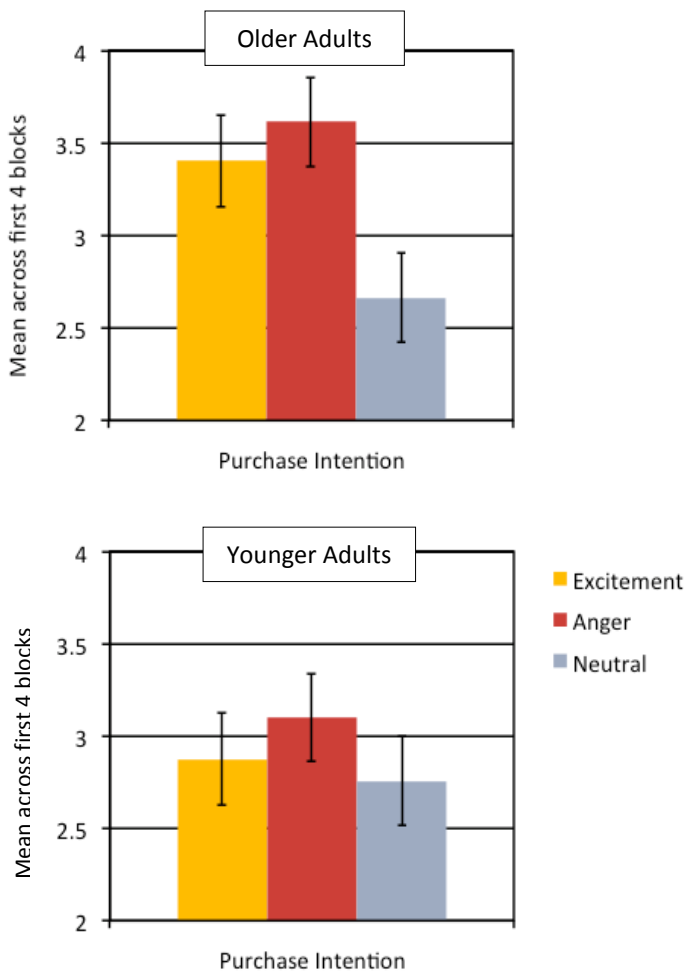


Note: Error bars denote standard error of the mean.

**Excitement and anger increase older adults', but not younger adults', intention to purchase falsely advertised items.**

Interestingly, in older adults, both the excitement and anger groups reported greater intention to purchase the advertised items compared to the neutral group ( $p < .05$ ). These group differences are shown in Figure 3, left panel. In younger adults, however, there were no significant group differences in intention to purchase the falsely advertised items (Figure 3, right panel).

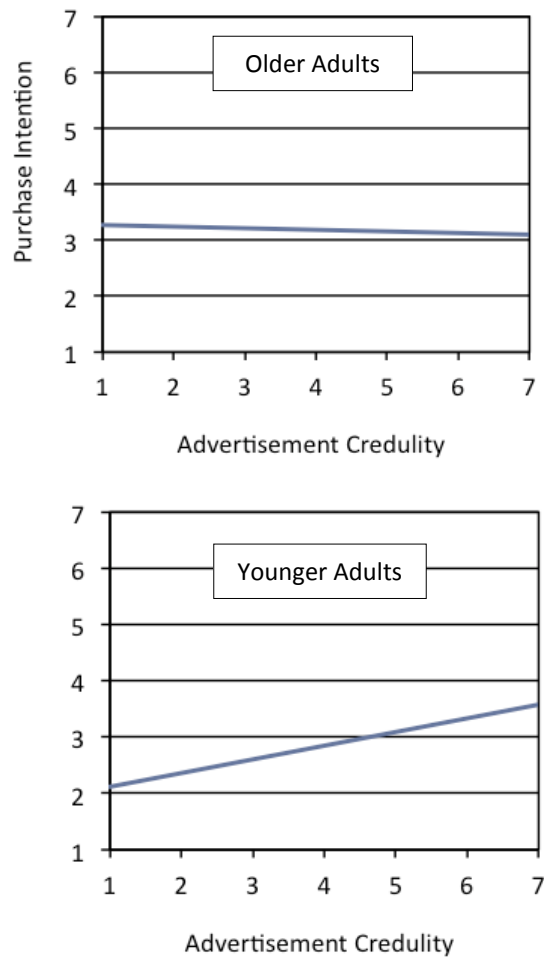
Figure 3. Ratings of purchase intention in older and younger adults.



**In younger adults, but not in older adults, advertisement credulity predicts intent to purchase.**

Across the three emotional arousal groups, there was a significant positive association between advertisement credulity and purchase intention ( $p < .05$ ) in younger adults. That is, the more highly younger participants rated the credibility of an advertisement, the more strongly they rated their intent to purchase the item being advertised. This association is shown in Figure 4, right panel. However, in older adults, there was no significant association between advertisement credulity and purchase intention, neither across nor within each of the three emotional arousal groups (Figure 4, left panel).

Figure 4. Association between ratings of advertisement credulity and purchase intention in older and younger adults.



**CONCLUSIONS**

Inducing both high-arousal positive and high-arousal negative emotions in older adults increased their susceptibility to misleading advertisements, leading them to indicate greater intention to purchase the falsely advertised items. This occurred despite the high-arousal groups not finding the advertisements to be more credible than did the low-arousal group. These results suggest that a state of high emotional arousal, regardless of the specific emotion of excitement or anger, has a broad influence on older adults' susceptibility to fraud. When we examined younger adults separately, we did not find these same effects. Further, whereas in younger adults greater advertisement credulity was associated with greater intention to purchase the item, credulity and purchase intention were not significantly related in older adults. These findings suggest that older adults' intention to purchase the advertised item was not based on perceived credibility, but rather on the high-arousal positive and negative emotional states that they were experiencing.

**IMPLICATIONS FOR FRAUD INTERVENTION AND PREVENTION**

Our high-arousal emotion inductions were designed to simulate the real-world tactics of financial fraud perpetrators (AARP, 2009). Communicating the current findings to consumers and investors,

particularly older adults, may increase their awareness of arousal-based financial fraud tactics and ultimately decrease their susceptibility to these tactics. In particular, because the results indicate a *broad and general* effect of arousal on fraud susceptibility, individuals may benefit from becoming more aware of increases in their general arousal level in response to finance-related offers. Instead of making purchase decisions in the "heat" of the moment, consumers should wait for emotions to subside. Future research should focus on developing and disseminating these types of interventions, and examining their potential effects on reducing fraud prevalence by helping consumers resist persuasion tactics.

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## REFERENCES

- AARP (1999). *Consumer behavior, experiences and attitudes: A comparison by age groups*. Princeton Survey Research, New Jersey.
- AARP (2003). *Off the hook: Reducing participation in telemarketing fraud*. US Department of Justice, Office of Justice Programs and the AARP Foundation.
- AARP (2009). *The con artist's playbook: The psychology behind ID theft, fraud, and scams*. AARP Fraud Watch Network.
- AARP (2011). *AARP Foundation National Fraud Victim Study*. AARP Foundation.
- 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. *Frontiers in Neuroscience, 6*, 100.
- Carstensen, L. L., Mikels, J. A., & Mather, M. (2006). Aging and the intersection of cognition, motivation, and emotion. In J. Birren & K. W. Schaie (Eds.), *Handbook of the Psychology of Aging*, pp. 343-362.
- Federal Trade Commission. (1991). Lewis Galoob Toys Inc. *Federal Trade Commission Decisions, 114*, 187-217.
- Federal Trade Commission Bureau of Consumer Protection. (1998). *Complying with the Made in USA Standard*. Federal Trade Commission Report.
- FINRA Investor Education Foundation (2013). *Financial Fraud and Fraud Susceptibility in the United States*. FINRA Investor Education Foundation and Applied Research Consulting.
- Knutson, B., Adams, C. M., Fong, G. W., & Hommer, D. (2001). Anticipation of increasing monetary reward selectively recruits nucleus accumbens. *The Journal of Neuroscience, 21*, RC159.
- Lerner, J. S., & Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgment and choice. *Cognition and Emotion, 14*, 473-493.
- Slovic, P., Peters, E., Finucane, M. L., & MacGregor, D. G. (2005). Affect, risk, and decision making. *Health Psychology, 24*, S35-S40.



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Stanford Center on Longevity  
Stanford University  
579 Serra Mall M  
Stanford, CA 94305