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Ability to Reduce Gram Scams Through Educational Intervention

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ABILITY TO REDUCE GRAM SCAMS THROUGH EDUCATIONAL INTERVENTION

by

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Abstract

Objective: This study aims to understand why people fall for scams and seeks to explore what interventions for scam prevention are the most effective in older adults. **Participants:** Approximately 686 participants aged 65 and above will be randomly assigned to view one of four intervention types: celebrity endorsement PSA, community-based PSA, personal advice from a family member, or the control group. **Method:** A path analysis will be conducted to examine how the type of intervention, gender of the participant, and history of financial fraud, mediated through concerns and susceptibility to scams, impact the propensity to fall for a hypothetical scam call. **Results:** The hypothesized path model fit is expected to fit the data quite well, and we would expect a small amount of variance accounted for overall. We would expect the relationships between the type of intervention, gender, history of financial fraud, concerns about scams, susceptibility to scams, and the propensity to fall for a scam to be significant. Mediation analysis would also reveal significant indirect paths for the type of intervention, gender, and history of financial fraud on the propensity to fall for scam through concerns about scams and susceptibility to scams. **Conclusion:** This research offers insight into the cognitive and behavioral factors influencing scam susceptibility. Findings from this work would extend beyond academic knowledge, as it has the potential to provide society with effective tools and targeted interventions to reduce scam compliance in older adults, which could be implemented on a local, national, and global scale.

Ability to Reduce Gram Scams Through Educational Intervention

Recently, scams have become quite prevalent in our society, posing substantial financial and emotional burdens on individuals. According to the Federal Trade Commission (FTC) data from 2022, consumers have lost almost $8.8 billion to fraudulent activities (Ritchie et al., 2023). Oftentimes, the scams have targeted vulnerable populations like older adults. Some research has shown that the elderly population has fallen prey to many of these scams, as they seem to be more susceptible to financial exploitation; however, anyone can fall for these tricks (Burnes et al., 2017). More recent statistics do not necessarily find this— but find that older people are targeted more, victimized at a greater rate, and lose more money per crime (Newman et al., 2023). Despite these statistics, consumers seem to believe they are immune to scams until they fall victim (Ellin, 2019). The American Association of Retired Persons (AARP) claims that scammers may target older adults as they are often empty nesters who are retired and seeking companionship or attention (Ibid). In addition, older adults typically have more assets than younger individuals (Goergen & Beaulieu, 2017). Financial burdens are not the only thing that are placed on these victims, as there are other nontraditional costs that individuals face like stress, anxiety, insomnia, drop in personal confidence, isolation, and depression (Sugar et al., 2020, p. 306). Trying to understand the particularly vulnerable population of older adults is critical, as we are expecting a significant demographic shift in the coming years. By the year 2030, approximately one in five Americans will be 65 years or older and there will be 61 million young-old, ages 65-84, and nine million old-old, ages 85 and older (Ouchida & Lachs, 2015). The world's older population will continue to grow at an extraordinary rate, as 17% of the world's population will be made up of older adults by 2050 (He et al., 2016).

Scams are uniquely different from other crimes and criminal activity. Scams can occur anywhere, and the perpetrators often operate from distant locations or from boiler rooms (Hanoch & Wood, 2021). In these boiler rooms, groups of people will try to call and make a connection with older adults and other individuals (Sugar et al., 2020, p. 306). Scammers may also pose as care providers or other professionals to gain access to older adults (DeLiema, 2018). In addition, what differentiates scams from other crimes is that the potential victims act as an aide in these schemes by giving their personal information away, sending money to these scammers, and in some cases not reporting it to the authorities, which is critical in understanding how these operations stay underground (Hanoch & Wood, 2021). The FTC follows 30 different types of fraud, scams, and confidence schemes, all under the classification of something called "consumer fraud" (Sugar et al., 2020, p. 307). Prize, lottery, sweepstake scams, Medicare and Social Security scams, sweetheart/affinity scams, and grandparent scams are among the most popular types of deceptive practices used against older adults.

Common Scams: There are many different types of scams, all of which have distinct elements. In the prize, lottery, or sweepstake scams, scammers pose as representatives of companies informing victims that they've won prizes or large sums of money. They then ask for some money upfront to cover the cost of shipping or fees, and the catch is that the promised prizes do not exist (Ibid). In government imposter scams, like a Medicare scam, callers claim to be official government representatives explaining they can improve the victim's benefits but just extract personal information (Ibid). Another category of scams are sweetheart scams which take place on online dating websites and social media accounts. Scammers create fake profiles and forge relationships and rapport with individuals before asking the victim to send them money (Ibid). Lastly, in grandparent scams, the callers impersonate a grandchild who is supposedly in

trouble and urgently needing money to resolve the situation (Ibid). Grandparents tend to have a difficult time saying no to their grandchildren, so these scam artists target the elderly and implement various emotional manipulation techniques to convince them (Federal Communications Commission, 2023). These con artists have become so sophisticated that they can access the victim's personal information and even use artificial intelligence to mimic a grandkid's voice to create a more accurate storyline (Ibid). Though we touched on many different types of scams in this paper, we will mainly be focusing on grandparent scams.

Characteristics of Victims of Fraud

DeLiema argues that Routine Activity Theory can be translated to psychology to help us better understand the conceptual framework surrounding scams (DeLiema, 2018). Routine Activity Theory, first developed by Cohen & Felson (1979), sought to understand the occurrence of criminal activities. Routine Activity Theory postulates that for a crime to occur, three elements must converge in time and space: a motivated offender, a suitable target, and the absence of capable guardians (DeLiema, 2018). An individual's behaviors can influence their vulnerability to scams. It might be assumed that individuals who lack security measures or engage in risky behaviors may be more vulnerable to crimes and scams. Understanding these psychological factors can help the public develop protection strategies to combat scam compliance. Though this theory is in the realm of criminology, it may help researchers understand the behavioral aspects of individuals with respect to scams. This theory scratches the surface of the psychology behind why people fall for scams. It is a good jumping-off point; however, it does not include demographic characteristics like age and gender, which might influence susceptibility.

Does Gender Play a Role in Scam Susceptibility?

The question of whether gender plays a significant role in understanding vulnerability to scams has not been greatly studied. Social Role Theory, proposed by Eagly, may be able to help us understand why gender differences may occur and how we might be able to translate this to scam susceptibility. Social Role Theory explains that gender differences are driven by societal expectations and norms rather than being genetically determined (Eagly, 2009). According to this theory, society assigns distinct roles to different groups of people. The reasoning behind this is that individuals tend to want to be successful and flourish in an established role. For example, men are often associated with assertiveness and placed in work-related roles, while women are typically linked to nurturing and caregiving roles. Gender stereotypes emerge from these assigned roles. This theory emphasizes that these roles dictate how one should behave, what they should value, and helps guide their ultimate goals to seek fulfillment. This socialization process begins early in life and continues to be perpetuated through social institutions. We see this in the workplace, family dynamics, and in societal expectations of heteronormativity. It may be the case that, historically, conforming to societal roles created order and helped individuals move through their social environment and work efficiently. Given this theory, it may be plausible to infer that there could be gender differences in responding to scam attempts, given the perceived gender roles they may identify with. In a recent study, using data from the Health and Retirement Study, DeLiema explored the differences between those who had reported having been a victim of fraud and those who did not (DeLiema, 2015 as cited in Anderson, 2016). DeLiema found that women were less likely to report having been a victim than men (Ibid). Some research has shown that men and women fall for different types of scams. Women are more likely to fall for

sweepstakes scams, while men are more vulnerable to investment and foreign lottery scams (Myers et al., 2021).

Generally, older adults tend to engage in more prosocial behavior. Beadle et al.'s (2013) study explored empathy and prosocial behavior in different age groups. Participants were told that they were to play a game against two opponents, with the opponents being confederates in the lab, where they had to decide how to split $10 amongst them. Before the game, emotional induction was manipulated, and participants received handwritten notes from their opponents (the confederates) discussing their battle with skin cancer. By the end of the study, older adults showed greater prosocial behavior than younger adults, and they also had a positive relationship between state emotional empathy ratings and prosocial behavior. These results suggest that older adults may be more motivated to help others compared to younger adults.

In addition to Beadle et al.'s (2013) study, Ebner et al. (2018) conducted research on how aging affects a person's susceptibility to fraud and scams. The researchers recruited young adult aged to middle-aged individuals. A fake email was sent to participants every day to see who did or did not click on the link. In addition, the researchers measured the participant's memory, affect, and awareness of the scams. The results indicated that people in the middle-old group, between the ages of 75-89 years of age, had a higher tendency to fall for the scams and tended to have a worse short-term memory capacity compared to the other groups. Participants between the ages of 18-37 years of age and 62-74 years of age who tended to fall for the fake scams were more likely to experience less positive to negative emotions. The authors also discussed that older women were more susceptible to falling for the scams compared to the male participants.

Conceptual Frameworks to Understand the Factors Related to Susceptibility

Because there is limited literature on the psychology of scam compliance, most of the research has been drawn from the psychology of persuasive communication and marketing (Fischer et al., 2013). One conceptual framework or model that might be beneficial in understanding why people fall for scams is the Elaboration Likelihood Model (Petty et al., 1986). The Elaboration Likelihood Model (ELM), coined by Cacioppo and Petty, is a highly regarded model that describes persuasion and attitude change. Cacioppo and Petty describe two possible routes to attitude change: the central route of persuasion and the peripheral route of persuasion. The central route involves careful consideration of the strengths and weaknesses of an argument, whereas the peripheral route involves far less critical thinking. Instead, when using the peripheral route to argue for attitude change, we employ heuristics to decide, quickly, whether to change our attitude or not. Essentially, these two routes are about careful processing versus heuristic processing. Generally, scammers assume we, as consumers, are on the peripheral route and doing lots of things to change our minds quickly without any meaningful information. They want to evoke emotion to keep consumers on the peripheral route. Usually in grandparent scams, older adults are manipulated by their concern for their family's well-being and will do anything for them.

Existing research by Fischer et al. (2013) uses parts of the ELM to explain psychological determinants of scam compliance and what techniques are so effective. The authors were interested in researching the differences between people who fall for scams and those who do not. The authors did this in a series of two studies. The first portion of the study was to gather preliminary data to gauge whether the participants had fallen for a scam in the past. They were asked how they felt and what their motivations and behaviors were. The researchers measured a

plethora of psychological processes that have been used in prior research like motivation, positive emotions, trust, vulnerability to persuasion techniques, and scarcity. The quality of decision-making and information-processing routes are reduced when people are in high motivational states. This refers to the ELM where people use cognitive shortcuts and fail to elaborate the pros and cons of a decision adequately. After analyzing the data, the researchers found that cues related to positive emotions like the words "friends" or "home", cues relating to the trustworthiness of the source/authority cues, and cost-benefit considerations including high monetary incentives seemed to pop up the most in the participants' responses. Using the results of Study 1, the researchers created fake scams using the cues that were associated with self-reports of scam compliance. Along with the fake scams, the researchers sent out the same questionnaire from Study 1. Study 2 matched the results from Study 1, demonstrating that the fake scams that were the most successful tended to include a high monetary incentive, evoke positive emotions, and utilize expert heuristics. Overall, older adults may depend more on heuristics and the automatic processes as they age, as this system tends to stay relatively intact in late life compared to the central route, focusing on working memory processes, which tend to become weaker as we age (Mueller et al., 2020).

The Role of Emotions in the Decision-Making Process

In addition to the ELM, emotions can also play a crucial role in the decision-making process by providing valuable information that can help guide decisions. Emotions can operate on an unconscious and conscious level. Feelings-as-information (FAI) theory, coined by Schwarz (2010), conceptualizes the role of subjective experiences like moods and emotions in decision-making and judgment. This theory assumes that people look to their feelings as a valid source of information when they lack other relevant information to rely on in the environment.

Within the framework of this theory, it appears that people presume that their momentary feelings are representative of the decision to be judged, and it is only when a feasible alternative source for the feelings is made salient that people begin to question the validity of their emotions being applied to the decision-making task (Schwarz, 1990, as cited in Schwarz, 2012). The theory was initially implemented to examine happy and sad moods on evaluative judgment, but the literature is expanding on other emotions such as fear. Norris & Brooks' (2021) article explores the roles of emotion in response to online fraud, looking at how fear or excitement can influence someone's susceptibility to scams. Both FAI theory and ELM provide greater insight into how focusing on certain cues in a scam message can influence the extent of elaboration and attention to detail. Scammers craft their emails or calls to evoke the least amount of cognitive processing of a message for the victim (Workman, 2008). In grandparent scams, the messages tend to include words such as "threat" or "deadline" to create a sense of urgency and fear, leading the victims to act quickly, utilizing the peripheral route of information processing (Norris & Brooks, 2021). These fear appeals are effective because they pose an immediate threat unless the recipient complies with the scammer (Ibid). Since most scams utilize fear tactics to persuade individuals, perhaps one could counteract this by using an intervention education program that evokes fear to convey the dangers of scams.

Psychological-Vulnerability Framework

While the research presented thus far focuses more on the cognitive process, others argue that psychological needs are activated when individuals are targeted for scams. Lichtenberg et al. (2013) introduces a psychological-vulnerability framework that indicates that scam compliance is linked to overall mental health and other psychological characteristics in their predictive models. The authors focused on affection, behavioral confirmation, and status which they called

the three social needs (Lichtenberg et al., 2013). In their study, depressive symptoms, functional

independence, self-rated health, affection, behavioral confirmation, status, and financial fraud

were measured. The results showed that age, education, and depression were all significant

predictors of fraud. In addition, social needs fulfillment was significantly related to fraud. High

rates of depression and low social needs were linked to the most psychologically vulnerable

older adults. The prevalence of scam-related activity was 14% higher in those participants with

the highest depression and the lowest social-needs fulfillment compared to the rest of the

participants. The combination of high depression individuals and low social needs being met was

associated with a 226% increase in fraud prevalence (Ibid). Furthermore, Wen et al. (2022) also

looked at how loneliness and self-control can heavily influence an individual's susceptibility to

persuasion and vulnerability to fraud compliance. The authors used a series of self-report

questionnaires to gauge the participant's loneliness, susceptibility to persuasion, self-control, and

vulnerability to fraud while controlling for participant variables such as age, gender, race, and

socioeconomic status. The authors showed that there was a positive relationship between

loneliness and the participant's vulnerability to fraud. In addition, a participant's susceptibility to

persuasion acted as a mediator. However, this significant effect was only seen in the condition

where the older adults were categorized as having low self-control in various situations. These

results add another layer of the different factors at play when individuals fall for a scam.

Existing Research on Effective Interventions

An effective intervention that has been used is an anti-scam board game. Chung & Yeung

(2023) researched how effective an anti-scam board game intervention might be in counteracting

older adults' inclination to engage in scams. This board game strategy had only been utilized

with younger populations, so the authors wanted to see if the results could also be generalized to

older adults. The game consisted of various hypothetical scam scenarios where a group of older

adults were given solution cards that contained ways to avoid being scammed. In each

hypothetical situation, participants were encouraged to discuss with other participants to select

up to three solution cards that might be the best at avoiding the risk of being scammed. A trained

staff member would then evaluate the participants' chosen solution cards, and if the solution

cards are not deemed appropriate to handle the scam, the player loses one to three coins. There

was a social embarrassment factor of losing coins in front of other peers, so this game

incentivized participants to try and win the game by picking the most suitable solution cards in

each round. Two weeks later, the participants received a fake scam call from the researchers to

measure how effective the anti-scam education program was. The authors found that participants

enrolled in the anti-scam education program had higher levels of self-efficacy in detecting scams

compared to the control group, meaning they had greater confidence in their ability to detect

various scam situations. In addition, along with self-efficacy, participants in the experimental

condition were less susceptible to falling for the fake scam call from the researchers, as they

were less likely to give their personal information to the researcher. This interactive game

approach increased the retention of scam awareness knowledge.

      Another potentially effective prevention strategy is forewarning (Scheibe et al., 2014).

Forewarning is a psychological intervention that has been effective in warning an individual

about a social influence appeal before they are faced with the persuasive appeal (Ibid). While

previous research about the use of forewarning focused on college-aged adults, Scheibe et al.'s

study targeted fraud victims, which included a decent portion of older adults in their sample. In

this study, the authors wanted to examine whether forewarning could reduce scam compliance in

people who were victimized in the past. The researchers had an experimental condition where

half of the participants were given a warning about the exact same hypothetical scam that they would encounter after their session, while the other half was forewarned about a different scam than the one they were exposed to at the end of the study. There were two time intervals where the participants were exposed to a mock scam via a telemarketer, one was 2 weeks after the participant was warned and one 4 weeks after. The results indicated that both warnings were effective at reducing scam compliance, but refusals (as opposed to overall weariness about the scam) were more frequent when the participant had the same scam warning than the different scam warning. In addition, the researchers found that the same scam warning was not as effective over time, while the different scam warning tended to be more effective over time. Forewarning may allow individuals to become more cognizant of these persuasive tactics and be better equipped to recognize and resist persuasive appeals. McGuire's Inoculation Theory can help explain why participants might be less vulnerable to being persuaded if they have previously fallen for a scam. Similarly, to how an individual can be inoculated against a disease or virus, this theory suggests that the same thing can be applied to people's attitudes (Compton, 2012). Participants would develop resistance against these scam tactics when they are exposed to a persuasive message that then explains the other side of things to weaken the argument, which the interventions would hopefully succeed at doing.

Rationale for Types of Interventions

This study will focus on various interventions. The interventions that are selected for this study are based on the psychological theories in the literature and draw on specific scam vulnerabilities of older adults. The celebrity endorsement public service announcement (PSA) draws on the ELM, specifically the peripheral route, using the expertise heuristic by including a well-liked celebrity from the 50+ age demographic. The peripheral route relies on celebrity

endorsements and positive characteristics. This route to attitude change is effortless and does not

require high cognitive load (Petty et al., 1986). Though this method of persuasion may promote

positive emotions toward the message against scams, the research has shown that this method

results in less permanent behavioral or attitude change (Ibid). The celebrity PSA also highlights

authority and credibility, which is founded on Cialdini's seven principles of influence. We are

cognitive misers and typically do not like to adjust or make the correction of how we view the

world. We engage in cognitive conservatism and given a multitude of information; we try to

make accurate judgments with as little information as possible (Ma, personal communication,

February 15, 2022). Cialdini's work on the psychology of social influence complements the

forewarning strategy mentioned earlier. Given this cognitive conservatism, Cialdini created these

seven principles of shortcuts that guide our decision-making: reciprocation, liking, social proof,

authority, commitment and consistency, scarcity, and unity (Dooley, 2021). In designing the

interventions for this proposed study, Cialdini's principle of authority will be utilized. The

celebrity endorsement PSA supports the principle of authority by incorporating a well-known

and trusted celebrity. People want to follow the lead of experts and, hopefully, they hook their

ideas to genuine authorities on the topic of scams. This should boost the credibility, gaining the

attention of the participants to change perceptions and behaviors toward scam prevention.

Meanwhile, the community-based PSA would not only include a person in the participant's

community, but the PSA would describe how someone has lost all their money to their name and

had been rejected from their community, explaining that their family and friends were

embarrassed of the victim. The community-based PSA emphasizes affinity and unity, as

someone within the participant's community is sharing their experience of falling for a scam,

which may be more persuasive due to the geographical proximity. In addition, participants might

use social proofing as a way to make a decision where they want to follow the lead of the people

who are comparable to them or similar to them (Ibid). Lastly, the personal advice PSA

emphasizes the authority and affinity principles, as the participants are gaining knowledge from

someone they trust and have a close relationship with. Overall, the rationale for creating the three

different types of interventions connects to the various cognitive heuristics that one might use,

using common tactics used in scams, but using them for a good cause.

Study Overview

The existing literature applies Routine Activity Theory, psychological frameworks, and

emotional responses to predict people's susceptibility to scams. Conceptual frameworks like the

Elaboration Likelihood Model and Feelings-as-information Theory offer insights into the

cognitive processes involved in scam compliance. There is limited research on gender

differences in scam susceptibility and how social roles might come into play. Interventions, such

as anti-scam board games and various forewarning strategies, have been shown to be effective in

increasing scam awareness and reducing susceptibility.

This project will address the gap in the literature by investigating specific interventions to

reduce scam compliance in older adults. The study will be conducted in-person where

individuals will be exposed to one intervention out of the four (Celebrity PSA, Community-

Based PSA, Personal Advice, and Control) conditions. They will then complete a series of self-

report questionnaires assessing scam knowledge and the effectiveness of the intervention before

being called two weeks later with a hypothetical scam call. Based on the limited findings of

previous research it is hypothesized that: (1) Intervention, gender, and history of financial fraud

will all have a direct effect on the propensity to fall for a scam, (2) the intervention, gender, and

history of financial fraud will have a significant indirect effect on the propensity to fall for the

scam through its effect on the concerns and susceptibility criteria, such that higher ratings of concerns and lower ratings of susceptibility to scams will result in a lower propensity to fall for the scam, (3) participants exposed to the community-based PSA and the personal advice group are expected to display a significantly lower propensity to fall for the scam compared to those in the control group with no intervention, whereas participants exposed to the celebrity PSA condition are expected to demonstrate an equivalent propensity to fall for the scam as those in the control group and (4) gender will be a significant factor, such that overall, female participants will be more susceptible to falling for scams compared to male participants.

<div align="center">**Proposed Method**</div>

Participants

According to Cohen (1992), approximately 686 adults above the age of 65 years old would be needed to conduct a path analysis. This is assuming there are six predictors, with a small effect size, and a desired power of .8. Though a path analysis will ultimately be conducted, to be more conservative, this a priori power analysis for multiple regression will be used instead of the rule-of-thumb for asymptotically distribution-free (ADF) which states about 200 participants would be needed if there are less than 12 variables in the model (Groscup, personal communication, October 23, 2023**)**. There will be no exclusions based on demographic variables other than age and cognitive ability. Participants with evidence of mild to severe cognitive impairment at the start of the study will be omitted. The study will be conducted in-person targeting older adults in the United States aged 65+ as the demographic group to focus on but will most likely consist of adults 65+ in Claremont and the surrounding communities in Southern California. Participants will be recruited on a voluntary basis via flyers posted in various assisted house living locations, 55+ retirement communities in California, and social media.

Announcements will also be made at the retirement homes during clubs or activities. A financial incentive of $20 will be given to the participants for the duration of the study. Money will be sent online (use of apps such as CashApp, PayPal, or Venmo) but can be mailed if participants are not online. Participants will be treated within the APA Ethics Code.

Materials

Stimulus

Type of Intervention: Public Service Announcements (PSA). Participants would be randomly assigned to read one type of public service announcement (celebrity endorsement, community-based, personal advice) or be assigned to the control group. This is a 4 condition between groups experimental design. The celebrity endorsement PSA would include a celebrity in the 50+ age demographic. The PSA would feature a neutral celebrity who is attractive, older, and well-liked. The celebrity would share important information on recognizing and avoiding scams. The community-based intervention would be to show participants a news story about someone in their community within a 5-mile radius who was scammed. It would be designed to create a sense of local relevance. The PSA will also include content about the victim losing all the money to their name, emphasizing that the worst thing about the situation is that their family and friends are embarrassed of the victim. The personal advice intervention would be to have somebody who the participant knows like their child or spouse warn them to be careful of possible scams. Upon participant sign-ups, the researchers will contact a spouse/child and have them record a video that will be used if the participant is randomly assigned to the personal advice condition. The content of each PSA will be similar in nature, including broadly applicable information about scams without revealing the specific scam that will be used at the conclusion of the study. Some warnings about fraud will include themes such as safeguarding personal

information and verifying the legitimacy of unexpected calls. Finally, the last group would just

be a control group where they do not see any educational programs about reducing scam

compliance. A pilot study would be run to establish and test the reliability of these different

interventions.

Measures

        Cognitive Status. Prior to entering the study, participants' cognitive abilities will be

assessed using The Montreal Cognitive Assessment (MoCA). The MoCA is a widely used

cognitive screener which can be helpful in assessing possible mild cognitive impairment (MCI)

and dementia (Lord et al., 2023). This cognitive screener evaluates executive functions,

visuospatial skills, naming, memory, attention, language, abstraction, delayed recall, and

orientation. Due to copyright restrictions, the MoCA has not been included in the appendix;

however, for those interested the full version can be accessed online. Some of the tasks include

connecting numbered dots (1, 2, 3, 4, 5) and lettered dots (A, B, C, D, E) in sequential order by

alternating numbers and letters, drawing an analog clock that reads a specific time, naming

animals, and recognizing commonalities between two different things (such as a watch and a

ruler) (Nasreddine, 2018). Scores are calculated by summing all the sub scores for each category,

adding one point for if the individual has less than 12 years of formal education, for a possible

total of 30 points (Ibid). A final total score greater than 26 points is considered to be in the

normal range. A cutoff score between 22- 25 indicates mild cognitive impairment, while a score

of 20 or less may indicate dementia (Wood, personal communication, September 27, 2023). For

the purposes of this study, participants who score below a 25 will be omitted, as that would

suggest at least mild cognitive impairment and perhaps even dementia. The reliability of the

MoCA was shown to be sufficient as the coefficient for Cronbach's alpha was .79 (Daniel et al.,

2022). The consensus regarding the content validity is that generally, the items and instructions on the MoCA were clear and comprehensive (Ibid).

Demographics. Data will be collected on participant's age, race/ethnicity, and gender identity. For gender identity, participants will have the option to select one or more options from a provided list, including Female, Non-Binary, and Other. Similarly, when asking about race/ethnicity, participants may select more than one option from the list of: White, Middle Eastern, Black or African American, East Asian, South Asian, Native American or Alaska Native, Native Hawaiian, Pacific Islander, Hispanic or Latino, or Other. Lastly, participants will be asked to provide their age by writing it in a designated space on the form.

History of Financial Fraud. To gauge the extent of participants' exploitation, they will be asked to report if they have been a victim of financial fraud in the last five years (Yes, No). These scores will be coded as 0 (no history of financial fraud) and 1 (fraud victim), meaning a higher score would be associated with greater fraud victimization (Lichtenberg et al., 2013).

Perceived Effectiveness of the Intervention. After viewing their respective interventions, participants will complete a semantic differential scale. The scale will be taken from Godinho et al. (2016). All prompts will be in the form of a question which will be on a Likert scale (1- *not persuasive at all*, 10- *very persuasive,* or 1- *not credible at all*, 10- *extremely credible*). Items on the *perceived message quality* scale consist of questions such as "In your opinion, how persuasive was the message?" and "How would you rate the message?". The reliability of the perceived message quality scale was also shown to be excellent as the coefficient for Cronbach's alpha was .93 (Godinho et al., 2016). Scores will be calculated by summing the scores to get one composite score. Higher scores would indicate a greater message evaluation. The intervention conditions will need to be dummy coded to be included in the path

analysis. The multi-level intervention conditions will be coded to have values of 0 (control group as the reference category), 1 (celebrity PSA), 2 (personal advice PSA), and 3 (community-based PSA).

Proposed Mediators

Susceptibility to Scams. Participants will be asked to complete the Susceptibility to Scams scale taken from James et al. (2014) to measure the perceived risk of scam victimization, which consists of a five-item self-report measure where participants rate their agreement on a Likert scale (1- *strongly disagree*, 10- *strongly agree*). Typical items might include: "I answer the phone when it rings, even if I do not know who is calling," "I have difficulty ending a phone call, even if the caller is a telemarketer, someone I do not know or someone I did not wish to call me," "If something sounds too good to be true, it usually is," "Persons over the age of 65 are often targeted by con-artists," and "If a telemarketer calls me, I usually listen to what they have to say". The total score is the average of ratings spanning across the five items, where items 1, 2, and 5 are reverse coded. Higher scores demonstrate more susceptibility to scams for all the items. The reliability of this scale was shown to be sufficient as the coefficient for Cronbach's alpha was .73 (Nolte et al., 2021).

Concerns about Scams. Questions collected from a *Survey on Scams and Fraud Experienced By Consumers* report released by the European Commission will be compiled to create a scale that measures an individual's concerns about scams (European Commission, 2020). This scale will consist of seven items. Item examples include: "You are suspicious of letters or emails containing spelling and grammar mistakes," "You perform checks on the credibility of the vendor, "and "You subscribe to specific services to avoid commercial calls" (see Appendix A for full scale). Participants would be asked to rate the statements using a 5-point Likert scale ranging

from "Strongly Disagree" to "Strongly Agree". Scores will be calculated by taking the average

of ratings across all the items to get one composite score. The last item will be reverse scored.

Higher scores would indicate an increase in one's concerns about scams. This could indicate

more cautious behavior towards scams. This scale appears to have good face validity and is

backed by research; however, the psychometrics are unknown. Reliability would be tested in the

study.

Dependent Variable

The propensity to fall for a scam is the dependent variable of interest. Two weeks after

the participants have viewed their respective interventions, they will receive a phone call from

the experimenter who is pretending to be the grandchild or close family member of the

participant who is supposedly in trouble and urgently needing money to resolve the situation.

The participants' responses to this fake scam call will be categorized into two categories: (0)

refused to provide their personal information or send money; and (1) participants provided their

personal information or agreed to send money/share bank account information over the phone. A

higher score would indicate a greater propensity to fall for the scam (Chung et al., 2023).

Procedure

The study will be conducted in-person to examine the effectiveness of scam intervention

programs and should take approximately 30 minutes to one hour. Before the participants begin

any portion of the experiment, informed consent will be obtained. The study protocol will begin

with cognitive evaluations of the potential participants using the MoCA. This will be done before

the participant is allowed to interact with the rest of the experiment and can be done in

collaboration with local retirement communities where the intake interviews can be conducted

in-house. The remaining participants after this evaluation will then be asked to complete a quick survey asking if they have fallen for a scam before.

The participants will then be randomly assigned to one of the four different conditions (Celebrity PSA, Personal advice, Community-based PSA, or Control Group). After viewing each group's given intervention, a manipulation check would be included. The participants will then be asked to fill out the concerns about scams scale, susceptibility to scams scale, and their perceived effectiveness of the intervention, as described above. At this point in time, the participants will be compensated for their time. The researchers will tell the participants that they may reach out to them in the coming weeks. Two weeks after the initial session, the researcher will call the participants using an anonymous phone number with a fake scam call to measure the propensity of falling for the scams after being introduced to their respective interventions. Please see Appendix B for the script that the researchers would use. Upon sign-ups, participants will be asked to include an emergency contact with that person's information. The researchers will reach out to this contact and ask for permission to use the name of the participant's grandchild in the hypothetical scam call, as scammers usually know the name of the grandchild when calling. If the emergency contact cannot be reached, the names of family members can often be found online or on social media, which the researchers could parse through. This will be discussed in more detail in the ethical considerations section. Immediately after this the participants will be properly debriefed and thanked. Along with the debriefing, participants will be told how they were deceived, and services will be offered to participants if their well-being was compromised due to the deception.

Ethical Considerations

Findings from this research will broaden our understanding of the tactics and persuasive techniques used in scams. Combined with the existing body of literature, this study will provide an opportunity to gain insight into what types of interventions are effective at combating scam conformity in older adults, and how these interventions may vary with different age groups. This research is important to society at large given that the number of older adults is expected to grow in the coming years, and older adults are often targeted by scammers due to their vulnerable status, financial stability, and potential cognitive decline. Scams result in significant financial losses. Effective prevention can reduce the economic impact and burdens on legal systems and public resources. There are no direct benefits to participants, and the level of risk to participants is minimal. The project does contain deception as part of the study, as it would require participants to be targeted by a fake boiler room approach with a hypothetical scam. Given the high frequency of scams that the participant may encounter in the natural environment, this project would not exceed minimal risk. The use of deception in our study was necessary to accurately assess older adults' susceptibility to scams and to test if intervention approaches would be effective at reducing scam compliance. By simulating realistic scam scenarios, we seek to gain insight into the specific factors that may make this demographic more prone to falling prey to scams. Participation is voluntary, and one can stop at any point within the study without penalty. Participants will be asked to engage in a cognitive assessment screening process, complete a series of questionnaires after looking at a specific intervention, and then they will later receive a fake scam call after the initial session. The fake scam call will be used to measure

the participant's propensity to fall for the scam after being introduced to their respective

interventions. Immediately after this, the participants will be properly debriefed. Along with the

debriefing, participants will be told how they were deceived and why they had to be deceived

within the context of the study. Services will be offered to participants if their well-being is

compromised due to the deception. If participants felt embarrassed at all throughout the process,

the researchers would assure the participants that this can happen to anyone and resources for

counseling would be provided. In addition, participants would be educated about where to report

scams. They would also be given information about which intervention was the most effective

after the research has been completed if they wanted to take part in the education program. Older

adults are often considered to be a vulnerable population, and some may become cognitively

impaired, losing the capacity to give informed consent. This will be discussed at the beginning of

the study, as cognitively healthy individuals will be included, and cognitively impaired

participants will be excluded from the study.

Minimal demographic information will be collected from participants (race/ethnicity,

age, gender). We will need to collect phone numbers to be able to reach out to participants. We

will also need to collect an emergency contact. We understand the sensitivity of obtaining and

utilizing participants' contact information, including emergency contacts. Information like this

that may identify an individual's identity will be kept confidential and stored in a password-

protected account. The researchers will be instructed to only use the contact information for the

intended purpose of seeking permission to use the participant's grandchild's name in the

hypothetical scam call. Efforts will be made to contact the provided emergency contact first,

obtaining informed consent and consent to use the grandchild's name before incorporating any

personal details into the study procedure. They will be assured that the grandchild's name will

only be disclosed within the context of the hypothetical scam call with the participant. In cases

where the emergency contact cannot be reached, the research team may resort to publicly

available information online or on social media, adhering to ethical standards and respecting

privacy. Because this information is usually publicly available, this would not exceed minimal

risk. Though the results may be referenced in the final manuscript for the overarching study or

included in the Scholarship@Claremont database, none of the data will be linked back to the

participant. Overall, the benefits that may arise from this research greatly outweigh the risks.

Anticipated Results

Data Cleaning Process

A manipulation check would be tested. If participants fail the manipulation check, they

would be excluded from the data set, as their answers or participation in the study would be

skewed if they do not know what is being manipulated. Descriptive statistics for the whole

sample will be assessed. If there are any missing values in the dataset, we might opt to use

imputation, using a replacement with the mean of the variable if less than five percent of the data

is missing, and the data does not appear to be systematic or meaningful or we could go with a

deletion approach. We will conduct a normality analysis to see if any of the variables are

problematic and perform appropriate bootstrapping techniques.

Data Analysis Strategy

We will run a simple analysis of variance (ANOVA) test as a preliminary analysis to

assess any significant differences between the interventions on the likelihood to fall for the

scam. It is hypothesized that participants exposed to the community-based PSA condition will display the highest reduction in scam compliance compared to those who were exposed to the personal advice group, followed by the celebrity PSA, and the control group. To test the proposed model, a path model analysis using AMOS 29 will be carried out using asymptotically distribution free (ADF) as a mean differences test after specifying and identifying the model. In the model, the type of intervention, gender of the participants, and history of financial fraud will be tested as predictors of the propensity to fall for the hypothetical scam call, with concerns about scams and susceptibility to scams acting as mediators. The ultimate outcome variable is the propensity to fall for the scam. Figure 1 illustrates this initial model.

Figure 1

Proposed Path Analysis
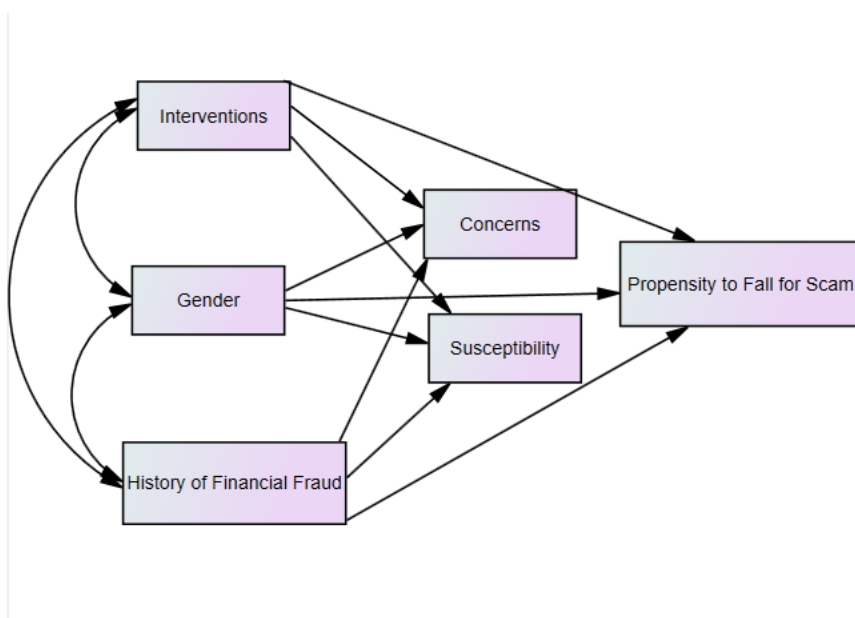
Model fit will be examined using several fit indices suggested by Kline (1998). The Model chi-square will not be significant, meaning that our model would be performing well.

Though fit indices do not necessarily tell us if the model is as hypothesized or theoretically meaningful, the goodness of fit indices (CFI, GFI, RMSEA, SRMR) would suggest that, overall, the model would have acceptable fit, meaning it would reproduce the correlations matrix. We would expect a small amount of variance accounted for overall considering the complexity of applied systems in the field of Psychology and Behavioral Economics. Given the numerous unaccounted factors inherent in such systems, including aspects beyond researchers' control, we would anticipate that the variance accounted for in this model would be small. This small effect would still have enormous implications in a real-world context (Prentice & Miller, 1992).

Given the research linking the predictors to the outcome variable of likelihood of falling for scams, the intervention, gender, and history of financial fraud are all expected to have a significant direct effect on the propensity to fall for the hypothetical scam call. It is expected that participants exposed to the community-based PSA and the personal advice group will display a significantly lower propensity to fall for the scam compared to those in the control group with no intervention. In addition, participants exposed to the celebrity PSA are expected to demonstrate an equivalent propensity to fall for the scam as those in the control group. Community-based PSA messages are more likely to be perceived as highly relevant to the participants due to their geographical proximity and connection to the victim. This could evoke a phenomenon known as the self-reference effect, where individuals are more likely to remember and encode information more successfully when the information is related to them in some way (Bentley et al., 2017). This could also be used to explain why the personal advice group would display a lower propensity to fall for the scam compared to those in the control. Furthermore, the community-

based PSA would involve a social embarrassment factor, describing how someone has lost all their money to their name and had been rejected from their community. Chung & Yeung (2023) included a social embarrassment factor in their anti-scam board game intervention. The game consisted of various hypothetical scam scenarios where a group of older adults were given solution cards thar contained ways to avoid being scammed. The participants would lose coins in front of others if they chose the wrong solution card. This game incentivized participants to pick the most suitable cards. Based on this research, it would be expected that hearing someone in the participants' community talk about the fear of being shunned may activate a fear-based reaction. It could be assumed that an individual would want to take all the necessary precautions to avoid being scammed for fear of being rejected or embarrassed. This intervention might capitalize on the power of peer influence and fear-based tactics. Most scams utilize fear tactics to persuade individuals, so one might be able to counteract this by using an intervention that evokes fear to convey the dangers of scams. In addition, leveraging social influence, especially from close relationships like in the personal advice PSA group, might reduce the propensity to fall for the scam. Given this PSA highlights Cialdini's authority and affinity principles, individuals may be more motivated to absorb the scam warnings when they are given by their loved ones who care about them (Dooley, 2021). The celebrity PSA would be the least predictive in reducing overall scam compliance and comparable to the control group. Based on the ELM, a celebrity endorsement might be categorized as an "expert". When there is a strong belief that the other person is an "expert," people tend to conform and may change their attitudes or decision-making strategies. Though the celebrity endorsement PSA may help with the initial persuasion and

attitude change, it would not be long-lasting or substantial enough to have the participants think critically about avoiding falling for the hypothetical scam call. The ELM would suggest that participants would be engaging in the peripheral processing mode, which employs heuristics to decide quickly.

Regarding gender, females will be more susceptible to financial scams than males. These findings would be consistent with Eagly's Social Role Theory that women are typically associated with nurturing and caregiving roles, which would increase their engagement in prosocial behavior, potentially leading women to be more vulnerable to certain types of scams like grandparent scams that target emotions and empathy. Participants who have had previous experience of financial fraud will be less likely to fall for the hypothetical scam call. It might be the case that they would be less vulnerable to being persuaded, given the research on McGuire's Inoculation Theory. Building on Scheibe et al.'s (2014) study, it would be expected that the use of scam warnings that are distinctly different than the mock scam tended to be effective over time. Our study will contain PSAs that address scams in relatively broad strokes, providing warnings that are not specific to the mock grandparent scam call at the conclusion of the study. The attitude object would also be different from the first time they had been scammed in this study. This aligns with Scheibe et al.'s (2014) findings, which demonstrated that the use of scam warnings that are distinctly different than the mock scam tended to be effective over time. People with a history of financial fraud may be more cautious about the risks and consequences of scams.

In addition, the intervention, gender, and history of financial fraud will have a significant indirect effect on the propensity to fall for the scam through its effect on the concerns and susceptibility criteria, such that higher ratings of concerns and lower ratings of susceptibility to

scams will result in a lower propensity to fall for the scam. Higher ratings of concerns about scams would demonstrate a heightened awareness of the potential risks, which could translate to participants being more cautious and risk-averse. It should be noted that higher ratings of concern may not necessarily translate to the likelihood of someone falling prey to the scam. It could be that these kinds of people who do take precautions may think they are immune to being scammed. They may put up their blinders and have a higher risk of falling prey. Conversely, lower ratings of susceptibility might suggest a reduced likelihood of falling for the scam.

<div align="center">

Scholarly Merit and Broader Impacts

</div>

Scholarly Merit

Findings from this research will expand our knowledge of the methods and persuasive strategies being used in scams. The literature has done a nice job of understanding the cognitive aspects of scam susceptibility in older adults and tapping into any psychological needs that may be activated when older adults are targeted for scams; however, there is a gap regarding the development of interventions aimed at mitigating the risk of falling for scams. This study combines the existing body of literature, aiming to provide clarity on understanding why people fall for scams (whether there is a psychological need or heuristics are being drawn upon, or a combination of both) and then seeks to bridge the gap by implementing effective measures to safeguard this vulnerable population, which varies with different age groups. This study will also add information to the literature about the gender differences among this group, as gender has not been thoroughly studied. Moreover, there is an urgency to understand this topic now. Scams have become so pervasive in our society, and their impact on individuals, particularly older adults, is concerning. This research is important to society at large; not only have scams grown in

the past few years, but the world's older population is also expected to grow exponentially in the coming years.

Broader Impacts

Findings from this work would extend beyond academic knowledge, as it has the potential to provide society with effective tools and strategies to reduce scam compliance. If these interventions are successful, this education program can be implemented on a local, national, and global scale. Older adults are often an underrepresented group in research studies. By focusing on this demographic, this research seeks to understand their unique vulnerabilities to scams, looking for ways to protect them from financial exploitation. Ultimately, we hope to reduce the financial and emotional burdens on older adults, improving their well-being and quality of life.

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Appendix A

Concerns about Scams Scale

1. You are suspicious of letters or emails containing spelling and grammar mistakes.

2. You avoid clicking links in emails or text messages unless you know the sender.

3. You install anti-spam software on your devices.

4. You perform checks on the credibility of the vendor.

5. You carefully read the terms and conditions of things.

6. You subscribe to specific services to avoid commercial calls.

7. You transfer money to someone you don't know (e.g via Western Union).

Participants would be asked to rate the statements using a 5-point Likert scale ranging from

"Strongly Disagree" to "Strongly Agree". Scores will be calculated by taking the average of

ratings across all the items to get one composite score. The last item will be reverse scored.

Higher scores would indicate an increase in one's concerns about scams.

Appendix B

Script to be used during hypothetical scam call

Hi grandma/grandpa, it's _____. I need to tell you that I was in horrible car accident today, and I need to undergo surgery immediately. I desperately need you to please send me $5,000 through a money order or other wire service. I am so embarrassed. Please don't tell mom or dad. I don't want them to be worried.