Correlates of susceptibility to scams in community-dwelling older Black adults

Lei Yu, PhD[a,b], **Gary Mottola, PhD**[c], **Lisa L. Barnes, PhD**[a,b,d], **S. Duke Han, PhD**[a,b,e,f,g,h], **Robert S. Wilson, PhD**[a,b,d], **David A. Bennett, MD**[a,b], **Patricia A. Boyle, PhD**[a,d]

[a]Rush Alzheimer's Disease Center, Rush University Medical Center, Chicago, IL, USA

[b]Department of Neurological Sciences, Rush University Medical Center, Chicago, IL, USA

[c]FINRA Investor Education Foundation, Washington DC, USA

[d]Department of Psychiatry and Behavioral Sciences, Rush University Medical Center, Chicago, IL, USA

[e]Department of Family Medicine, University of Southern California, Los Angeles, CA, USA

[f]Department of Neurology, University of Southern California, Los Angeles, CA, USA

[g]Department of Psychology, University of Southern California, Los Angeles, CA, USA

[h]School of Gerontology, University of Southern California, Los Angeles, CA, USA

Abstract

Introduction: Evidence suggests that older Black adults are frequent victims of financial fraud and exploitation. This study aims to identify factors associated with scam susceptibility in older Black adults.

Methods: Participants were 383 older Black adults living in the Chicago metropolitan area (mean age=78 years, and 82% female). A scam susceptibility measure assessed perceptions and behaviors that predispose older adults to fraud and scams. Categories of age-associated factors, including cognition, physical health, psychosocial factors, personality and behavioral economics, were measured using uniform systematic assessments. For each category separately, measures associated with scam susceptibility were identified via stepwise variable selection.

Corresponding Author Lei Yu, Rush Alzheimer's Disease Center, 1750 W Harrison Street, Suite 1000, Chicago, IL 60612, USA, Tel: 312-942-0543, Lei_Yu@rush.edu.

Results: Older age was associated with greater scam susceptibility. Further, the analysis revealed a robust association of cognitive health with scam susceptibility, particularly the domains of semantic and working memory. Psychological wellbeing was associated with susceptibility, as was neuroticism. Behavioral economic measures including financial and health literacy as well as financial and health decision making ability were also implicated. In a final model that included all the measures initially retained by variable selection, semantic memory, psychological wellbeing, and financial and health literacy were independently associated with scam susceptibility. Moreover, the association of age was attenuated and no longer significant after adjusting for these correlates.

Discussion: Age-associated vulnerabilities, rather than age itself, predispose older Black adults to financial fraud and scams. The correlates of scam susceptibility in community living older Black adults primarily involve cognitive health, psychological, and behavioral economic factors.

Keywords

Introduction

Evidence suggests that older adults, and particularly older Black adults, are frequent victims of financial fraud and exploitation. Each year in the United Sates, over 5% of cognitively intact older community residents fall prey to fraudsters and scammers [1]. A previous population-based survey estimated that, after turning 60 years of age, Black adults have almost triple the prevalence of financial exploitation than White adults [2]. A more recent study further reported that Black race is significantly associated with both higher one-year period prevalence and higher lifetime prevalence of financial exploitation [3]. Older victims of financial exploitation often suffer from serious health consequences that include loss of independence, hospitalization [4] and even death [5]. The critical public health issue posed by fraud and scams is ever more urgent with the recent surge of COVID scams targeting older adults [6]. Understanding factors associated with scam susceptibility helps to identify at risk older adults and to facilitate education and training programs for fraud and scam prevention and intervention.

Recent studies have reported on factors that predispose older adults to financial fraud and scams as well as financial exploitation in general. A spectrum of age-associated factors are implicated, which range from impaired cognitive function [7], to declining physical health, difficulty with deceit detection [8] and psychosocial and other factors [9]. Notably, however, the current literature on correlates of susceptibility to financial fraud and scams among older adults largely relies on data from Whites. As a result, findings from these studies may not be readily applicable to older Black adults who, as some studies suggest, may be at even greater risk of exploitation. Thus, the factors that render older Black adults vulnerable to financial fraud and scams remain largely unknown.

We conceptualize scam susceptibility as part of financial vulnerability. That is, whether or not one engages in behaviors associated with risk of scams and exploitation (e.g., answering

a call from an unwanted caller, listening to sales pitches) involves a series of choices and decision points. In our conceptual framework, age-associated financial vulnerability, including scam susceptibility, predispose older adults to a range of adverse financial and health outcomes [10]. This framework is supported by extensive work on aging and decision making and largely aligns with other proposed models [11, 12]. Factors contributing to age-associated financial vulnerability span multiple domains, including cognition, personality traits such as anxiety and trust, psychosocial factors such as depression and loneliness, medical comorbidities, and contextual (e.g., domain-specific literacy) and environmental factors. Importantly, identification of factors associated with scam susceptibility in older Black adults is critical for developing measures to assess financial vulnerability and exploitation among diverse, vulnerable older adults [2]. Further, many of these risk factors are modifiable; thus, their identification offers the potential of guiding policy and education efforts to improve the awareness of financial fraud and scams among older Black adults.

In this study, by leveraging rich data from three epidemiologic cohort studies of aging that are currently being conducted at the Rush Alzheimer's Disease Center, we examined the correlates of scam susceptibility among 383 older Black adults who live in communities throughout the greater Chicago area. As very little is known about correlates of scam susceptibility in older Black adults, we chose a comprehensive approach by surveying multiple categories of factors thought to contribute to age-associated financial vulnerability [11, 13]. For each category separately, factors associated with scam susceptibility were identified via a stepwise variable selection process. Scam susceptibility was measured using a self-report scale based on content from AARP and questions from the Financial Industry Regulatory Authority (FINRA) Risk Meter. The current study focused on the following age-associated factors, 1. cognitive function (episodic memory, semantic memory, working memory, processing speed, and visuospatial ability); 2. physical health (disabilities and chronic medical conditions); 3. psychosocial factors (psychological wellbeing, depressive symptoms, life space, self-reported discrimination, social network, adverse childhood experience, and loneliness); 4. personality (trust and neuroticism), as well as 5. behavioral economic factors (financial and health decision making ability, financial and health literacy, self-confidence in literacy, temporal discounting and risk aversion).

Materials and Methods

Study Participants

Data came from older Black participants of the Rush Memory and Aging Project, the Minority Aging Research Study and Rush Clinical Core. All studies were approved by an institutional review board of Rush University Medical Center. Written informed consents were obtained from each participant. Participants came from various communities (e.g. retirement homes, subsidized senior housing, local churches and social service agencies that serve socially disadvantaged older adults) throughout the Chicago metropolitan area and surrounding suburbs. At enrollment, all participants were free of known dementia and agreed to annual evaluations which later incorporated a decision making substudy. The follow-up rates among survivors exceed 90% for all studies. Notably, all 3 studies are conducted by the same research team with a large common core of data at the item level.

This allows data to be pooled for combined analyses, and the resulting larger sample size helps to examine the correlates of scam susceptibility for older Black adults with greater fidelity.

All three studies are ongoing, and the current data were frozen on 08/24/2020. A total of 1,262 Black participants were enrolled, 57 had died and 39 had withdrawn from the parent studies before the decision making substudy was introduced. Of the remaining 1,166, 54 were ineligible due to reasons such as severe hearing, vision, language deficit, or moving out of geographical area, and 544 had yet to be approached due to the relatively recent start of the decision making substudy. As a result, 568 participants were eligible, and 397 had completed baseline evaluation. The primary analyses focused 383 participants after further excluding 3 participants with missing scam susceptibility measure and 11 with dementia. Data from the baseline decision making assessment were used for statistical analyses.

Scan susceptibility

Scam susceptibility was measured using a 5-item instrument that assesses perceptions and behaviors that are believed to be related to financial fraud and scams [10]. Three of the five items inquiry about participant's tendency of (1) answering and (2) ending a phone call from a stranger; as well as (3) listening to sales pitches from a telemarketer. For the remaining 2 items, participants are asked to rate their agreement on (4) whether something is true if it sounds too good and (5) whether older persons are commonly targeted by con-artists. Individual items are rated on a 7-point Likert scale and averaged into a summary score, with higher scores indicating greater scam susceptibility.

The Cronbach α for the scam susceptibility items is 0.54, which is relatively low. However, we note that these items were based on findings and toolkit materials from the leading authorities on elder financial fraud and scams [14, 15]. In support of its validity, the measure has been shown to be related to various age-related vulnerabilities such as cognitive impairment and dementia [10]. Further, a principal component analysis reveals 2 components that explain almost 60% of the variance. As expected, responses on the 3 items on telemarketing were loaded to the first component, and responses on the remaining 2 items were loaded to the second component.

Cognitive function

Cognitive function was examined using a uniform neuropsychological evaluation. The core battery assesses 5 cognitive systems of episodic memory, semantic memory, working memory, perceptual speed and visuospatial ability. Episodic memory is assessed using immediate and delayed recall of story A from the logical memory subtest of the revised Wechsler Memory Scale [16], immediate and delayed recall of the east Boston story [17], word list memory, word list recall, and word list recognition [18]. Semantic memory is assessed using Boston naming [19] and verbal fluency [18]. Working memory is assessed using digit span forward, digit span backward [16], and digit ordering [20]. Perceptual speed is assessed using symbol digit modalities [21], number comparison [22], Stroop color naming and Stroop word reading [23]. Visuospatial ability is assessed include line orientation [24] and standard progressive matrices [25]. To minimize potential floor and

ceiling effects and reduce measurement noise, composite scores were computed [26]. Individual test scores were standardized using the baseline mean and standard deviation of the entire cohorts, and then averaged within each cognitive system. Higher scores indicate higher cognitive function. The Cronbach α for all the 18 tests included in our cognitive testing battery is 0.88.

A neuropsychologist provides a judgement on the presence of cognitive impairment after reviewing the impairment rating by computer and other clinical information. Participants with cognitive impairment who did not meet the diagnostic criteria for dementia were classified as mild cognitive impairment (MCI).

Physical health

Physical health includes measures of disability and chronic medical conditions. Three disability measures were included. Briefly, the Katz activities of daily living scale (ADL) measures the difficulty in performing 6 basic physical activities (walking across a small room, bathing, dressing, eating, moving from bed to chair, and toileting). The instrumental activities of daily living scale (IADL) measures the difficulty in performing 8 daily living activities (telephone use, meal preparation, money management, medication management, light and heavy housekeeping, shopping, and local travel). Mobility disability was measured by the inability to perform 3 tasks (heavy work around the house, walking up and downstairs, and walking half a mile). For each of the three disability measures, higher scores indicate more disability. The Cronbach αs for the items within each disability measure range between 0.68 and 0.80.

Histories of seven chronic medical conditions (hypertension, diabetes, heart disease, cancer; thyroid disease; head injury with loss of consciousness, and stroke) were reported annually by participants and then summarized as the total number of conditions present by the time of scam susceptibility assessment. Higher scores indicate more chronic illness.

Psychosocial factors

Psychosocial factors include measures of psychological wellbeing, depressive symptoms, life space, self-reported discrimination, social network, adverse childhood experience, and loneliness. Psychological wellbeing was measured using an 18-item instrument adapted from Ryff's Scales of Psychological Well Being. The measure covers 6 subscales of self-acceptance, autonomy, environmental mastery, purpose in life, positive relations with others, and personal growth. Participants rate each of the 18 items using a 7-point Likert scale and item-specific ratings were averaged to obtain a summary score. Higher scores indicate greater psychological wellbeing. The Cronbach α for the wellbeing items is 0.81.

Depressive symptoms were measured using a 10-item version of the Center for Epidemiologic Studies Depression scale (CES-D) [27]. Participants report whether they experienced each symptom much of the time during the past week. A summary score counts the total number of symptoms reported. Higher scores indicate more depressive symptoms. The Cronbach α for the depressive symptom items is 0.72.

Life space assesses the spatial movement of older adults [28]. On a 6-point scale, the measure includes 6 spatial zones with participant's bedroom as the reference location (other rooms inside the house, an area immediately outside the house, an area further away from the house, a place in the immediate neighborhood, a place outside the immediate neighborhood, and a place out of the town). The final score is the furthest spatial zone participants travelled during the past week. Higher scores indicate less constricted life space. Of note, life space is a multidimensional construct for functional status in old age that moves above and beyond traditional measures of disability or physical function. That is, the measure integrates physical performance with motivational, psychological and social factors that are important for older adults to maintain independence and interaction with the outside world. Prior studies have shown that a constrained life space is associated with various adverse health outcomes including frailty, dementia and mortality.

Self-reported discrimination assesses participants' experiences with everyday discrimination. Discrimination restricts access to socioeconomic resources and acts as a known psychosocial stressor that has been linked to various adverse health outcomes. This measure is of particular relevance in this work considering the history of systemic racism against Blacks in the United States. Participants rate, on a 4-point scale (none, rarely, sometimes, or often), on the 9 statements framed in the context of general mistreatment. The complete list is previously reported [29], and an example statement is "You receive poorer service than other people at restaurants or stores". A summary score counts the total number of statements rated sometime or often. Higher scores indicate greater discrimination. The Cronbach α for the discrimination items is 0.79.

Social network was measured based on the size of three social relationships. Participants report the number of children, relatives and close friends, as well as frequencies of interaction they had with each relationship [30]. A summary score counts the total number of family members and friends that participants see on a monthly basis. Higher scores indicate larger social network.

Adverse childhood experience measures emotional and physical trauma participant experienced as a child [31]. Participants rate items regarding 5 aspects of adverse experience that include emotional neglect, financial need, parental intimidation, parental violence, family problems and separation. Item-specific ratings across all aspects were added to obtain a summary score for total childhood adversity. Higher scores indicate more adverse experience during childhood. The Cronbach α for the adverse experience items is 0.85.

Loneliness was measured based on questions from a modified version of de Jong-Gierveld Loneliness Scale [32]. Participants rate, on a 5-point scale, agreement with 5 statements on general sense of emptiness, missing having people around, not having enough friends, feeling abandoned, and missing having a close friend. The summary score is the average rating on the individual items, and higher scores indicate more loneliness. The Cronbach α for the loneliness items is 0.80.

Personality

Personality measures include those of trust and neuroticism. The trust measure was based on 8 items from the NEO Personality Inventory [33]. Participants rate, on a 5-point scale, agreement with the statements on whether they are skeptical of other people's intentions, think most people are well-intentioned, think people are trying to take advantage of them, whether people are honest and trustworthy, and other related aspects of trust. A summary score was derived by adding item-specific ratings, and higher scores indicate higher level of trust. The Cronbach α for the trust items is 0.72.

Neuroticism assesses susceptibility to psychological distress. The measure was derived using a short form of the neuroticism scale from the NEO Five-Factor Inventory. Participants rate, on a 5-point scale, agreement with 6 statements on being a worrier, feeling inferior to others, feeling tense and jittery, angry at the way they are being treated, tendency of giving up when things go wrong, and feeling helpless. Item-specific ratings were added to obtain a summary score, and higher scores indicate greater neuroticism. Of note, this 6-item scale correlates highly with the 12-item scale from which it was derived [31]. The Cronbach α for the neuroticism items is 0.77.

Behavioral economic factors

Behavioral economic factors include measures of financial and health decision making, financial and health literacy, self-confidence in literacy, temporal discounting and risk aversion. Financial and health decision making was measured using a modified 12-item version of the Decision Making Assessment Tool that simulates financial and health decision making situations older adults commonly encounter in the real world. Participants are presented with tables of information about different mutual funds (financial decision making) and HMO plans (health decision making), and asked questions (6 each) with varying degrees of difficulty [34]. The summary score for decision making is the total number of financial and health decision making questions answered correctly, and higher scores indicate higher decision-making ability.

Financial and health literacy was measured using a 32-item instrument, of which 23 items assess financial knowledge (e.g. stocks, mutual funds, and bond prices) and numeracy (e.g. converting percentages and calculating discount price), and 9 items assess knowledge of health information and concepts (e.g. Medicare, Medicare Part D, and flu vaccination). The financial literacy score is the percentage of total number of financial literacy items answered correctly [35]. The health literacy score was constructed similarly. The total literacy score is the average of the two domain-specific subscores, higher scores indicating higher level of literacy.

Following response to each question on financial knowledge, participants also rate, using a 4-point scale (not at all, a little, fairly, extremely), on their confidence level of having the correct answer. The score for confidence in financial literacy is the average of confidence ratings on individual financial literacy questions [36]. The score for confidence in health literacy was constructed similarly. The summary score for confidence in literacy was the average of the two subscores, higher scores indicating higher level of confidence.

Temporal discounting assesses the preference of taking an immediate but smaller payoff over waiting for a later but larger payoff. Two sets of questions were used to estimate the discounting for small (7 questions) and separately large (5 questions) stakes. For small stakes, participants choose $10 now or larger amounts in a month (varying between $11 to $30). For large stakes, participants choose $1,000 now or larger amounts in a year (varying between 1,100 to 3,000). Small stakes, and separately large stakes, discounting coefficient was estimated by modeling the odds of taking future payment as a function of discounted later payoff relative to the immediate payoff [37]. Larger coefficients indicate more temporal discounting.

Risk aversion assesses the preference of taking a certain but smaller payoff over an unknown but possibly larger payoff. In a series of 10 questions, participants choose $15 for sure or a coin toss (gamble) in which they get larger amounts (varying between $20 and $300) if it is heads or nothing if it is tails. A risk aversion coefficient was estimated by modeling the odds of taking gamble as a function of gamble option payoff relative to the safe option payoff [38]. Larger coefficients indicate more risk averse.

The Cronbach αs for the items within each behavioral economic measure range between 0.64 and 0.90, suggesting that these measures have reasonably good internal consistency.

Covariates

Age was calculated using date of birth and date at scam susceptibility assessment. Race, sex and years of education were reported by participants at baseline interview. Participants also choose an income level using the show-card method that represents their total annual income ($0 - $4,999, $5,000 - $9,999, $10,000 - $14,999, $15,000 - $19,999, $20,000 - $24,999, $25,000 - $29,999, $30,000 - $34,999, $35,000 - $49,999, $50,000 - $74,999, $75,000 and over).

Statistical analysis

Student *t*-test and Spearman correlations were used to describe the bivariate relationship of demographic and individual measures of interest with scam susceptibility, and the results were also used as an initial screening. Next, we conducted a series of linear regression models with the scam susceptibility score as a continuous outcome. For each category of age-associated factors separately, measures shown to have a bivariate correlation with scam susceptibility were included in a single model as predictors. A stepwise variable selection was performed, with an α level of 0.05 for both entering and staying in the model. Measures associated with scam susceptibility were identified for each category. Collinearity was assessed using variance inflation factors (VIFs) and we did not observe serious violation for multicollinearity (all VIFs below 2). All models were adjusted for age, sex, education and income. The statistical analyses were implemented using SAS/STAT software (Version 9.4) and the R program (Version 4.0.2).

Results

Characteristics of the study participants

Characteristics of the older Black adults included in this study are described (Table 1). On average, they were 78 years of age, 82% female, and had 15 years of education. The median income level was $30,000 - $34,999. The mean scam susceptibility score for the participants was about 2.5.

All participants were free of dementia at the scam susceptibility assessment, and approximately 30% had MCI. Participants had relatively good physical health. A majority reported no mobility disability or disability of daily living activities. Three quarters of participants reported having 2 or fewer chronic medical conditions or less.

Overall, participants reported high levels of psychological wellbeing with an average score of nearly 6 on the scale of 1–7. Three quarters reported experiencing 2 or fewer depressive symptoms. Participants tended to have a large life space, and most travelled to places outside neighborhood or out of town in the past week. The median score for self-reported discrimination was 1, indicating that a majority did not feel being frequently mistreated. Half of the participants reported seeing 5 relatives or friends at least once a month. The mean loneliness score was about 2, which is towards the lower end of the scale of 1–5. The median score for adverse childhood experience was 8, on the scale of 0–58.

Participants tended to have relatively low psychological distress and a high level of trust. The mean neuroticism score was about 6 on the scale of 0–24 and the mean trust score was about 21 on the scale of 0–32.

On average, participants accurately answered 7 of the 12 financial and health decision making questions. Similarly, a little over 60% of the financial and health literacy questions were answered correctly. Participants were quite confident in their literacy performance, with a mean confidence score above 3 on the scale of 1–4.

Bivariate correlations with susceptibility to scams

Older age was correlated with greater scam susceptibility (Table 2). Years of education or income level were not correlated with scam susceptibility, and susceptibility scores did not differ between males and females. Consistent with a prior report on a largely White sample [39], older Black adults with MCI were also more susceptible to scams than those who were cognitively intact. Lower cognitive scores in all 5 systems were correlated with greater scam susceptibility. No physical health index was correlated with scam susceptibility. Poorer psychological wellbeing, loneliness, lower trust, and psychological distress were all correlated with greater scam susceptibility. Finally, poorer financial and health decision-making ability, lower financial and health literacy, lower confidence in literacy, and large stake temporal discounting were also correlated with scam susceptibility.

Regression analysis for correlates of susceptibility to scams

We performed a series of regression analysis to further examine the correlates of scam susceptibility within each category after adjusting for key demographics. The reference

model included terms for age, sex, education and income level. Older age was associated with greater scam susceptibility (β: 0.16, Standard error [SE]: 0.04, p<0.001).

The analysis revealed a robust association of cognitive health with scam susceptibility. MCI status was significantly associated with higher scam susceptibility (p<0.001). With all 5 cognitive systems included in the same model, however, only semantic and working memory were retained by the variable selection process (Supplementary Table 1). Of the 2 psychosocial measures shown to correlate with scam susceptibility, the association of psychological wellbeing persisted, while loneliness was not retained. Of the personality measures, only neuroticism was retained. Of the behavioral economic measures, financial and health decision making and financial and health literacy were retained (Figure 1).

Finally, we included in a single model all the measures that were retained by the variable selection. The model highlights 3 measures, including semantic memory, psychological wellbeing and financial and health literacy, as factors that are independently associated with scam susceptibility (Table 3). Notably, the association of age was attenuated and no longer significant after adjusting for these correlates.

Secondary analysis

An earlier study looked at the correlates of scam susceptibility in a predominantly White sample from our cohorts [9], suggesting that cognition, psychological wellbeing and domain-specific literacy are also the key correlates of scam susceptibility among older White adults. To further investigate this hypothesis, we conducted a secondary analysis on a larger group of White participants with available data in our cohorts (N=1,128). On average, White participants are older, with higher education and income. Statistical differences are also observed in various age-associated factors (Supplementary Table 2). In particular, White participants had higher average scores in cognition, financial and health literacy as well as financial and health decision making. Surprisingly, the average scam susceptibility score was lower in Black participants than White participants. We observed a large overlap of the correlates between the two races (Supplementary Table 3). In regression analyses with stepwise variable selection, semantic memory, perceptual speed, disability in instrumental daily activities, psychological wellbeing, neuroticism, financial and health literacy and confidence in literacy were retained for older White adults (Supplementary Table 4).

Discussion

Little is known about the risk factors that may predispose older Black adults to financial fraud and scams. To fill this knowledge gap, the current study aimed to identify factors associated with scam susceptibility using data from nearly 400 community dwelling older Black adults. In addition to key demographics, the study systematically surveyed measures from multiple categories of age-associated factors. Our findings suggest that correlates of scam susceptibility in older Black adults are multifactorial and particularly involve cognitive health, psychological and behavioral economic factors. Specifically, the study shows that older Black adults with poor semantic memory, low psychological wellbeing and poor financial and health literacy are among the most susceptible to fraud and scams.

The current study extends previous findings on the correlates of scam susceptibility in a sample of mostly non-Latino White participants [9]. First, the analyses focused exclusively on community-living older Black adults, and our findings thus inform on those who may be most vulnerable to fraud and exploitation. Second, we expanded the variables of interest by examining additional measures of age-associated factors. Some of the new measures (e.g. experiences of discrimination) are especially relevant to Black population. Third, we investigated differential associations between multiple cognitive systems. Fourth, in a secondary analysis, we reexamined the correlates of scam susceptibility in older White adults. Overall, we observed an overlap in the findings between older Black and White adults, suggesting that both groups likely share similar correlates of scam susceptibility.

The results between older Black and White adults also revealed some differences. Surprisingly, the average scam susceptibility score in older Black adults is statistically lower than older White adults. Whether this difference indicates that older Black adults are less susceptible to scam than older White adults needs further investigation. If confirmed, a lower scam susceptibility in older Black adults could be attributable to higher vigilance that stems from historical societal bias and systemic racism. Separately, compared with older Black adults, we observed stronger associations of age, sex, income as well as disability of instrumental daily activities with scam susceptibility in older White adults. Importantly, we note that Black and White participants enrolled in the study differ significantly in key demographics as well as available sample sizes. Future studies tailored for direct comparison between the two populations are warranted.

The association between cognitive health and financial exploitation and scam susceptibility in older age has been reported [40], but little data exist on differential associations between cognitive systems. A population-based study examined episodic memory and perceptual speed in relation to elder abuse and reported that both are associated with financial exploitation [7]. A similar result was reported for older adults with MCI [39]. Interestingly, the current analysis of older Black adults reveals a different pattern. With five cognitive systems included in the same model, semantic memory, and to a lesser extent working memory, were the only 2 cognitive systems that showed associations with scam susceptibility. There are several explanations for this difference. First, the previous studies were not race-specific, and participants in the study on MCI in particular were almost all non-Latino Whites. Considering there can be distinct cognitive profiles between older Black and White adults, it is possible that cognitive systems implicated in scam susceptibility may differ by race or ethnicity. Future studies are warranted to test this hypothesis. Second, the previous analyses examined each cognitive system in separate model, which did not account for between-domain correlations. As such, the reported associations could be confounded by each other. By contrast, in the current analysis all 5 cognitive systems were examined simultaneously and those associated with scam susceptibility were selected empirically. Interestingly, in the final regression model that included all significant correlates identified via variable selection, semantic memory was the only cognitive system that remains associated with scam susceptibility. This result suggests that, relative to fluid abilities, aspects of crystallized abilities are likely more important in relation to scam susceptibility.

Deteriorating physical health in old age is a potential risk factor for scam susceptibility. A small pilot study of 34 participants showed a marginal relationship between self-reported financial exploitation and number of medical conditions [41]. Here, we investigated multiple indices of disability and chronic medical conditions, and we did not find strong association with susceptibility to scams in older Black adults. This could be attributable to the fact that most older Black adults included in the current study were in relatively good health. Separately, as scam susceptibility predisposes older adults to fraud and scams but is not necessarily representative of actual victimization, the result does not contradict the established finding that physical health and financial fraud victimization in older age are linked. Our inability to find a relationship between disability, chronic medical conditions, and scam susceptibility, if confirmed, would support the hypothesis that poor physical health is more likely a consequence of financial fraud victimization rather than a risk factor. Of note, one specific item in the instrumental activities of daily living assessment directly asks participants to report whether they need help or are unable to take care of their finances including paying bills, writing checks, and keeping track of income. In a secondary analysis, we examined this particular disability item in relation to scam susceptibility. A very small percentage (3%) of the participants reported that they needed help or were unable to manage their finances. In a regression model that adjusted for demographics and income, disability in managing finances was nominally associated with greater scam susceptibility. However, the association was attenuated and no longer significant when other important correlates of scam susceptibility was included in the model (Supplementary Table 5).

Psychosocial and personality factors play an important role in scam susceptibility. Depression, loneliness, social isolation, lack of social support, adverse life events, social emotion and risk-taking have previously been reported to be associated with fraud or susceptibility to fraud among the older adults [42–44]. Our results for older Black adults are largely consistent with these findings. We show that psychological wellbeing and neuroticism in particular are the primary psychosocial and personality correlates of scam susceptibility. While the specific wellbeing measure in relation to scam susceptibility has not been reported outside of this group, certain aspects of social needs important for subjective wellbeing (e.g. status fulfillment) are predictive of fraud [45]. In a secondary analysis, we further investigated individual subscales that constitute our overall psychological wellbeing measure. With all 6 subscales included in the same model, lower scores for self-acceptance, autonomy, and personal growth were independently associated with greater scam susceptibility. By contrast, environmental mastery, purpose, and positive relations were not significant. These results indicate that lack of self-determination or self-actualization may contribute to scam susceptibility in older Black adults.

Our data show a strong association between financial and health literacy and susceptibility to scams. The finding is consistent with some but not all literature on the role of literacy in financial fraud and scams. The 2011 FTC survey reported that consumers with less numeracy skills are more likely be victimized by fraud [46]. An earlier study suggests that financial knowledge rather than basic money management skills are necessary to navigate increasingly sophisticated fraud and scam schemes [47]. A previous review reported that the literacy and fraud relationship depends on the types of fraud, where victims of investment fraud tend to be more financially literate while lottery fraud victims on the other hand

are less literate [48]. A null association of financial literacy and fraud victimization has also been reported based on data from the Health and Retirement Study. Differences in the instruments used for assessing literacy as well as the outcomes (i.e. fraud victimization versus scam susceptibility) could explain the null findings in some of the prior studies. This is a challenging issue that has not been resolved in the field. Fraud in particular is difficult to assess due to embarrassment and shame about reporting, fear that reporting may lead to a further loss of independence, and unawareness that one has been victimized. Our scam susceptibility measure, which gets at behaviors related to victimization but not victimization itself, may be preferable for these reasons. In this study, when domain-specific literacy measures were included in the same regression model, lower scores for both financial and health literacy were independently associated with greater scam susceptibility, suggesting that the literacy association with scam susceptibility is not necessarily confined to the financial domain. Further studies are needed to elucidate this potentially complex relationship.

Our finding on the role of age is of particular interest. The regression model that include key demographics suggests that with increasing age, older Black adults are more susceptible to scams. Notably, the age association was attenuated and no longer significant after the model was further adjusted for correlates of scam susceptibility. This result suggests that it is age-associated vulnerabilities, rather than age itself, that predispose older adults to fraud and scams. Investigating correlates of scam susceptibility helps to formulate profiles of older adults most vulnerable to fraud and scams victimization. In addition, certain psychosocial and behavioral economic risk factors (e.g. financial and health literacy) are modifiable. Taken together, our findings have potential to facilitate education and training programs by identifying characteristics of at-risk and diverse populations and prioritizing areas for intervention.

In this study, we were able to leverage rich data sources from 3 ongoing cohort studies of aging. Uniform assessments of cognitive, physical, experiential, psychosocial, behavioral and other factors are systematically conducted, and most of these data are collected annually. Because the scam susceptibility assessment, as part of a decision making substudy, was introduced into the parent studies years later, the existing study infrastructure allows variables of interest to be pulled from the same annual visit, which improves the validity of our findings. The current study is among the first that provides a comprehensive survey of correlates of scam susceptibility specific for older Black adults who live in a metropolitan area. Limitations are noted. Participation in our cohorts are voluntary. As a result, Black participants in this study likely differ from the general population. We recognize that, for example, our participants have a relatively high level of education, income and fewer adverse health conditions, which may mask other potential correlates not identified here. Separately, the current study focused on correlates of susceptibility to scams, an outcome that is not equivalent to actual victimization of fraud and scams. Nevertheless, these findings suggest avenues for future research and potentially interventions aiming to reduce fraud and exploitations among vulnerable older Black adults.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements

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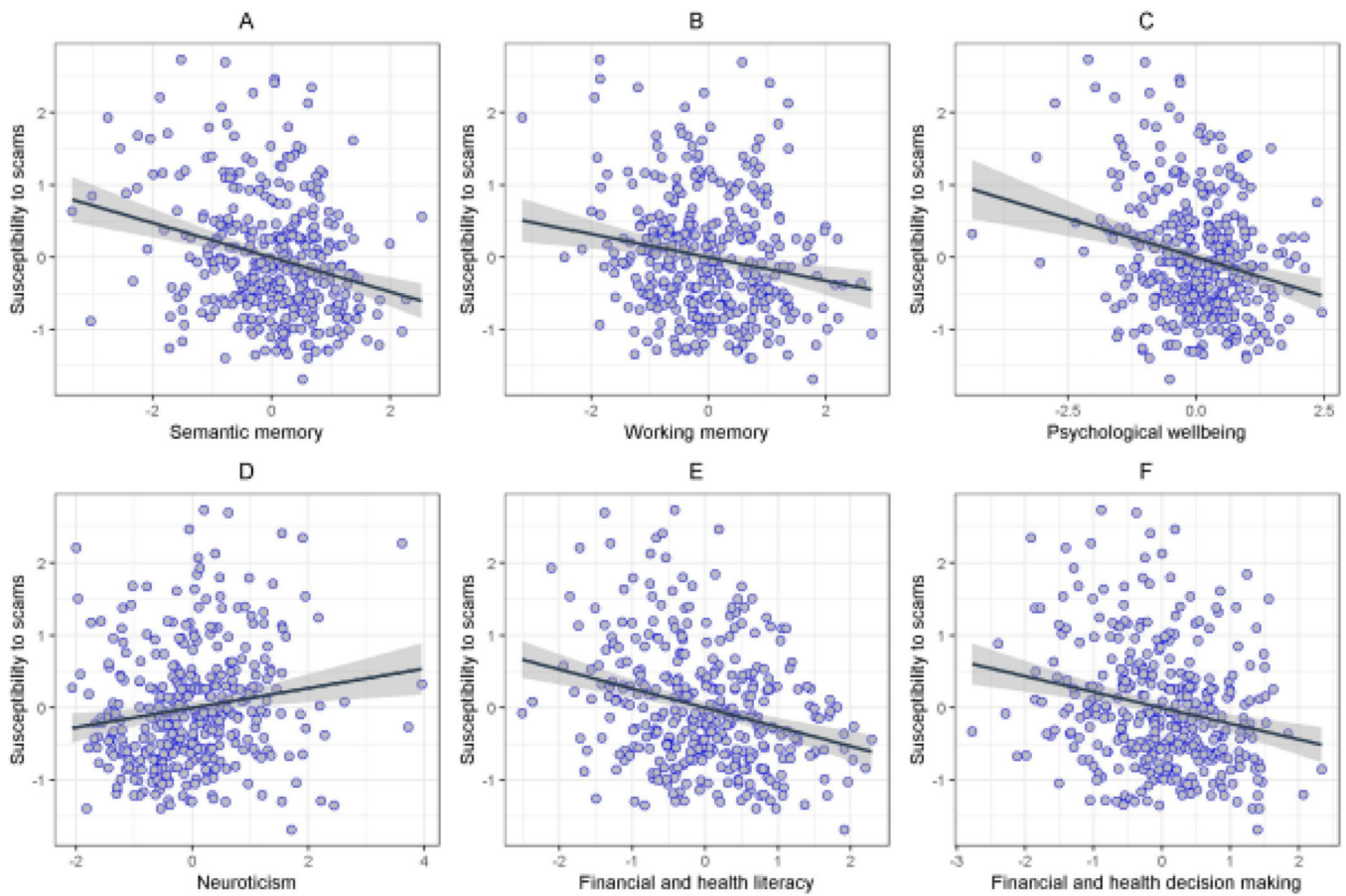
Figure 1.
illustrates cognitive, psychosocial, personality and behavioral economic measures associated with scam susceptibility, after controlling for demographics. Each panel is a partial residual plot with corresponding regression line and 95% confidence band. Blue circles are adjusted scam susceptibility rating plotted against semantic memory (A), working memory (B), psychological wellbeing (C), neuroticism (D), financial and health literacy (E), and financial and health decision making (F). The covariates of age, sex, education, and income are regressed out.

Table 1

Characteristics of study participants

Demographics	
Age (Mean, SD, Range)	77.7, 6.5, 62.7–95.0
Female (N, %)	315, 82.3%
Education (Mean, SD, Range)	15.1, 3.2, 8–30
Income (Median, IQR, Range)	7, 4–9, 1–10
Cognition	
MCI (N, %)	116, 30.3%
Global cognition (Mean, SD, Range)	0.14, 0.53, −1.64–1.45
Episodic memory (Mean, SD, Range)	0.32, 0.63, −2.30–1.69
Semantic memory (Mean, SD, Range)	0.09, 0.72, −2.43–1.77
Working memory (Mean, SD, Range)	−0.01, 0.78, −2.39–2.39
Perceptual speed (Mean, SD, Range)	0.12, 0.86, −2.36–2.56
Visuospatial ability (Mean, SD, Range)	−0.16, 0.79, −2.87–1.35
Physical health	
Basic activities of daily living (Median, IQR, Range)	0, 0–0, 0–5
Instrumental activities of daily living (Median, IQR, Range)	0, 0–1, 0–7
Mobility disability (Median, IQR, Range)	0, 0–1, 0–3
Medical conditions (Median, IQR, Range)	2, 1–2, 0–5
Psychosocial factors	
Wellbeing (Mean, SD, Range)	5.7, 0.6, 3–7
Depressive symptoms (Median, IQR, Range)	1, 0–2, 0–8
Life space (Median, IQR, Range)	6, 5–6, 1–6
Self-reported discrimination (Median, IQR, Range)	1, 0–3, 0–9
Social network (Median, IQR, Range)	5, 3–7, 0–34
Loneliness (Mean, SD, Range)	2.1, 0.6, 1–4
Childhood adverse experience (Median, IQR, Range)	8, 4–14, 0–45
Personality	
Neuroticism (Mean, SD, Range)	6.2, 3.6, 0–22
Trust (Mean, SD, Range)	20.8, 4.0, 9–31
Behavioral economics	
Financial and health decision making (Mean, SD, Range)	7.0, 2.4, 0–12
Financial and health literacy (Mean, SD, Range)	61.0, 13.1, 24.2–90.1
Temporal discounting (small) (Mean, SD, Range)	0.02, 0.03, 0.002–0.10
Temporal discounting (large) (Mean, SD, Range)	1.10, 1.04, 0.07–3.05
Risk aversion (Mean, SD, Range)	0.42, 0.31, 0.04–0.91
Confidence in literacy (Mean, SD, Range)	3.2, 0.5, 1.4–4

Table 2

Bivariate correlations with scam susceptibility

Demographics	
Age[1]	0.20 ($p<.001$)
Female[2]	$t_{381}=-0.61$ ($p=0.54$)
Education[1]	-0.09 ($p=0.06$)
Income[1]	-0.06 ($p=0.25$)
Cognition	
MCI[2]	$t_{381}=-5.32$ ($p<.001$)
Episodic memory[1]	-0.22 ($p<.001$)
Semantic memory[1]	-0.27 ($p<.001$)
Working memory[1]	-0.20 ($p<.001$)
Perceptual speed[1]	-0.28 ($p<.001$)
Visuospatial ability[1]	-0.14 ($p=0.007$)
Physical health	
Basic activities of daily living[1]	0.10 ($p=0.06$)
Instrumental activities of daily living[1]	0.06 ($p=0.31$)
Mobility disability[1]	0.05 ($p=0.31$)
Medical conditions[1]	0.04 ($p=0.49$)
Psychosocial factors	
Wellbeing[1]	-0.23 ($p<.001$)
Depressive symptoms[1]	0.05 ($p=0.28$)
Life space[1]	-0.06 ($p=0.24$)
Self-reported discrimination[1]	-0.06 ($p=0.22$)
Social network[1]	0.02 ($p=0.72$)
Loneliness[1]	0.19 ($p<.001$)
Childhood adverse experience[1]	0.02 ($p=0.73$)
Personality	
Neuroticism[1]	0.19 ($p<.001$)
Trust[1]	-0.12 ($p=0.031$)
Behavioral economics	
Financial and health decision making[1]	-0.29 ($p<.001$)

Demographics	
Financial and health literacy [1]	−0.29 (p<.001)
Temporal discounting (small) [1]	0.10 (p=0.06)
Temporal discounting (large) [1]	0.11 (p=0.03)
Risk aversion [1]	0.05 (p=0.32)
Confidence in literacy [1]	−0.18 (p<.001)

[1] Spearman correlation

[2] Student t test

Table 3

Correlates of scam susceptibility in older Black adults

	β (SE), *p*
Age	0.026 (0.045), 0.568
Male sex	0.097 (0.107), 0.262
Education	0.140 (0.051), 0.006
Income	0.012 (0.019), 0.523
Semantic memory	−0.143 (0.048), 0.003
Working memory	−0.059 (0.047), 0.207
Psychological wellbeing	−0.162 (0.049), 0.001
Neuroticism	0.045 (0.046), 0.331
Financial and health decision making	−0.085 (0.053), 0.112
Financial and health literacy	−0.137 (0.053), 0.011
Model adjusted R ^{2}	0.17