Cognitive Decline and Financial Decision Making in Old Age

Social Security Advisory Board
March 27, 2017

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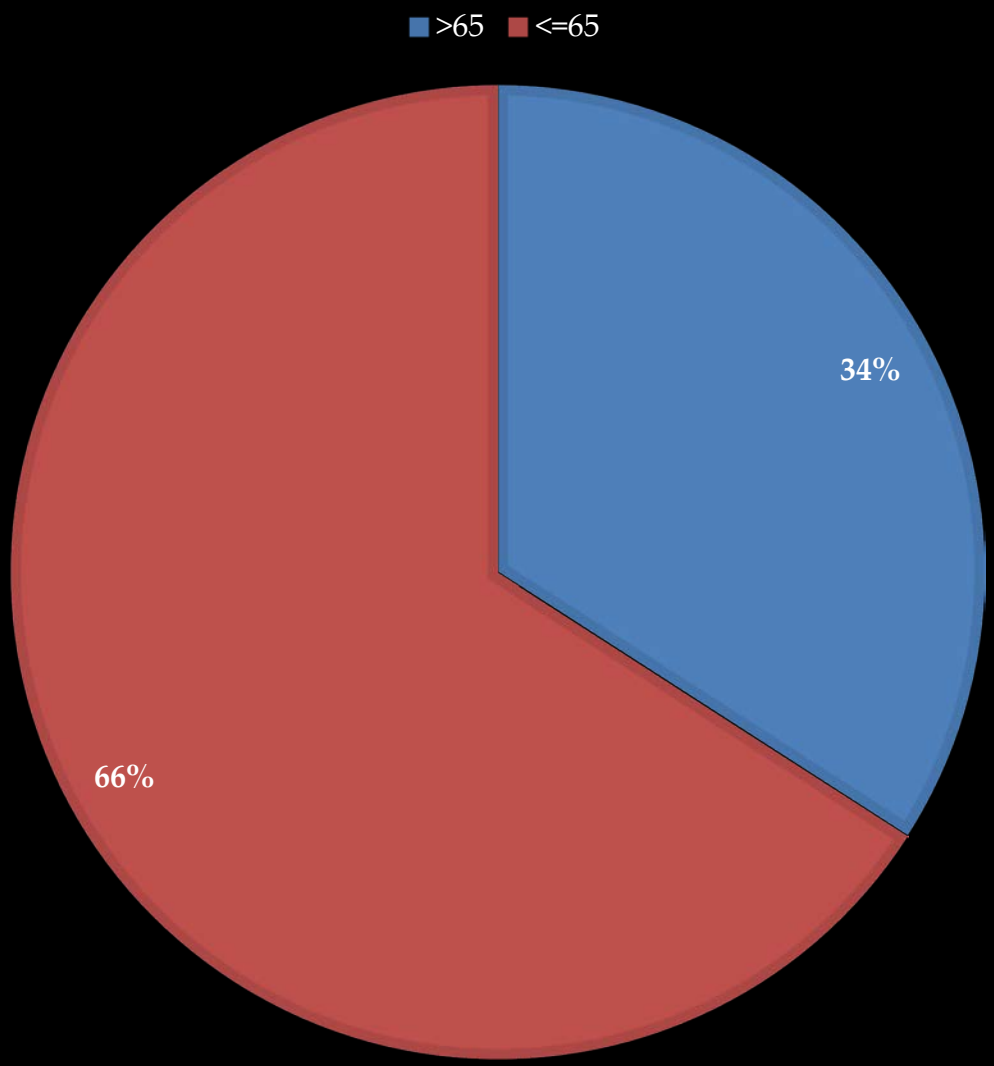
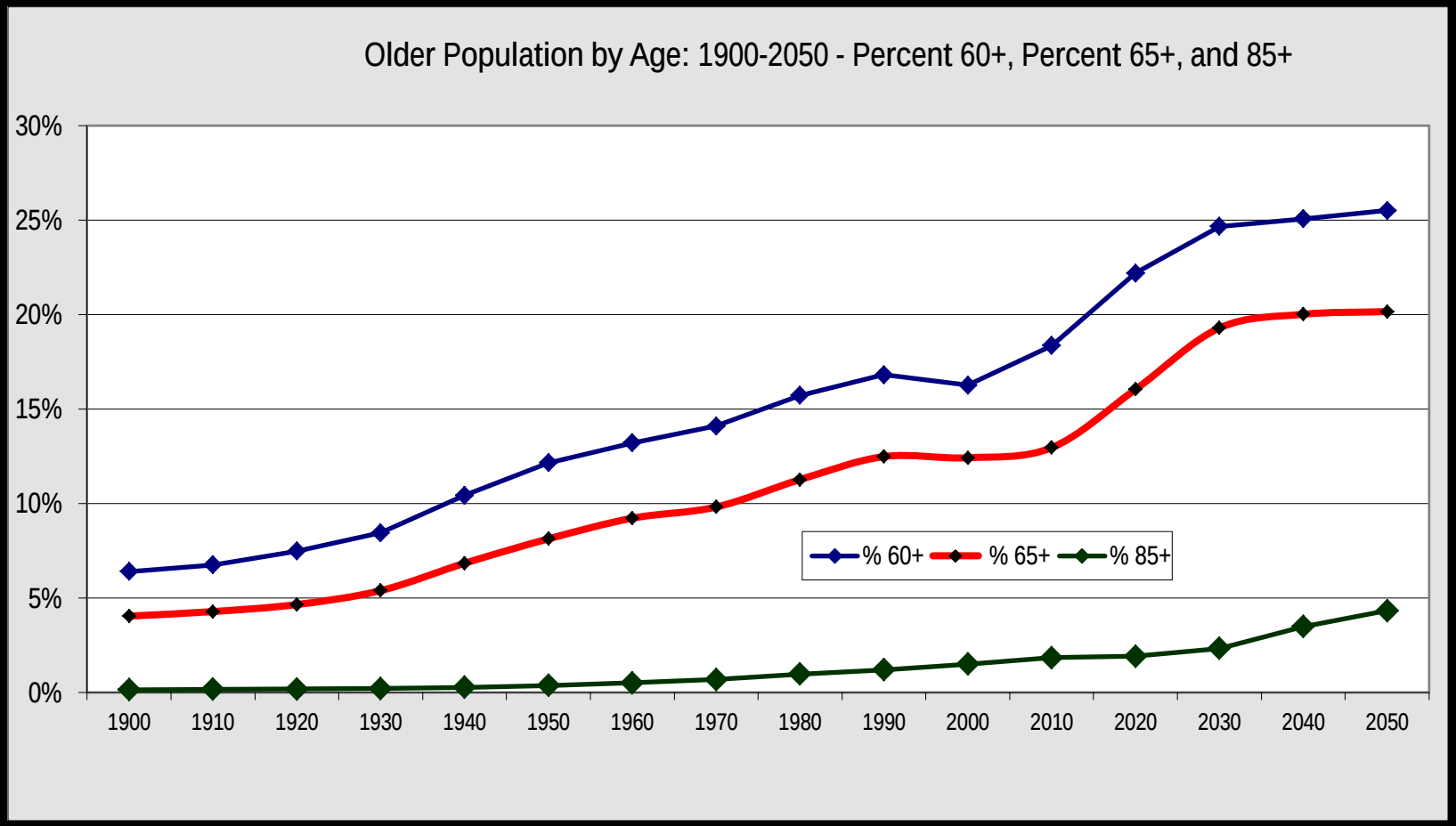
U.S. Net Wealth (2011)



Aging Population



Financial Decision Making

Financial Decision Making

Forbes

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How Aging Affects Financial Decision-Making

Next Avenue

Where grown-ups keep growing FULL BIO

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Next Avenue, Con CBS NEWS / *April 17, 2014, 10:13 AM*

"Grandparent scam" explained: What you need to know

USA TODAY

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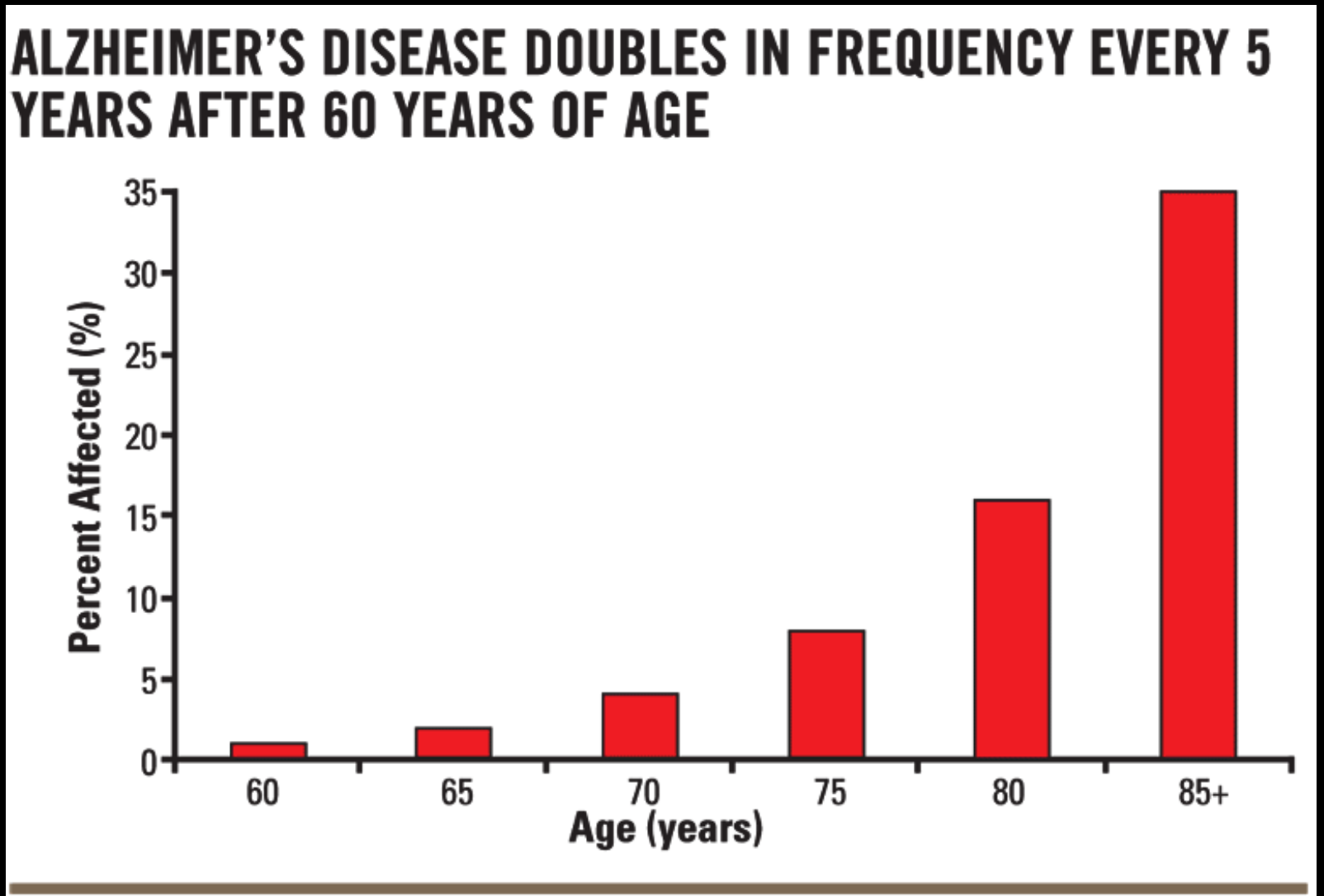
Are you a victim of these scams targeting seniors?

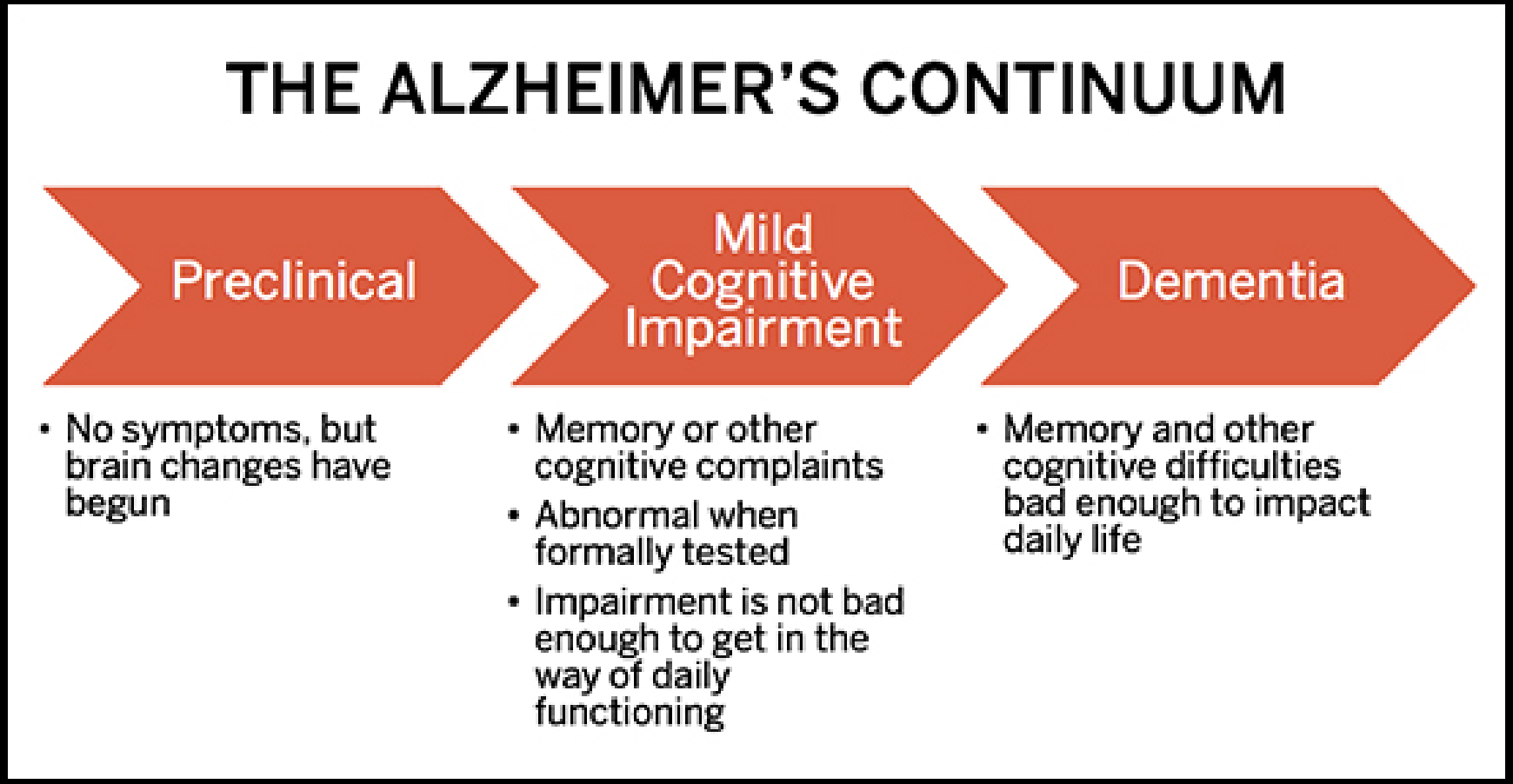
Kevin McCoy , USA TODAY Published 2:32 p.m. ET Feb. 15, 2017 | Updated 6:41 p.m. ET Feb. 15, 2017

Alzheimer's Disease



Cummings JL. *Primary Psychiatry*. Vol 15, No 2. 2008.

Mild Cognitive Impairment



Boston University Alzheimer's Disease Center

Mild Cognitive Impairment Is Associated with Poorer Decision-Making in Community-Based Older Persons

S. Duke Han, PhD,[†‡§] Patricia A. Boyle, PhD,*[†] Bryan D. James, PhD,*[‖] Lei Yu, PhD,*[‡] and David A. Bennett, MD*[‡]*

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0002-8614/15/$15.00

Table 2. Relationship Between Mild Cognitive Impairment (MCI) and Decision-Making, Adjusted for Age, Education, and Sex

	Model 1	Model 2
Model Term	**Estimate (Standard Error) *P*-Value**	
Total decision-making		
Age	–0.11 (0.01) <.001	–0.10 (0.01) <.001
Education	0.28 (0.03) <.001	0.28 (0.03) <.001
Male	0.82 (0.22) <.001	0.89 (0.21) <.001
MCI		–1.35 (0.23) <.001
Financial decision-making		
Age	–0.06 (0.01) <.001	–0.05 (0.01) <.001
Education	0.11 (0.02) <.001	0.12 (0.02) <.001
Male	0.52 (0.12) <.001	0.55 (0.11) <.001
MCI		–0.61 (0.12) <.001
Healthcare decision-making		
Age	–0.06 (0.01) <.001	–0.05 (0.01) <.001
Education	0.16 (0.02) <.001	0.16 (0.02) <.001
Male	0.30 (0.13) .02	0.34 (0.13) .007
MCI		–0.74 (0.13) <.001

Table 4. Relationship Between Individual Cognitive Function Measures and Decision-Making in Individuals with Mild Cognitive Impairment

Cognitive System	Estimate (Standard Error)	*P*-Value	R^2 Change
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Global cognition	3.20 (0.47)	<.001	0.16
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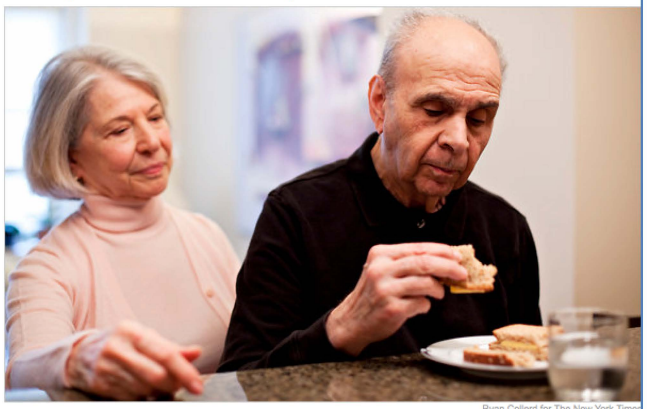
THE VANISHING MIND

Money Woes Can Be Early Clue to Alzheimer's



Ryan Collerd for The New York Times

As Arthur Packel's dementia grew worse, he forgot how to handle money, and his wife, Renee, could not find where it all went.

By GINA KOLATA
Published: October 30, 2010

Renee Packel used to have a typical suburban life. Her husband, Arthur, was a lawyer and also sold insurance. They lived in a town house just outside Philadelphia, and Mrs. Packel took care of their home and family.

One day, it all came crashing down. The homeowners' association called asking for their fees. To Mrs. Packel's surprise, her husband had simply stopped paying them. Then she learned he had stopped writing checks to his creditors, too.

It turned out that Mr. Packel was developing Alzheimer's disease and had forgotten how to handle money. When she tried to pay their bills, Mrs. Packel, who enlisted the help of a forensic accountant, could not find most of the couple's money.

"It just disappeared," she said.

What happened to the Packels is all too common, Alzheimer's experts say. New research shows that one of the first signs of impending dementia is an inability to understand money and credit, contracts and agreements.

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Béatrice de Géa for The New York Times

Dr. Max Gomez, left, with his son, does not understand why he needs Medicaid: "I have money."

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Dr. Max Gomez, left, with his son, does not understand why he needs Medicaid: "I have money."

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Poor Decision Making Is a Consequence of Cognitive Decline among Older Persons without Alzheimer's Disease or Mild Cognitive Impairment

Patricia A. Boyle[1,2]*, Lei Yu[1,3], Robert S. Wilson[1,3], Keith Gamble[1,4], Aron S. Buchman[1,3], David A. Bennett[1,3]

1 Rush Alzheimer's Disease Center, Rush University Medical Center, Chicago, Illinois, United States of America, **2** Department of Behavioral Sciences, Rush University Medical Center, Chicago, Illinois, United States of America, **3** Department of Neurological Sciences, Rush University Medical Center, Chicago, Illinois, United States of America, **4** Department of Finance, DePaul University, Chicago, Illinois, United States of America

Table 2. Decision making and scams as a function of cognitive decline*.

	Persons without dementia N = 420		No cognitive impairment only N = 334	
	EST (SE)	P	EST (SE)	P
Decision making				
Age	−0.057 (0.017)	<.001	−0.051 (0.018)	0.005
Female	1.142 (0.276)	<.001	0.949 (0.308)	0.002
Education	0.154 (0.042)	<.001	0.115 (0.047)	0.015
Starting level of cognition	2.284 (0.286)	<.001	2.935 (0.364)	<.001
Cognitive decline	0.229 (0.041)	<.001	0.195 (0.051)	<.001
Susceptibility to scams				
Age	0.019 (0.005)	<.001	0.026 (0.005)	<.001
Female	0.030 (0.080)	0.703	0.062 (0.088)	0.478
Education	−0.019 (0.012)	0.106	−0.017 (0.013)	0.194
Starting level of cognition	−0.152 (0.082)	0.065	−0.195 (0.104)	0.060
Cognitive decline	−0.039 (0.012)	0.001	−0.031 (0.015)	0.037

*Parameter estimates of cognitive decline per 0.01 unit increase in rate of change; estimated from regression models adjusted for age, sex, education, and starting level of cognition.

doi:10.1371/journal.pone.0043647.t002

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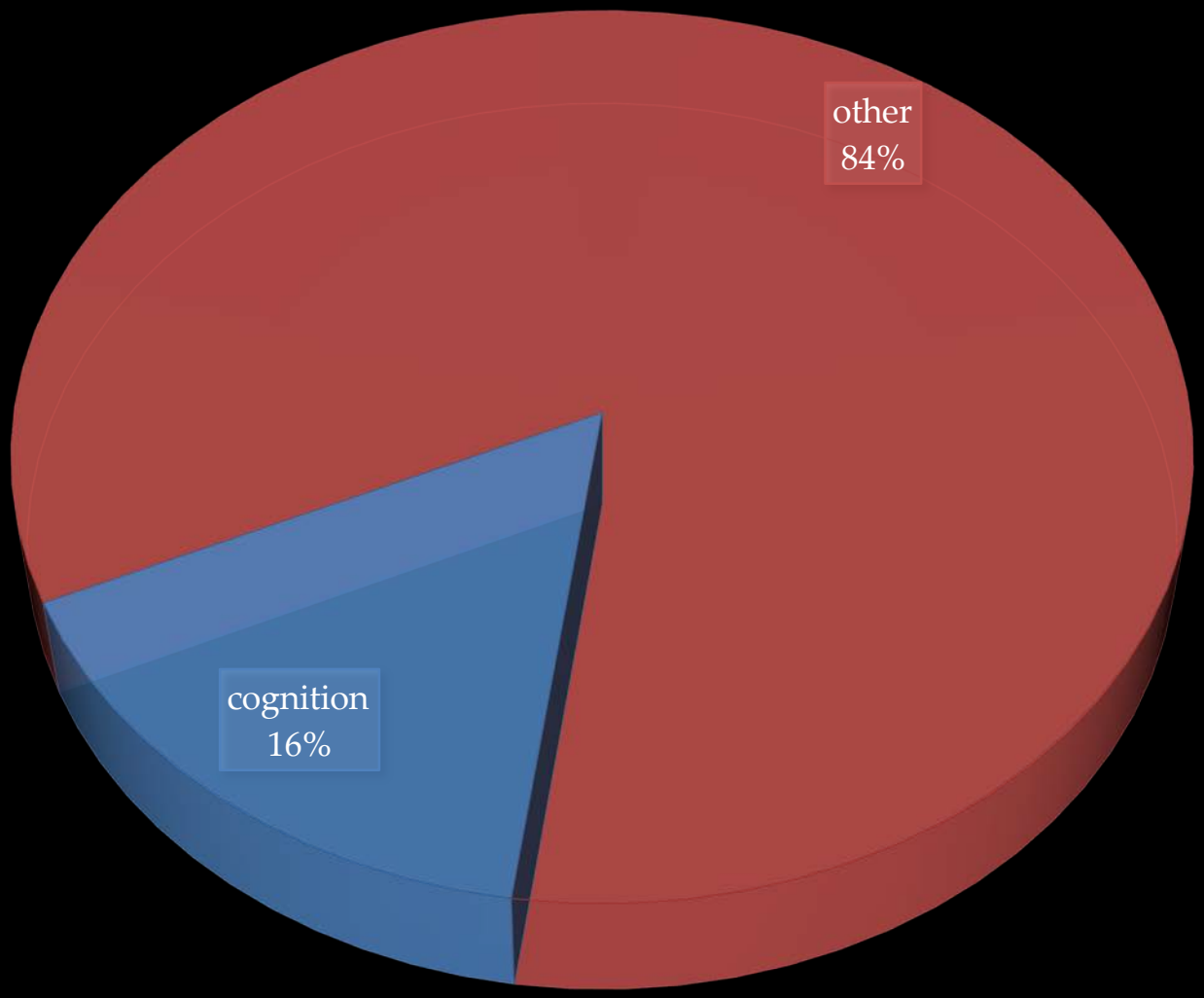
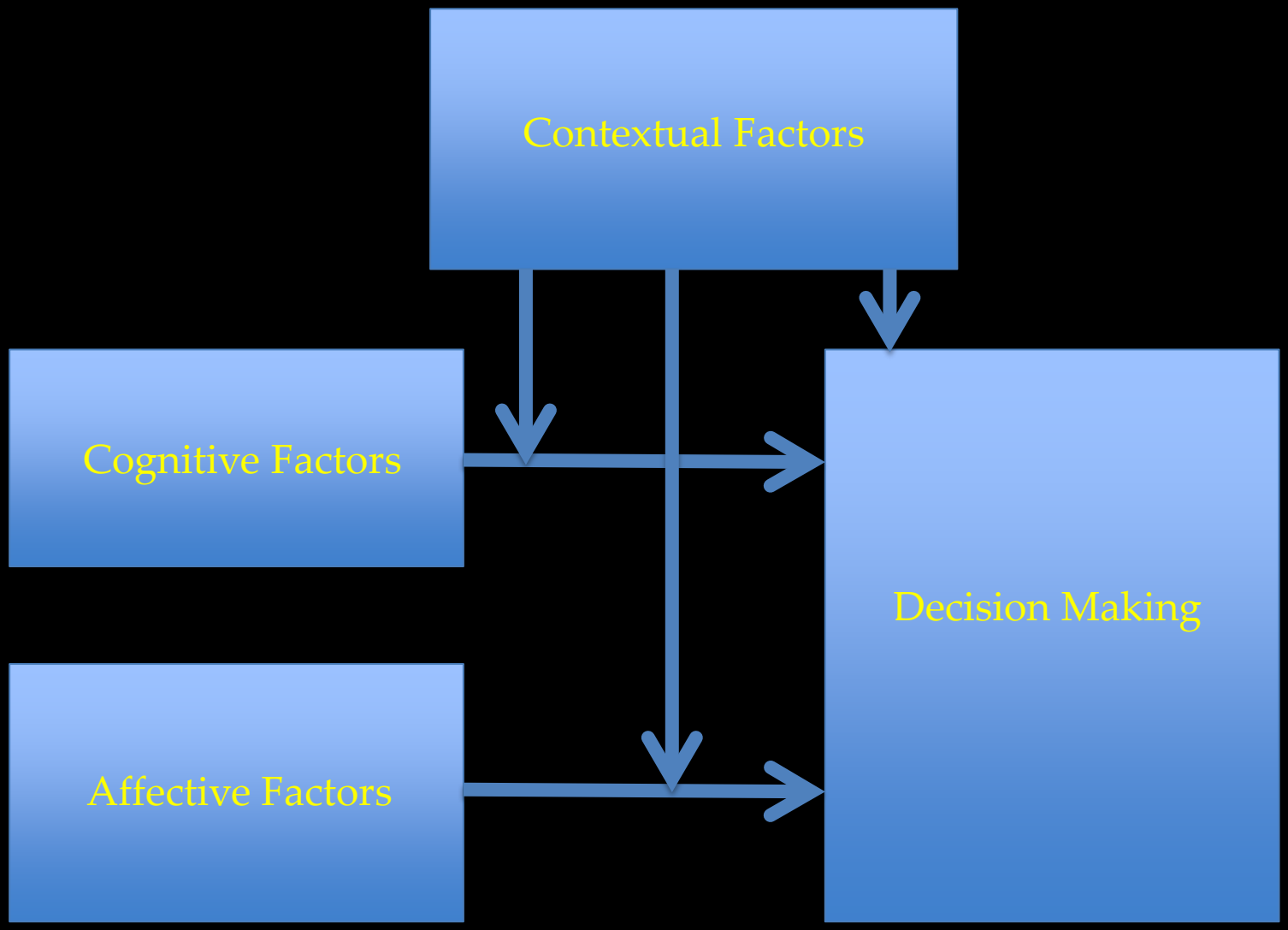
Decision Making




Contextual Factors
Cognitive Factors
Affective Factors
Decision Making

This online-first version will be replaced with a final version when it is included in the issue. The final version may differ in small ways.

Annals of Internal Medicine

Age-Associated Financial Vulnerability: An Emerging Public Health Issue

Mark S. Lachs, MD, MPH, and S. Duke Han, PhD

Various processes common in the aging brain may affect an older adult's ability to manage personal finances, the most recognized of which are dementing illnesses (1). These conditions can affect cognitive abilities, which may jeopardize an older adult's financial well-being over their longitudinal course. However, recent studies suggest that even cognitively intact older adults can have "functional" changes that may render them financially vulnerable. Social isolation also increases dramatically with age, which places older persons at risk for exploitation from predators. Furthermore, capitalistic enterprises can threaten the financial security of this group, which is perceived to be a large untapped market and, in an era of information overload, is often presented with a dizzying array of products and services.

We propose the concept of age-associated financial vulnerability (AAFV) and discuss aspects of its epidemiology from the vantage of a neuropsychologist (S.D.H) and geriatrician–epidemiologist (M.S.L) who are both researchers and clinicians working in the field of elder abuse. We believe that considering AAFV a clinical syndrome may be advantageous to further critical research, promote public policy work, and encourage physicians to recognize it.

need not be associated with cognitive impairment differentiates research on this condition from previous work that has focused on cognitive impairment as the driving force for financial vulnerability (3).

Age-associated financial vulnerability and financial exploitation (4, 5) can be linked—AAFV may predispose an older adult to financial exploitation—however, we perceive them as conceptually different. Age-associated financial vulnerability focuses on a potential condition that may have multiple causes and ultimately may or may not lead to exploitation. We view financial exploitation as focusing on specific mechanisms that drive a particular outcome, often consisting of intentional or forceful methods of exploitation. In this sense, persons who do not show AAFV can be victims of financial exploitation. More is known about the effects of financial exploitation; less is known about AAFV because we believe that this concept is new.

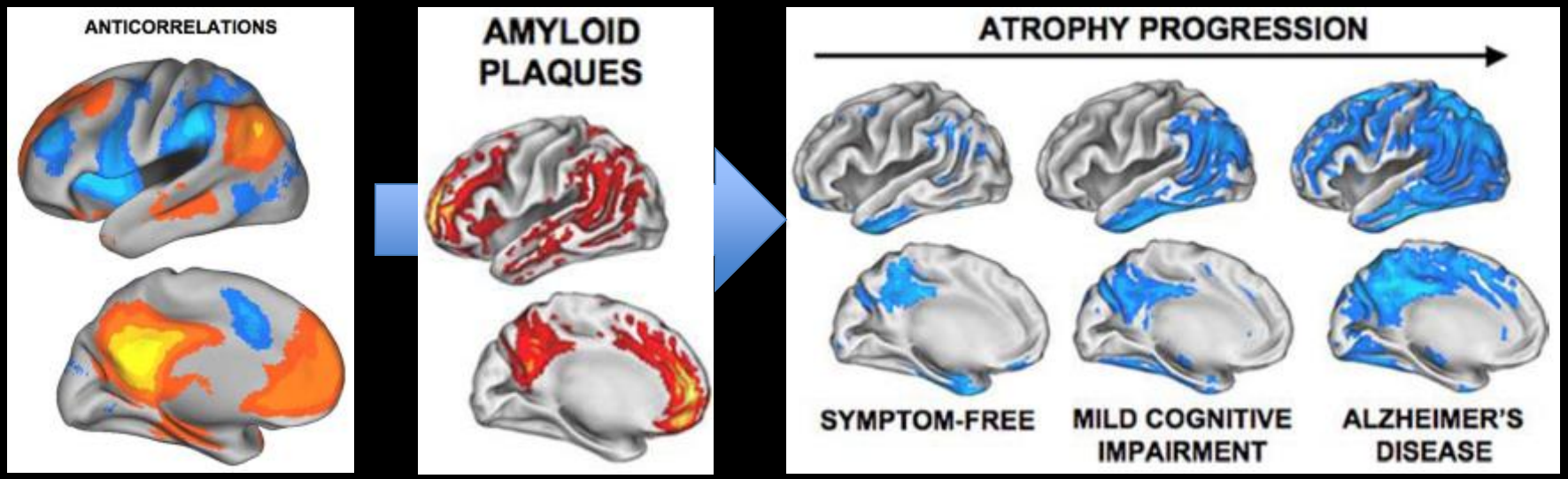
EPIDEMIOLOGY OF AAFV: PREVALENCE AND RISK FACTORS

Although a precise determination of the prevalence of AAFV would require assessment of a large population-based sample of older adults, community-

Table. Possible Factors Contributing to Age-Associated Financial Vulnerability

Domain Factor	Mechanism
Cognitive/emotional	
Executive dysfunction	Reduced ability to multitask, organize by time, and abstractly comprehend future ramifications of current financial actions
Acalculia	Inability to quickly calculate figures mentally to verify numbers or to perform numerical calculations
Frontal disinhibition	Reduced ability not to commit to financial courses of action with potentially negative consequences
Anxiety	May increase pressure to take bad financial risks or not pursue appropriate financial safeguards
Reduced ability to discern trustworthy persons	Results in having less information by which to discern good financial opportunities from bad financial risks
Medical and functional	
Serious progressive illness	Serious underlying medical illness unresponsive to traditional therapy may motivate patients to seek expensive and unproven treatments, creating susceptibility to fraud
Impaired mobility	Reduced ability to extricate themselves from an environment in which they are being pressured to make financial decisions
Vision and hearing loss	Decreased likelihood that complex financial transactions and/or documents are fully comprehended before execution
Polypharmacy	May contribute to delirium, directly influencing vulnerability; expense of medication may also lead to inadvisable risk-taking
Psychosocial	
Depression	Associated with executive dysfunction (7); shame and guilt may also preclude older persons from revealing their predicament to trusted friends and family who could extricate them from exploited role
Social isolation	No beneficent person within the older person's social network to recognize, mitigate, or report financial exploitation
Loneliness	Patients may engage potential exploiters as a mechanism of fostering social connectedness
Environmental/societal	
Wealth concentration	High concentration of wealth in older populations makes them targets of potential exploiters
Information overload	Complex offering of products and services may paradoxically reduce sound decision making in the aging brain
Sophisticated marketing	The aging brain may be more susceptible to increasing use of behavioral economics and cognitive neuroscience to sway consumers

Age-Associated Neuropathology



Buckner et al., 2008; Buckner et al., 2005; Lustig et al., 2003

Susceptibility to Scams

Brain Imaging and Behavior
DOI 10.1007/s11682-015-9422-4

ORIGINAL RESEARCH

Grey matter correlates of susceptibility to scams in community-dwelling older adults

S. Duke Han[1,2,3,4] · Patricia A. Boyle[1,2] · Lei Yu[1,3] · Konstantinos Arfanakis[6,7] · Bryan D. James[1,5] · Debra Fleischman[1,2,3] · David A. Bennett[1,3]

- Voxel-based morphometry (VBM) to assess grey matter density at the voxel level
- N=348 nondemented older adults
- Mean age=81.55, s.d.=7.25; mean number of years of education=15.30, s.d=2.91; 74.10% female

Grey matter correlates of susceptibility to scams in community-dwelling older adults

S. Duke Han, Patricia A. Boyle, Lei Yu, Konstantinos Arfanakis, Bryan D. James, Debra A. Fleischman & David A. Bennett

Brain Imaging and Behavior

ISSN 1931-7557

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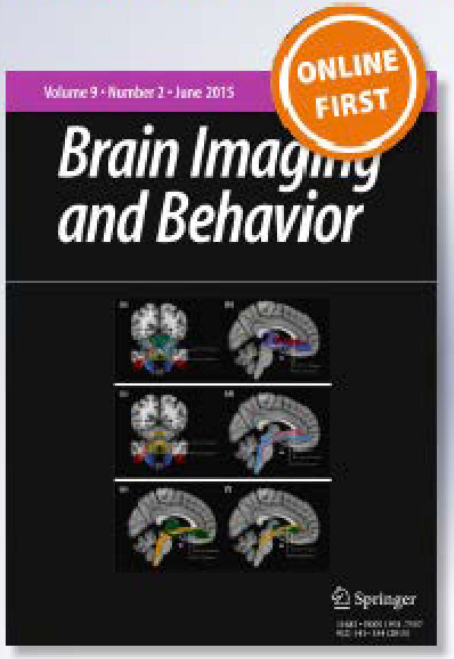

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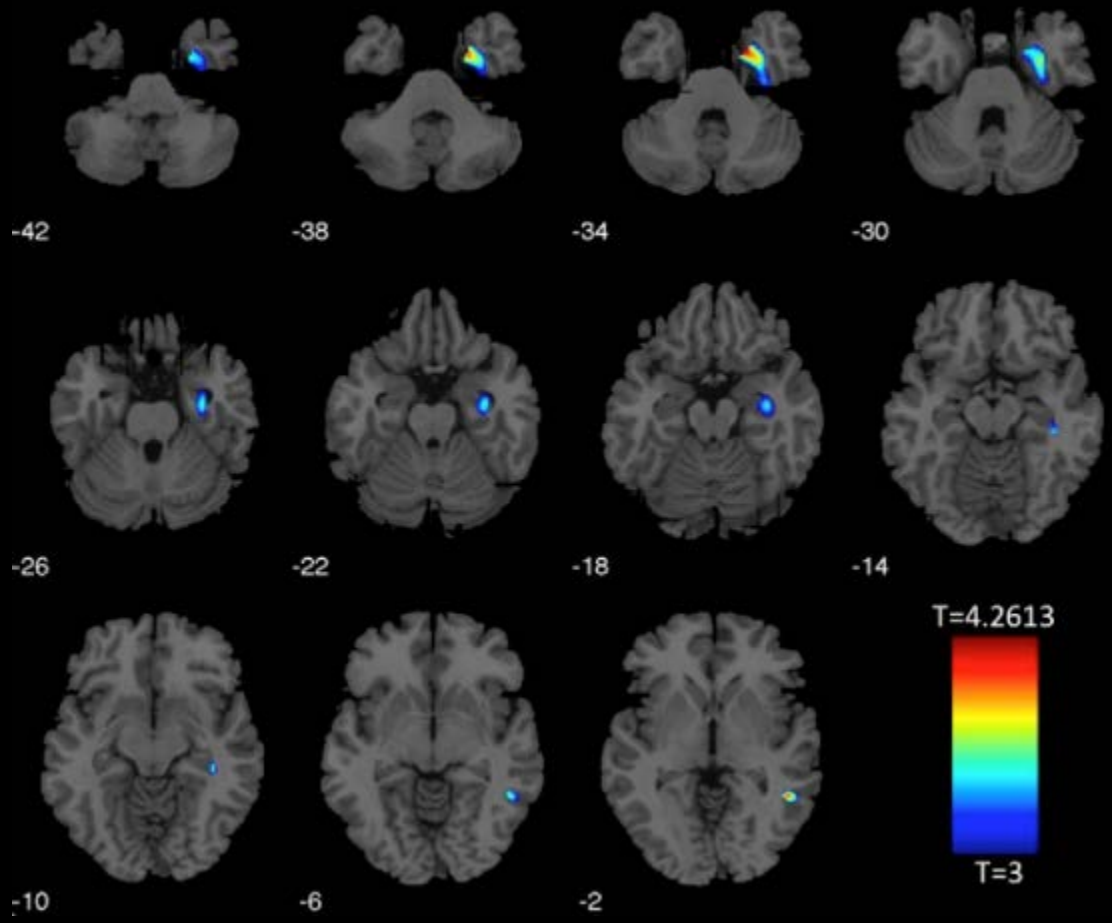
Assessment of susceptibility to scams

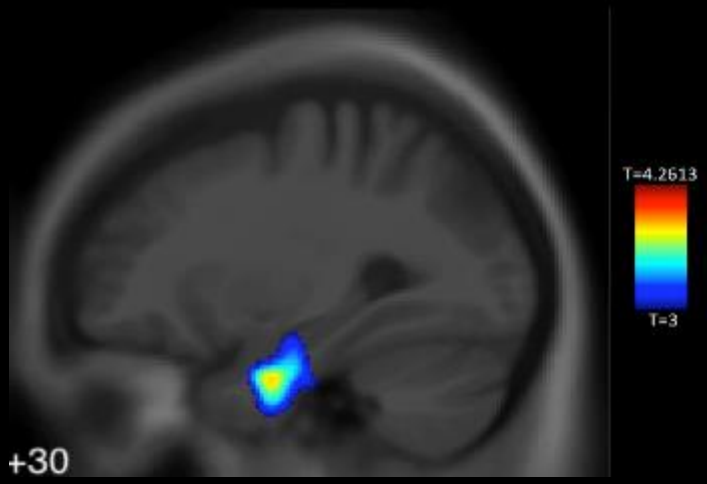
The susceptibility to scams scale is a five-item self-report measure in which participants rated their agreement to a statement according to a 7-point Likert scale (strongly agree to strongly disagree). The five statements included in the measure have been previously reported (James et al. 2014) and address topics such as telemarketing behaviors, older adults being targeted by con-artists, and suspiciousness of claims that seem too good to be true. The statements are:

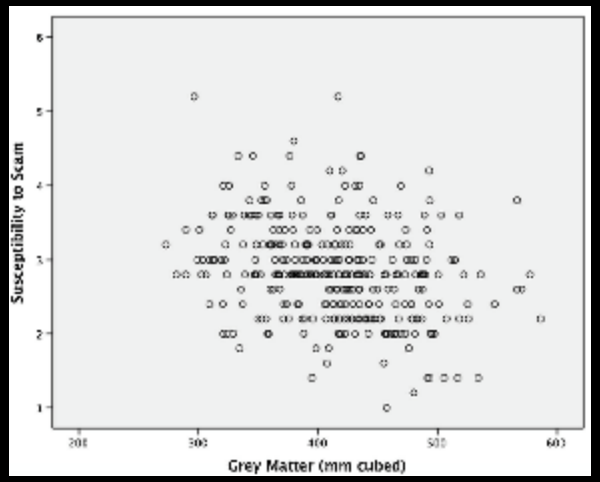
1. I answer the phone whenever it rings, even if I do not know who is calling.
2. I have difficulty ending a phone call, even if the caller is a telemarketer, someone I do not know, or someone I did not wish to call me.
3. If something sounds too good to be true, it usually is.
4. Persons over the age of 65 are often targeted by con-artists.
5. If a telemarketer calls me, I usually listen to what they have to say.

Each question corresponds to a Likert scale and has a total possible range of 1 to 7 (1 = strongly agree, 2 = agree, 3 = slightly agree, 4 = neither agree or disagree, 5 = slightly disagree, 6 = disagree, 7 = strongly disagree). The total score for susceptibility to scams was calculated by averaging the five items (with items 1, 2, and 5 reverse coded). The statements were based generally on findings from the AARP and the Financial Industry Regulatory Authority Risk Meter, a measure of poor and risky financial decision making that is widely used in finance studies (AARP 1999; Financial Industry Regulatory Authority 2013). The intraclass correla-

Susceptibility to Scams







Summary

Important Final Caveats

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