



## Understanding the mechanisms underlying the effects of loneliness on vulnerability to fraud among older adults

Jing Wen, Hang Yang, Qianhan Zhang & Jingjin Shao

**To cite this article:** Jing Wen, Hang Yang, Qianhan Zhang & Jingjin Shao (2022) Understanding the mechanisms underlying the effects of loneliness on vulnerability to fraud among older adults, *Journal of Elder Abuse & Neglect*, 34:1, 1-19, DOI: [10.1080/08946566.2021.2024105](https://doi.org/10.1080/08946566.2021.2024105)

**To link to this article:** <https://doi.org/10.1080/08946566.2021.2024105>



Published online: 13 Jan 2022.



Submit your article to this journal [↗](#)



Article views: 1481



View related articles [↗](#)




View Crossmark data [↗](#)



Citing articles: 25 View citing articles [↗](#)



# Understanding the mechanisms underlying the effects of loneliness on vulnerability to fraud among older adults

Jing Wen, Hang Yang, Qianhan Zhang, and Jingjin Shao 

Center for Mental Health Education, Faculty of Psychology, Southwest University, Chongqing, China

## ABSTRACT

The current study aimed to clarify the relationships among loneliness, susceptibility to persuasion, self-control, and vulnerability to fraud among older adults. Especially, we wanted to investigate whether susceptibility to persuasion mediates the association between loneliness and vulnerability to fraud, and whether self-control moderates the relationship in this process. A moderated mediation model was examined with 252 Chinese older adults ( $M_{\text{age}} = 67.94$ ,  $SD = 6.27$ ) who completed questionnaires regarding loneliness, susceptibility to persuasion, self-control, and vulnerability to fraud. The results revealed that loneliness significantly predicted older adults' vulnerability to fraud and susceptibility to persuasion partially mediated this relationship. Moreover, this mediating effect was only significant for older adults with low self-control. These findings enrich our understanding of how loneliness affects older adults' vulnerability to fraud and provide practical guidance for establishing protections against fraud targeting older adults.

## KEYWORDS

Older adults; loneliness; susceptibility to persuasion; self-control; vulnerability to fraud

## Introduction

With a growing number of aging populations worldwide, criminal fraud cases targeting older adults are also increasing at a high rate. It is no exaggeration to say that deception aimed at older adults has become a serious social problem domestically and internationally (Burnes et al., 2017; Lichtenberg et al., 2016). Although individuals could be victims of fraud at any age (DeLiema, 2017), fraud is a crime that is most frequently experienced by older adults for various reasons, such as their cognitive impairments (e.g., the decline in comprehension and memory abilities), their preference for positive information, or their lack of necessary knowledge and ability to recognize fraud (Carcach et al., 2001; Kircanski et al., 2018; Lee & Soberon-ferrer, 1997). Simultaneously, because older adults are often unemployed, retired, and living on a fixed income source, scams against the aging population could not only bring them considerable economic damage, but also exert an inestimable lasting impact both on their physical and mental well-being (Burnes et al., 2017; Button et al., 2014). For example, previous research has documented that the

incidence rate of financial deception is 5.6% among older adults (Burnes et al., 2017), and the annual cameralistic loss to older adults in the United States due to financial scams was approximately 2.9 billion dollars in 2010 (MetLife, 2011). Additionally, the experience of being a victim of deception can lead to older adults experiencing severe negative emotions (e.g., anger, shame, and remorse) as well as psychological trauma, including major depression, generalized anxiety disorder, and somatic complaints (Ganzini et al., 1990). Accordingly, assessing older adults' risk of being a victim of financial fraud is necessary for both their well-being and overall social stability, which also can inform protection policies to prevent older adults from being deceived.

Loneliness, a common phenomenon among older adults as well as a critical challenge during senectitude (Chen & Schulz, 2016; Hu et al., 2011), is often considered a strong psychosocial predictor of being deceived for older adults (Alves & Wilson, 2008; Shao et al., 2019). More specifically, if older individuals' needs for belonging are not satisfied or they lack effective social interactions to obtain support and understanding from others, they usually suffer from loneliness (Deci & Ryan, 2000); consequently, they may seek out "emotional alternatives" to alleviate the negative emotions they experience (Alves & Wilson, 2008). Notably, due to cognitive impairments and other reasons mentioned above, older adults with a strong desire for emotional attachment and experience of loneliness are easily taken advantage of in various ways (e.g., "emotional care") in their search of substitutes for their lack of connection with others (Xing, 2020). Thus, pursuing inappropriate emotional substitutes may increase the possibility of becoming victims of fraud (Xing et al., 2020). This notion that loneliness is positively connected to fraud victimization has been supported in previous empirical studies (Judges et al., 2018; Li et al., 2018). For example, Jia et al. (2018) confirmed the positive association between older adults' loneliness and their purchase behavior of health care products. Similarly, Fees et al. (1999) found that the higher the level of loneliness older adults experienced, the more frequent telephone contact they had with strangers, which further increased their vulnerability to fraud. Thus, for older adults, loneliness would play an important role in their vulnerability to fraud.

In general, a review of the literature shows that prior studies have primarily focused on the direct link between loneliness and older adults' fraud victimization, whereas few studies have investigated the underlying mechanisms (i.e., potential mediating and moderating variables). To date, no research has examined how loneliness influences older adults' fraud vulnerability (i.e., the mediating effect) or the conditions under which this relationship is stronger or weaker (i.e., the moderating effect). Identifying mediating and moderating factors could be crucial in clarifying how loneliness affects older adults' fraud vulnerability and enrich theories about financial fraud among the older adult population, which could also facilitate the development of effective interventions or protection strategies. Therefore, we investigated a potential

mechanism underlying the association between loneliness and vulnerability to fraud through a complex conceptual model to better examine the mediating role of susceptibility to persuasion and the moderating role of self-control.

### ***The mediating role of susceptibility to persuasion***

Susceptibility to persuasion may be one of the possible mediators in the link between loneliness and vulnerability to fraud among older adults. Previous empirical and theoretical evidence suggest two disparate ways in which loneliness may be associated with vulnerability to fraud (Cross, 2017). First, loneliness provides the motivation for older adults to engage in social interaction. According to social activity theory (Friedman, 1992), older adults' range of activity decreases as age increases after their retirement, and the proportion of "empty nesters" also increases, making it more likely for older adults to experience loneliness (Walton et al., 1991; Wu, 2008). At the same time, numerous traumatic events usually occur in old age, such as physical illness, the death of a spouse, or the loss of only child (Dahlberg et al., 2015; Dahlberg & McKee, 2014), which may further exacerbate loneliness (Yao et al., 2018). Thus, to alleviate loneliness, individuals often take the initiative to expand their social circle with the aim of obtaining supportive social relationships through various activities and interactions. Notably, compared with older adults who have normal social interactions (such as socializing with family members and friends), older adults with a strong sense of loneliness may have a tendency to attach their emotions to strangers in the social process as a means of alleviating feelings of loneliness (Alves & Wilson, 2008; Kang & Ridgway, 1996). Even more remarkable, older adults need to estimate various types of information received during social interactions to make decisions; thus, they are more likely to be subject to a range of social influences (Sassenberg & Jonas, 2007; Wood & Hayes, 2012). More specifically, older adults who experience loneliness usually have a tendency toward self-abasement (Xing et al., 2020), and they are more likely to trust authority or conform to group norms in social interactions as well as strive to be highly consistent with others or groups (Cialdini & Goldstein, 2004; Modic & Lea, 2013). Accordingly, we presumed that lonely older adults would be more inclined to automatically defer to others in social interactions, thus showing high susceptibility to persuasion.

Second, older adults' loneliness provides an opportunity for offenders to build trust with the people they are scamming, through either non-contact or face-to-face interaction (Cross, 2017). Consequently, older adults who suffer from severe loneliness may be ideal targets for con artists. There are two possible reasons: (1) loneliness leads individuals to exert their strong desire for interaction with others, including strangers and potential fraudsters who can cater to their emotional dependence; (2) the overwhelming

majority of lonely older adults live alone due to the death of a spouse or because one's children have moved away after getting married; thus, effective supervision from family members to prevent fraud is often not available for them (Shao et al., 2019). Here, it is necessary to mention that fraud is a specific contact process involving communication, and in which the perpetrator may use various persuasion tactics (Holtfreter et al., 2006; Reisig & Holtfreter, 2013) to interfere with the victim's decision-making process and mislead them into providing something of value (DeLiema et al., 2014; Pak & Shadel, 2011). During this process, older adults who are easily persuaded or even unaware that they are being persuaded show a higher tendency to respond to the actions of the person perpetrating the fraud (Fischer et al., 2013). Therefore, under the influence of loneliness and an age-related decline in the ability to recognize others' motives and intentions, older adults experiencing loneliness may find it difficult to resist offenders' various persuasion strategies (e.g., emotional care, free gifts, and false promises of high returns; Kircanski et al., 2018). Thus, older adults who are suffering from loneliness could be more susceptible to persuasion and further lured into fraud (DeLiema et al., 2014; Pinsker et al., 2010).

Taking these factors together, this study assumed that susceptibility to persuasion might function as a mediator in the link between older adults' loneliness and their vulnerability to fraud (Hypothesis 1).

### ***The moderating role of self-control***

Although perceived loneliness could increase the susceptibility to persuasion of older adults and this may in turn cause them to exhibit a higher vulnerability to fraud, not all lonely older people are easily persuaded and fall victim to fraud (Titus & Gover, 2001). There may exist certain individual characteristics that could buffer the impact of loneliness on vulnerability to fraud. We proposed that self-control may be a possible moderator in the process of how loneliness in older adults contributes to fraud vulnerability. The function of self-control involves stimulating, restraining, or regulating one's desires, thoughts, emotions, and behaviors, and ultimately helping the individual achieve their target (Duckworth, 2011). Self-control plays several roles that are usually reflected in the following aspects. First, as one of the necessary indicators of emotion management, self-control not only affects an individual's moral formation but also emotion regulation (Eisenberg et al., 2011). Second, as an important aspect of personality, low self-control is often closely related to impulsive consumption decisions and unwise financial investments (Chen et al., 2020). Moreover, self-control can also be defined as an individual's ability to regulate their behavior (Kanfer & Karoly, 1972); that is, one's level of self-control is closely linked to whether they have enough capacity to

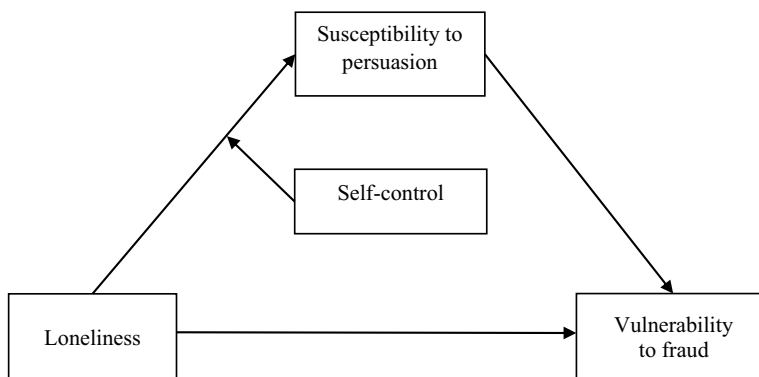
restrain or motivate their behavior (Gailliot et al., 2007). Finally, self-control is usually perceived as a limited resource that does not increase throughout one's life cycle, but rather is depleted over time (Baumeister et al., 1998).

Early empirical evidence may assist us in better understanding why self-control plays an irreplaceable role in fraud victimization. For example, earlier studies have shown that individuals who have more difficulty regulating their emotions were usually those who have a low level of self-control (Tangney et al., 2004; Wheeler et al., 2007). Other similar studies have elaborated that individuals are vulnerable to judgment errors when their emotional control comes under pressure, which further results in suboptimal decision-making in response to fraud (Baumeister et al., 2007; Langenderfer & Shimp, 2001). Moreover, in order to satisfy their own needs, individuals with low self-control may have difficulty resisting or doubting temptations around them in most situations (Modic, 2012). Based on these arguments, it is reasonable to deduce that the capacity of self-control will deplete to differing degrees as age increases. Given that older adults usually show lower self-control and may tend to have more emotion control difficulties (Kang & Ridgway, 1996), when loneliness strikes they may be more likely to rely on strangers or even swindlers to meet their social needs and alleviate their negative emotions. Furthermore, when encountering the persuasion strategies of others (especially con artists), older adults with low self-control may be unable to suppress their compliant behavior through active self-control, which may lead them to make erroneous judgments or involuntary decisions, and these errors could further increase their susceptibility to persuasion (Langenderfer & Shimp, 2001). In other words, older adults with low self-control may be highly susceptible to persuasion due to their loneliness, which may easily cause them to fall victim to fraud or a scam. On the contrary, when exposed to potential fraud, lonely older adults with high self-control would be able to ease their loneliness and maintain optimism, which would put them at low risk of being persuaded.

In summary, self-control is considered as a momentous psychological factor that can buffer the impact of loneliness on susceptibility to persuasion. Therefore, in the current study, we presumed that the indirect influence of loneliness on older adults' fraud vulnerability, via susceptibility to persuasion, would be moderated by self-control. Specifically, self-control would have a moderating effect on the relationship between loneliness and susceptibility to persuasion (Hypothesis 2).

### ***The present study***

As the current study focused on developing a more comprehensive understanding of the underlying mechanisms connecting older adults' loneliness and their vulnerability to fraud, we constructed a conceptual model of moderated mediation (Figure 1) to address the following two questions.



**Figure 1.** The conceptual model of moderated mediation.

Does susceptibility to persuasion among older adults mediate the relationship between their loneliness and vulnerability to fraud? Does self-control moderate the association between older adults' loneliness and their susceptibility to persuasion? Namely, this integrated model can address questions on both mediation (i.e., how does loneliness relate to vulnerability to fraud among older adults) and moderation (i.e., when and for whom the link is stronger or weaker) in one model. In this regard, we examined the following two hypotheses: (1) susceptibility to persuasion would mediate the relationship between older adults' loneliness and their vulnerability to fraud, and (2) self-control would moderate the relationship between loneliness and susceptibility to persuasion. Validation of the mediating role of susceptibility to persuasion and the moderating role of self-control would have vital significance for protecting older adults from being scammed.

## Methods

### Participants

Using convenience sampling, 259 participants aged 60 years or older were recruited from Jiangxi, Sichuan, Gansu, and Shandong provinces in China. After excluding survey questionnaires that had incomplete answers and outliers ( $\pm 3$  standard deviations), the final sample included 252 older adults (130 women and 122 men, effective response rate = 97.3%) aged from 60 to 86 ( $M = 67.94$ ,  $SD = 6.27$ ). Most of the participants (79.3%) reported they were married or cohabited with a partner. Additionally, 34.5% had a primary school education or below, 38.9% had a junior high school education, 25.4% had a high school education, and 1.2% had a bachelor's degree or above. As to their occupations prior to retirement, 29.4% were farmers, 31.3% were business persons, 21.8% were general salaried staff, 11.9% were mid-level staff, and 5.6% were senior executives. On average, our participants' monthly disposable income was ¥2158.12.



## Procedure

The Institutional Review Board at the authors' affiliated institutions approved all materials and procedures used in this study. Prior to beginning the study, the researcher emphasized that participation was completely voluntary and each participant had the right to withdraw at any time during the study. Then, informed consent was obtained from the participants. To standardize the data collection process, all of the participants were invited into a quiet room and well-trained postgraduate students administered the questionnaires. Participants were first screened for cognitive functioning using the Mini-Mental State Examination (MMSE; Folstein et al., 1975), after which eligible participants completed the survey questionnaire. The questionnaire asked for demographic information and included measures of loneliness, susceptibility to persuasion, self-control, and vulnerability to fraud. Each participant received ¥25 (approximately 3.70 US dollars) for their participation.

## Measures

### Loneliness

Loneliness was assessed using the short-form of the UCLA Loneliness Scale (ULS-8; Hays & Dimatteo, 1987). The ULS-8 consists of 8 items such as "I am willing to make friends" and "When I am sad, I can find someone to accompany me." Participants were asked to recall whether they have experienced the feelings mentioned in each item over the past year and to rate the frequency using a four-point scale (1 = *never* to 4 = *always*). There are two reverse-scored items (item 3 and item 6) and total scores range from 8 to 32. The higher the participants' scores on the scale, the more loneliness they felt. The Chinese version of the ULS-8 has demonstrated good reliability and validity (Li, 2012). In the current study, the Cronbach's  $\alpha$  was .79.

### Susceptibility to persuasion

The Susceptibility to Persuasion Scale (Modic, 2012) was used to measure persuasion susceptibility. This scale comprises 12 items divided into four domains of persuasion: authority, social influence, self-control, and consistency. Each of the domains is assessed with three items. Participants rated the degree to which they agreed with the views described in each item. An example item is "I feel safe and legally protected when buying goods from authority figures." Items are responded to using a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate an individual is more susceptible to persuasion or easily persuaded. Cronbach's  $\alpha$  in the present study was .72.



### **Self-control**

Self-control was assessed with the Brief Low Self-Control Scale (Tangney et al., 2004), which comprises 13 items of which five are reverse-scored. Example items include “I refuse things that are bad for me” and “I am lazy.” Participants were asked to evaluate their level of agreement with each item using a 5-point scale ranging from 1 (*not at all like me*) to 5 (*very much like me*). Higher total scores on the scale represent a high level of self-control. Hu’s study (Hu, 2013) demonstrated that the Chinese version of this scale had good reliability and validity. Cronbach’s  $\alpha$  was .71 in the current study.

### **Vulnerability to fraud**

The Fraud Vulnerability Scale developed by Du (2018) based on previous research was used to estimate the likelihood of being gullible in real fraud situations (James et al., 2014; Lee & Soberon-ferrer, 1997; Pinsker et al., 2010). The scale includes 17 items that are divided into four dimensions: openness to marketing campaigns (e.g., “I wish someone would talk with me more, even if he is a strange salesman”), vigilance to marketing activities (e.g., “I think the products recommended by the mass media are trustworthy”), lack of necessary commercial literacy (e.g., “I don’t know how to verify the authenticity of the product information”), and easy to being manipulated (e.g., “I am often persuaded to buy things I don’t need”). Items were rated on a 5-point Likert scale (from *strongly disagree* to *strongly agree*) indicating participants’ degree of agreement. Higher total scores indicate a greater risk of becoming a victim of fraud. The Cronbach’s  $\alpha$  coefficient was .83 in this study.

### **Control variables**

Demographic variables such as gender, age, and socioeconomic status (SES) were associated with vulnerability to fraud (Pak & Shadel, 2011), so these variables were controlled for in the statistical analyses. Gender was dummy coded as 0 for female and 1 for male. Referring to the study by Fang et al. (2008), we also synthesized an index for SES by using level of education, occupation, and disposable income of the participants. The total score for SES in the current study ranged from  $-1.90$  to  $2.82$  ( $M = 0.01$ ,  $SD = 1.00$ ). Higher scores indicate higher SES.

### **Statistical analysis**

All data analyses were performed using SPSS 22.0 and PROCESS procedure for SPSS. First, we used SPSS 22.0 to conduct both descriptive statistics and correlation analysis. Subsequently, the SPSS PROCESS macro (<http://www.afhayes.com>) developed by Hayes (2013) was used to

verify the conceptual model of moderated mediation. Specifically, the model was verified in two steps. We first examined the mediating role of susceptibility to persuasion in the relationship between loneliness and vulnerability to fraud after controlling for gender, age, and SES. Next, we tested the moderating role of self-control in the link between loneliness and susceptibility to persuasion. The bootstrapping method produced 95% bias-corrected confidence intervals (CIs) for all the indexes based on 5,000 resamples (sample size = 252). CIs that did not include 0 indicated that the effect in the model was significant.

## Results

### *Common method bias*

Methods such as setting reverse-scored items in advance and protecting participants' anonymity during the data collection process were used to exclude the impact of common method bias. Additionally, the Harman single-factor method (Podsakoff et al., 2003) was used as a post facto measure to identify common method variance. The results revealed that there were 9 factors with eigenvalues greater than 1.0. Among them, the first factor accounted for 16.84% of the variance, which was far below the reference value of 40%. Therefore, there was no evidence of common method bias and the data could be further analyzed.

### *Preliminary analyses*

Descriptive statistics, including means, standard deviations, and Pearson correlations for all variables of interest, as well as the control variables of gender, age, and SES, are presented in Table 1. As expected, loneliness was positively correlated with susceptibility to persuasion ( $r = .35, p < .01$ ) and vulnerability to fraud ( $r = .41, p < .01$ ), and susceptibility to persuasion was positively correlated with vulnerability to fraud ( $r = .51, p < .01$ ). In contrast, self-control was significantly negatively correlated with loneliness ( $r = -.29, p < .01$ ), susceptibility to persuasion ( $r = -.34, p < .01$ ), and vulnerability to fraud ( $r = -.41, p < .01$ ). These results provided a basis for verifying the mediating role of susceptibility to persuasion and the moderating effect of self-control.

### *Test of mediation*

Hypothesis 1 posited that susceptibility to persuasion would mediate the relationship between older adults' loneliness and their vulnerability to fraud. In order to verify the hypothesis, Model 4 of the 76 typical models put

**Table 1.** Descriptive statistics and correlations.

| Variable                  | <i>M</i> | <i>SD</i> | 1     | 2      | 3      | 4      | 5      | 6      | 7 |
|---------------------------|----------|-----------|-------|--------|--------|--------|--------|--------|---|
| 1. Gender                 | .49      | .51       | 1     |        |        |        |        |        |   |
| 2. Age (years)            | 67.94    | 6.27      | .20** | 1      |        |        |        |        |   |
| 3. SES                    | .01      | 1.00      | .12   | -.11   | 1      |        |        |        |   |
| 4. Loneliness             | 18.66    | 3.64      | -.01  | -.06   | .01    | 1      |        |        |   |
| 5. SP                     | 33.81    | 5.45      | -.11  | -.09   | -.11   | .35**  | 1      |        |   |
| 6. Self-control           | 44.77    | 6.74      | -.05  | -.21** | -.29** | -.29** | -.34** | 1      |   |
| 7. Vulnerability to fraud | 46.86    | 10.30     | -.04  | -.05   | -.19** | .41**  | .51**  | -.41** | 1 |

Note. *N* = 252. Gender was dummy coded: 0 = female, 1 = male. SES = socioeconomic status; SP = susceptibility to persuasion.

\**p* < 0.05. \*\**p* < 0.01.

forwarded by Hayes (2013) was selected to detect the mediating role of susceptibility to persuasion by means of two regression equations using the PROCESS macro after standardizing the data. In particular, equation 1 was used to examine the impact of loneliness on susceptibility to persuasion, and equation 2 was used to test the path coefficient between susceptibility to persuasion and vulnerability to fraud. Table 2 shows the path analysis results.

As presented in Table 2, the results of equation 1 revealed that after controlling for the covariates, the effect of loneliness on susceptibility to persuasion was significant ( $\beta = .35$ ,  $t = 5.95$ , CI [.24, .47],  $p < .001$ ). In equation 2, there was also a significant effect of susceptibility to persuasion on vulnerability to fraud ( $\beta = .41$ ,  $t = 7.23$ , CI [.30, .52],  $p < .001$ ). Moreover, the direct effect of loneliness on vulnerability to fraud was also found to be statistically significant ( $c = .27$ ,  $t = 4.79$ , CI [.16, .38],  $p < .001$ ). Finally, according to the results of the bias-corrected bootstrap, susceptibility to persuasion partially mediated ( $ab = .14$ ,  $SE = .02$ , CI [.08, .22]) the relationship between loneliness and vulnerability to fraud. The indirect effect accounted for 34.84% of the gross effect of loneliness on vulnerability to fraud. In sum, loneliness not only had a direct effect on older adults' vulnerability to fraud, but also increased their vulnerability indirectly through their susceptibility to persuasion. That is, older adults' susceptibility to persuasion partially mediated the relationship between their loneliness and vulnerability to fraud. Hence, Hypothesis 1 was supported.

**Table 2.** Results of the mediation analysis.

| Predictor             | Susceptibility to persuasion |          |             | Vulnerability to fraud |          |              |
|-----------------------|------------------------------|----------|-------------|------------------------|----------|--------------|
|                       | $\beta$                      | <i>t</i> | 95% CI      | $\beta$                | <i>t</i> | 95% CI       |
| Gender                | -.16                         | -1.36    | (-.39, .07) | .05                    | .50      | (-.15, .26)  |
| Age (years)           | -.06                         | -1.06    | (-.18, .06) | -.02                   | -.31     | (-.12, .09)  |
| SES                   | -.10                         | -1.75    | (-.22, .01) | -.15                   | -2.83**  | (-.25, -.04) |
| Loneliness            | .35                          | 5.95***  | (.24, .47)  | .27                    | 4.79***  | (.16, .38)   |
| SP                    |                              |          |             | .41                    | 7.23***  | (.30, .52)   |
| <i>R</i> <sup>2</sup> | .15                          |          |             | .34                    |          |              |
| <i>F</i>              | 10.88***                     |          |             | 25.81***               |          |              |

Note. *N* = 252. All variables were standardized before analysis. Gender: 0 = female, 1 = male. CI = confidence interval; SES = socioeconomic status; SP = susceptibility to persuasion.

\*\**p* < 0.01. \*\*\**p* < 0.001.

### Test of moderated mediation

To examine the moderating role self-control plays in the relationship between loneliness and susceptibility to persuasion (Hypothesis 2), model 14 of the PROCESS procedure was adopted to test the conceptual model in Figure 1. The results are illustrated in Table 3. Firstly, loneliness had a significant effect on vulnerability to fraud ( $\beta = .27$ ,  $t = 4.79$ , CI [.16, .38],  $p < .001$ ). Furthermore, loneliness was significantly linked to susceptibility to persuasion ( $\beta = .27$ ,  $t = 4.51$ , CI [.15, .39],  $p < .001$ ), and there was also a significantly positive association between susceptibility to persuasion and vulnerability to fraud ( $\beta = .41$ ,  $t = 7.23$ , CI [.30, .52],  $p < .001$ ). The most important finding was that susceptibility to persuasion was significantly negatively related to the interaction term of loneliness and self-control ( $\beta = -.16$ ,  $t = -3.11$ , CI [-.27, -.06],  $p < .01$ ).

The results of the bias-corrected bootstrap further showed that self-control moderated the link between loneliness and susceptibility to persuasion; the index of the moderated mediation effect was .07 and the 95% confidence interval did not include zero (95% CI [.03, .12]). Specifically, among participants with a low level of self-control (i.e., 1 SD below the mean), loneliness had a stronger influence on vulnerability to fraud through susceptibility to persuasion; the index of the mediation effect was .17 (95% CI [.10, .27]). However, the indirect effect of susceptibility to persuasion was not significant among participants with high self-control (i.e., 1 SD above the mean; 95% CI [-.03, .10]).

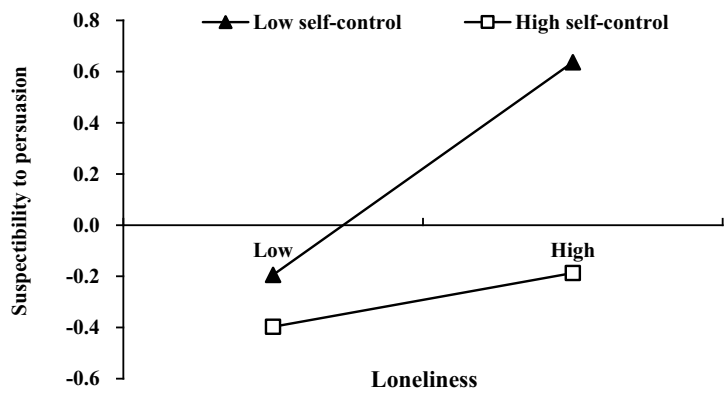
A simple slope test as shown in Figure 2 was performed using the data of one SD below the mean for low self-control and one SD above the mean for high self-control. The simple plot indicated that among participants with low self-control, higher loneliness was related to higher susceptibility to persuasion ( $\beta_{\text{simple}} = .43$ ,  $t = 5.69$ ,  $p < .001$ ), whereas loneliness had no significant effect on susceptibility to persuasion ( $\beta_{\text{simple}} = .11$ ,  $t = 1.32$ ,  $p = .19$ ) among participants with high self-control. Therefore, Hypothesis 2 was supported.

**Table 3.** Results of the moderated mediation analysis.

| Predictor                        | Vulnerability to fraud |         |              | Susceptibility to persuasion |          |              |
|----------------------------------|------------------------|---------|--------------|------------------------------|----------|--------------|
|                                  | $\beta$                | $t$     | 95% CI       | $\beta$                      | $t$      | 95% CI       |
| Gender                           | .05                    | .50     | (-.15, .26)  | -.17                         | -1.50    | (-.39, .05)  |
| Age (years)                      | -.02                   | -.31    | (-.12, .09)  | -.02                         | -.034    | (-.14, .10)  |
| SES                              | -.15                   | -2.83** | (-.25, -.04) | .03                          | -.45     | (-.14, .09)  |
| SP                               | .41                    | 7.23*** | (.30, .52)   |                              |          |              |
| Loneliness                       | .27                    | 4.79*** | (.16, .38)   | .27                          | 4.51***  | (.15, .39)   |
| Self-control                     |                        |         |              | -.27                         | -4.11*** | (-.40, -.14) |
| Loneliness $\times$ Self-control |                        |         |              | -.16                         | -3.11**  | (-.27, -.06) |
| $R^2$                            | .34                    |         |              | .23                          |          |              |
| $F$                              | 25.81***               |         |              | 11.92***                     |          |              |

Note.  $N = 252$ . All variables were standardized before analysis. Gender: 0 = female, 1 = male. CI = confidence interval; SES = socioeconomic status; SP = susceptibility to persuasion.

\*\* $p < 0.01$ . \*\*\* $p < 0.001$ .



**Figure 2.** Interaction effect of loneliness and self-control on susceptibility to persuasion.

### Discussion

In view of the serious negative impact of increasing cases of fraud on older adults and society as a whole, and given that loneliness is considered an important factor affecting vulnerability to fraud in older adults, the current study explored the potential mechanisms underlying the relationship between loneliness and vulnerability to fraud among older adults. The results showed that in addition to the direct relationship between loneliness and vulnerability to fraud, loneliness was positively associated with vulnerability to fraud via susceptibility to persuasion. In addition, the level of self-control moderated the effect of loneliness on susceptibility to persuasion, which could further influence their vulnerability to fraud. Thus, the results provide support for our theoretical model. Furthermore, the findings have theoretical value for enriching the study of risk factors and mechanisms of fraud among older adults, and suggest a feasible path for the prevention of and interventions on such fraud.

### *Loneliness and vulnerability to fraud*

The results of our study revealed that loneliness had a significant effect on older adults' vulnerability to fraud, which is in accordance with previous research on scams aimed at older adults (Jia et al., 2018; Judges et al., 2018). The theory of social isolation (Lee & Soberon-ferrer, 1997) provides a possible interpretation of this finding, which posits that positive social support and effective market information provided by social interaction may protect older adults from social isolation and consumer fraud (Alves & Wilson, 2008). Conversely, older adults who lack supportive social interactions and effective emotional connection, which are supplied by relatives and friends, are more likely to experience loneliness and a sense of social isolation. The feelings of isolation may generate a burning desire to engage in social interactions with others, including strangers and scammers (e.g., illegal telemarketers or

salespeople), in order to satisfy the need for social interaction and emotional attachment. Therefore, loneliness may result in older adults being more willing to interact with strangers and even con artists to obtain a sense of emotional care, even though it is false (Kang & Ridgway, 1996), which increases the likelihood of falling victim to a scam.

In summary, the current study substantiates the non-negligible impact of loneliness on vulnerability to fraud among older adults, which not only helps to enrich the existing research on deception among older adults, but also reminds us to pay more attention to the effect of loneliness on fraud vulnerability in older people. Hence, prevention of feelings of isolation and loneliness among older adults should be given priority attention, such as interventions and activities provided by formal care providers or volunteer organizations.

### ***Mediating effect of susceptibility to persuasion***

In the present study, older adults' susceptibility to persuasion was associated with increased levels of perceived loneliness, and a high susceptibility to persuasion could increase their vulnerability to fraud. In other words, susceptibility to persuasion played an important role as a mediator in the relationship between loneliness and vulnerability to fraud. Thus, Hypothesis 1 was supported. This finding could be reasonably interpreted in terms of two perspectives. On the one hand, to alleviate the negative impact of loneliness, older adults may consciously increase their social interactions to obtain emotional support (Friedman, 1992). Notably, due to social influences such as authority and group norms, and with the aim of maintaining close social contact to avoid being alone, lonely older adults tend to behave consistently with others or groups during the social interaction process (Modic & Lea, 2013), thus showing higher susceptibility to persuasion. On the other hand, compared with those individuals who can obtain social support and emotional care from the usual channels such as family members and friends, older adults experiencing loneliness may more frequently interact with strangers around them to search for emotional substitutes (Alves & Wilson, 2008; Kang & Ridgway, 1996), which provides an opportunity for malicious fraudsters to carry out their schemes. Specifically, they usually cater to the emotional needs of older adults through showing hypocritical solicitude (Consumer Fraud Research, 2006) and influence their decisions using various persuasion tactics, such as posing as an authority figure and promising a bogus outsize benefit (DeLiema et al., 2014), which would make the person fall into the swindle designed by fraudsters in advance step by step. Accordingly, the findings of the current study indicate that susceptibility to persuasion is a crucial potential mechanism that can explain the influence of loneliness on vulnerability to fraud.

Although previous studies have confirmed that loneliness is a momentous predictor of vulnerability to fraud, this is the first study to probe the underlying mechanism of how and when loneliness affects older adults' vulnerability to fraud. In addition, our findings suggest that if susceptibility to persuasion could be relieved as much as possible, the risk of being scammed among the older adult population would be reduced correspondingly.

### ***Moderating role of self-control***

Another important finding of the present study was that self-control moderated the link between loneliness and susceptibility to persuasion, which verified Hypothesis 2. Specifically, loneliness was a positive predictor of susceptibility to persuasion only among older adults with a low level of self-control. For older adults with high self-control, there was no moderating effect. This result is consistent with the general theory of crime and the strength model of self-control (Baumeister et al., 2007; Holtfreter et al., 2008). According to the perspectives advocated in these theories, self-control is often regarded as a finite resource that can be depleted over time. Thus, older adults may have more difficulty with controlling emotions caused by age-related depletion in self-control, which will make them less able to effectively alleviate loneliness and more likely to relate companionably to strangers, even marketing scammers who seem to provide them emotional comfort (Kang & Ridgway, 1996). In the meantime, when in the face of a variety of deceptive persuasion strategies from others (especially con artists), older adults with low self-control generally do not query the veracity of what others had promised, as well as inhibit their compliant behaviors through active self-control, which can lead to errors in judgment and increased vulnerability to fraud (Langenderfer & Shimp, 2001).

In conclusion, our findings showing that the relationship between loneliness and susceptibility to persuasion was moderated by self-control advances the current thinking in the field on fraud in older adult populations by elucidating why there will be variability in vulnerability to fraud among older adults with similar experiences of loneliness.

### ***Implications and limitations***

The present research study has far-reaching significance for both theory and practice. In terms of its theoretical value, the current study described in more detail the mechanism underlying the relationship between loneliness and vulnerability to fraud among older adults, as well as illuminated the conditions in which susceptibility to persuasion plays a role. These findings not only provide powerful empirical evidence supporting the existing theory of fraud, but also provide a new perspective for subsequent research on how and why



deceptive behavior can have an effect on older adults. More importantly, the results of this study could be used to solve the increasingly serious problem of financial fraud and scams aimed at older adults. Specifically, more attention should be paid to the importance of loneliness in older adults' vulnerability to fraud, and it is necessary to ensure that older adults can reduce their loneliness through effective social interaction. In addition, the mediating role of susceptibility to persuasion in the relationship between loneliness and vulnerability to fraud suggests a feasible approach for interventions against deception among older adults. Thus, effective measures should be taken to improve older adults' ability to identify false information and persuasion strategies, thereby further decreasing their fraud risk. Finally, in view of the role self-control plays in moderating the vulnerability to fraud among older adults, increasing older adults' self-control and keeping them alert to possible persuasion strategies could be crucial forms of protection against being defrauded due to placing too much trust in others.

Several limitations of this study should also be noted. First, although the moderated mediation model in the current study provides useful information about the relationships among the variables, the data were collected using a single method of self-report scales, which may inflate the relationship of the measures. Furthermore, due to the cross-sectional design of this study, we cannot make any causal inferences about associations between the observed variables. Future research should use longitudinal or experimental designs to provide robust empirical evidence regarding the underlying mechanisms and their interrelationships in the theoretical model. Second, the conclusions drawn in this study are not based on actual fraud victims, rather an index of vulnerability to fraud in certain future situations was assessed. Therefore, future research should examine these factors in older adults who have actually fallen victim to fraud. Third, the participants in our study were recruited from a group of Chinese older adults living independently in the community with intact cognitive functioning. However, other factors such as cognitive impairment, nationality, religion, and types of fraud may also influence the relationship between loneliness and vulnerability to fraud; therefore, the generalizability of our findings are limited. Future research should take these factors into account and include larger samples of diverse older adult populations in order to provide support for the external validity of our study. In addition, although the measure of loneliness used in this study has been widely used, it measures only a single dimension of loneliness. The use of a multi-dimensional measure could undoubtedly provide a more comprehensive understanding of loneliness as a predictor of vulnerability to fraud. Therefore, future research should investigate the multidimensional aspects of loneliness in relation to older adults' vulnerability to fraud.

## Disclosure statement

There are no relevant financial interests to report.

## Data availability statement

The data that support the findings of this study are available from the website: <https://doi.org/10.7910/DVN/RXEP51>

## Declarations of interest

There are no conflicts of interest to declare.

## Funding

This work was supported by the National Social Science Fund of China under Grant [number 16BSH101];The Fundamental Research Funds for the Central Universities [SWU2109224];

## ORCID

Jingjin Shao  <http://orcid.org/0000-0002-8931-5871>

## References

- Alves, L. M., & Wilson, S. R. (2008). The effects of loneliness on telemarketing fraud vulnerability among older adults. *Journal of Elder Abuse & Neglect*, 20(1), 63–85. [https://doi.org/10.1300/J084v20n01\\_04](https://doi.org/10.1300/J084v20n01_04)
- Baumeister, R. F., Bratslavsky, E., Muraven, . M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology*, 74(5), 1252–1265. <https://doi.org/10.1037/0022-3514.74.5.1252>
- Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science*, 16(6), 351–355. <https://doi.org/10.1111/j.1467-8721.2007.00534.x>
- Burnes, D., Henderson, C. R., Sheppard, C., Zhao, R., Pillemer, K., & Lachs, M. S. (2017). Prevalence of financial fraud and scams among older adults in the United States: A systematic review and meta-analysis. *American Journal of Public Health*, 107(8), 1295–1303. <https://doi.org/10.2105/AJPH.2017.303821a>
- Button, M., Lewis, C., & Tapley, J. (2014). Not a victimless crime: The impact of fraud on individual victims and their families. *Security Journal*, 27(1), 36–54. <https://doi.org/10.1057/sj.2012.11>
- Carcach, C., Graycar, A., & Muscat, G. (2001). *The victimization of older Australians*. Australian Institute of Criminology.
- Chen, X. H., Jin, Y., Liu, W. J., Huang, R. R., & Wang, C. H. (2020). Self-control and impulse buying tendency of college students: Mediating effect of money attitude. *Chinese Journal of Clinical Psychology*, 28(5), 1050–1053. <https://doi.org/10.16128/j.cnki.1005-3611.2020.05.040>

- Chen, Y. R., & Schulz, P. J. (2016). The effect of information communication technology interventions on reducing social isolation in the elderly: A systematic review. *Journal of Medical Internet Research*, 18(1), 18–25. <https://doi.org/10.2196/jmir.4596>
- Cialdini, R. B., & Goldstein, N. J. (2004). Social Influence: Compliance and Conformity. *Annual Review of Psychology*, 55(1), 591–621. <https://doi.org/10.1146/annurev.psych.55.090902.142015>
- Consumer Fraud Research. (2006). *Investor fraud study final report*. NASD Investor Education Foundation.
- Cross, C. (2017). They're Very Lonely: Understanding the fraud victimisation of seniors. *Social Science Electronic Publishing*, 5(4), 60. <https://doi.org/10.5024/ijcsd.v5i4.268>
- Dahlberg, L., Andersson, L., McKee, K. J., & Lennartsson, C. (2015). Predictors of loneliness among older women and men in Sweden: A national longitudinal study. *Ageing & Mental Health*, 19(7), 409–417. <https://doi.org/10.1080/13607863.2014.944091>
- Dahlberg, L., & McKee, K. J. (2014). Correlates of social and emotional loneliness in older people: Evidence from an English community study. *Ageing & Mental Health*, 18(4), 504–514. <https://doi.org/10.1080/13607863.2013.856863>
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behaviour. *Psychological Inquiry*, 11(4), 227–268. [https://doi.org/10.1207/S15327965PLI1104\\_01](https://doi.org/10.1207/S15327965PLI1104_01)
- DeLiema, M., Yon, Y., & Wilber, K. H. (2014). Tricks of the trade: Motivating sales agents to con older adults. *The Gerontologist*, 56(2), 335–344. <https://doi.org/10.1093/geront/gnu039>
- DeLiema, M. (2017). Elder fraud and financial exploitation: Application of routine activity theory. *The Gerontologist*, 58(4), 706–718. <https://doi.org/10.1093/geront/gnw258>
- Du, W. P. (2018). *The vulnerability to fraud among Chinese older adults* (Unpublished thesis). Southwest University.
- Duckworth, A. L. (2011). The significance of self-control. *Proceedings of the National Academy of Sciences*, 108(7), 2639–2640. <https://doi.org/10.1073/pnas.1019725108>
- Eisenberg, N., Smith, C. L., & Spinrad, T. L. (2011). *Effortful control: Relations with emotion regulation, adjustment, and socialization in childhood*. Guilford Press.
- Fang, X., Fan, X., & Liu, Y. (2008). Perceived discrimination and loneliness: Moderating effects of coping style among Migrant Children. *Psychological Development and Education*, 24(4), 93–99.
- Fees, B. S., Martin, P., & Poon, L. W. (1999). A model of loneliness in older adults. *Journal of Gerontology*, 54(4), 231–239. <https://doi.org/10.1093/geronb/54B.4P231>
- Fischer, P., Lea, S. E., & Evans, K. M. (2013). Why do individuals respond to fraudulent scam communications and lose money? The psychological determinants of scam compliance. *Journal of Applied Social Psychology*, 43(10), 2060–2072. <https://doi.org/10.1111/jasp.12158>
- Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). “Mini-mental state”: A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, 12(3), 189–198. [https://doi.org/10.1016/0022-3956\(75\)90026-6](https://doi.org/10.1016/0022-3956(75)90026-6)
- Friedman, M. (1992). Confidence swindles of older consumers. *Journal of Consumer Affairs*, 26(1), 20–46. <https://doi.org/10.1111/j.1745-6606.1992.tb00014.x>
- Gailliot, M. T., Baumeister, R. F., Dwall, C. N., Maner, J. K., Plant, E. A., Tice, D. M., Brewer, L. E., & Schmeichel, B. J. (2007). Self-control relies on glucose as a limited energy source: Willpower is more than a metaphor. *Journal of Personality and Social Psychology*, 92(2), 325–336. <https://doi.org/10.1037/0022-3514.92.2.325>
- Ganzini, L., McFarland, B. H., & Cutler, D. (1990). Prevalence of mental disorders after catastrophic financial loss. *The Journal of Nervous and Mental Disease*, 178(11), 680–685. <https://doi.org/10.1097/00005053-199011000-00002>

- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.
- Hays, R., & Dimatteo, M. R. (1987). A short-form measure of loneliness. *Journal of Personality Assessment*, 51(1), 69–81. [https://doi.org/10.1207/s15327752jpa5101\\_6](https://doi.org/10.1207/s15327752jpa5101_6)
- Holtfreter, K., Reisig, M. D., & Blomberg, T. G. (2006). Consumer fraud victimization in Florida: An empirical study. *Thomas Law Review*, 18(3), 761–789.
- Holtfreter, K., Reisig, M. D., & Pratt, T. C. (2008). Low self-control, routine activities, and fraud victimization. *Criminology*, 46(1), 189–220. <https://doi.org/10.1111/j.1745-9125.2008.00101.x>
- Hu, H. W., Chuan, H. L., Yang, F., & Guo, M. Q. (2011). A Study on psychological symptoms and influencing factors of the elderly in China. *Journal of Southwest University (Social Science Edition)*, 37(6), 45–152. <https://doi.org/10.13718/j.cnki.xdsk.2011.06.025>
- Hu, Y. Q. (2013). *Research on self-perception of aging of the elderly and its influencing factors* (Unpublished thesis). The Second Military Medical University.
- James, B. D., Boyle, P. A., & Bennett, D. A. (2014). Correlates of susceptibility to scams in older adults without dementia. *Journal of Elder Abuse & Neglect*, 26(2), 107–122. <https://doi.org/10.1080/08946566.2013.821809>
- Jia, M., Sun, J., Niu, G., & Xu, F. (2018). Qualitative study on the health care products fraud experience among older people in Taiyuan Community. *Journal of Chinese Nursing Management*, 4(3), 272–275.
- Judges, R., Li, H., & Lee, K. (2018). The impact of loneliness on financial fraud victimization in Chinese older adults. *Innovation in Aging*, 2(1), 487. <https://doi.org/10.10093/geroni/igy023.1818>
- Kanfer, F. H., & Karoly, P. (1972). Self-control: A behaviouristic excursion into the lion's den. *Behaviour Therapy*, 3(3), 398–416. [https://doi.org/10.1016/s0005-7894\(72\)80140-0](https://doi.org/10.1016/s0005-7894(72)80140-0)
- Kang, Y., & Ridgway, N. M. (1996). The importance of consumer market interactions as a form of social support for elderly consumers. *Journal of Public Policy and Marketing*, 15(1), 108–117. <https://doi.org/10.1177/074391569601500110>
- Kircanski, K., Notthoff, N., DeLiema, M., Samanez-Larkin, G. R., Shadel, D., Mottola, G., Carstensen, L. L., & Gotlib, I. H. (2018). Emotional arousal may increase susceptibility to fraud in older and younger adults. *Psychology and Aging*, 33(2), 325–337. <https://doi.org/10.2139/ssrn.2815652>
- Langenderfer, J., & Shimp, T. A. (2001). Consumer vulnerability to scams, swindles, and fraud: A new theory of visceral influences on persuasion. *Psychology & Marketing*, 18(7), 763–783. <https://doi.org/10.1002/mar.1029>
- Lee, J., & Soberon-ferrer, H. (1997). Consumer vulnerability to fraud: Influencing factors. *Journal of Consumer Affairs*, 31(1), 70–89. <https://doi.org/10.1111/j.1745-6606.1997.tb00827.x>
- Li, T., Xu, X., & Zhang, X. Y. (2018). Loneliness and consumption: An empirical investigation of the health care consumption of among older adults in China. *Economic Research Journal*, 53(1), 124–137. <https://doi.org/cnki:sun:jjyj.0.2018-01-010>
- Li, Z. (2012). *The evaluation and application of UCLA Loneliness Scale (ULS-8)* (Unpublished thesis). Central South University.
- Lichtenberg, P. A., Sugarman, M. A., Paulson, D., Ficker, L. J., & Rahman-Filipiak, A. (2016). Psychological and functional vulnerability predicts fraud cases in older adults: Results of a longitudinal study. *Clinical Gerontologist*, 39(1), 48–63. <https://doi.org/10.1080/07317115.2015.1101632>
- MetLife. (2011). *The MetLife study of elder financial abuse crimes of occasion, desperation, and predation against America's elders*.
- Modic, D. (2012). *Willing to be scammed: How self-control impacts Internet scam compliance* (Unpublished thesis). University of Exeter.

- Modic, D., & Lea, S. E. G. (2013). *Scam compliance and the psychology of persuasion*. Social Sciences Research Network. <https://ssrn.com/abstract=2364464>
- Pak, K., & Shadel, D. (2011). AARP Foundation national fraud victim study. Washington, DC: America Association of Retired Persons. <http://www.aarp.org/money/scamsfraud/info-03-2011/fraud-victims-11html>
- Pinsker, D. M., McFarland, K., & Pachana, N. A. (2010). Exploitation in older adults: Social vulnerability and personal competence factors. *Journal of Applied Gerontology*, 29(6), 740–761. <https://doi.org/10.1177/0733464809346559>
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioural research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Reisig, M., & Holtfreter, K. (2013). Shopping fraud victimisation among the elderly. *Journal of Financial Crime*, 20(3), 324–337. <https://doi.org/10.1108/JFC-03-2013-0014>
- Sassenberg, K., & Jonas, K. J. (2007). *Attitude change and social influence on the net*. Oxford University Press.
- Shao, J., Zhang, Q., Ren, Y., Li, X., & Lin, T. (2019). Why are older adults victims of fraud? Current knowledge and prospects regarding older adults' vulnerability to fraud. *Journal of Elder Abuse & Neglect*, 31(3), 225–243. <https://doi.org/10.1080/08946566.2019.1625842>
- Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, 72(2), 271–324. <https://doi.org/10.1111/j.0022-3506.2004.00263.x>
- Titus, R. M., & Gover, A. R. (2001). *Personal fraud: The victims and the scams*. In Criminal Justice Press.
- Walton, C. G., Schultz, C. M., Beck, C. M., & Walls, C. W. (1991). Psychological correlates of loneliness in the older adult. *Archives of Psychiatric Nursing*, 5(3), 165–170. [https://doi.org/10.1016/0883-9417\(91\)90017-Y](https://doi.org/10.1016/0883-9417(91)90017-Y)
- Wheeler, S. C., Briñol, P., & Hermann, A. D. (2007). Resistance to persuasion as self-regulation: Ego-depletion and its effects on attitude change processes. *Journal of Experimental Social Psychology*, 43(1), 150–156. <https://doi.org/10.1016/j.jesp.2006.01.001>
- Wood, W., & Hayes, T. (2012). Social Influence on consumer decisions: Motives, modes, and consequences. *Journal of Consumer Psychology*, 22(3), 324–328. <https://doi.org/10.1016/j.jcps.2012.05.003>
- Wu, J. (2008). Relationship between social support, loneliness and subjective well-being among older adults. *Psychological Science*, 31(4), 984–986. 1004. <https://doi.org/10.16719/j.cnki.1671-6981.2008.04.059>
- Xing, T. (2020). *The influence of false advertising and product type on the persuasive effect of the elderly* (Unpublished thesis). Tianjin Normal University.
- Xing, T., Sun, F., Wang, K., Zhao, J., Wu, M., & Wu, J. (2020). Vulnerability to fraud among Chinese older adults: Do personality traits and loneliness matter? *Journal of Elder Abuse & Neglect*, 32(1), 46–59. <https://doi.org/10.1080/08946566.2020.1731042>
- Yao, R. S., Guo, M. S., & Ye, H. S. (2018). Influence mechanism of social support on older adults' social well-being: Mediating effect of hope and loneliness. *Journal of Psychology*, 50(10), 85–92. <https://doi.org/10.3724/SP.J.1041.2018.01151>