

The Dual Vulnerability of Cognitive Decline and Social Deficiency: The Psychology of Elderly Victims of Telecom Fraud

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Abstract: With the aggravation of ageing of the population and the increasing telecom fraud crimes connected to the elderly in china, it is imperative to investigate and analysis the psychological mechanism of these elderly. According to the cognitive aging theory and social support theory, a three-levels psychological risks model of the elderly telecom fraud was proposed. The double fragile issues in the elderly, cognitive decline and social loneliness, interact each other, resulted the telecom fraud cases. At the level of risk input, the double fragile issues, cognitive decline, such as weak working memory, decreased information processing rate and declined executive control abilities, and social loneliness brought high trust and low doubt to the elderly. At the level of interacting, cheaters used the pointed Language manipulation skill, such as the emotion guide, authority suggestion and making the sense of urgency, to meet the elderly's cognitive decline. At the same time, the elderly's affect hunger from social loneliness eased the cheaters' manipulation. At the level of result output, cognitive decline and social loneliness made the elderly falsely trust the cheaters and accept false information. At the same time, the elderly can not ask for help timely because of absenting of social support. All these resulted in the economic losses and psychological injuries. At the conclusion, the elderly telecom frauds were not only from the geriatric cognitive decline, but also from the social loneliness.

Keywords: Telecom Fraud; Cognitive Decline; Social Loneliness; Language Manipulation; Geriatric Psychology

1. Introduction

The number of elderly people in China has been increasing. By the end of 2023, there were 297 million people aged 60 and above in the country, accounting for 21.1% of the total population.

China has entered a deeply aging society. Meanwhile, telecom fraud crimes are on the rise. According to statistics from the Ministry of Public Security, the average annual growth rate of telecom fraud cases from 2019 to 2023 was over 15%, while the proportion of victims among the elderly rose from 23.4% in 2019 to 31.7% in 2023. The average amount defrauded per person was 42,000 yuan, far exceeding 28,000 yuan for the same age group. This indicates the vulnerable position of the elderly in the digital society. Traditional preventive publicity and technical means are difficult to be effective. It is necessary to analyze the psychological reasons why the elderly become victims of telecom fraud from a psychological perspective.

Most current studies have analyzed telecom fraud from the perspectives of sociology, criminology or technical prevention, but there is a lack of research on the cognitive characteristics of the elderly themselves and the psychological mechanisms of the influence of social environment on their gullibility. Cognitive aging theory suggests that as people age, their working memory, the speed of information processing, and the ability of executive control all decline, which may affect their judgment [1] of complex information. In addition, social support theory holds that social networks have a significant impact on an individual's mental health and decision-making behavior, and the shrinking of social networks and social isolation faced by the elderly increase their likelihood of being deceived. Therefore, it is necessary to establish a theoretical model that combines cognitive and social factors to fully reveal the psychological process of the elderly being subjected to telecom fraud, so as to better guide the implementation of relevant preventive measures.

2. The Theoretical Basis of Multiple Vulnerabilities of Elderly Victims of Telecom Fraud

2.1 The Mechanism by Which Cognitive Aging Affects Information Processing Ability

Cognitive aging is the main cause of telecom fraud among the elderly. During cognitive aging, the information processing of the elderly is greatly affected, and the capacity of working memory is reduced. The elderly have difficulty remembering and processing multiple pieces of information simultaneously when facing complex fraud information, and thus cannot detect logical loopholes in the fraud script. Neuroscience studies have found that the decline in the function of the prefrontal cortex in the elderly reduces their executive function, resulting in a lack of effective inhibitory control and cognitive flexibility when facing the carefully designed situations of fraudsters. Slower information processing also increases the vulnerability of the elderly, who have difficulty responding quickly and conducting a thorough risk assessment [2] when fraudsters use fast, high-pressure speech.

Note that an imbalance in resource allocation is also an important aspect of how cognitive aging affects fraud identification. Older people, due to their reduced ability to control their attention, are easily drawn to the emotional content in fraud messages and ignore the problems and danger signals therein. The decline in executive function leads older people to rely more on intuition rather than rational thinking when making decisions, which fits the psychological strategy of fraudsters. Studies have shown that older people are more than 35 percent more likely to make mistakes in time-limited situations than younger people, which is one of the reasons why telecom scams are more likely to succeed.

2.2 Psychological Vulnerability Traits of Social Isolation

Social isolation is the psychological basis for older people to become victims of telecom fraud, and their vulnerability is mainly reflected in unmet emotional needs and the absence [3] of a social support system. As people age, their social connections shrink, and factors such as the death of a spouse, the establishment of children, and the reduction of friends can all lead to a decrease in the daily social activities of the elderly. According to a 2023 survey by the China National Research Center on Aging, 42.8% of elderly people living alone in urban areas spend less than two hours a day on social activities,

and the proportion is higher in rural areas, reaching 58.3%. The sense of loneliness and isolation brought about by social isolation makes the elderly have a strong need for attention and care from the outside world, which is precisely the psychological weakness that fraudsters can exploit. Fraudsters fill the emotional void of the elderly with long periods of companionship and false concern to gain their trust.

2.3 The Role of Interpersonal Traits in Susceptibility to Fraud

Older people generally have higher levels of trust and lower levels of suspicion, which is one [4] of the personal factors that make older people more likely to be victims of telecom fraud. And these traits are related to their life experiences and socialization. In traditional societies, people trust each other, but in today's information-rich society, they seem out of place. The high level of trust makes the elderly prone to believing in the kindness of others and lacking the necessary ability to be suspicious and discerning of the words of strangers. Low suspicion, on the other hand, is characterized by a lack of alertness to abnormal information and an inability to detect any possible fraud in time. These two personality traits have a natural connection with the way telecom fraud occurs, and scammers take advantage of this by using false identities and genuine feelings to win the trust of the elderly.

2.4 Construction of a Dual Vulnerability Theory Framework

Based on the theories of cognitive aging and social support, this paper proposes a theoretical model [5] of dual vulnerability of the elderly to telecommunications fraud (As shown in figure 1). The model explains how the two major vulnerabilities, cognitive decline and social deficiency, interact and promote each other in the process of telecom fraud, which leads to the psychological process of the elderly being deceived. The dual vulnerability theory model suggests that the elderly suffer from telecom fraud as a result of the combined effect of their own cognitive decline and the lack of social support. Cognitive vulnerability refers to the decline in cognitive abilities such as reduced working memory capacity, slower information processing speed, and weakened executive control ability. These cognitive changes make it difficult for the elderly to distinguish complex

information and make reasonable judgments about risks. Social vulnerability refers to social isolation such as shrinking social circles, reduced social support, and increased sense of loneliness, which not only affects the emotions and decisions of the elderly, but also reduces support and warnings from social networks. The dual vulnerability theory framework holds that the two vulnerabilities interact and reinforce each other [6]. Cognitive decline makes older people more prone to social withdrawal behavior, which exacerbates social loneliness. The lack of

social interaction reduces cognitive stimulation and social feedback, further deteriorating cognitive function and creating a vicious cycle. In telecom fraud, this double vulnerability becomes the target of the fraudsters' language manipulation, who use emotional inducement to meet the social and emotional needs of the elderly, and at the same time use authoritative insinuations and the creation of urgency to bypass the elderly's already deteriorating cognitive defense ability to achieve the purpose of fraud.

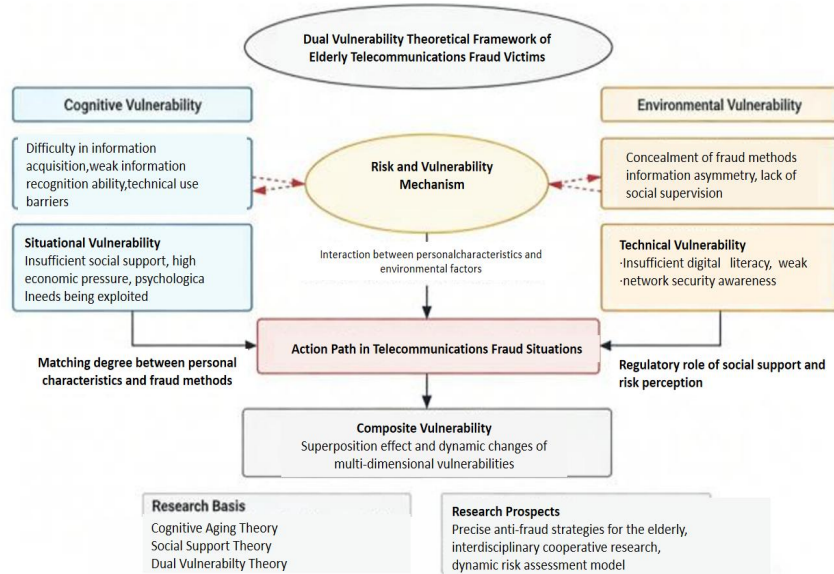


Figure 1. Dual Vulnerability Theoretical Framework of Elderly Telecommunications Fraud Victims

This theoretical framework helps us better understand the psychological motivations of the elderly who suffer from telecom fraud and provides a theoretical basis for future related research and intervention measures.

3. Cognitive Psychological Mechanisms of Language Manipulation in Telecom Fraud

3.1 Matching Patterns of Language Manipulation Strategies and Cognitive Biases

Language manipulation in telecom fraud fits [7] well with cognitive biases in older people. Fraudsters fully grasp the psychological characteristics of the elderly and formulate corresponding scripts. The most common tactic is to pose as a staff member of public security, procuratorial, judicial, bank, hospital and other institutions, taking advantage of the elderly's fear of authority to make them abandon rational thinking. This is exactly in line with the authority bias of the elderly, who tend to obey rather than doubt when faced with so-called

"official orders". Urgency is also an important means of putting time pressure on the elderly to make decisions quickly when their cognitive resources are limited, while the rational thinking ability of the elderly weakens under time pressure. Emotional induction strategies are targeted at the psychological characteristics of the lack of emotional needs in the elderly, using emotions such as false concern, sympathy, and fear to influence the judgment [8] of the elderly. Scammers usually adopt a gradual emotional investment, starting with daily concern to gradually build up the affection, and then use that emotion at the right time to commit fraud. This strategy takes advantage of the fact that older people value emotions more than reason, using emotional control to achieve effects that cannot be achieved through reason. According to statistics, in cases of telecom fraud using emotional induction tactics, the elderly are defrauded for 2.3 times more time than otherwise, but for 1.8 times more money than otherwise (As shown in figure 2).

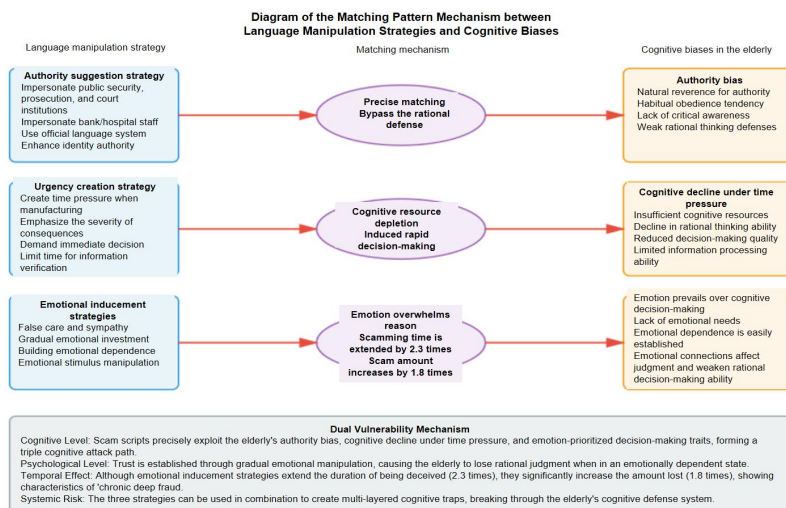


Figure 2. Diagram of the Matching Pattern Mechanism between Language Manipulation Strategies and Cognitive Biases

3.2 The Amplification Mechanism of Loneliness Emotions on the Effect of Language Manipulation

Loneliness plays an amplifying role in telecom fraud, and this amplification is mainly caused by attentional bias and emotional dependence. Lonely elderly people are more sensitive to social interaction signals and are more likely to be influenced by the false concern of scammers, devoting more energy emotionally and ignoring logical problems [9]. Therefore, the same rhetoric can have a greater impact on lonely elderly people. Studies have shown that elderly people with high levels of social isolation have more than 40 percent stronger emotional responses to scams than those with normal social conditions.

Emotional dependence further amplifies feelings of loneliness. An elderly person who has long lacked social interaction develops an emotional attachment when constantly cared for by a swindler, and this attachment makes the elderly lose their ability to judge what the swindler says. Loneliness can also affect the risk awareness of the elderly, causing them to be biased [10] in judging potential losses. When the swindler offers emotional comfort and demands money at the same time, lonely elderly people tend to choose to preserve the rare affection rather than rationally weigh the financial loss, which is also one of the reasons for the swindler's success.

3.3 Application of Cognitive Load Theory in Fraud Situations

The cognitive load theory is a good Angle to explain how older people make mistakes in

telecom fraud. Fraudsters use elaborate and complex fraud scenarios to deliberately impose a significant cognitive burden on the elderly, nearly depleting their cognitive resources. Under high loads, the way the elderly process information in their dual systems changes, and they rely more on intuition than reason to make decisions. In this situation, the choices made by the elderly often lack thoughtfulness and awareness of the risks, and are easily misled by the rhetoric of [11] the fraudsters. The increased cognitive load also weakens the inhibitory control ability of the elderly, making them unable to resist the various temptations and threats of the fraudsters.

3.4 The Association between Emotional Regulation Imbalance and Impaired Judgment

Changes in the emotional regulation ability of the elderly have a significant impact on their judgment in fraud situations. Although the elderly usually have good emotional regulation ability, when they encounter tense and critical situations created by scammers, their emotional regulation ability will have problems. Emotional regulation problems are mainly manifested in excessive reactions to negative emotions and excessive pursuit of positive emotions, both of which can be exploited by scammers. Negative emotions such as fear and anxiety can cause stress responses in the elderly, causing them to focus more on emotions than on [12] reason.

An excessive pursuit of positive emotions leads to a lack of vigilance in elderly people when they receive the care and assurances from fraudsters, and positive emotional experiences

mask potential risk signals. This is closely related to poor emotional regulation and reduced judgment.

Older people with greater emotional fluctuations are more likely to make mistakes in fraudulent situations and have a lower ability to assess risks.

4. Psychological Process Model of Elderly Victims of Telecom Fraud

4.1 Risk Input Layer: Cumulative Effects of Underlying Vulnerability Factors

In the psychological process model of elderly victims of telecommunications fraud, the risk input layer (As shown in figure 3) is the basis for constituting individual vulnerability. Cognitive decline is the most significant risk factor at this level, mainly manifested in reduced working memory capacity, slower information processing speed, and reduced executive control ability. The decline in working memory makes it difficult for older people to remember and process multiple pieces of information at the same time, and they

cannot make a good judgment [13] by linking various pieces of information when encountering complex fraud rhetoric. Slower information processing makes it difficult for the elderly to detect and respond to fraudulent information in a timely manner, while reduced executive control makes it difficult for the elderly to control their impulsive behavior and make rational choices.

The shrinking of social networks is an important issue in this regard. The social circle of the elderly shrinks as they age. The death of a spouse, the establishment of children, and the reduction of friends all make the social support system of the elderly weaker and weaker. This social isolation leads to a strong sense of loneliness and unfulfilled emotional needs, and also deprives the elderly of a way to obtain information and social support from the outside world. In addition, older people generally have a higher level of trust and a lower level of suspicion, which is conducive to building good interpersonal relationships in normal social situations, but they are easily deceived and lack vigilance [14] when faced with fraud.

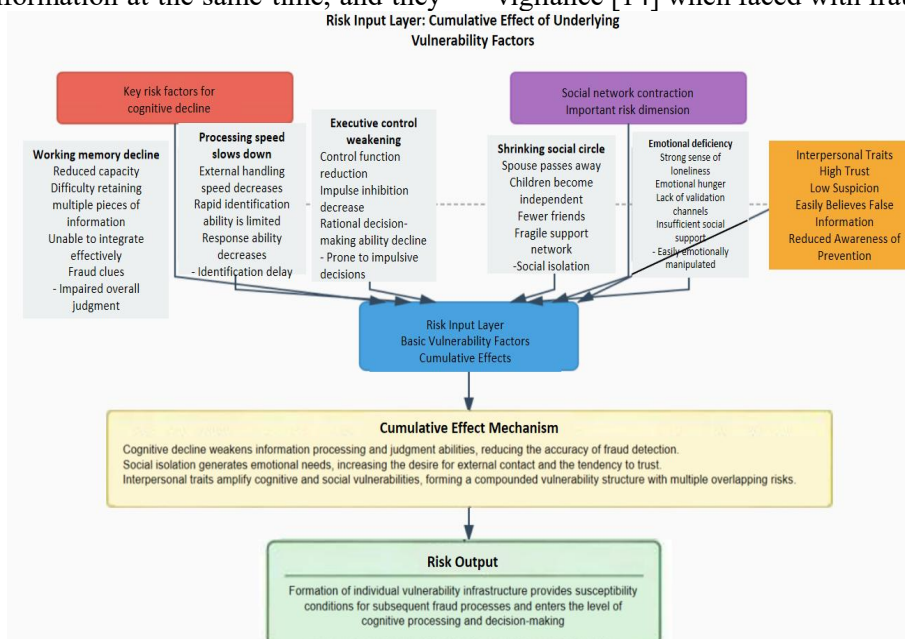


Figure 3. Risk Input Layer: Cumulative Effects of Basic Vulnerability Factors

4.2 Interaction Process Layer: The Dynamic Interaction Mechanism of Cognitive-Emotion-Behavior

The interaction process layer reflects how fraudsters manipulate the cognitive emotional vulnerability of older people with precise language to create a vicious cycle. Fraudsters use highly professional language manipulation methods, emotional inducement, authoritative

cues, and time urgency to precisely target the cognitive deficits of the elderly. Emotional inducement involves making the elderly worry about the safety of their loved ones or trust authoritative institutions, creating a tense atmosphere that causes intense emotional fluctuations in the elderly, thereby avoiding rational thinking. Authority cues imitate the tone and identity of official institutions and take advantage of the elderly's obedience to authority

to reduce their suspicion and desire to verify information. The urgency of time also leaves the elderly little time to think, allowing them to make decisions [15] with insufficient information. The emotional hunger brought about by social loneliness plays a role in exacerbating this process. Due to the lack of normal social activities for a long time, the elderly have a great need for attention and concern from the outside world, which makes them easily swayed by the so-called "concern" of scammers. It is the scammers who take advantage of this and, on the basis of long-term emotional investment and trust building, gradually break down the psychological defenses of the elderly. In addition, the lack of social networks also leads to the elderly lacking timely access to information and being unable to discover loopholes in scams through communication with others, thereby increasing the likelihood of being deceived. Cognitive vulnerability and social isolation interact with each other, creating a vicious cycle that makes older people more likely to comply when they are deceived [16].

4.3 Result Output Layer: Psychological Pathways of Trust Misalignment and Delayed Seeking Help

The outcome output layer is the result of the interaction between two vulnerabilities: cognitive decline and social deficiency. Trust misplacement is the main feature of this stage, where older people are deceived by scammers with elaborate language, giving the trust that should have been given to relatives or formal institutions to scammers. This misplacement of trust is not just a firm belief in the fraud information, but a blind following of the fraudster's advice, believing the fraudster even when questioned by family members. Also, due to a lack of social support, when elderly people encounter suspicious situations, they often have no one to turn to or choose to solve them themselves out of fear of being ridiculed as "stupid", missing the opportunity to detect and stop the fraud in time. The delay in seeking help makes the losses caused by the fraud even greater, causing more mental distress and shame to the elderly and creating a vicious cycle [17] of victimization.

4.4 Theoretical Verification and Revision of the Psychological Process Model

The theoretical validation of mental process models requires the use of multiple research methods to test factors at various levels and their interactions. By analyzing a large number of cross-sectional survey data, it is found that the higher the cognitive ability, the less likely one is to be a victim of telecom fraud, and the stronger the sense of social loneliness, the more likely one is to be a victim of telecom fraud, which indicates that the risk input layer hypothesis holds true. Longitudinal tracking studies also found that the faster the rate of cognitive decline, the higher the susceptibility to fraud, which provides some support for the dynamic mechanism of the interaction process layer. In addition, the results of the case analysis and in-depth interviews indicated that the majority of the victims had behavioral characteristics of trust misplacement and delayed seeking of help, which was in line with the assumptions of the result output layer. The empirical study also pointed to areas where [18] the model needs improvement. The research shows that education level and previous fraud experience play a mediating role between cognitive vulnerability and risk of victimization. A higher education level can to some extent compensate for the increased risk caused by cognitive decline, while having been defrauded can increase the vigilance of the elderly. Moreover, the quality of family support is more effective in reducing the risk of victimization than the quantity, and good family communication can still significantly reduce the chances of elderly people being defrauded even when social networks are small. Therefore, an improved psychological process model based on this adds educational level and quality of family support as moderating factors to better predict and explain the psychological process of elderly victims of telecom fraud.

5. Conclusions

The three-tier psychological risk model of victims of telecom fraud among the elderly presented in this paper illustrates the interaction process of the dual vulnerabilities of cognitive decline and social isolation. Telecom fraud victimization among the elderly is not merely a matter of individual cognitive level, but rather the result of the combined effects of various factors such as individual physiological aging, psychological characteristics, social environment, and fraud methods. Cognitive decline and reduced social connections are fundamental

vulnerabilities, and scammers use language skills to cater to or even exacerbate these vulnerabilities, resulting in adverse consequences such as trust bias and delayed seeking help. This model is of great significance for understanding the psychological process of elderly victims of telecom fraud and provides guidance on how to take effective measures to prevent it. Future prevention efforts should focus on enhancing the cognitive abilities of the elderly, establishing good social relationships, and improving their ability to identify fraud, to form a comprehensive system for protecting the elderly from telecom fraud. At the same time, people in society should be aware of the complexity of the problem of telecom fraud involving the elderly. Instead of simply blaming them, they should consider as a whole how to better protect the interests of the elderly.

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