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The Effect of the Nudge Theory on the Consumption Decision of Older Adults

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Abstract. As the phenomenon of fraudulent marketing takes place among the older population more and more frequently, behavioral research is increasingly focusing on how the older population can avoid deception. By reviewing previous relevant studies, this paper summarizes the causes of older adults' vulnerability in decision-making, which is caused by both internal factors such as physiological aging and psychological aging, as well as external societal factors, and further explains the mechanism of fraudulent marketing using the Nudge Theory. While the Nudge Theory is usually used to benefit the decision-makers, the non-benevolent usage of the Nudge Theory by merchants is called "Sludge", which uses various patterns to complicate the process of consumption decision-making, leading to irrational and false judgment. Most importantly, this paper concludes with practical means for the older population and product designers in order to minimize the harm brought by fraudulent marketing and sludge. Future research should expand more on the strategies of how to avoid sludge, protecting the financial rights of older adults.

Keywords: nudge, older adults, consumption decision

1. Introduction

Population aging has transformed older adults into an increasingly influential yet vulnerable consumer segment worldwide. This vulnerability is not merely theoretical. Empirical evidence suggests that older adults are disproportionately targeted by fraudulent and manipulative marketing practices. In the United States, the Federal Bureau of Investigation has estimated that approximately 14,000 digital marketing companies operate fraudulent schemes, with about 80% of them specifically targeting older adults [1]. This phenomenon extends beyond telemarketing fraud into everyday consumption domains. In China, for instance, a survey of older consumers of healthcare products found that 23.42% regarded such products as a "cure-all", while 18.8% mistakenly believed that these products could treat disease outright [2], pointing to a broader pattern of irrational and exploitable consumption behavior among older populations. Except for external stimulation, the irrational consumption by older consumers is also attributed to three dimensions of aging factors: biological, psychological, and social.

From an external perspective, the Nudge Theory is one of the tactics that merchants use to trigger those irrational consumption among older adults. Although the benevolent nudging is intended to promote convenience and welfare, telemarketing merchants often exert it in the opposite way: by

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confusing the consumers. Such figures suggest that older adults' vulnerability in the marketplace is not an isolated or anecdotal concern but a systemic phenomenon warranting closer studies. Previous studies have mostly targeted the health condition of the older population, instead of proposing the importance of their abilities to make judgement in the context of consumer decision-making.

This review aims to bridge this gap. It first summarizes features of older adults' consumption behavior and decision-making process. It then explains the Nudge Theory in two effects: the pro-social nudge and sludge. Focusing more on how Nudge Theory secretly changes consumers' decision making and behavior, this review gives practical suggestions on helping avoid unnecessary financial loss for consumers. For algorithm-developing companies and platforms, they should utilize the Nudge Theory to design a better online shopping environment for the older consumers, which this paper will mention in the last section four.

2. The characteristics and influencing factors of older adults' decision-making behaviors

When facing a fast-developing society with the frequent emergence of new products and devices, older adults are often stuck in difficulties with decision-making as they are not familiar with modern technology [3]. This is not only due to chronological aging in the most elementary sense, but also to aging dimensions that are more personally sensitive: biological aging, psychological aging, and social aging [4].

2.1. Internal factors

An important internal factor contributing to irrational decision making among older adults is the impairment of their cognitive ability. The prefrontal region of the brain, also known as the ventromedial prefrontal cortex, plays an imperative role in people's decision making. Empirical studies suggest that the function of the region may decline with aging, which may cause the elderly to act abnormally in their decision making process. Denburg, Tranel & Bechara [1] conducted a study by inviting younger and older groups of individuals who have neither neurological nor psychiatric diseases to participate in the Gambling Task. In the experiment, all participants were given four choices, each of which could lead to either a cash reward or a punishment. When two of the choices were chosen, there would be a long-term loss; the other two choices lead to a long-term profit. The participants needed to find out the pattern by themselves. The results showed that above 90% of the participants in the younger group learned to avoid the irrational choices, whereas only 37.5% of the participants in the older group acted rationally. The researchers thus concluded that despite all other confounding factors, such as psychiatric diseases, health conditions, or weakness in other cognitive aspects, most older adults still show impairment in decision-making, similar to the patients who have ventromedial prefrontal cortex damage. In other words, according to the results of Gambling Task, it is inevitable that aging affects the function of older people's ventromedial prefrontal cortex, leaving them unable to weigh short-term gains against long-term consequences. This change in the biological system is considered as a part of biological aging, according to Hettich et al. [4].

Another dimension of aging is psychological aging, which focuses on the change in individual personality, self, and cognition [5]. Also, related to psychological factors, emotion predicts behavioral patterns of consumers. For example, for individuals who are more emotionally sensitive, persuasive languages in advertisements often trigger high levels of emotional arousal, a visceral factor which increases consumers' intention to purchase without further considering its credibility

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[6]. This weakness of susceptibility to persuasion is examined as an important psychological reason causing irrational consumption [2].

2.2. External factors

Besides the weakness caused by biological and psychological aging, there are also societal reasons. Hettich et al. [4] also mentioned the third dimension of aging—social aging, which takes the quantity, quality of social relations, roles and habits of individuals within a society or culture into consideration. Older adults who are socially isolated, lacking societal resources, will face greater exposure to their psychological and biological vulnerability, whereas social capital often acts as a buffer in this situation [4]. Moreover, with the rising awareness of being healthy in society, healthcare product consumption among older adults has increased sharply, along with irrational consumption [2]. Using a structural equation model, the study by Chen et al. [2] aimed to test the effect of societal support on irrational consumption and the mediating role of loneliness. Results demonstrated that social support is directly negatively related to irrational consumption, and loneliness triggers irrational consumption. In fact, most of the older adults lack companionship both because they have no chance to make social connection with others, forming relationships, and lack of time spent with their busy working children, the age gap between them and their grandchildren. As a result, their only source of information and news is television and some easy-to-use social media platforms. There, the algorithms are limiting their information intake, giving them misleading news and scam advertisements, leading to irrational purchases and financial deception [2].

3. The explanation by Nudge Theory

3.1. Definition of the Nudge Theory

The origins of the Nudge Theory can be traced back to the discussion of paternalism by Thaler & Sunstein [7]. They rejected the misunderstanding idea of paternalism of involving coercion, and suggested the new concept of libertarian paternalism, in which public and private institutions guide people toward better choices that maximize their personal welfare while preserving freedom. They used several examples and research evidence, such as the "default choice" and the cafeteria line example, to prove that there is no contradiction between "no one is forced to do anything" and "no choice is forbidden". This is similar to what Nudge Theory, which was officially defined in the book published by Thaler and Sunstein [8], truly means: changing people's behavior in a predicted way without preserving choice freedom or obviously altering their economic purposes, using ways that still provide them the opportunity to choose differently, but potentially leading them in a certain direction. Focusing on allowing choices with freedom, the implementer of the Nudge Theory is steering the choice maker to a way they want in an imperceptible way, and their methods vary. Mostly, people use benevolent nudging, or pro-social nudging, which promotes and encourages people for their welfare. However, there is also "sludge", which muddles things and impedes people from making wise decisions, first mentioned by Thaler [9].

3.2. Pro-social nudge and sludge

Numerous nudging techniques are already widely used in markets, but whether they are really beneficial to older adults is a question people should consider in order to help with older adults' decision making and their consuming behavior.

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Nowadays, the competition between markets is aggressive; thus marketers are thinking of all kinds of verbal tricks and advertisements to attract purchasing. Especially those who are targeting at the elderly, they are even manipulating their behavior. Thus, they make the process of decision making more confusing and more complex for consumers. While sludge makes things up, complicating pro-social activities [9]. Kozyreva, Lewandowsky & Hertwig [10] have focused on dark patterns which were used in digital, online environments. They concluded seven specific categories of dark patterns, which is considered a little bit different from sludge: sneaking, urgency, misdirection, social proof, scarcity, and obstruction [10]. Online merchants with algorithms that intend to implement dark patterns will secretly add goods to the cart with hidden purchase, sneaking to make more profit. Some merchants and platforms which would want to accelerate consumer decision making process, they set countdown time of discounts and low storage reminders, and unknown source comments, in order to stimulate impulse purchase. It is an undeniable fact that older adults are more possible to get in touch with fake news and information, because of cognitive discrepancies and social motivations. Of course, there are also some pro-social nudging tactics from governments. Similar to the categories of dark patterns, the framework of pro-social nudge, known as the MINDSPACE, is presented by the British Behavioural Insights Team, comprising of messenger, incentives, norms, defaults, salience, priming, affect, commitments, and ego. Those are all practical principles for product design, such as default delays on suspicious transactions and prominent risk warnings, for steering users toward safer decisions without restricting their choices [11].

On one hand, the benevolent nudge is helping effectively on changing their decisions. On the other hand, governments cannot avoid the malevolent nudging exerted by retailers. As a result, researchers have found and warned that affecting by both benevolent and malevolent nudging could surprisingly be a worse situation for the older adults [12]. When discussing the empirical studies and experiments about the role of nudging in financial areas, researchers discovered that in a finance practice, when more structure information like potential payoffs, which is considered as nudging, the participants' choices are wiser. Although the usage of nudging could reduce possible mistakes in credit transaction practices, it does not provide similar beneficial effect among the old. Receiving the benevolent nudging from the government, such as some regulations about labeling and malevolent nudges exerted by immoral merchants at the same time, it will not only mediate all the effects of the governments' helpful nudging, but even lead older adults with poor financial knowledge and cognitive, decision making deficiencies in an incorrect direction. In a word, even benevolent nudging is not always beneficial in every scenario.

4. The application of the Nudge Theory

4.1. Suggestions help with decision making

At the moment, much behavioral research focuses on nudge methods that steer individuals in a certain direction without eliminating their freedom of choice. In contrast, there is another non-coercive intervention that preserves the freedom of decision makers, called "boost", which complements nudge. Targeting competence, boost aims to strengthen an individual's capability of making sound judgments. That is, boost encourages people to actively involve in enhancing judgement abilities, helping with independent decision making when facing uncertainties in the long term.

Hertwig and Grüne-Yanoff [13] demonstrated the notion of boost first by arguing although the Nudge Theory is built on a particular psychological stance, which insists that people's decision

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making system has inherent flaws which are hard to rectify, it is just a single-sided argument among all the other psychological stances and explanations [13]. Simply put, people's decision-making system does not have to be defective, and the "boost" method will also be effective and tenable.

As mentioned earlier, the purpose of boosting is to promote individual's competence instead of an immediate behavior to make their own decisions, and must be transparent, preserving agency. The researchers have distinguished the short-term boost and the long-term boost [13]. Short-term boost, according to the report, is a partial, situation-fixed modification, targeting only the problem faced at this moment, while long-term boost is a sustainable, flexible ability that can be used in any new situations. An educational nudge, such as a reminder, warning, is approximate to short-term boost. They are both constrained in a situational, specific problem, require only a little motivation and cognitive skill, whereas long-term boost requires more dedication, in exchange of more holistic, stable, sustainable ability.

As a result, the older adults should be actively involved in long-term boost training in order to own the steady ability to distinguish scam and deception, instead of relying on an occasional default choice. Hertwig and Grüne-Yanoff [13] categorized long-term boosts training into risk literacy boosts, uncertainty management, and motivational boosts. They involve fostering the understanding of statistical information in different domains with potential risks, establishing judgement abilities, predictions, and assessments when facing uncertainty, and raising internal self-awareness like motivation, cognitive manipulation, and expressions. Through the continuous training, the older adults are able to distinguish some misleading contents, refusing faulty consumption [13].

4.2. Practical design

Before turning to specific design recommendations, a common misconception needs to be addressed: people consider convenient, straightforward process or products the better ones. However, Sunstein [14] pointed out that friction, the steps or messages hinder the normal process, is neither good nor bad in itself, and the key lies in whom it serves by using a useful framework [14]. For example, the nudging that is used to promote deep consideration is exactly utilizing friction to protect decision maker like older adults on purpose; the real sludge are those friction which seems proper, but in fact only beneficial for the merchants. An inconspicuous kind reminder before purchase can save older consumers from financial fraud; but a malicious, unreal product review made up by merchants can lead to improper purchases. As such, a product intended to protect older adults from fraud should not aim to minimize all friction indiscriminately; instead, it should strategically reduce sludge, friction that serves no one but the fraudster, while deliberately introducing friction at points where deliberation is most needed.

According to the MINDSPACE principle [11], here are some that should be taken into account aiming to protect older consumers [11]. Firstly, defaults can be used to insert a protective delay without requiring active user comprehension. For instance, transfers to unknown accounts, or above a certain amount threshold, could be set to a period of holding time before the funds are released, giving them time to withdraw instead of instant completion. Secondly, the characteristic of salience can be used in visual, auditory, and any kind of prominent warning when triggered by a probable risk such as a suspect transaction made at late night, an unusual large amount transaction, and an unfamiliar payee. Thirdly, reminders that enlist social norms can counteract the malicious techniques used by the fraudsters. As people often show compliance to social norms, a reminder like "most people usually choose to ask their family members first before decision" could save older adults from making wrong decisions. Finally, suggesting commitments can interrupt impulsive action by

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forcing an explicit reflection by asking a question like "when do you plan to tell your family member about this?" rather than allowing the transaction through directly.

5. Conclusion

By reviewing and summarizing empirical studies, this paper focuses mainly on the role of Nudge Theory in older adults' consumption behavior. The weakness in judgment abilities among older adults is due to both internal and external aging factors, which naturally occur in most of the aging population. This could be a reason why most of the telemarketing companies are targeting at the older population: older adults are more likely to be deceived compared to other age groups. Still, merchants are applying dark patterns and sludge on the elderly even if pro-social nudging is assisting older adults to make rational, proper decisions. Consequently, this review suggests the older adults frequently practise boosting, a technique to protect them from deception to a certain degree. Platforms and product designers are also an imperative part of the protection; thus, the paper lists out the MINDSPACE model and examples for effective risk management.

However, there are some flaws that should be addressed in future research. As there are few empirical studies that have elaborated in how personality, considered associated with psychological aging, affects the decision-making of the older adults. In addition, prior research has pointed out that there is no holistic theory proving the existence of social aging; only explanations in single scenarios, such as activities, disengagement, etc. These two areas need further verification to be defensible and integral. This paper is a preliminary attempt of combining the Nudge Theory and solving decision-making problems of the older consumers, so the practical designs yet need to be tested to prove its accessibility and effectiveness. Future researchers can pay more attention to examining the suggested practical means, older consumer behavior, promoting social welfare.

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