Psychology and Behavioral Sciences
2023; 12(1): 23-30
http://www.sciencepublishinggroup.com/j/pbs
doi: 10.11648/j.pbs.20231201.13
ISSN: 2328-7837 (Print); ISSN: 2328-7845 (Online)

The Relationship Between Future Time Perspective of the Elderly and the Use of E-banking: A Moderated Mediator Model

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To cite this article:

Lidan Liu, Yonghong Yu. The Relationship Between Future Time Perspective of the Elderly and the Use of E-banking: A Moderated Mediator Model. *Psychology and Behavioral Sciences*. Vol. 12, No. 1, 2023, pp. 23-30. doi: 10.11648/j.pbs.20231201.13

Received: January 17, 2023; **Accepted**: February 7, 2023; **Published**: February 24, 2023

Abstract: Digital finance has increasingly become an indispensable part in life, and integral to digital finance is E-banking. However, the elderly, who are one of the target groups of inclusive finance, have a low utilization rate of digital finance and E-banking. Based on socioemotional selectivity theory, this study explored the relationship between future time perspective of the elderly in China and their use of E-banking, and the mechanism underlying the relationship. A total of 1400 elderly people (including 623 males and 777 females) aged over 60 in Ningbo and Guangzhou were recruited. Their use of E-banking, security perception, attitude and future time perspective of digital finance were investigated. The results showed that future time perspective was significantly correlated with attitude towards digital finance and use of E-banking. Future time perspective indirectly affects use of E-banking through the attitude towards digital finance. Perception of digital finance security moderated the relationship between future time perspective and attitude towards digital finance. The current research finds that the perception of future time of the elderly will affect their attitude towards digital finance and their use behavior, which can be used to promote the use of E-banking and digital finance in real life. In addition, in order to change the attitude towards digital finance of the elderly, their views on future digital financial security should also be considered. The research needs to further explore the factors that affect attitude towards digital finance of the elderly, and how to change their attitude towards digital finance through intervention.

Keywords: The Elderly, Future Time Perspective, Digital Financial Attitude, Security Perception, E-banking

1. Introduction

Digital finance refers to the digitization of the financial industry, which includes all electronic products and services of the financial sector, such as credit and chip cards, management systems such as electronic express delivery and ATMs. In addition, digital finance involves all mobile device services and application services [1]. Digital Financial Services (DFS) extend traditional banking services through innovative technologies such as E-banking, mobile phone-enabled solutions, E-money models and digital payment platforms [2]. As an important part of digital finance, which is the transformation and upgrade of traditional banking [3], E-banking refers to the banking services and other banking financial institutions using communication channels or open public networks, as well as special networks established by banks for specific self-service facilities or customers [4]. E-banking covers a wide range of services such as online banking, mobile banking and WeChat banking.

Compared with traditional finance, digital finance is more inclusive and flexible [5], and has the advantage of easing liquidity constraints [6], reducing transaction costs [7], and facilitating payment by residents [8]. For the elderly, the use of the Internet not only improves mental health by reducing loneliness and improving happiness [9-10], but also provides great convenience to daily life; especially for the elderly with difficulty in walking around, they can obtain information and handle business remotely [11]. The use of digital finance can support the re-socialization of the elderly and their adaptation

to social development [12]. Financial exclusion may occur if older people cannot learn to use digital financial products.

In reality, the number of the elderly who benefit from the convenience brought by digital financial services is limited [13]. According to the 48th Statistical Report on the Development of the Internet in China, only 12.2% of Internet users are over 60 years old. In addition, according to the 2020 Mobile Payment User Questionnaire Report, only 3.4% of users over 61 years old make mobile payments., The 2012-2013 China Use of E-banking Survey Report shows that the proportion of online banking and mobile banking is only 1.4% among elderly people over 51 years old. In conclusion, the utilization rate of digital financial services among the elderly is far from reaching the level pursued by inclusive finance. Affected by COVID-19, the Ministry of Commerce and the National Health Commission issued the "Notice on the prevention and control of novel coronavirus pneumonia in life service enterprises." It is emphasized that the service industry should promote card payment and various mobile payment methods, which makes the use of digital financial increasingly important part of daily life. Therefore, it is necessary to help the elderly learn to use digital financial products and E-banking.

1.1. Use of Digital Financial Products and E-banking

Previous studies have found that the use of digital financial products and E-banking is affected by demographic factors such as income, education and census register. For example, individual income affects the promotion and use of digital finance [14]. Groups with less financial knowledge are more difficult to accept and understand informationized financial digital products and services [15-16]. People with higher education level can acquire more financial knowledge [17], so they are more likely to learn how to use financial products [18-19].

The elderly over 60 years old are affected by historical, economic, social and other factors, and their cultural level is low [20]. There are age differences, and the elderly are vulnerable to financial exclusion. In addition, the gap between urban and rural areas leads to a large gap in the development of digital finance in urban and rural areas [21-23].

In addition, psychological factors can also affect individuals' use of digital financial products and E-banking. Previous studies have shown that people who have a good opinion about a particular behavior are more likely to follow this behavior [24], and the more positive the attitude of the elderly toward digital finance, the more likely they are to use digital financial products [25]. However, there is controversy especially with regard to future-oriented behaviors such as saving [26-27]. Thus, the relationship between digital financial attitude and use of digital financial products warrants further investigation.

1.2. Future Time Perspective, Attitude Towards Digital Finance, and Use of E-banking

Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) have been used to examine digital finance [28-32]. According to TAM, the use of new technologies and systems is determined by behavioral intention, which is determined by both attitudes to use and perceived usefulness [33]. Studies have found that perceived usefulness and perceived ease of use are positively correlated with the use of mobile payment products by the elderly [34]. Later, Venkatesh and Davis [35] developed and improved TAM and proposed UTAUT, which holds that performance expectation and effort expectation will directly affect the intention of using a certain technology, thus affecting the actual use of it. Each element of these models can be integrated into the attitude towards new technology, which affects the use and promotion of it [36-37].

Both the TAM and the UTAUT focus on the influence of individual attitude towards new technology on technology use in the process of research, but few studies have focused on the antecedents of attitude towards new technology [38]. In the research on the TAM and use of digital finance, young people and middle-aged people are the main research objects, while relatively few studies have focused on the elderly [39]. However, studies have found that age is an important factor affecting the use of digital finance, and there are age differences in attitude towards digital finance and use of digital finance [14, 40-41]. However, the above TAM and UTAUT cannot well explain why older users are unwilling to use new technologies.

According to Socioemotional Selectivity Theory (SST), the age difference of individuals stems from the decrease of the perceived time range, and with the increase of age, the perceived time of individuals becomes increasingly limited [42]. SST is a lifelong motivation theory [43]. When future time is considered sufficient, individuals will determine the priority of information-centered goals. When time is considered to be limited, individuals prioritize emotion-related goals [44], pursuing emotional satisfaction, and optimizing their emotional states by interacting with others [45]. This kind of individual perception of time range is called future time perspective (FTP), which is a personality trait of individuals' cognition, experience and action tendency towards future time [41]. FTP guides two sets of overarching goals that govern most human social behaviors. One set of goals concerns the acquisition of knowledge; the other set of goals involves the regulation of emotional states [44, 46].

Some researchers have explained the effects of age on use of new technologies from the perspective of motivation. In explaining why individuals engage in online social interaction, including social motivation and information motivation, Zhou [47] and Yin [48] found that future time perspective had an impact on these two types of motivation, thus influencing online use behavior.

Based on SST, this study expected a correlation between FTP of the elderly and use of E-banking. Specifically, it was hypothesized that FTP would increase older people's intention of using E-banking (H1). Further, this study hypothesized that the attitude of older people toward digital financial has a mediating role (H2).

The moderating effect of security perception of digital finance.

Although digital finance brings changes to financial industry and convenience to the society, its security has always been a topic of concern [49]. The risks of digital finance mainly include three aspects: credit risk, credit security risk and digital technology operation risk [50-52]. However, there is great information asymmetry in responses of users to digital financial risks, and with the rapid development of science and technology, the risks associated with digital finance is constantly changing, and the understanding of the risks of digital finance of user is not comprehensive. Compared with the risk of digital finance itself, individual subjective perception of digital finance security is more important [53].

Some researchers believe that perceived risk has a negative impact on decision-making, and perceived security will affect the use of different digital financial products [54-56, 36]. Digital financial insecurity cases such as digital financial fraud are often exposed through various channels, increasing concern of people about using digital finance, resulting in low security perception and lack of trust in digital finance, thus hindering the promotion of digital finance [57]. On the contrary, perceived security of digital financial products can increase trust in digital financial products, contribute to a positive attitude towards digital finance, and promote the use of digital finance [58]. Therefore, this study hypothesized that perception of digital finance security plays a moderating role in the relationship between future time perspective and Attitude towards digital finance (H3).

Based on the above theoretical framework, the following moderated mediating model was proposed (see Figure 1).

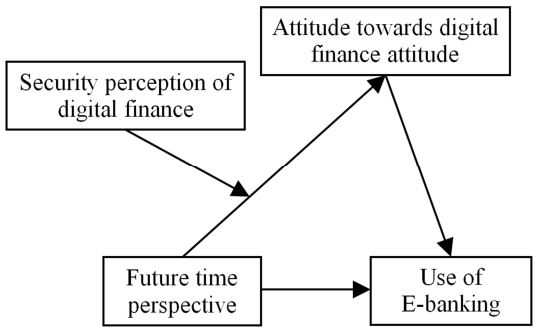

Figure 1. *Basic assumptions of this study.*

2. Methods

2.1. Participants

With the help of Ningbo and Guangdong Consumer Protection Association, 1704 questionnaires were distributed to the elderly over 60 years old. After removing the data of participants who spent less than 2 minutes and more than 1 hour on the questionnaire, the final sample size was 1400 (623 males and 777 females), including 659 people aged 60-64 years, 413 people aged 65-69 years, 207 people aged 70-74 years, 75 people aged 75-79 years and 46 people aged over 80 years.

2.2. Measures

2.2.1. Attitude Towards Digital Finance

Based on From Shen [59], two items (i.e., "digital financial services to improve the efficiency of financial affairs"; "learning to use digital financial services is very easy for me") were used to measure attitude towards digital finance on a five-point scale (1 =strongly disagree; 5 = strongly agree). In this study, the Cronbachα coefficient was 0.88.

2.2.2. Future Time Perspective

The short version of the Time Perspective prepared by Zimbardo was used to measure future time perspective [60]. There are three items, one of which is about "achieve the goal", which is not in line with the actual situation of the elderly, the older people are, the less personal goals they have [61-62]. Finally, two items (i.e., "I complete projects on time by making steady progress"; "I will plan the schedule step by step, and complete the arranged things on time") were used to measure future time perspective on a five-point scale (1 = strongly disagree; 5 = strongly agree). In this study, the Cronbachα coefficient was 0.90.

2.2.3. USE of E-banking

One item (i.e., "Do you use mobile banking or online banking?") was used to measure use of E-banking (1 = yes; 0 = no).

2.2.4. Perception of Digital Finance Security

One item (i.e., "Do you think the previously mentioned digital financial systems are secure?") was used to measure perception of digital finance security (-1 = not safe; 0 = don’t know; 1 = very safe).

3. Results

3.1. Descriptive Statistics and Correlation Analyses

The descriptive statistics and results of correlation analyses were shown in Table 1. The results showed that 704 elderly people (46.7%) used E-banking and 502 elderly people (53.3%) did not use E-banking. Age, household registration, educational level, employment status, annual income, attitude towards digital finance and future time perspective were significantly correlated with use of E-banking. The chi-square tests were further conducted for demographic factors that were significantly correlated with use of E-banking, and the results were shown in Table 2. There were significant differences in use of E-banking among different levels of age, household registration, educational level and annual income.

Figure is as follows: Place figures and tables at the top and bottom of columns. Avoid placing them in the middle of columns. Large figures and tables may span across both columns. Figure captions should be below the figures; table heads should appear above the tables. Insert figures and tables after they are cited in the text. Use the “Figure 1”, even at the beginning of a sentence.

Table 1. *Descriptive Statistics and Correlation Matrix between Variables.*

variable	*M* ± *SD*	gender	age	The household registration	Record of formal schooling	Annual income	1	2	3	4
1. Future time perspective	3.412 ± - 1.27	0.01	0.05	0.11***	0.20***	0.21***	1			
2. Digital financial attitude	3 ± - 1.142 3.46	0.00	0.10***	0.14***	0.23***	0.20***	0.69***	1		
3 Use E-banking	0.426 ± - 0.49	0.01	0.12***	0.21***	0.31***	0.25***	0.32***	0.45***	1	
4. Perception of digital finance security	0.259 ± - 0.69	0.02	0.06*	0.11***	0.15**	0.18***	0.37***	0.50***	0.54***	1

* P < 0.05, **P < 0.01, ***P < 0.001.

Table 2. *Use of E-banking by Older Adults with Different Characteristics.*

Observation variable		n	Use E-banking	Not using E-banking	χ2	P
age	60-64 years old	659	317	342	24.40	0.00
	65-69	413	175	238		
	70-74	207	68	139		
	75-79	75	22	53		
	More than 80 years old	46	14	32		
Census register	Urban household registration of the province	775	406	369	79.50	0.00
	Rural household registration of this province	554	163	391		
	Urban household registration in other provinces	36	20	16		
	Rural household registration of another province	35	7	28		
Education level	Elementary school and below	477	115	362	136.77	0.00
	Junior high school	439	188	251		
	High school/technical secondary/technical school	314	177	137		
	University college	113	77	36		
	College degree or above	57	39	18		
Annual income	Less than 20,000 yuan	285	83	202	93.46	0.00
	Within 20,000-50,000 yuan	624	223	401		
	50,000-100,000 yuan or less	373	209	164		
	More than 100000	118	81	37		

3.2. Future Time Perspective and Use of E-banking

The regression results of the model were shown in Table 3.

Table 3. *OLS regression results.*

Variable	Step 1		Step 2		Step 3	
	Beta.	*t*	*Beta.*	*z*	*Beta.*	*t*
Future time perspective (FTP)	0.52***	29.74	0.08	0.98	0.50***	27.36
Digital financial attitude			0.51***	5.59		
Age	0.05**	2.742	0.25***	3.59	0.05**	2.66
Census register	0.02	0.46	0.33**	3.03	0.01	0.33
Income	0.02	1.13	0.22**	3.05	0.02	1.08
Education	0.06*	3.13	0.45***	6.43	0.06**	3.12
Perception of digital finance security	0.43***	13.21	1.66***	13.24	0.13	1.36
FTP × Perception of digital finance security					0.09***	3.47
Adj-R 2	0.55***				0.55***	
Pseudo R2			0.32***			

* P < 0.05, **P < 0.01, ***P < 0.001.

According to the results of Step 1, the regression coefficient of FTP on attitude towards digital finance was 0.52 ($t = 29.74$, $p < 0.001$, *95% CI* = [0.49, 0.56]), indicating that FTP has a significant positive impact on attitude towards digital finance (i.e., the more time is perceived to be abundant in the future, the more positive the attitude towards digital finance is). However, the regression coefficient of FTP on Use of E-banking is not significant, indicating that FTP does not have a significant impact on use of E-banking. Attitude towards digital finance, as a mediating variable, had a significant positive predictive effect on use of E-banking ($Z = 5.59$, $p < 0.001$, *95%CI* = [0.33, 0.69]), indicating that attitude towards digital finance had a significant positive impact on use of E-banking (i.e., the more positive the attitude towards digital finance, the more positive the attitude towards digital finance is, the more likely the elderly are to use E-banking).

According to Zhao, Lynch and Chen [63], the Bootstrap method was used to test the mediation effect. FTP had a significant impact on use of E-banking (*95% CI* = [0.18, 0.37]), and the mediating effect size was 0.268. Therefore, attitude towards digital finance plays a full mediating role in the impact of FTP on use of E-banking, which supports H1.

As can be seen from the regression results of Equation 3, FTP has a significant positive predictive effect on attitude towards digital finance ($t = 27.36$, $p < 0.001$, *95%CI* = [0.47, 0.54]). Perception of digital finance security has a significant moderating effect between FTP and attitude towards digital finance ($t = 3.47$, $p < 0.001$, *95% CI* = [0.03, 0.14]), indicating that perception of digital finance security plays a positive moderating role in the relationship between FTP and attitude towards digital finance. Hypothesis 2 is proved.

In order to better understand the moderating effect of perception of digital finance security on FTP and attitude towards digital finance, this research conducted a simple slope test using the method of Aiken and West [64]. The results show that participants with higher FTP and perception of digital finance security have a more positive attitude towards digital finance, while participants with lower FTP and perception of digital finance security have a more negative attitude towards digital finance, as shown in Figure 2.

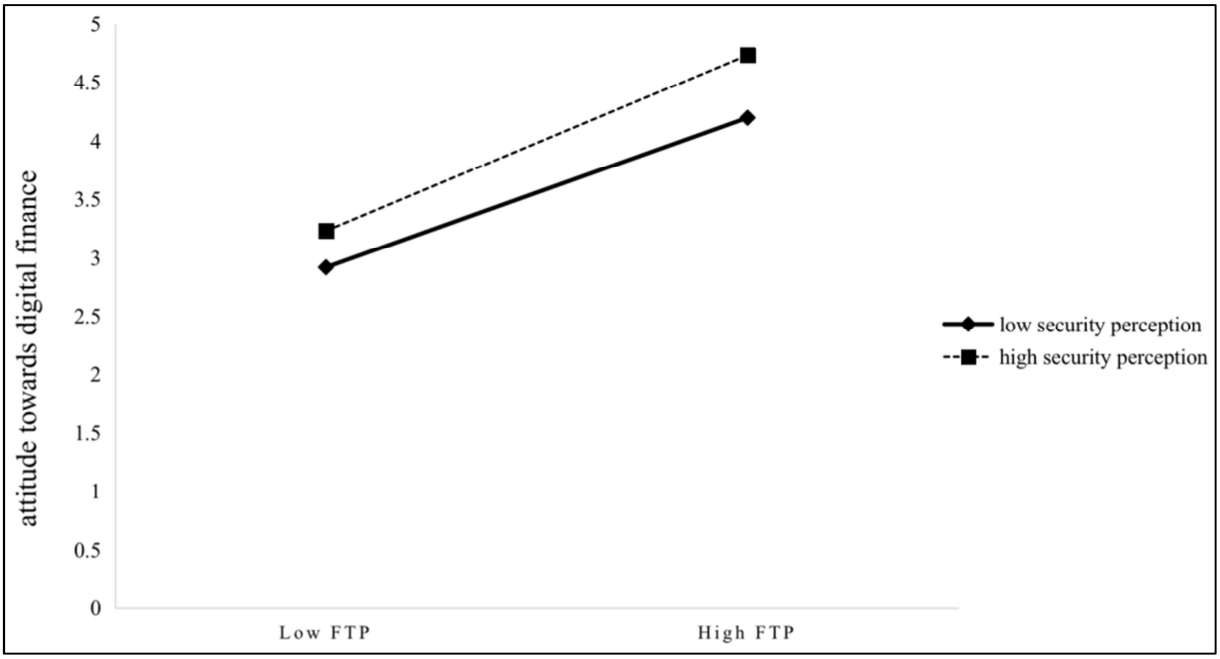

Figure 2. *Moderating effect of perception of digital finance security on FTP and attitude towards digital finance.*

4. Discussion

4.1. Future Time Perspective and Use of E-banking

Age and FTP are important factors affecting the attitude of older people towards E-banking and digital finance. There is a positive correlation between FTP and Attitude towards digital finance, and longer time perspective can better predict the consistency of attitude and behavior [65].

FTP will affect whether the elderly use E-banking, mainly because the goals in future time perspective will directly affect the behavior of individual [42]. When the future time is perceived to be limited and short, individuals will not pursue the goal of information acquisition and learning new technologies. Learning to use E-banking involves reading and acquiring information, which is more consistent with the goals of future-focused individuals (i.e., knowledge acquisition), and information consistent with time perspective is more likely to influence behavior and attitude than information inconsistent with it [66].

4.2. Mediation of Attitude Towards Digital Finance

This study confirmed the relationship between FTP, Attitude towards digital finance, and Use of E-banking among the elderly, and explored the mechanism of future time perspective affecting Use of E-banking, that is, attitude towards digital finance played a mediating role. When older people are more future-focused, they are more likely to develop a positive attitude towards digital finance and are more inclined to use E-banking. A good Attitude towards digital finance is the basis for participating in financial activities [67]. The more positive the elderly are towards digital finance, the more inclined they are to use digital financial products [25].

Previous studies have found that time perspective can affect individual attitude and behaviors [68]. Future-oriented individuals show less stimulus seeking, antisocial behavior and health risk behavior [69]. FTP also has a positive impact on attitude towards entrepreneurship [70]. Researchers believe that the future time perception will affect individuals' attitude through two ways. First, FTP will affect the accessibility of attitude. Individuals with longer future time perception may have increased attitude accessibility. Since attitude toward future behavior are formed in the process of considering possible future outcomes, thinking about the distant future makes such attitude more salient, and attitude that are more easily recognized are more likely to lead to corresponding behaviors [71-72]. Second, future time perspective affects attitude stability. Individuals with longer future time perception

may have increased attitude stability. Attitude are most stable when the information considered in attitude formation is still relevant at the time of behavior implementation [73]. Future considerations and expectations are likely to be salient in the formation of attitude towards future behavior. If the same considerations and expectations are also active at the moment of behavioral choice, the attitude is more stable and more likely to lead to the corresponding behavior [74].

Future shorter time perception of the elderly, to understand and learn new things and new knowledge has certain difficulties, they prefer to go to the pursuit of emotional target goals rather than knowledge, may make the elderly are more likely to maintain a long spending habits, a lack of to use and digital electronic banking financial motivation, even negative attitude to digital financial holding conservative, Therefore, they are not willing to learn to use E-banking and digital financial products.

4.3. Moderation of Security Perception of Digital Finance

Digital financial security in the FTP and perception between financial attitude play a role of regulation, it shows that digital financial security awareness can be improved in the FTP of Attitude towards digital finance, the influence of digital financial security awareness can improve the consciousness to the future of the limited time of the old technology to produce to avoid learning new knowledge, At the same time, the perception of digital financial security can improve the attitude of the elderly who perceive the limited future time to avoid learning new knowledge, and promote the willingness of the elderly who perceive the abundant future time to accept new knowledge.

5. Limitations and Future Directions

This study also has limitations. First of all, in terms of sample selection, only the elderly in Ningbo and Guangdong were selected, thus limiting the external validity of the study. As the economy of these two regions is developed, the use of smart phones by the elderly has become more common. The usage rates of smart phones and Internet in this sample reached 80.1% and 68.3%, which are higher than the national average level, in future research, older people from diverse regions should be recruited to test the generalizability of the current results. Secondly, the current study only revealed correlations between variables. In future studies, the experimental method should be used to manipulate variables (e.g., future time perspective) so as to elucidate the causal effects.

The results reveal the importance of attitude towards digital finance, and attitudinal change strategies can be adopted in subsequent studies to intervene the elderly to develop a more positive attitude towards digital finance, including E-banking, so as to promote their use of digital financial products. In addition, in future research, it is possible to intervene in the FTP of the elderly by initiating technology [75-76] to enhance the motivation to pursue knowledge goals, and then promote their use behavior of digital financial products.

6. Conclusion

This study examined relationship among the use of E-banking of the elderly, attitude toward digital finance, future time perspective and the security perception. Future time perspective influences the use of E-banking of the elderly through their attitude toward digital finance, and the security perception of the elderly in digital finance plays a moderating role. According to the results of this study has certain guiding significance for the promotion of digital finance and financial inclusion, and has conducive to helping the elderly better integrate into modern society.

Acknowledgements

Thanks to the "Protection Federation of Financial Consumption Rights and Interests of Guangdong, Protection Association of Financial Consumption Rights and Interests of Ningbo and Visa Inc." for their strong support to the data collection of this survey.

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