Effects of Financial Knowledge on Rationality of Financial Behavior in College Student: A Mediation Model

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Abstract: Financial literacy includes knowledge, as well as attitudes, behaviors, and skills. This research explores how different degrees of financial literacy affect the rationality of financial decisions among university students, utilizing insights from the Delayed Gratification theory. Through the exploration of a moderated mediation model, the research delves into the mediating role of Delayed Gratification. Findings from a detailed survey of 4676 Chinese college students highlight two key points. Firstly, the research indicates that college students' knowledge of finance has a substantial and positive effect on the rationality of their financial actions. Secondly, the findings reveal that Delayed Gratification serves as a partial mediator in the complex link between financial knowledge and the rationality of financial behavior. This research contributes to the existing body of knowledge on financial literacy while also deepening our comprehension of how college students' financial awareness shapes the dynamics of their financial decision-making rationality. The results stress the significance of considering the information students possess and underscore the importance of Delayed Gratification in translating knowledge into responsible financial behavior. Considering the essential importance of financial literacy in managing today's intricate financial environment, this study offers significant insights that could guide educational approaches and initiatives aimed at enhancing the financial health of college students.

Keywords: Financial Knowledge; College Student; Delayed Gratification; Rationality of Financial Behavior

1. Introduction

The importance of financial knowledge is becoming more and more significant in today's society, especially for college students. The evolving economy underscores the growing importance of individuals in making financial decisions. Therefore, having a good understanding of financial matters has become a vital skill. As the future leaders of society, the way college students manage their finances directly affects their personal economic welfare and the stability of the broader socio-economic environment.

The development of financial behavior is influenced by a variety of factors, encompassing individual psychological traits to the external social context. Regarding psychological aspects, Kahneman's study (1979) [1]. indicates that people often display risk-averse behaviors in uncertain situations, significantly affecting their financial decision-making strategies. Furthermore, the depth of financial knowledge has been shown to be a critical psychological element that correlates directly with the soundness of investment choices.

The social context significantly influences financial behavior. Previous studies [2-5]. have shown a clear link between an individual's social background, family culture, and financial choices. The cultural norms and economic framework of a society also have a substantial impact on how people manage their finances, underscoring the importance of conducting macro-level research. Additionally, personal attributes play a crucial role in financial decision-making. Other researchers [6-10]. have identified a strong relationship between characteristics like age, gender, and education level with financial choices. Younger individuals often lean towards high-risk, high-reward investments, whereas as they grow older, they tend to opt for more conservative and cautious investment strategies. These elements are interconnected

and collectively mold individuals' financial behaviors.

In a similar vein, the financial behavior of college students is often influenced by various factors, with financial knowledge playing a crucial role. Investigating the precise mechanism of this influence is essential. Prior research has demonstrated a robust connection between an individual's level of financial knowledge and their financial behavior [11].

Lusardi's 2011 study [4]. indicates that individuals with higher financial knowledge are more likely to make rational savings and investment choices compared to those with lower financial knowledge. This emphasizes the need to improve college students' financial knowledge to encourage wiser financial behavior. Nonetheless, additional research is required to deepen our comprehension of the link between financial knowledge and college students' financial behavior, including any influencing factors that might exist.

Through detailed investigation of this topic, we aim to offer insightful contributions towards crafting customized educational approaches and enhancing college students' financial literacy. This effort is expected to foster more judicious and proficient involvement in economic endeavors, establishing a robust groundwork for their long-term financial health.

This paper is organized as follows: Section 2 provides a review of existing literature and outlines the hypothesis development. Section 3 focuses on the variables and data used in the study. Section 4 highlights the main findings. The paper concludes with Section 5, which discusses the research outcomes, limitations, and suggests avenues for future research.

2. Review of Literature and Hypotheses Formulation

2.1 Financial Behavior Rationality

Financial behavior can be categorized into two primary types: long-term and short-term. Long-term financial behavior involves activities like retirement planning, saving for retirement, and making long-term investments. On the other hand, short-term financial behavior focuses on whether individuals have an emergency fund in place instead of depending on overdraft accounts.

Long-term financial behavior refers to the process of planning an individual's future financial arrangements, which includes preparing for retirement and investing in assets for the long run. It entails strategic thinking and decision-making about an individual's financial future [5].

On the other hand, short-term financial behavior mainly looks at how individuals handle their finances in the current moment. Choosing to have an emergency fund rather than relying on overdraft accounts is a proactive way to maintain short-term financial well-being. This guarantees that individuals have a sufficient financial cushion when dealing with unexpected situations, rather than being stressed by financial strain caused by overdrafts [9].

Financial behavior can be categorized into two main types: long-term and short-term. Long-term financial behavior involves activities like planning for retirement, saving for the future, and investing for the long term. In comparison, short-term financial behavior focuses on having an emergency fund in place rather than relying on overdraft facilities. Long-term financial behavior involves preparing for future financial needs, including retirement planning and managing long-term investments, requiring thoughtful decision-making and planning for one's financial future. Conversely, short-term financial behavior revolves around managing current finances, such as maintaining an emergency fund for unexpected expenses instead of using overdrafts. Rational financial behavior is crucial for individuals to make wise financial choices that comply with established standards, ultimately securing their financial health and long-term stability.

The rationality of financial behavior assesses whether an individual's financial decisions align with established norms. Practicing rational financial behavior helps prevent individuals from facing financial troubles caused by irrational choices in financial matters. Adhering to these norms is essential for safeguarding individuals' financial well-being and ensuring their long-term stability. Therefore, rational financial behavior is vital for maintaining individuals' economic well-being.

2.2. Financial Knowledge

Grasping financial concepts and having awareness of financial products constitute key components of financial literacy, collectively referred to as financial knowledge. This knowledge is built through education or firsthand experience [12]. Scholars typically divide financial knowledge into categories such as objective financial knowledge, subjective financial knowledge, and investment experience. A solid grasp of financial knowledge and information is crucial for individuals to make well-informed financial decisions, thereby affecting their financial behavior. Elevated levels of financial knowledge are associated with the active formation of financial values, motivations, and attitudes [13]. Objective financial knowledge is often measured by the accuracy of answers to questions about financial knowledge. On the other hand, self-assessed literacy, also termed subjective financial knowledge, involves individuals' own evaluation of their competence and comprehension of financial matters. Investment experience indicates how well an individual knows their way around financial products. This research seeks to investigate the influence of objective financial knowledge on the accuracy of financial behaviors. Evidence suggests that those with more extensive financial knowledge tend to achieve superior outcomes in financial and retirement planning [14]. Additionally, they demonstrate good habits with credit cards, debt management, and making wise investments in the stock market. Substantial evidence exists demonstrating a significant relationship between financial knowledge and the implementation of robust financial habits. Such habits encompass punctual bill payments, expense monitoring, budgeting, fully paying off credit card bills every month, consistent saving from income, establishing emergency reserves, diversifying investments, and formulating financial objectives. On the flip side, diminished financial knowledge may result in unfavorable financial choices. Those with restricted financial knowledge often avoid the stock market, thereby foregoing considerable potential gains. Families with inadequate financial knowledge may make unfavorable choices when selecting loans or mortgages, resulting in problems like escalating debt, bankruptcy, and loss of property due to mortgage default.

This research posits that the financial literacy of college students forms the foundation for making informed financial decisions.

Hypothesis 1 A positive correlation exists between financial knowledge and the rationality of financial decisions among college students.

2.3 The Mediating Role of Delayed Gratification

The concept of Delayed Gratification involves forgoing immediate rewards in exchange for achieving more valuable long-term goals and exercising self-discipline during the waiting period. This skill is essential for success in various tasks, maintaining healthy relationships, and effectively adapting to societal norms. Delayed gratification is more than just waiting or suppressing desires; it is about navigating through challenges in the present to secure future benefits. It requires individuals to sacrifice instant gratification and control their actions while striving towards long-term objectives. Without the determination to resist distractions and prioritize work or education over short-term indulgences, achieving goals can become significantly more challenging.

People who come from a high socioeconomic status in childhood tend to prioritize saving for the future, while those from a lower socioeconomic background often prefer spending money to enhance their current quality of life through consumption. Research indicates that individuals who grew up in quieter environments are more inclined towards immediate rewards, whereas individuals who had a higher childhood socioeconomic status are more inclined towards delayed gratification.

Individuals who grew up in lower socioeconomic conditions may prioritize immediate gratification, act more impulsively, and take greater risks in response to challenges like mortality, economic recessions, environmental uncertainties, and financial dangers. Conversely, individuals from a higher childhood socioeconomic background are more likely to focus on future rewards, show greater self-control, and exhibit delayed gratification when faced with the same challenges. Study [15]. has shown that a child's ability to delay gratification can impact their social interactions and academic success, while

in the workforce, delayed gratification is linked to job satisfaction. Based on these findings, this study puts forward the following hypotheses:

Hypothesis 2 Delayed Gratification serves as the mediating factor between financial knowledge and the rationality of financial behavior.

The research framework depicted in Figure 1 outlines the structure of this paper.

Figure 1. Illustration of a Mediation Model in the Research

3. Research Methods

3.1 Sampling

Table 1. Demographic profile of the sample (N=4676)

Variables		Frequency	Proportion(%)
Gender	Male	533	24.4
	Female	1648	75.6
Place of birth	Rural	2222	47.5
	Urban	2454	52.5
Grade	Freshman	905	19.3
	Sophomore	2196	47
	Junior	1521	32.5
	Senior	44	0.9
Only-child identity	Yes	10	0.2
	No	2045	43.7
Monthly cost of living (yuan)	<=800	2631	56.3
	800 < x <= 2000	185	3.9
	>2000	3759	80.4
	I don't know	615	13.1
Family monthly income (yuan)	<=5000	117	2.5
	5000 < x <= 10000	1342	28.7
	10000 < x <= 20000	1879	40.2
	>20000	1046	22.4

In November 2021, an online questionnaire survey was conducted to gather responses from full-time university students in Sichuan Province. A total of 4,901 questionnaires were received. This Study excluded 81 questionnaires with a completion time of less than 240 seconds, 5 questionnaires with a questionnaire star rating below 100 points, 12 questionnaires filled out by master's and doctoral students, and 1 questionnaire with incomplete information. In total, 4,676 valid questionnaires were retained. The demographic profile of the sample is outlined in Table 1.

3.2 Variables and Measurement

3.2.1 Financial Knowledge

Table 2 illustrates that objective financial knowledge is assessed through 23 financial knowledge questions, each offering multiple answer choices, but only one correct answer. Based on the responses of each respondent, this project determines whether their answers are correct or not, ultimately forming a binary variable with two levels: incorrect and correct.

Table 2. Items for Measuring Financial Knowledge

Code	Items
FK1	Inflation
FK2	Simple interest calculation
FK3	Interest calculation in borrowing
FK4	Compound interest calculation
FK5	Risk in investments
FK6	Relationship between inflation and cost of living
FK7	Risk of stocks
FK8	Interest costs in mortgage loans
FK9	Relationship between diversified investments and risk
FK10	Relationship between interest rates and bond prices
FK11	Identification of the buying price of the U.S. dollar
FK12	Identification of high-return financial products
FK13	Identification of assets with fluctuating returns
FK14	Comparison of risks between bonds and stocks
FK15	Time value of assets
FK16	Meaning of stock mutual funds
FK17	Reserve requirement ratio
FK18	Nature of stockholders
FK19	Health insurance
FK20	Personal credit rating
FK21	Impact of adverse credit history
FK22	Installment payments for purchasing a car
FK23	Applying for a personal credit report

3.2.2 Generalized Delayed Gratification

The measure of delayed gratification was derived from Fernandes et al. (2014) [6]. In this measure, this study removed the following five items: "Adhering to a specific, healthy diet would be challenging for me.", "Whenever

confronted with a task that requires significant physical effort, I tend to procrastinate.", "I often overlook the impact my actions have on others.", "Handling money responsibly is a challenge for me." "I struggle to find the motivation needed to achieve long-term objectives." and retained the other five items, as shown in Table 3. The Cronbach's Alpha for the entire variable measure was 0.738, greater than the threshold value of 0.7. Except for "To achieve my goals, I've sacrificed physical comfort and pleasures." whose Corrected Item-Total Correlation corresponds to a value of 0.329, slightly less than the threshold value of 0.4, the values of other items are all greater than 0.4. All measurement items were retained for this project to maintain the completeness of information. Overall, the measurement of delayed gratification has high reliability.

Table 3. Items for Measuring Delayed Gratification and Their Reliability to the Overall Scale

No.	Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1	I consistently aim to maintain a healthy diet, understanding its long-term benefits.	0.555	0.67
2	I make an effort to think about the long-term impact of my actions on others.	0.469	0.703
3	I endeavor to manage my spending prudently.	0.562	0.668
4	I've always believed that my efforts would ultimately yield rewards.	0.595	0.656
5	I've sacrificed physical comfort and pleasures to achieve my objectives.	0.329	0.753

3.2.3 Financial Behavior Rationality

The rationality of financial behavior is evaluated using four items on a five-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to gauge the perceptions of respondents, as outlined in Table 4. The Cronbach's Alpha for the overall variable measurement is 0.787, surpassing the threshold of 0.7 when the number of items is greater than two. The Corrected Item-Total Correlation values for each individual item all surpass the threshold of 0.4. Therefore, it can be concluded that the measurement of financial behavior rationality demonstrates a high level of reliability.

Table 4. Items for Measuring Financial Behavior Rationality and Their Reliability in Relation to the Overall Scale

No.	Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1	I carefully consider whether I can afford something before making a purchase.	0.603	0.733
2	I repay loans on time.	0.659	0.703
3	I pay close attention to my financial matters.	0.729	0.668
4	I establish long-term financial goals and diligently work towards achieving them.	0.412	0.822

4. Results

4.1 Descriptive Statistics and Correlation Analysis

Table 5. Descriptive Statistics and Correlation

Variable	M	SD	1	2	3
1 Financial knowledge	13.11	4.76	1.00	0.186**	0.324**
2 Delayed Gratification	3.37	0.69	0.186**	1.00	0.380**
3 Financial behavior rationality	3.78	0.84	0.324**	0.380**	1.00**

Note: *p<0.05, **p<0.01, ***p<0.001

SPSS 26.0 was employed for the analysis to investigate the impact mechanism of financial knowledge on the rationality of college students' financial behavior.

Descriptive statistics and correlation analysis of key variables are presented in Table 5. The findings reveal a positive correlation between Delayed Gratification and financial knowledge ($p < 0.01$), along with a positive correlation

between Delayed Gratification and financial behavior rationality ($p < 0.01$).

Furthermore, there is a significant positive correlation between the rationality of financial behavior and financial knowledge ($p < 0.01$).

4.2 The Mediating Effect of Delayed Gratification

To delve deeper into the mediating role of Delayed Gratification in the connection between financial knowledge and the rationality of college students' financial behavior, an analysis was conducted using the Bootstrap method in SPSS 26.0. After adjusting for variables such as age, gender, only-child status, and monthly living expenses, the direct impact of financial knowledge on the rationality of financial behavior is found to be statistically significant with a 95% confidence level ($\beta = 0.06$, $t = 19.13$, $p < 0.001$). The direct influence of financial knowledge on financial behavior rationality continues to be significant, even when Delayed Gratification is introduced as a mediating variable in the PROCESS analysis ($\beta = 0.05$, $t = 15.74$, $p < 0.001$). Moreover, the effect of financial knowledge on Delayed Gratification is found to be significant as well ($\beta = 0.03$, $t = 38.30$, $p < 0.001$), and Delayed Gratification significantly influences financial behavior rationality ($\beta = 0.45$, $t = 20.03$, $p < 0.001$) (see Table 6).

Additionally, the bootstrap confidence interval (CI) for the indirect effect of Delayed Gratification between financial knowledge and the rationality of financial behavior is [0.0103, 0.0154], as shown in Table 7. This interval does not encompass zero, indicating that Delayed Gratification partially mediates the relationship between financial knowledge and the rationality of financial behavior in college students. Therefore, Hypothesis 2 is supported. Combining the results of the direct and mediating effects, we conclude that financial knowledge not only directly promotes the financial behavior rationality of college students but also indirectly facilitates this relationship by enhancing Delayed Gratification.

Table 6. Mediating effect test of Delayed Gratification

Regression(N=4676)		Fitting index			Coefficient signiftcance	
Result	Predictive	R	R^2	F	β	t
variable	variable					
Financial behavior rationality		0.29	0.08	81.49		
	Financial knowledge				0.06	19.13*
	Gender				0.15	4.30*
	Grade				-0.06	-2.87*
	Monthly living expenses				-0.05	-1.52
	Only-child				0.03	0.97
Generalized Delayed Gratification		0.20	0.40	35.99		
	Financial knowledge				0.03	38.30*
	Gender				-0.04	12.92*
	Grade				-0.05	-1.72
	Monthly living expenses				0.04	-3.53*
	Only-child				-0.01	-0.29
Financial behavior rationality		0.41	0.16	141.1		
	Financial knowledge				0.05	15.74*
	Delayed Gratification				0.45	20.03*
	Gender				0.17	5.03*
	Grade				-0.04	-1.91
	Monthly living expenses				-0.07	-2.32
	Only-child				0.03	1.10

Note: In the regression equation, the continuous variable has been substituted with its standardized counterpart.

Table 7. Mediating effect analysis of Delayed Gratification in PROCESS

Mediating variable	Coefficient	Boot SE	Boot LLCI	Boot ULCI
General Delayed Gratification	0.0127	0.0013	0.0103	0.0154

5. Conclusion

This study offers an in-depth examination of the connection between financial knowledge and the rationality of financial behavior among college students, highlighting the mediating effect of Delayed Gratification within this dynamic. The findings highlight that objective financial knowledge significantly enhances the rationality of financial behavior among college students, indicating that financial knowledge can guide students in making correct and rational financial decisions. This discovery complements existing research results in China. Additionally, this research enriches the current body of knowledge by examining the mediating role of Delayed Gratification in the relationship between objective financial knowledge and the rationality of financial

behavior. The results show that enhanced objective financial knowledge in college students may result in greater levels of delayed gratification, thereby enhancing the rationality of their financial decisions.

While this research has made significant progress, it also identifies several limitations. First, the emphasis of this study on Chinese college students could restrict the applicability of its conclusions to broader populations. Second, the exclusive use of self-reported data may lead to response bias. Future studies could improve the validity of findings by including objective metrics for a more thorough evaluation.

6. Future Development

This research holds significant practical implications for financial education and practice:

6.1 Enhancing Financial Knowledge Education

Schools should provide systematic and comprehensive financial knowledge education, including basic knowledge in financial management, investment, and risk management. This approach can assist students in developing a basic comprehension of finance and augment their rationality in making financial decisions.

6.2 Emphasizing the Importance of Delayed Gratification in Education

Schools and educational institutions should incorporate the concept of delayed gratification into financial education curricula and emphasize its importance in fostering rational financial behavior. Through case studies, practical projects, and other methods, students can understand the benefits of delayed gratification for long-term financial goals and be encouraged to practice it in their daily lives.

6.3 Practical Teaching

In addition to theoretical knowledge, schools should provide practical teaching methods such as simulated investment competitions and field studies. By engaging in practical experiences, students can bring theoretical knowledge into real-life contexts, thereby enriching their understanding and awareness of rational financial behavior.

6.4 Providing Personalized Guidance

Schools can offer personalized financial knowledge guidance and counseling based on students' individual levels and needs. This includes regular one-on-one counseling, group discussions, online learning resources, etc., to help students address practical issues and improve the rationality of their financial behavior.

6.5 Establishing a Financial Knowledge Sharing Platform

Schools can establish platforms for sharing financial knowledge, encouraging students to exchange experiences and ideas. This facilitates a deeper understanding of financial knowledge among students while fostering collaboration and communication skills.

6.6 Continuous Evaluation and Feedback

Schools should establish continuous evaluation mechanisms to assess students' financial knowledge and behavior regularly, providing timely feedback. This helps students identify areas for improvement and adjust their learning and behavioral strategies promptly, enhancing the rationality of their financial behavior.

In conclusion, this research provides a new theoretical perspective in the academic field and offers practical suggestions for financial education and practice. It is important to acknowledge some limitations, however. The concentration on Chinese college students in this study may limit the wider applicability of its results. The exclusive use of self-reported data might introduce response bias. Incorporating objective metrics in future research could enhance the validity of the findings. Nonetheless, despite these limitations, the study marks an important advance in grasping the complex aspects of financial literacy and establishes a groundwork for additional investigations across various settings. It contributes significantly to the development of future societal members with comprehensive financial literacy, while also pointing out areas for improvement and expansion in future research efforts.

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