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Financial Literacy and Financial Planning for Retirement: The Mediating Roles of Bias and Attitudes among Laborers in Thailand

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Abstract

Background: Many countries are becoming aging societies, making retirement planning a critical priority. However, limited financial literacy and financial bias hinder laborers’ retirement planning, particularly in Thailand’s Songkhla Province, which is characterized as a semi-urban, multicultural community and a major commercial center in southern Thailand.

Objective: This study examines the relationship between financial literacy and retirement financial planning, with financial biases and attitudes as mediating variables.

Design and Methodology: Data were collected using a questionnaire administered through fieldwork from 400 formal and informal laborers from Songkhla Province in Thailand. The study used proportionate stratified sampling to collect data, which were then analyzed using structural equation modeling.

Results: Financial literacy did not significantly influence retirement financial planning ($\beta = .17, p = .08$), but it significantly influenced financial biases ($\beta = -.66, p < .001$) and financial attitudes ($\beta = .45, p < .001$). Financial biases negatively predicted retirement financial planning ($\beta = -.42, p < .001$) and mediated the relationship between financial literacy and retirement financial planning ($\beta = .28, p < .001$). Similarly, financial attitudes positively influenced retirement financial planning ($\beta = .31, p < .001$) and also served as a mediator ($\beta = .14, p = .02$).

Conclusion and Implications: This study integrates behavioral science and behavioral finance to show how financial literacy shapes attitudes and biases in retirement decisions. The findings highlight its role in improving retirement planning and reducing biases. However, financial literacy alone may be insufficient; thus, policies should promote positive financial attitudes and reduce behavioural biases to enhance effective retirement planning.

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Thailand is rapidly transitioning into an aging society, creating significant macroeconomic and social challenges. According to the World Bank (2021), Thailand is among the fastest-aging countries in East Asia, with the proportion of individuals aged 60 and above projected to exceed 30% within the next two decades. This demographic shift is further exacerbated by economic uncertainties and structural vulnerabilities, including income inequality and insufficient pension coverage (National Statistical Office of Thailand, 2025). These conditions place increasing pressure on public welfare systems and emphasize the necessity for effective retirement planning among the working population.

Despite these macro-level concerns, evidence suggests that retirement preparedness among Thai workers remains inadequate. Despite increasing life expectancy, financial preparation for retirement

remains low. Thailand faces an inadequate pension system and insufficient mechanisms for generating post-retirement income, which could lead to future economic impacts. While the government and financial institutions continue to promote retirement planning, there is still a lack of insight into the deep-rooted causes of this unpreparedness (Ketkaew et al., 2022). Such behavioral patterns indicate a gap between awareness of retirement needs and actual financial preparation, reflecting suboptimal financial decision-making.

Financial literacy has been widely recognized as a key determinant of financial behavior and retirement planning. Previous research indicates that individuals possessing elevated financial literacy are more inclined to participate in retirement savings, investment diversification, and long-term financial planning (Lusardi & Mitchell, 2014; Mustafa et al., 2023, 2025). In Thailand, financial literacy has been associated with enhanced financial outcomes and more judicious financial behaviors; it has been demonstrated that financial literacy and conduct positively impact the growth of net worth across all employment statuses (Janposri, 2021).

Individuals with higher financial knowledge are more likely to engage in effective planning, as they better understand financial concepts, risks, and long-term decision-making. However, studies examining this relationship suggest that it is not always consistent (Lusardi & Mitchell, 2014). Some individuals with adequate financial literacy still fail to engage in proper financial planning, possibly due to factors such as behavioral biases, lack of motivation, or external economic pressures that influence their decision-making. This inconsistency indicates that financial literacy alone may not fully explain financial behavior. In practice, even financially literate individuals may exhibit inappropriate planning behaviors. Conversely, individuals with limited financial knowledge often experience greater financial anxiety and tend to reduce spending (Xue et al., 2021). These findings suggest that additional factors play an important role in shaping financial planning behavior.

Beyond financial knowledge, behavioral and psychological factors, including cognitive biases and personal attitudes, shape how knowledge translates into retirement planning behavior. Both act as mediating mechanisms linking financial literacy to financial decision-making. Behavioral finance suggests individuals often behave irrationally, favoring short-term gains over long-term security (Johnjun & Supanut, 2022). Thus, financial literacy alone may be insufficient (Lusardi & Mitchell, 2014). Prior research revealed that financial biases, such as present bias, overconfidence bias, and anchoring bias (Mittal, 2022; Sudirman et al., 2025), implicitly affect financial decision-making. This effect is particularly evident among the Thai labor force, which includes formal workers who receive regular income and are protected by labor laws. Therefore, it is essential to understand the role of financial biases that may influence workers' behavior.

Similarly, prior research has confirmed the importance of financial attitudes in shaping individuals' intentions to engage in retirement planning (Ahamed & Limbu, 2024). Drawing on the theory of planned behavior (Ajzen, 1991), financial attitudes influence behavioral intentions, which in turn determine actual behavior. While financial literacy enhances individuals' understanding, attitudes determine whether such knowledge is translated into motivation and concrete action. Nevertheless, several important gaps remain: existing studies rarely develop an integrated mediation framework combining financial literacy, financial biases, and financial attitudes; most focus on general consumers rather than specific groups such as the labor force; and empirical evidence from emerging economies remains limited, particularly in capturing socio-economic and cultural diversity (Ingale & Paluri, 2025; Mittal, 2022).

Therefore, this study aims to examine the effect of financial literacy on retirement financial planning among Thai workers, with financial biases and attitudes serving as mediators. Drawing on insights from behavioral finance, this study extends prior research by integrating cognitive biases and attitudinal factors into a framework of financial literacy and retirement planning. It also provides empirical evidence from Thailand, a rapidly aging country where retirement preparedness is increasingly important. Finally, the findings offer practical implications for policymakers and educators, emphasizing the necessity for financial education programs that address both knowledge gaps and behavioral constraints to support more effective and sustainable retirement planning.

Literature Review

This study examines the relationship between financial literacy and financial planning for retirement, with financial biases and financial attitudes as mediating factors. Using behavioral economics theory, the study develops and tests hypotheses linking four variables.

Theoretical Background

Behavioral economics is a branch of economics that expands the concepts and theories of conventional economics by incorporating social and psychological factors. Originally, it was thought that humans made decisions based solely on a rational calculation of the costs and benefits of various options. Market systems suffer from imperfections, risk, uncertainty, and rigidities that hinder the availability of information, according to behavioral economists. Behavioral economics posits that decision-making in such an environment is susceptible to cognitive biases and bounded rationality (Mudzingiri et al., 2018). Therefore, behavioral economics links psychological factors with economic analysis to enhance economic analysis and better understand consumer behavior empirically (Thaler, 2015). In financial and savings contexts, behavioral economics can be implemented.

The life-cycle hypothesis by Modigliani (1966) suggests that individuals plan their consumption and savings throughout their lives to maintain a stable consumption level, but this is not solely based on income during specific periods. The life-cycle hypothesis serves as a conceptual framework for explaining financial planning behavior. Individuals with low incomes may borrow or save less in their early years whereas those with higher incomes can accrue more savings. When they retire, they will spend their money, resulting in a savings pattern that increases during midlife and drops later in life.

This concept acknowledges that financial planning and saving are long-term activities linked to income throughout one's life, impacting both individuals and the economy. The demographic structure also determines the level of national savings. However, while this theory assumes that people are rational and can plan effectively, saving behavior is frequently influenced by psychological factors and behavioral constraints, such as impulsive spending, a lack of financial literacy, and social influences, all of which can lead to poor saving decisions. The nudge theory (Thaler, 2018) further explains that individuals may fail to act even when they have sufficient knowledge due to inertia and behavioral biases. Integrating these perspectives, this study proposes that financial literacy influences retirement planning indirectly through financial biases and financial attitudes, addressing the gap between rational theory and actual behavior.

Financial Literacy and Financial Planning for Retirement

Planning for retirement is the process of preparing for the day when an individual will no longer be employed and receive money from their job. It might be viewed as a strategy to strike a balance between reserves and current spending to guarantee a secure retirement (Tomar, 2021). As a result, retirement saving should begin during one's working years, as effective financial management requires both basic financial knowledge and an understanding of related factors to ensure long-term well-being. Insufficient financial literacy impairs the effectiveness of financial decision-making (Esomar et al., 2025). Individuals with financial literacy possess the ability to comprehend financial matters and concepts, enabling them to make effective financial decisions for their financial well-being. Financial literacy is not limited to knowledge, but also includes understanding principles and applying them effectively, as well as being aware and able to use financial tools appropriately in daily life (Dai et al., 2021). This means that individuals with financial literacy understand that if they want to have significant savings when their income decreases, especially after retirement, they should not spend more than their income (Mustafa et al., 2023). Financial behavior links these aspects together.

Therefore, financial literacy is both a tool for creating personal economic stability and an important factor in financial decision-making that affects long-term quality of life. Financial literacy also fosters a positive financial attitude and impacts financial management (Baptista & Dewi, 2021; Rahayu et al., 2023), and reduces financial bias (Baker et al., 2019; Ozen & Ersoy, 2019). A part of saving for retirement is having the right kind of financial literacy; Mustafa et al. (2023) found that people are more likely to plan

financially for retirement if they are financially literate. Therefore, financial literacy promotes financial planning for retirement. Thus, the following hypotheses are proposed.

H1: Financial literacy has a positive effect on financial planning for retirement.

H2: Financial literacy has a negative effect on financial biases.

H3: Financial literacy has a positive effect on financial attitudes.

Financial Literacy, Financial Biases, and Financial Planning for Retirement

Financial biases can be linked to behavioral economics concepts because they encourage the use of psychological principles to understand people's decisions and behaviors. Financial decision-making accentuates the present bias, which is a prejudice caused by current preferences or prioritizing the now over the future. For example, being content with current consumption beyond necessity results in a lack of future savings. This financial conduct may result in a failure to repay debts on time due to a lack of debt payback preparation. Behavioral economists argue that people often struggle to make rational decisions, as evidenced by present bias, the tendency to prefer immediate money over spreading wealth across time.

Research in behavioral finance consistently demonstrates that cognitive biases significantly distort individuals' financial decisions (Almansour et al., 2023; Kartini & Nahda, 2021), especially in retirement planning, which necessitates long-term decision-making and rigorous discipline. The work of Tanuatmodjo et al. (2024) shows that both emotional biases, such as self-control bias and regret aversion, as well as cognitive biases, such as overconfidence and representativeness, significantly affect retirement planning behavior.

The key mechanism is that biases act as a distortion of decision-making by causing individuals to prioritize irrelevant factors or evaluate information irrationally. For example, a lack of self-control leads to the choice of current consumption over saving for the future while overconfidence may result in underestimating risks, thus making financial plans less prudent. Additionally, Lestari et al. (2025) also pointed out that financial anxiety exacerbates biases, causing individuals to avoid planning or to fail to make effective decisions. Therefore, financial biases tend to have a negative impact on retirement planning. Although numerous studies have found that financial literacy directly affects retirement planning (Baker et al., 2019; Ozen & Ersoy, 2019), the mechanistic explanation is still insufficiently clear. This study proposes that financial biases act as a mediator between knowledge and planning behavior.

The primary mechanism is that financial knowledge aids in enhancing rational thinking, which allows individuals to process information, assess alternatives, and gain greater awareness of their cognitive biases. As the level of knowledge increases, the tendency for biases such as herding or overconfidence decreases, resulting in more rational financial decisions. On the other hand, when biases are reduced, individuals can plan for retirement more effectively, as they are not overwhelmed by poor decisions or momentary emotions. Therefore, financial knowledge not only directly impacts planning but also indirectly through bias reduction, resulting in the subsequent hypotheses.

H4: Financial bias has a negative effect on financial planning for retirement.

H5: Financial bias mediates the relationship between financial literacy and financial planning for retirement.

Financial Literacy, Financial Biases, Financial Attitudes, and Financial Planning for Retirement

Financial attitudes are considered an important factor that influences an individual's financial management behavior. It has been found that those with a positive outlook on finances tend to manage their money more effectively. Psychologically, financial attitudes reflect an individual's internal state regarding financial issues. Financial attitudes are a psychological response to various financial situations or information, which may manifest through feelings, opinions, or interpretations related to money management. These attitudes can thus be regarded as psychological indicators that affect financial decisions and actions (Banthia & Dey, 2022). Over the past few decades, academic communities have debated the

significance of the idea of financial attitudes. Research studies attempting to investigate the connection between financial attitudes and other financial-related characteristics are becoming increasingly numerous.

Aside from biases, financial attitudes are another important factor that influences planning behavior. Research by Baptista and Dewi (2021) and Moko et al. (2022) found that positive attitudes are positively correlated with appropriate financial behaviors, including saving and investing. Financial attitudes are a key mechanism that helps determine behavioral predispositions such as discipline, responsibility, and future orientation, all of which are important factors in retirement planning. Rahayu et al. (2023) pointed out that a positive attitude leads to effective financial management, while Dai et al. (2021) and Mustafa et al. (2023) found that attitudes and confidence encourage individuals to start planning for retirement seriously. Furthermore, self-confidence also helps individuals to make financial planning decisions even in volatile market conditions, resulting in more continuous and effective planning.

Although financial literacy is a crucial foundation, translating it into behavior requires psychological mechanisms. In this context, financial attitudes, enhanced by financial knowledge, increase confidence and perceived control, leading individuals to have a positive attitude toward managing their finances. When individuals understand financial concepts, they gain confidence in decision-making and are more motivated to plan for the long term. These positive attitudes, such as future orientation and discipline, directly influence retirement planning behavior. In particular, people who have positive attitudes are more likely to start planning early, save regularly, and handle risks better. Therefore, financial knowledge indirectly affects retirement planning by fostering appropriate attitudes, which serve as significant mediating variables, leading to the subsequent hypotheses.

H6: Financial attitudes have a positive impact on financial planning for retirement.

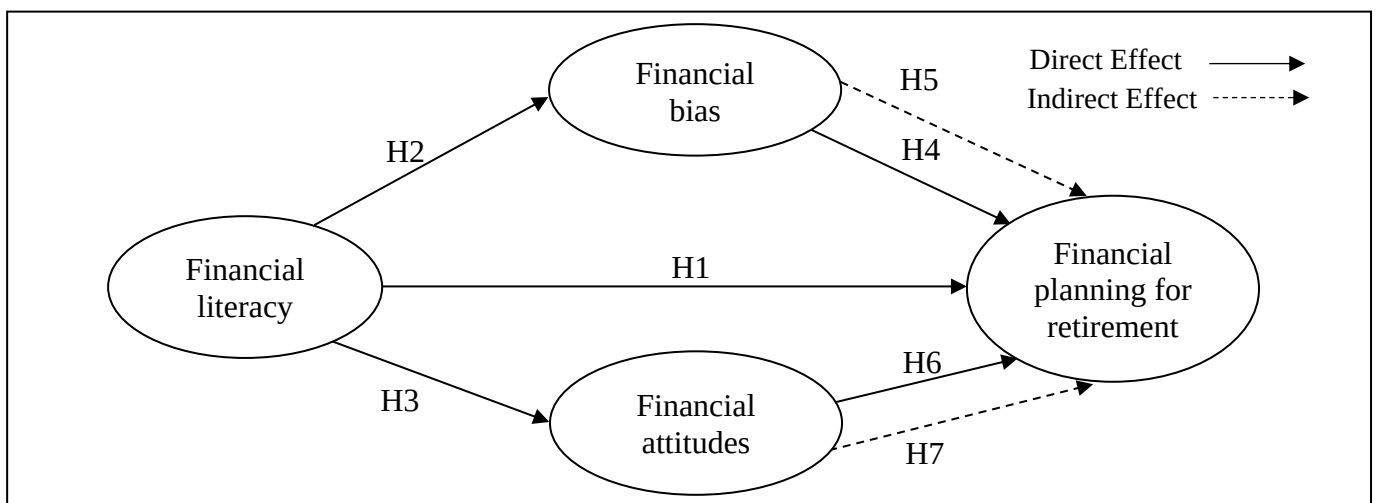
H7: Financial attitudes mediate the relationship between financial literacy and financial planning for retirement.

Conceptual Framework

The conceptual framework in Figure 1 derives from theory and hypotheses.

Figure 1

Proposed Conceptual Framework



Method

Research Design

This study adopted a quantitative research approach, with laborers as the unit of analysis. Data were collected through a structured questionnaire to examine the relationships among financial literacy, financial biases, financial attitudes, and retirement planning.

Population and Sample

The research population comprised 914,188 formal and informal workers in Songkhla Province, Thailand (Provincial Labour Office Songkhla, 2024), including government, private-sector, and self-employed workers. Hair et al.'s (2019) criteria were used to select the sample size of labor, which indicates that the sample-to-parameter ratio should be 10:1, 15:1, or 20:1 to be sufficient for confirmatory factor analysis (CFA). There were 21 observable variables discovered. As a result, the sample group must include at least 210–420 laborers. To guarantee statistical validity, the sample size comprised 400 workers, as determined by Yamane's (1967) calculations, and the minimum appropriate sample size for data analysis using structural equation analysis was determined to be 400 (Hair et al., 2019). Accordingly, a final sample of 400 workers was considered adequate for SEM analysis, in line with the recommendations of Hair et al. (2019), while the Yamane formula was used as a supplementary reference to support sample adequacy.

Sampling and Procedures

This study employed a stratified proportional sampling method by dividing the research area into districts. Representatives were selected from all 16 districts in Songkhla Province, including four districts with populations exceeding 100,000 residents: Hat Yai District, Mueang Songkhla District, Sadao District, and Chana District. Together, these districts account for a substantial proportion of the province's population and represent key economic zones, including urban, semi-urban, and border trade areas. This selection was intended to capture socio-economic diversity. In the next stage, convenience sampling was used within each selected district to recruit respondents from accessible labor groups. Participants were approached at workplaces, local markets, commercial areas, and community centers where laborers are commonly concentrated. This approach was adopted due to the absence of a comprehensive sampling frame of workers and practical constraints in accessing dispersed labor populations.

The inclusion criteria required participants to be: (1) at least 18 years old; (2) currently employed in the labor force (including government, private sector, or self-employed workers); and (3) residing or working in the selected districts. While the sample includes diverse occupational groups, this heterogeneity reflects the actual structure of the labor force in the study area during the data collection period of 3 months, which spanned from May 2025 to July 2025. After data cleaning to remove incomplete or invalid entries, 400 valid observations were retained for final analysis.

Instruments

A multi-item quantitative research questionnaire with a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used for all variables. All the questions have been adapted and derived from the original research, which has been developed and reviewed, to ensure consistency with the theoretical framework and the content being studied. The questionnaire was originally developed in English and translated into Thai using a back-translation procedure to ensure semantic equivalence. Discrepancies were reviewed and resolved to maintain conceptual consistency (Brislin, 1970). The financial retirement planning factors were assessed using Antoni et al.'s (2020) 6-item scale. Furthermore, the financial literacy factors were assessed using a 3-item scale from Nguyen et al. (2022), whereas the financial attitude variables were assessed using a four-item scale from Jalil et al. (2013). Elhoussein and Abdelgadir (2020) utilized four questions to assess cognitive biases, and Ritika (2022) used four questions to assess emotional biases. The last measure, financial biases, was assessed with eight questions. In addition to theoretical justification, confirmatory factor analysis (CFA) provide empirical support for combining financial bias into a single construct. All items demonstrated strong factor loadings and acceptable reliability and validity, reflecting a common underlying dimension (Hair et al., 2019). All items demonstrated strong factor loadings and acceptable reliability and validity, supports the use of a unified financial bias construct. Although cognitive and emotional biases may be conceptually distinct, they were modeled as a single construct in this study due to their shared influence on financial decision-making and empirical support from the measurement model.

The measurement tool of this study has passed the content validity assessment of the research instrument using the item objective congruence (IOC) method, with three experts who have relevant experience reviewing and evaluating the tool, resulting in an IOC value that meets the requirements. Each question has an IOC value ranging from 0.67 to 1.00, with an overall IOC value of 0.94, indicating that the questionnaire is highly consistent with the measurement objectives and is suitable for data collection. The questionnaires were distributed through field visits to ensure that data collection covered a wide range of labor groups, such as government, private, and independent workers. Data collection depends on field visits to gather information directly, as outlined in the analysis. All procedures conducted in this study involving human subjects adhered to established ethical standards.

Data Analysis

This study employed structural equation modeling (SEM) to examine the hypothesized relationships among financial literacy, financial biases, financial attitudes, and retirement planning. SEM was selected because it enables the simultaneous estimation of both the measurement model and the structural relationships among latent constructs while accounting for measurement error. Furthermore, SEM is particularly suitable for testing complex models involving multiple latent variables and mediation effects. The mediating effects of financial biases and financial attitudes were examined using a bootstrapping procedure with 5,000 resamples to estimate indirect effects and their corresponding confidence intervals. Data analyses were conducted using Mplus version 8.7. Model fit was evaluated using multiple goodness-of-fit indices, including $\chi^2/df < 2.00$, Comparative Fit Index (CFI) $> .90$, Tucker–Lewis Index (TLI) $> .90$, Root Mean Square Error of Approximation (RMSEA) $< .08$, and Standardized Root Mean Square Residual (SRMR) $< .08$ (Hair et al., 2019).

Results

Sample Characteristics

According to the sample profiles, there was a greater number of female respondents (64%) than male respondents (36%). The largest age group was between 31 and 40 years old. Most of the respondents were operating level employees (41.30%). The largest income group was 10,001–20,000 Thai Baht (approximately USD 280–560; 49.80%), followed by less than 10,000 Thai Baht (approximately USD 280; 19%), as shown in Table 1.

Table 1
Demographic Profile of the Respondents (n=400)

Demographics	Frequency	Percent (%)
Gender		
Male	144	36.00
Female	256	64.00
Age in years		
21–30	96	24.00
31–40	146	36.50
41–50	108	27.00
51–55	50	12.50
Position at work		
Business owner	26	6.50
Operating level	165	41.30
Supervisor level	151	37.80
Other	58	14.50
Average monthly income (Baht)		
Less than 10,000	76	19.00
10,001–20,000	199	49.80
20,001–30,000	55	13.80
More than 30,000	70	17.50

Descriptive Results

The mean values ranged from 2.13 to 4.08, the standard deviations from .81 to 1.02, and the research variables' correlation coefficients were significant from -.60 to .54. All correlations were below .90, indicating no multicollinearity (Hair et al., 2019), as presented in Table 2.

Table 2

Means, Standard Deviations, and Correlation among the Study Variables

Variables	<i>M</i>	<i>SD</i>	1	2	3	4
Financial retirement planning	4.08	0.84	1			
Financial literacy	3.76	1.02	.48**	1		
Financial biases	2.13	0.96	-.59**	.60**	1	
Financial attitude	4.22	0.81	.54**	.38**	.34**	1

Note. ** $p < .01$.

Furthermore, convergent validity was established because all factor loadings were within the allowed range of .67 to .94. The composite reliability (CR) of constructions ranged from .87 to .94 while the average variance extracted (AVE) values ranged from .64 to .70. Cronbach's alpha coefficients exceeded the recommended threshold of .70 (Nunnally, 1978), indicating satisfactory internal consistency, as presented in Table 3.

Table 3

Construct Reliability and Validity

Construct	Factor loading	R^2	α	CR	AVE
1. Financial retirement planning (FRP)			.93	.93	.69
FRP1	.75	.56			
FRP2	.89	.78			
FRP3	.89	.79			
FRP4	.87	.76			
FRP5	.86	.73			
FRP6	.73	.52			
2. Financial literacy (FLI)			.89	.87	.70
FLI1	.70	.50			
FLI2	.87	.76			
FLI3	.92	.83			
3. Financial biases (FBI)			.94	.94	.66
FBI1	.88	.77			
FBI2	.91	.82			
FBI3	.94	.89			
FBI4	.83	.69			
FBI5	.75	.56			
FBI6	.76	.57			
FBI7	.72	.52			
FBI8	.67	.44			
4. Financial attitude (FAT)			.86	.88	.64
FAT1	.86	.74			
FAT2	.85	.71			
FAT3	.79	.64			
FAT4	.70	.47			

Note. α : Cronbach's alpha reported in parentheses, CR: Composite reliability, AVE: Average variance extracted.

Hypotheses Testing Results

The SEM after model modification indicated that the estimated model fit the data well ($\chi^2 = 398.70$, $df = 182$, $\chi^2/df = 2.19$, $p < .01$, RMSEA = .07, CFI = .94, TLI = .93, SRMR = .07). CFA was used to test the measurement model (construct validity), whereas SEM was used to test the structural model (hypotheses). Table 4 shows the results of direct and indirect structural model tests. Furthermore, the analytical evidence supports six out of the seven assumptions.

Table 4

The Results of Direct and Indirect Structural Model

Effects	Hypothesis	Relationships	β	SE	p-value	95% CIs		Results
						LLCI	ULCI	
Direct	H1	LIT $\rightarrow$ FRP (+)	.17	.09	.08	-	-	No Supported
	H2	LIT $\rightarrow$ BIA (-)	-.66	.07	.00	-	-	Supported
	H3	LIT $\rightarrow$ ATT (+)	.45	.09	.00	-	-	Supported
	H4	BIA $\rightarrow$ FRP (-)	-.42	.10	.00	-	-	Supported
	H6	ATT $\rightarrow$ FRP (+)	.31	.10	.00	-	-	Supported
Indirect	H5	LIT $\rightarrow$ BIA $\rightarrow$ FRP	.28	.07	.00	.03	.25	Full Supported
	H7	LIT $\rightarrow$ ATT $\rightarrow$ FRP	.14	.06	.02	.14	.42	Full Supported

Note. FRP: Financial retirement planning, LIT: Financial literacy, BIA: Financial biases, ATT: Financial attitudes, CIs = 95% bootstrap confidence intervals, LLCI = lower limit confidence interval, ULCI = upper limit confidence interval.

Discussion and Conclusion

Discussion of Main Results

This study utilized the life-cycle hypothesis and behavioral economics perspectives, particularly bounded rationality and nudge theory, as an analytical framework to examine how cognitive knowledge interacts with psychological and behavioral mechanisms in shaping long-term financial decision-making. From a behavioral economics perspective, this study operationalizes bounded rationality and cognitive limitations through financial bias (e.g., present bias, overconfidence, and anchoring) and captures psychological attitudes through financial attitudes. Financial literacy is modeled as a cognitive resource; however, the results indicate that it does not directly influence retirement planning. Instead, its effect is fully mediated by financial bias and financial attitude. This finding suggests that financial knowledge shapes retirement planning only through behavioral and attitudinal channels, which is consistent with behavioral economics, that posits that individuals rely on heuristics and exhibit systematic biases in financial decision-making.

First, the relationship between financial literacy and retirement planning behavior is not directly significant. Consistent with recent Asian evidence, Jiang and Shimizu (2025) found no direct effect of financial literacy on retirement planning. This suggests that financial literacy alone does not immediately translate into planning behavior but operates indirectly through mediating variables. Consistent with behavioral economics, individuals are not fully rational and are influenced by psychological factors in financial decision-making (Thaler, 2018). Thus, financial literacy may need to be transformed into favorable attitudes and reduced biases before affecting retirement planning. This finding supports prior studies highlighting the mediating role of behavioral and attitudinal factors (Ahamed & Limbu, 2024). However, it differs from studies in developed countries reporting a direct positive effect of financial literacy on retirement planning (Boisclair et al., 2017; Kalmi & Ruuskanen, 2018). The present study extends the literature by showing that, in a Thai context, the effect of financial literacy may be indirect rather than direct.

Second, financial literacy is negatively related to financial bias (H2). Financial bias negatively influences retirement planning and mediates the effect of financial literacy on retirement planning (H4 and

H5). This is consistent with the concept of cognitive biases as systematic deviations from rational judgment. Individuals with higher financial literacy are less likely to rely on mental shortcuts such as overconfidence, loss aversion, misinterpretation, or present bias when making financial decisions and are more likely to recognize and mitigate the effects of biases such as overconfidence, present bias, or anchoring, thereby making more future-oriented and prudent decisions. This finding suggests that financial literacy can function as a debiasing mechanism by improving individuals' analytical thinking and risk evaluation ability.

The findings show that financial literacy does not exert a significant direct effect on financial planning; rather, its influence operates indirectly through the mitigation of financial biases. By enhancing individuals' analytical capacity and risk evaluation, financial literacy reduces susceptibility to bias, which in turn shapes planning behavior. The identification of financial bias as a full mediator (Ahamed & Limbu, 2024) suggests that knowledge alone is insufficient for rational financial decisions, as limited financial knowledge often increases anxiety and reduces spending (Xue et al., 2021). This finding aligns with behavioral economic theory, which challenges the assumption of fully rational *homo economicus* and emphasizes that decision-making is systematically influenced by affect, heuristics, and short-term preferences (Thaler, 2015). Accordingly, effective interventions should extend beyond providing knowledge by strengthening self-efficacy and fostering long-term goal orientation to improve financial behavior.

The result contributes to behavioral economics by providing empirical evidence that cognitive improvement can partially mitigate behavioral distortions in financial decision-making. This reinforces the debiasing function of education as proposed by behavioral scholars such as Ozen and Ersoy (2019), whose study found that increasing individuals' financial literacy reduces cognitive biases and heuristics. In addition, financial literacy leads to variances in cognitive biases with people who do not acquire financial education having different cognitive biases to those who do. Tanuatmodjo et al. (2024) found that the self-control component influences individual investment decisions. Self-control refers to an individual's ability to direct his own conduct as well as repress or inhibit existing urges. Self-control can be utilized to reduce unnecessary spending and make retirement planning decisions. Financial literacy helps to minimize financial prejudices (Baker et al., 2019).

Third, the data show that financial literacy increases financial attitudes (as predicted by H3), implying that financial knowledge improves cognitive understanding and affects psychological orientation toward financial management. Individuals with higher financial literacy are more likely to acquire good attitudes toward saving, long-term planning, and fiscal discipline (Lusardi & Mitchell, 2014). In behavioral economics, attitudes are internal motivating structures that determine how people turn knowledge into action. This research lends support to the theory that economic conduct is influenced not only by rational calculation, but also by psychological readiness and emotional comfort with financial planning.

Additionally, the findings show that financial attitudes considerably increase retirement planning behavior (H6) and mediate the association between financial literacy and retirement planning (H7) and H6 and H7 are consistent with behavioral economics. The findings indicate that emotions, perceptions, and attitudes serve as motivational drivers, transforming financial information into actual conduct. This mediating mechanism demonstrates that individuals do not automatically employ financial information in real-life decisions (Lusardi & Mitchell, 2014) unless they have positive psychological views about long-term financial security. This is consistent with behavioral economic theory, which holds that affective and psychological elements influence financial decision-making. Retirement planning is thus more than just a computation (Goda et al., 2023); it is influenced by behavioral inclinations that can be modified by education and attitude changes, such as fostering a positive outlook on financial security and understanding the long-term benefits of saving (Ajzen, 1991; Lusardi & Mitchell, 2014).

From a practical standpoint, improving retirement preparedness should go beyond financial literacy alone. Financial education should be combined with behavioral interventions that reduce decision biases and encourage saving behavior (Lusardi & Mitchell, 2014). Tools such as nudges, default enrollment, and simplified planning options may improve retirement decisions. Workplace-based programs can also

strengthen long-term financial awareness and disciplined saving. In addition, interventions that promote goal setting, future orientation, and financial self-efficacy may enhance retirement planning outcomes (Ajzen, 1991).

Finally, the study contributes to behavioral economics by showing that financial literacy influences retirement planning indirectly through financial bias and financial attitude. The results suggest that cognitive limitations and financial biases can hinder the conversion of knowledge into effective financial decisions, whereas positive financial attitudes encourage long-term retirement planning behavior.

Limitations

Several limitations should be acknowledged. First, the sample was confined to formal and informal laborers in Songkhla Province, which may limit the generalizability of the findings to other regions or labor contexts in Thailand. Furthermore, employing a convenience and heterogeneous sample may result in sampling bias, as the respondents may not accurately reflect the larger workforce population. This limitation may affect the stability and external validity of the mediation model, particularly in terms of how financial literacy, financial biases, and financial attitudes interact across different demographic and socio-economic groups. Second, the study employed a cross-sectional survey design which restricts the ability to capture dynamic changes in financial literacy, financial attitudes, and behavioral biases over time, as well as to infer causal relationships among these constructs. As these factors may change with life and economic conditions, their relationships may differ over time. Finally, financial literacy was measured using only three items, which may not fully capture its multidimensional nature and could affect the accuracy of the mediation estimates, particularly in understanding how different aspects of financial literacy influence financial attitudes and behaviors.

Implications for Behavioral Science

This study advances behavioral science by using a behavioral economics framework to explain retirement planning as a behavior shaped by bounded rationality, psychological biases, and attitudes. Specifically, it demonstrates that financial literacy influences retirement preparedness indirectly through behavioral mechanisms such as financial bias and attitude, highlighting how cognitive capacity is translated into actual financial behavior.

The findings suggest that behaviorally informed policies that focus on decision-making under uncertainty and savings behavior can enhance retirement planning outcomes. Integrating personal finance education based on behavioral principles into secondary and higher education, along with “nudge”-based interventions like default (opt-out) retirement enrollment, may improve long-term financial readiness. Future research should further examine how different behavioral biases influence financial planning and identify effective strategies to reduce these barriers.

Conclusion

This research confirms that financial literacy plays a crucial role in substantially diminishing financial biases among both formal and informal laborers in Songkhla Province, Thailand. Financial literacy positively impacts post-retirement financial planning, with biases and financial attitudes serving as mediators, in alignment with behavioral economics theory. This contributes to the literature by incorporating psychological and behavioral finance principles, which aid individuals in understanding the importance of financial literacy, attitudes, and biases. Furthermore, pertinent agencies could establish effective behavioral interventions to promote financial planning for retirement.

Declarations

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