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Time Orientation and Mental Accounting: Examining Indirect Effects of Financial Literacy and Impulsivity

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With a wide variety of complex financial assets and securities available in the market, individuals often struggle with their financial planning due to a lack of financial literacy, high impulsivity, and short-term time orientation, hampering their financial satisfaction. The current study examines the yet unexplored indirect effect of investors' time orientations on mental accounting through financial literacy and impulsivity. We conducted a cross-sectional survey and collected 162 active investors' responses via structured questionnaires distributed in both online and offline portals across India to gauge their financial literacy, time orientation, impulsivity, and mental accounting. We used Smart PLS-4 software along with structural equation modeling to test the direct and indirect effects of time orientation on mental accounting. Findings support the statistical significance of the indirect effect of time orientation on mental accounting through financial literacy and impulsivity. In other words, the way an individual perceives time has an impact on the categorization of incomes and expenses. Moreover, impulsiveness and financial literacy play a key role in between. The findings of this study contribute to the discipline by advancing a model for predicting investors' mental accounting, as well as partially answering the question of why, if mental accounting is so important, many individuals do not use it for their investment decisions. This study's findings offer suggestions on how investors can be influenced to use this model. Moreover, this study suggests how financial therapy and counseling can play a critical role in improving the financial health and well-being of individuals.

Keywords: impulsivity; time-orientation; financial literacy; mental accounting; investor well-being

INTRODUCTION

Investor behavior has undergone a transformation over the last several decades. This has been partly the cause and partly the result of the emergence of a wide variety of complex financial products available in the financial market. Individual investors tend to struggle with their financial planning in the presence of a lack of financial literacy, high impulsivity,

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and present-oriented behavior, which consequently hampers an investor's financial well-being. Literature suggests mental accounting plays a crucial role for individual investors in managing and categorizing funds and, thus, assists in financial planning. The theater ticket study of Kahneman and Tversky conducted in 1981 offered the first-ever empirical substantiation of individuals controlling, spending, and budgeting through psychological accounting. Later, several studies collectively argued that humans have gone against the principles of *Homo Economicus* by breaking the financial premise of fungibility (i.e., money does not have labels). It is important to comprehend the ways in which mental accounting might affect a wide range of intricate financial choices made by households on a regular basis (Zhang & Sussman, 2017). Mental accounting is usually understood using the cognitive principles of categorization since these principles are identical to those underlying the categorization of things or events in general (Heath & Soll, 1996; Henderson & Peterson, 1992). This categorization improves cognitive efficiency by making it easier to quickly recall, evaluate, and make decisions on pertinent information. In the absence of such classification, a person would have to take into account their entire financial portfolio while making almost any financial decision.

A concept similar to mental accounting is time orientation. An expansive body of literature points towards the significance of studying time as a factor in any phenomenon. Surprisingly, although time is an important dimension of psychology and finance, little empirical work has been done to examine how time orientation can be significant in studying the variance in mental accounting.

Additionally, we discovered that out of two broad aspects of mental accounting (consumption and investment), a consumption point of view is often explored, but there are limited studies on the context of investing decisions. Our study suggests that investors indulge in mental accounting while making and altering investment decisions. For instance, investors might segregate investments into speculative and safe portfolios and rewards into certain and uncertain or delayed, thereby expecting to prevent the portfolio's overall returns from being negatively impacted by any unfavorable speculative investment outcome. The aim of the current research is to bridge these gaps by exploring a connection between time orientation and mental accounting from an investor's point of view.

Similarly, impulsivity as a psychological concept is closely tied to temporal orientation. Impulsivity is defined as a personality trait marked by quick decisions made without consideration of the potential negative outcomes (DeYoung & Rueter, 2010). Since the theory of mental accounting is also regarded as the theory of self-restraint, it is prudent to hypothesize that people high on impulsivity or poor self-control have a tendency to not indulge in mental accounting (Antonides & Ranyard, 2017). To date, there have been limited studies that have explored this aspect (Muehlbacher & Kirchler, 2019; Olsen et al., 2019).

Notably, very few researchers have assessed the relationship between financial literacy and mental accounting. In the literature, financial planning appears to coincide with standard concepts of money management and mental accounting (Muehlbacher & Kirchler, 2019). Baker et al. (2019) tried to explore the relationship between financial literacy and mental accounting and found a positive correlation between them. However, the authors did

not study the causation effect. More recent studies that incorporated financial literacy to study its impact on mental accounting gave contrasting results, from arguing no relation (Olsen et al., 2019) to concluding mental accounting is linked to higher financial literacy (Muehlbacher & Kirchler, 2019).

In summary, more research is needed to identify how a person's time orientation may encourage or inhibit impulsivity and financial literacy and, thus, enable individuals to use mental accounting. This study primarily advances understanding of how a person's orientation of time towards investment improves their mental accounting by reducing impulsivity and increasing financial literacy.

A household that attempts to save and invest for the future needs of themselves, their spouse, children, retired parents, or extended family must have a future-oriented (long-term time orientation) approach and a high level of financial literacy with reduced impulsivity. This will lead them to classify their future expenses and help them to invest in diversified portfolios in order to hedge against risky fluctuations.

Moreover, mental accounting through the categorization of funds aids not just in avoiding risk associated with portfolios, but also because it leads to the systematization of budgets of a household, reducing the level of financial anxiety and improving financial health. Financial counseling and therapy in this context is as necessary as accumulating financial knowledge because young individuals tend to seek pleasure in the present (in the form of consumption or leisure) rather than deriving utility at a later point. For sustaining a long-term oriented approach, it is imperative to tradeoff the smaller sooner reward for the larger later reward (Oberrauch & Kaiser, 2022). Impatience or impulsivity obstructs this tradeoff (Koo & Lim, 2021). Thus, financial therapy and counseling can have a key role in moderating the level of financial literacy and impulsivity to provide a far-sighted outlook to individuals.

The objectives of this research are hereunder: (a) to investigate the link between time orientation (long-term and short-term) and mental accounting; (b) to examine the indirect effect of time orientation on mental accounting through non-planning impulsivity; (c) to inspect the indirect effect of time orientation on mental accounting through financial literacy; and (d) to examine the indirect effect of time orientation on mental accounting via financial literacy and impulsivity. The following section of this paper examines the literature review, theoretical underpinnings of time orientation and mental accounting, the motivation of this research, and the formulation of hypotheses.

LITERATURE REVIEW

Theoretical Background and Research Motivation

Time has been recognized as an important determinant in psychology, economics, and their well-known subfields like investor and buyer behavior (Amyx & Mowen, 1995; Bergadaa, 1990; Guy et al. 1994). As observed by several researchers, most of life's essential decisions are inter-temporal. From retirement savings to educational investment choices to nutrition and lifestyle choices. The majority of these decisions entail deferring satisfaction

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obtained from leisure or consumption to earn utility in the future (Oberrauch & Kaiser, 2022). A large body of research on time perspective suggests that it is important to break down this extremely wide concept into various components. Three temporal models—(a) linear-separable, (b) circular-traditional, and (c) procedural-traditional—were presented by Guy et al. (1994) and are studied across various disciplines. On the other hand, social scientists have employed a binary notion of temporal orientation: present and future time orientation (e.g., Amyx & Mowen, 1995; De Volder, 1979; Gjesme, 1979, 1983).

Regardless of the viewpoint, we assert that the role of time is pivotal to the mental mapping and accounting that individuals perform prior to engaging in decision-making behavior. When confronted with a choice, people engage in a mental accounting process when they weigh the costs and benefits of meeting their immediate wants while also considering potential long-term effects and the cost of mitigating those implications. A more common example is spending all of one's income on necessities rather than setting aside money for personal future needs and general well-being, or even for a child's future needs. The process of resisting the urge to consume now and save for tomorrow requires self-control. Self-control has been connected to a variety of terms, including self-regulation, ego strength, self-discipline, willpower, and lack of compulsiveness and impulsivity (Ainslie, 1975; Baumeister et al., 1998, 2008; Hoch and Loewenstein, 1991; Metcalfe & Mischel, 1999).

Mental budgeting is the tool employed for segregating as well as monitoring the distribution and usage of funds among distinct accounts having either implicit or explicit spending caps called *budgets* (Galperti, 2019). Extensive research has addressed mental budgeting (Abeler & Marklein, 2017; Antonides & Groot, 2022; Ferber & Lee, 1974; Frederick, 2005; Karlsson et al., 1997). Effective financial management requires knowledge about the purpose and advantages of budgets (Krishnamurthy & Prokopec, 2010). This research aims to explore the relationship between time and mental accounting and examine the interplay of closely related attributes like impulsivity and financial literacy therein. The next four sections will highlight the literature review, conceptual model development, and hypotheses development.

Time Orientation and Mental Accounting

Time orientation refers to how people position themselves in relation to time (Chakhovich, 2019). Future-time orientation, goal orientation, and high success have been found to be positively correlated (Gjesme, 1979). Arguably, future planning may not be appealing to someone with a strong present-time orientation (Guzman et al., 2019). They would rather enjoy life now than postpone gratification and may feel that the act of planning somehow takes away from enjoying life in the present. Contrarily, individuals having stronger future-time orientation have higher chances of putting off gratification, saving money, and making plans for the future (Cheng et al., 2012; Klineberg, 1968).

Mental accounting is closely knit with time preference and issues of self-control. Shefrin and Thaler (1988) observed that an individual was more likely to consume from a

current income account compared to current or future asset accounts. This effect was explained by Karlsson et al. (1997) as a concern of *future effects* while using current assets. Interestingly, mental accounts are seen by Cheema and Soman (2006), and Wertenbroch (2001) as a tool for self-control. Even for customers who use credit cards, Huffman and Barenstein (2005) found evidence of a decrease in spending between pay days, indicating a reluctance to borrow and spend money from a future income account. These studies imply a connection between mental accounting and future-time orientation. Empirically, present-time orientation was negatively correlated with mental budgeting in the Dutch population, suggesting that impatient consumers avoid mental budgeting (Antonides et al., 2011). Similarly, mental budgeting was found to be positively impacted by long-term time orientation, indicating that patient individuals use it if they can see its long-term benefits.

In contrast, Muehlbacher and Kirchler (2019) found in their exploratory study that short-term and long-term time orientations had no statistically significant relation with mental accounting. They found mental accounting to be associated with both time orientation measures (e.g., negatively correlated with short-term orientation and positively correlated with long-term orientation); however, causation was not established. While controlling for three types of impulsivities in the regression analysis, long and short-term time orientations lost their importance. This provided an indication of an indirect effect of time orientations on mental accounting via impulsivity. For example, long-term time orientation may lead to decreased impulsivity, resulting in an increase in mental accounting. Contrarily, short-term time orientation may lead to an increase in impulsivity, further leading to a decrease in mental accounting (e.g., indulging in swing trading as opposed to long-term investments). The findings for time orientation and impulsivity, taken together, lend support to the idea that mental accounting is a theory of self-control. In light of this evidence from the literature, time orientation may have a direct relationship with mental accounting. Thus, we propose the following hypotheses:

H1(a)- There is a positive relationship between long-term orientation and mental accounting.

H1(b)- There is a negative relationship between short-term orientation and mental accounting.

Non-planning Impulsivity

Impulsivity is a multidimensional construct characterized as the pathological aspect of risk-taking behaviors. It denotes a very strong tendency to participate in risky, impromptu activities as well as hasty decisions and spontaneous actions. Thus, impulsivity manifests mostly as difficulties with self-control and the inability to defer satisfaction (Rzeszutek et al., 2015). Impulsivity is regarded as a personality trait in behavioral research, portrayed by fast, spontaneous behaviors in the absence of consideration for any negative effects. In the literature, the three subtypes of impulsivity are frequently distinguished: (a) non-planning impulsivity, (b) motor impulsivity, and (c) attentional impulsivity (Meule et al., 2011).

Wertenbroch (2001) conducted a field experiment that provided direct evidence of the link between the need for self-control and deliberate debt aversion, demonstrating that

people who received a high score on an impulsivity scale had a preference for cash payment rather than credit, indicating not just their distinct mental accounts of current assets, current income, and future income, but also their different marginal propensity to consume from these accounts. In their study of susceptibility to behavioral biases, Rzeszutek et al. (2015) discovered no association between the tendency to use mental accounting and impulsivity. Contrarily, in the context of intended tax planning, Olsen et al. (2019) observed that low impulsivity promotes mental accounting, consequently increasing tax planning. Although all three types of impulsivities—namely, attentional, motor, and non-planning impulsivity—were discovered to be negatively correlated with mental accounting in Muehlbacher and Kirchler's (2019) zero-order correlation analysis, which is a technique to evaluate the linear relationship between two variables without taking into account the influence of other variables. Only the subtype of non-planning impulsivity showed a significant relationship when all three types of impulsivities were evaluated simultaneously in a regression analysis. Thus, we decided to limit the measures of impulsivity to non-planning impulsivity only while constructing our model.

Likewise, there exist contrary claims in the literature regarding the relationship between mental accounting and time orientation in reference to impulsivity. As opposed to previous findings, Antonides et al. (2011) revealed no significant relationship between short or long-term temporal orientation and mental accounting. However, in their zero-order correlation analysis, both measures of temporal orientation—long-term and short-term—were linked to mental accounting and the three types of impulsivity, especially with non-planning impulsivity. This suggested that mental accounting, time orientation, and impulsivity are intricately linked. Similarly, in the context of buying impulsiveness, Özyörük (2022) demonstrated that future orientation, along with risk perception and holistic thinking, negatively affects buying impulsiveness. Based on the aforementioned arguments, we believe that short-term time orientation (present orientation) enhances impulsivity (specifically, non-planning impulsivity) among individuals, which further triggers them towards poor or no mental accounting while making financial decisions. On the other hand, long-term time orientation (future orientation) suppresses non-planning impulsivity, which motivates them to strive for efficient mental accounting. Therefore, we propose:

H2(a)- Long-term time orientation has an indirect effect on mental accounting through non-planning impulsivity.

H2(b)- Short-term time orientation has an indirect effect on mental accounting through non-planning impulsivity.

Financial Literacy

Noctor et al. (1992), defined the concept of financial literacy as the financial knowledge that leads to informed decision-making. Unlike several other definitions that followed, Lusardi and Mitchell (2014) went beyond financial knowledge by stating that financial literacy is the ability of economic information analysis and informed financial decision-making. This implies that merely having financial knowledge isn't enough. An individual who is unable to use this knowledge appropriately for making sound financial decisions is deemed to be financially illiterate. In most situations, financial knowledge or

literacy indexes are treated as inputs for anticipating the need for financial education as well as for explaining variations in financial results like investing, saving, and debt behavior (Huston, 2010). Strong grasp of financial skills is found to have a substantial positive link with financial well-being by Hudson et al. (2022). However, there is considerable acknowledgment of financial literacy being more than an ability to pass a finance or economics test (Warmath & Zimmerman, 2019). One of the most comprehensive definitions was given by The Handbook of OECD, International Network on Financial Education. It states that “Financial Literacy is a combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being (OECD INFE, 2016, p. 47).” Moreover, the financial literacy literature indicates that financial literacy is a key determinant of financial behavior (Allgood & Walstad, 2016; Carpena et al., 2011; Hastings et al., 2013; Hogarth, 2002).

Despite an enormous body of literature on mental accounting, there is still a need for academic research to investigate the relationship between financial literacy and mental accounting. One of the very few studies in this direction was conducted by Baker et al. (2019), who in their work, studied the association between several behavioral biases and financial literacy and concluded that financial literacy has a negative relation with mental accounting. However, this study simply examined the correlation between the variables and did not test for causality. In 2019, Muehlbacher and Kirchler found a positive link between the degree of mental accounting and being female, financially literate, and conscientious. Contrarily, Thanki et al. (2022) observed that all the cognitive biases in their study, including mental accounting, were significantly negatively influenced by financial literacy. Interestingly, Xiao and Neill (2018) discovered two patterns: people who scored higher on perceived financial behavior and subjective financial literacy were more inclined to budget, whereas, respondents with low to medium objective financial literacy scores, were more likely to engage in budget-related behavior. While perceived financial behavior and subjective financial literacy may have a positive relationship with mental budgeting, objective financial literacy appears to have a negative relationship. Aligning with this, Radianto et al. (2022) concluded that the mental accounting practice of an individual is not necessarily influenced by financial knowledge within their study of entrepreneurs.

Time orientation has also been linked to financial literacy in the literature by a few scholars. Yu et al. (2015) provided an explanation for the causes of variation in the level of financial literacy. According to Yu et al., financial literacy variation can be traced back to variations in psychological dispositions aligned with retirement savings: long-term time orientation, clarity of goals, risk tolerance, ability to manage finances, and financial knowledge. Along the same lines, the existing literature claims that financial literacy may be improved by developing the right financial attitude in terms of risk appetite, right time orientation, and training (Esiebugie et al., 2018).

In light of the above closely-knit scholarly work, we believe there is a need to empirically investigate the relationship between time orientation, financial literacy, and mental accounting. Therefore, we propose:

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H3(a)- Long-term time orientation has an indirect effect on mental accounting through financial literacy.

H3(b)- Short-term time orientation has an indirect effect on mental accounting through financial literacy.

Financial Literacy and Non-planning Impulsivity

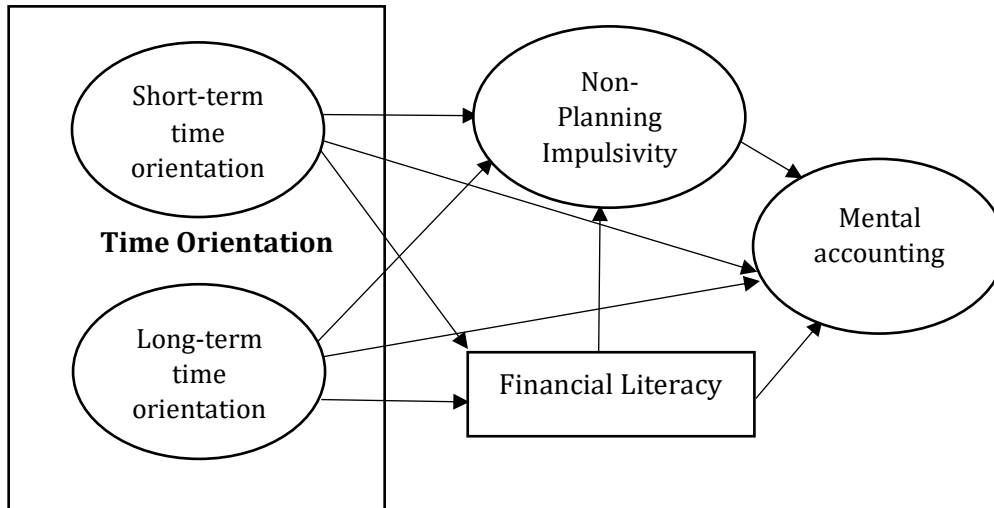
In the context of consumer buying behavior, Jabar and Delayco (2021) established that impulse buying is closely related to financial literacy. Individuals high on financial literacy in terms of acquiring and employing financial information and maintaining records are less likely to buy on impulse. Additionally, impulsivity and financial literacy are negatively associated (e.g., impulsive people are less financially literate).

In a similar vein, Meier and Sprenger (2013) provided compelling evidence that time preferences and the decision to obtain financial information and education are related. The authors show that acquiring financial knowledge is not a desirable investment for impulsive people, suggesting that these people do not intend to participate in financial education programs. Furthering these conclusions, Ottaviani and Vandone (2018) found that impulsivity eliminates the positive impact of financial literacy on debt.

In light of the aforementioned literature, we believe that long-term time orientation encourages individuals to acquire financial knowledge and become financially literate, which eventually makes them less impulsive and drives them to direct their efforts toward enhancing mental accounting in their investing behavior. On the same lines, we believe that short-term time orientation discourages individuals from investing in themselves by acquiring financial knowledge and consequently reduces their chance of controlling impulsivity to mentally account for their investments.

H4(a)- Long-term time orientation has an indirect effect on mental accounting through financial literacy and non-planning impulsivity.

H4(b)- Short-term time orientation has an indirect effect on mental accounting through financial literacy and non-planning impulsivity.

Figure 1.*Conceptual Model.*

Note. Observed variables are shown in rectangles and latent variables are represented by oval shapes.

METHODOLOGY

Measures

Non-Planning Impulsivity Measures

The Barratt Impulsiveness scale described impulsivity as having three dimensions: (a) a motoric dimension, (b) an attentional dimension, and (c) a non-planning dimension (Patton et al., 1995). Motor impulsivity is the absence of consideration of prior actions; attentional impulsivity is making decisions quickly; and non-planning impulsivity is defined as a tendency to have a concern for the present but not for future planning.

This study measured impulsivity by using the Barratt Impulsiveness scale (Bhat et al., 2018; Meule et al., 2011; Muehlbacher & Kirchler, 2019; Spinella, 2007). Since Muehlbacher and Kirchler (2019) already established that only non-planning impulsivity has a significant impact on mental accounting, we only selected the five questions that measured non-planning impulsivity as a latent construct from this scale. In order to maintain uniformity with other measures of our questionnaire, the questions were adapted on a 5-point Likert scale.

Short-term and Long-term Orientation Measures

The second section of the questionnaire included short-term and long-term temporal orientation items. The items were adopted from Antonides et al. (2011) on a 5-point Likert scale. The four components of the latent construct—short-term temporal orientation scale—

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gauge how much attention is given to the present and how little is given to the future. It measures respondents' propensity to invest for the long term, save money, and prepare for difficult times. It also measures respondents' inclination to think about the future.

Measuring Mental Accounting

The components of the latent construct—mental accounting—reflect fundamental ideas from the theory, adapted from an interview and earlier studies (Muehlbacher & Kirchler, 2019, 2013; Soman, 2001). These include being well-organized, having a good overview, being able to distinguish between various financial activity categories, and so on. It was measured on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

Measuring Financial Literacy

For measuring financial literacy, we used one of the most comprehensive, up-to-date, and robust scales of OECD INFE (2011). This study measured three interrelated components of financial literacy: (a) financial knowledge, (b) behavior, and (c) attitude toward long-term financial planning. The sum of the three scores was used to compute the overall financial literacy level and was created into an index for analysis.

Population, Sampling, Data Collection, and Empirical Test

A standardized survey was prepared, and a convenience sampling strategy along with a snowball sampling technique was used to elicit responses. Self-administered questionnaires designed using Google Forms were distributed online through social media platforms to active investors all over India, and pen-paper-based questionnaires were administered to reach out to investors in the nearby cities of researchers. 200 structured questionnaires were distributed in total. We received 190 complete questionnaires. Incomplete questionnaire forms were discarded. This high response rate was observed due to mandatory fields used in Google Forms. Using G-Power technique, the appropriate sample size for this investigation was determined (Faul et al., 2009). Appropriate power analysis and calculation of sample size are highly valued factors in research. Studies with inadequate sample sizes yield low power or imprecise estimates and are unable to answer research questions (Kang, 2021). G-power is considered a superior tool to the conventional rule of thumb for sample size estimation because it predicts sample size based on the effect size required. The open-source statistical power application, G-Power, permitted the use of a maximum of five predictors with an effect size of 0.15 and a statistical power of 0.80. The estimated minimum sample size was 85. The gathered data was screened before being subjected to analysis and hypotheses testing. In response to the screening question, “What best describes your investment experience?”, 28 individuals categorized themselves as “Beginners with no investment experience.” Thus, their responses were excluded from further data analysis. A total of 162 complete responses from active investors were used for subsequent analysis. The descriptive analysis was done with SPSS 23.0, and the structural equation modeling (SEM) was done with Smart-PLS 4.0.

RESULTS

Sample Characteristics

The participants' profiles are compiled into the list below. 61.1% of respondents were male, compared to 38.9% who were female; 42.6% of respondents were married, compared to 57.4% who were single; 50% of respondents had graduate degrees while 27.2% had bachelor's degrees, and 39.5% of respondents were salaried. 79% of respondents were in the 20–40 age group; 14.2% were in the 40–60 age group, and 6.8% were under 20. Students currently enrolled in institutions of higher education were also included in this study since they were considered both current and potential investors, and 44.4% of the overall sample was made up of them; 3.7% were businessmen, 9.3% were professionals, and 3.1% included others (homemakers and retired individuals; see Table 1).

Table 1.

Demographic Characteristics.

Demographic Characteristics	Frequency	%
Gender		
Male	99	61.1
Female	63	38.9
Age		
Below 20	11	6.8
20-40	128	79.0
40-60	23	14.2
Educational Qualification		
Under Graduate	19	11.7
Graduate	44	27.2
Post Graduate	81	50
Others (including Ph.D.)	18	11.1
Marital Status		
Unmarried	93	57.4
Married	69	42.6
Occupation		
Student	72	44.4
Salaried	64	39.5
Business	06	3.7
Professional	15	9.3
Homemakers and Retired	05	3.1
Annual Income		
Below 1 Lakh	54	33.3
1 lakh- 3 lakh	09	5.6
3 lakh- 6 lakhs	24	14.8
6 lakh- 8 lakhs	16	9.9
8 lakh- 10 lakhs	15	9.3
Above 10 Lakh	44	27.2
Do you have a Financial advisor?		
No	139	85.8
Yes	23	14.2

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Investment experience:		
Beginner	--	--
Moderate	54	33.3
Knowledgeable	99	61.1
Experienced	09	5.6
Total sample size	162	100

Measurement Model

Smart PLS-4 software was used for confirmatory factor analysis. A threshold of 0.50 was used to evaluate factor loadings in order to determine inter-item reliability. Factor loadings should be ≥ 0.5 and, ideally, > 0.7 (Hair et al., 2010). A Factor loading of 0.5 to 0.7 was observed for two items of the long-term orientation construct. The remaining values were all > 0.7 .

The convergent validity was tested by average variance extracted (AVE) analysis, and a threshold of 0.50 was maintained (Fornell & Larcker, 1981). Composite reliability scores were examined to assess internal consistency reliability. All the values were above the threshold of 0.70 (Chin, 1998; Fornell & Larcker, 1981; Gefen et al., 2000; Hair et al., 2021). Table 2 presents the results of the measurement model.

Table 2.

Factor Loadings, AVE, CR, and Cronbach's Alpha.

Factors	Items	Loadings	AVE	CR	Cronbach's Alpha
Long-term Orientation	LT1	0.567	0.571	0.835	0.834
	LT2	0.957			
	LT3	0.835			
	LT4	0.589			
Mental accounting	MA1	0.881	0.612	0.887	0.887
	MA2	0.788			
	MA3	0.785			
	MA4	0.700			
	MA5	0.745			
Non-planning Impulsivity	NPI1	0.780	0.661	0.907	0.907
	NPI2	0.844			
	NPI3	0.800			
	NPI4	0.810			
	NPI5	0.829			
Short-term Orientation	ST1	0.895	0.716	0.909	0.908
	ST2	0.840			
	ST3	0.927			
	ST4	0.705			

Discriminant Validity

Due to the recent criticisms of the Fornell and Larcker (1981) criterion, the Heterotrait-Monotrait Ratio of Correlations (HTMT) technique is employed to determine the discriminant validity (Henseler et al., 2015). HTMT value must be less than 0.90 (Gold et al., 2001) or less than 0.85 (Kline, 2005). All HTMT values met the required criteria of 0.85 (Kline, 2005). See Table 3.

Table 3.

Heterotrait-Monotrait (HTMT) Ratio.

	LT	MA	NPI	OECD scale	ST
LT					
MA	0.397				
NPI	0.499	0.597			
OECD scale	0.307	0.295	0.290		
ST	0.134	0.094	0.146	0.531	

Hypothesis Testing

In the second step, bootstrapping was employed with 5,000 subsamples to test the hypotheses (Hair et al., 2011) with the help of Smart PLS version 4 (Anderson & Gerbing, 1988; Henseler et al., 2009; Wah Yap et al., 2012). The summary of the hypotheses test results is presented in Table 4. The results show that long-term and short-term time orientation constructs had a positive and negative effect on mental accounting with respective path coefficient values of 0.359 and -0.132. However, the effect of short-term orientation was not statistically significant (p-value = 0.384). Therefore, H1(a) was supported, while H1(b) could not be supported.

Table 4.

Path Coefficients.

Sr. No.	Hypotheses	Beta	S.E.	t-values	P-values	CIs		Decision
						97.50%	2.50%	
H1(a)	LT -> MA	0.359	0.078	4.626	0.000	0.208	0.512	Supported
H1(b)	ST -> MA	-0.132	0.152	0.871	0.384	-0.276	0.248	Not Supported
H1(a)	LT -> MA (After introducing NPI and FL)	0.127	0.092	1.374	0.170	-0.046	0.309	Not Supported
H1(b)	ST -> MA (After introducing NPI and FL)	-0.102	0.090	1.135	0.256	-0.268	0.088	Not Supported
H2(a)	LT -> NPI -> MA	0.161	0.057	2.806	0.005	0.067	0.289	Supported
H2(b)	ST -> NPI -> MA	-0.126	0.042	3.019	0.003	-0.219	-0.055	Supported
H3(a)	LT -> FL-> MA	0.044	0.026	1.682	0.093	0.001	0.103	Not supported
H3(b)	ST -> FL-> MA	0.087	0.042	2.081	0.037	0.003	0.168	Supported
H4(a)	LT -> FL-> NPI -> MA	0.034	0.014	2.321	0.020	0.011	0.066	Supported
H4(b)	ST -> FL -> NPI -> MA	0.066	0.024	2.772	0.006	0.027	0.120	Supported
	FL -> NPI -> MA	0.134	0.043	3.104	0.002	0.059	0.228	Supported

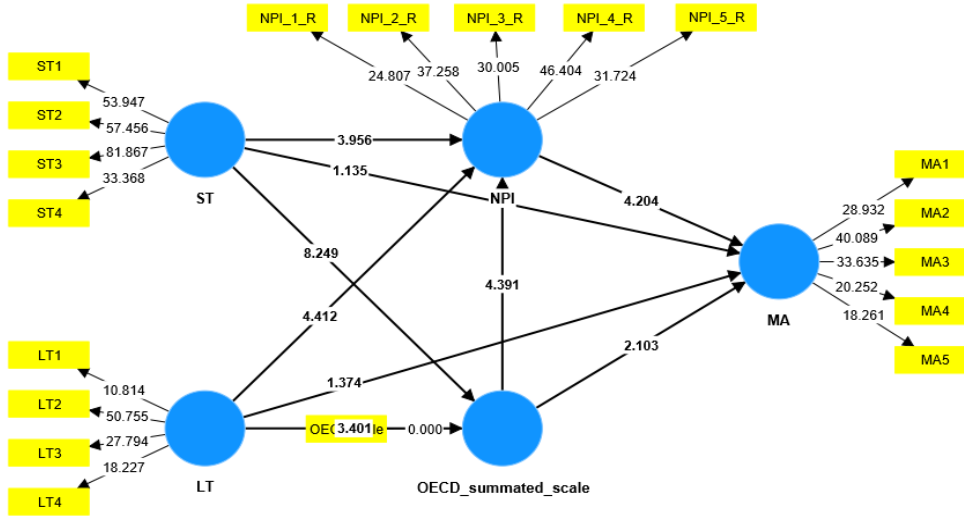
The recommendations of Preacher and Hayes (2004) were followed to assess the role of financial literacy and non-planning impulsivity in the indirect relationship between time-orientations and mental accounting. H2(a) speculates that long-term orientation indirectly affects mental accounting via non-planning impulsivity. H2(b) speculates that short-term time orientation indirectly affects mental accounting via non-planning impulsivity. The findings were statistically significant for H2(a) ($\beta = 0.161$, $t = 2.806$, $p = 0.005$) as well as H2(b) ($\beta = -0.126$, $t = 3.019$, $p = 0.003$). Therefore, both H2(a) and H2(b) were supported.

Similarly, H3(a) speculates that long-term time orientation indirectly affects mental accounting via financial literacy, and H3(b) assumes that short-term time orientation indirectly affects mental accounting via financial literacy. The findings were statistically insignificant for H3(a), with a p-value of 0.093. Therefore, H3(a) could not be supported, while H3(b) was supported ($\beta = 0.087$, $t = 2.081$, $p = 0.037$).

H4(a) speculates that long-term orientation indirectly affects mental accounting via financial literacy and non-planning impulsivity, and H4(b) assumes that short-term orientation indirectly affects mental accounting via financial literacy and non-planning impulsivity. Findings in this regard were statistically significant for both hypotheses, with respective path coefficient values of 0.034 and 0.066. Hence, both H4(a) and (b) were fully supported. Please refer to Figures 2 and 3.

Figure 2.

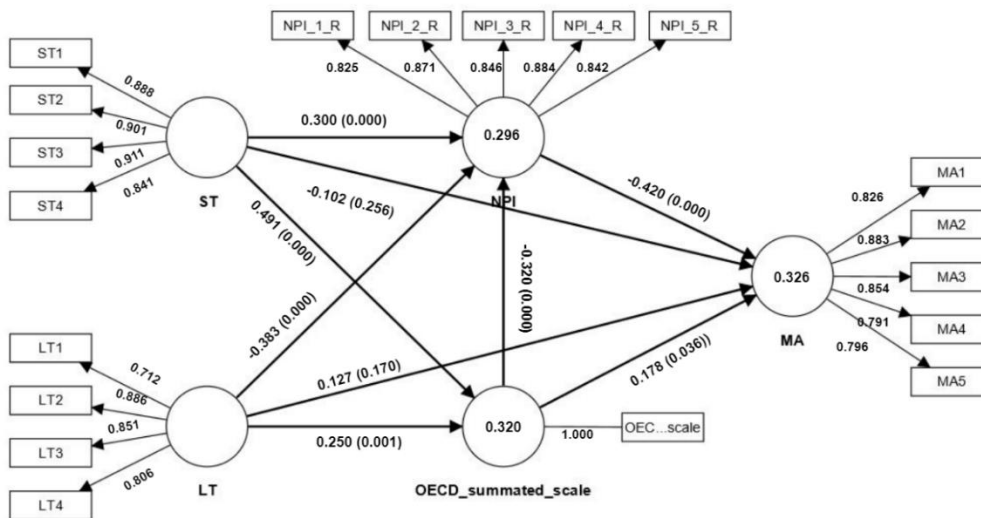
Structural Model (software output) Reporting T-Values in Inner Model and Outer Model.



*Blue circles indicate unobserved latent constructs.
 **Yellow rectangles represent observed construct items

Figure 3.

Structural Model Reporting Path Coefficients and P-Values in Inner Model, Factor Loadings in Outer Model and R-Square Values at Constructs.



Explanatory Power of the Model

R² was used to determine the model's explanatory power (Shmueli & Koppius, 2011). The values of R² range from 0 to 1. A value closer to 1 indicates greater explanatory power. As a general practice, a value of 0.26 is considered substantial, 0.13 as moderate, 0.02 as weak (Cohen, 2013). However, R² values must be interpreted based on the context of the research. The results in Table 5 show that R² for all the endogenous constructs is over 0.26. Thus, the model's explanatory power is substantial (Cohen, 2013).

Table 5.

R² and F² Assessment.

Predictor(s)	Outcome(s)	R Square	f Square
LT			0.018
ST			0.010
NPI			0.184
OECD	MA	0.326	0.029
LT			0.190
ST			0.094
OECD	NPI	0.296	0.099
LT			0.091
ST	OECD	0.32	0.353

The change in R² after excluding a specific exogenous construct from the model is estimated to accurately assess the explanatory value of each exogenous construct in the model; this measure is known as the effect size (F²). The impact of predictor variable is high when F² is 0.35, medium when F² is 0.15 and small when F² is 0.02 (Cohen 2013). The results (see Table 5) revealed that F-square effect size ranged from 0.010 (negligible) for short-term orientation on mental accounting to 0.353 (high) for short-term orientation on financial literacy.

Predictive Power of the Model

Scholars like Shmueli et al., (2016, 2019) proposed a novel method of evaluation considering the prediction-oriented approach of PLS-SEM. Based on this, we have also incorporated a predictive relevance analysis using PLS-Predict in our study. As Table 6 displays, the Q² prediction for financial literacy, non-planning impulsivity, and mental accounting are all > 0, suggesting that the prediction error of mean values is higher than the prediction error of the PLS-SEM results. Additionally, the PLS benchmark yields lower prediction errors in terms of RMSE (or MAE) for the majority of indicators when compared to the linear regression model (LM), highlighting the medium predictive power of the model.

Table 6.*PLS Predict Assessment.*

Construct Prediction Summary							
	Q²						
Financial literacy	0.300						
Non-planning impulsivity	0.189						
Mental accounting	0.098						
Indicator Prediction Summary							
	Q²predict	PLS-SEM		LM		PLS-LM	
		RMSE	MAE	RMSE	MAE	RMSE	MAE
MA1	0.095	0.831	0.693	0.863	0.696	-0.032	-0.003
MA2	0.074	0.995	0.801	1.018	0.818	-0.023	-0.017
MA3	0.078	0.947	0.727	0.989	0.748	-0.042	-0.021
MA4	0.044	1.014	0.834	1.033	0.838	-0.019	-0.004
MA5	0.036	0.934	0.761	0.961	0.788	-0.027	-0.027
NPI1	0.108	0.978	0.777	0.970	0.781	0.008	-0.004
NPI2	0.164	0.955	0.738	0.964	0.741	-0.009	-0.003
NPI3	0.122	0.984	0.790	0.965	0.787	0.019	0.003
NPI4	0.124	0.886	0.688	0.886	0.680	0.000	0.008
NPI5	0.154	0.832	0.664	0.843	0.671	-0.011	-0.007
Financial Literacy	0.296	2.605	1.999	2.639	2.029	-0.034	-0.030

DISCUSSION

Our study found that time as a factor is intricately woven with mental accounting. Short-term and long-term orientation are not only related to an individual's mental accounting but also are associated with an individual's psychological and behavioral aspects like impulsivity and financial literacy. This research adds to the discipline of behavioral finance and therapy by extending earlier research on investor behavior and mental accounting. For instance, financial literacy and impulsivity were found to have an intervening role in the relationship between temporal orientations and mental accounting individually as well as serially.

Most of the findings were consistent with our expectations. However, a few that were not gave new insights to our study. The results showed that mental accounting was positively related to long-term orientation. This finding strengthened the argument that patient investors who can foresee the long-term benefits of mental accounting might engage in it (Antonides et al., 2011; Olsen et al., 2019). However, short-term orientation had a negative relationship on mental accounting. Still, this connection was not statistically significant ($\beta = -0.132, 0.871, p = 0.384$), which conformed with Muehlbacher and Kirchler's (2019) exploratory study, but contrary to Antonides et al. (2011). In our view, the most compelling explanation for this specific insignificant result is that our study is in the context of investors as opposed to previous studies that have been conducted on consumers' mental accounting, and we argue that an investor (not a trader or consumer) is inherently largely long-term oriented. Thus, this could be why their long-term-oriented behavior could connect with mental accounting more accurately than their short-term-oriented behavior.

Time Orientation and Mental Accounting

Our results further reveal that long-term orientation has a positive indirect effect on mental accounting through non-planning impulsivity. Along the same lines, it suggests that short-term orientation has a negative relationship with mental accounting via non-planning impulsivity. Moreover, no significant relationship remains between time orientation (long-term and short-term) and mental accounting after introducing the variable non-planning impulsivity to the model, suggesting that the indirect effect of both long-term and short-term time orientation on mental accounting fully passes through non-planning impulsivity proving a significant indirect relationship between time orientations and mental accounting (Preacher & Hayes, 2004).

Several studies have established that financial literacy has a significant impact on mental accounting, and time orientation is an important aspect that influences financial literacy. Still, financial literacy has not yet been examined as an intervening variable in the relationship between time orientation and mental accounting. The study aimed to fill this gap. Our results reveal that financial literacy acts as an intervening variable in the indirect relationship between short-term time orientation and mental accounting but could not significantly intervene in the relationship between long-term orientation and mental accounting. We expected that a long-term-oriented investor would tend to enhance his financial literacy, which will motivate him to indulge in mental accounting and vice versa for a short-term-oriented investor. The probable explanation can be argued by the fact that while future-oriented persons believe they are financially literate, they are as likely to be suffering from poor financial health. One with a strong focus on the future could be so preoccupied with their profession, for example, that they neglect to take care of their personal life. It also implies that their personal finances might be degrading. An individual may work till midnight to ensure an increase in his company's future earnings but fail to pay his personal bills. Moreover, there is a high possibility that overconfidence bias comes into the picture with long-term-oriented investors. Thus, they may not attempt to improve their financial literacy. Consequently, the indirect effect of long-term orientation on mental accounting via financial literacy may have been statistically insignificant. On the other hand, a short-term-oriented investor who readily financially literates himself consequently improves his level of mental accounting, and thus, we can say that short-term time orientation has a significant indirect effect on mental accounting through financial literacy.

Therefore, we conclude with this study that short or long-term orientation in investors affects their levels of mental accounting through financial literacy and their levels of impulsivity. In other words, financial literacy and non-planning impulsivity sequentially intervene in the relationship between time orientations and mental accounting. These results are a novel contribution to the literature on mental accounting and investor behavior.

Implications of the Study

Theoretical Implication

This study adds to the literature on mental accounting, financial literacy, and investor behavior in many ways. Based on structural equation modeling, this study establishes a link

between time orientations (short-term and long-term) and mental accounting. Thus, this paper can at least partially answer why, if mental accounting is so essential, many individuals do not use it for their investment decisions and how they might be influenced to use it. Furthermore, this study contributes by relating time orientation to mental accounting through investors' financial literacy. This study specifically reveals that there may be a relationship between time orientations, financial literacy, impulsivity, and mental accounting in a way that when investors become financially literate and are likely to contain their impulsivity, their financial well-being is potentially improved by using mental accounting (note, causality cannot be claimed and needs further research to determine).

A few studies have demonstrated a connection between impulsivity and mental accounting (Antonides et al., 2011; Muehlbacher & Kirchler, 2019). However, efforts have not yet been made to examine the indirect effect of time orientation on mental accounting through impulsivity. Thus, our study contributes by connecting time orientation and mental accounting through impulsivity and finds a significant indirect relationship. The sequential intervention of financial literacy and impulsivity was investigated to better comprehend the role of time orientation in improving mental accounting. Most studies have used Lusardi and Mitchell's (2014) scale. Our attempt has addressed this limitation by using a more comprehensive and robust measure of financial literacy i.e., OECD INFE (2011). Additionally, by employing NPI as an intervening variable, the current study also addresses a recommendation made by Muehlbacher and Kirchler (2019) that predicted some unexplored complex relation between mental accounting, time orientation, and non-planning impulsivity. Moreover, we have provided evidence from one of the fastest-developing economies' contexts (i.e., India). We thus conclude that time orientations (both short and long-term) are associated with the mental accounting of investors in developing countries directly and indirectly through non-planning impulsivity and financial literacy.

Practical Implication

Various practical implications can be drawn based on our findings. In order to improve financial well-being, it is important that investors and households mentally account for their expenses and incomes; however, the causality of this path needs further investigation. As reflected by the findings of this paper, financial literacy has an intervening role between time orientations and mental accounting. Various government and non-government organizations, financial institutions, and regulators may undertake widespread financial education development programs to instill a healthy level of mental accounting in investors.

This might assist current and potential investors in improving their financial knowledge, money management skills, and, consequently, impulsivity management. However, imparting financial knowledge through literacy programs is not a new concept. As asserted by Huston (2010), financial knowledge alone cannot resolve issues with personal finances because financial literacy has two components, namely financial knowledge and its application, and individuals must modify their current patterns of financial behavior in order to use their newfound financial knowledge which falls in the domain of financial therapy.

Time Orientation and Mental Accounting

Integrating behavioral biases to achieve favorable outcomes in financial management is still in its infancy (Delgadillo, 2021).

Moreover, since impulsivity is a psychological construct, it is influenced by several other psychological, situational, and cultural phenomena (Chavosh et al., 2011; Foroughi et al., 2012; Herabadi et al., 2009; Jalees, 2009; Karbasivar & Yarahmadi, 2011; Mehta & Chugan, 2013; Stern, 1962; Verplanken & Herabadi). In the past ten years, researchers have studied how people make financial decisions and found that impulsivity, cognitive capacity, heuristics, and emotions all play a role (Shelton et al., 2019). To alter the level of impulsivity, efforts need to be directed towards instilling financial literacy at an early stage. In order to better address the issue of financial literacy in working and college-bound adolescents, financial therapy should also be included in financial literacy programs (Smith et al., 2017). This can include budgeting, saving, investing, and debt management information. It will also help individuals address specific financial issues contributing to impulsive spending, such as credit card debt or a lack of savings. Addressing these will help individuals develop a plan to manage and reduce the financial stress and anxiety caused by impulsive spending. Effective financial decision-making and behavioral engagement that improves control with financial self-efficacy and financial knowledge can deal with financial anxiety, as Lee et al. (2023) noted. Financial therapy can help individuals understand the underlying emotional and psychological factors contributing to their financial behaviors. For example, individuals may overspend as a way to cope with stress or anxiety. Financial therapy can help individuals identify these triggers and develop healthier coping mechanisms. We also concluded from our study that long and short-term orientations are complementary and not independent of each other. An individual will need to adapt their orientations (long or short) dynamically and continuously based on the situations they come across in life while investing. The increased financial literacy can facilitate individuals in making more informed decisions. Professional financial advisors can also help individuals better manage their finances by emphasizing the importance of non-impulsive, future-oriented conduct and financial literacy.

The degree of impulsivity, time orientation, and financial literacy of an investor can also be used to tailor financial products and services, and businesses may target investors depending on their desired unique demands, enhancing the quality of product segmentation. Money acts as a reward and punishment mechanism at times, and many people wrestle with money addiction. Financial therapists may contribute to the body of knowledge by dealing with clients who display such addiction (Archuleta & Grable, 2010). Thus, interventions provided by clinically trained financial therapists in such scenarios are likely to result in better outcomes and increased life satisfaction. Additionally, our model may provide insight into the minds of individuals with different time orientations, impulsivity, and mental accounting, which can aid financial therapy professionals to better understand and further help the individuals who seek such therapy.

Limitations and Future Research Scope

Despite significant advancements, the current research has a few notable limitations. Bumcrot et al. (2011) describe that financial literacy varies across demographics. Also, various surveys using OECD INFE (2011) all over the world suggest that the level of financial literacy varies across developed and developing nations due to resource availability, cultural differentiation, etc. Thus, it can be concluded from the current study that investors' time orientations will differ among industries, cultures, and nations, as well as between developed and developing economies. The findings have limited generalizability since the current study was conducted in a specific geographical location (i.e., India). Thus, future studies can take up the task of validating our findings in various other industrial and cultural contexts. Another potential direction for researchers enthusiastic about the subject is to compare the results across developing and developed nations.

The current research examined the effect of time orientations on mental accounting through intervening variables: financial literacy and impulsivity. However, this study does not offer evidence for a particular causal path based on the current design. Further research can be conducted in order to determine this. Thus, additional research based on a more robust design, such as incorporating a longitudinal approach, can help to strengthen our model. Moreover, the current research model's explanatory power can be improved by studying other psychological, cultural, social, demographic, and economic mediators or moderators.

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