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Reforming theory of planned behavior to measure money management intention: a validation study among student debtors

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Abstract

Purpose – This study aims to validate the money management intention screening questionnaire under the framework of theory of planned behavior, which includes attitude, subjective norms, perceived behavioral control and intention.

Design/methodology/approach – A total of 919 undergraduate students with loans were randomly selected and grouped into four sub-studies to address the psychometric properties of the imposed structure. The item–object congruence, confirmatory factor analysis (CFA), test–retest reliability method and other statistical tests were carried out for item selection and confirmation. Two self-reported measures, namely, Saving Behavior Scale and Short Dark Triad (SD3-Thai version), were applied for the measure concurrent validation.

Findings – The final 12 items with four-component structures were deemed reliable and generally valid in university students with loans, with CFA results indicating good fit indices ($\chi^2 = 96.44$, df = 43; CFI = 0.96; GFI = 0.94; RMSEA = 0.06). The test–retest method indicated values between 0.66 (subjective norm) and 0.71 (attitude). Machiavellianism from SD3-TH and saving attitude from the Saving Behavior Scale showed the strongest significant relation among the items. The abbreviation of the 12-item structure was labeled in the Money Management Intention Questionnaire (MMIQ-TPB).

Research limitations/implications – This study provided a reliable and valid substantial structure for identifying money management intention. However, there was a consideration that MMIQ-TPB questions referred to cognitive influences through intention; thus, it was designed to cover the intended preparation and not in the action stage.

Practical implications – Great money management practically predicts a lower likelihood of being in debt. Attentive educators or loan providers can thus benefit from this alternative structure as a screening scale for identifying risky cognitive mismanagement.

Social implications – The evidence provided in this study highlights the possibility of identifying students who necessarily need a program to improve their monetary management skills during their studying periods. Policymakers could address this problem at the first stage of the general mode in the loan providing operation.

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Originality/value – This study bridges the gap in the literature on financial behavioral changes for establishing money management intention among undergraduate students with loans. Furthermore, it confirms the advantages and disadvantages of having certain dark personality traits in a financial context.

Keywords Validation, Intention, Planned behavior, Money management

Paper type Research paper

1. Introduction

In Asia, policies that oversee national education loan programs help promote equitable education. Unlike other countries, Thailand provides the loan from the upper secondary level to decrease the rate of students who choose to work instead of continuing their study after completing their 15-year free education program. Currently, 5.7 million student debtors (approximately 8.58% of the Thai population) are financially allocated a total of 592 billion baht (about US$20b) in a huge cash budget (Chichaibelu & Waibel, 2017; Lau, Law, & Poon, 2011; Sereetrakul, 2014). However, instances of in debt statuses, including nonrepayment statuses, have been increasing among graduates in many communities (Lewis & Lewis, 2017). The current unstable status of loan fund performance is due to the largely imbalanced in debt status arising from graduated students' repayment ratio, which is lower than 40%. Among them, at least 2.3 million nonrepayment debtors may expect to be seriously prosecuted. A properly managed loan fund is not enough, especially if there are administrative inefficiencies on several repayment issues (Salam, 2018). Individual elements, including financial misbehaviors, pose certain threats to future investments in the country wherein money management curricula have been rarely implemented in schools or universities.

As we know, the current status quo is more financially driven than in the past century; hence, individuals are expected to acquire and develop the ability to manage their financial affairs. Students' money management skills, which play an important role in their financial literacy, can be defined as the extent to which a person's decisions or judgments regarding the use of money are deemed effective (Xu & Zia, 2012). In financial literacy, money management is an output linked to financial awareness, skills, knowledge and decision-making. This skill also includes the use of techniques to maximize the highest value for any amount spent, such as budgeting, expense tracking, investment and banking. This ability might be developed from the preschool stage and has a significant relationship with the children's family backgrounds in terms of saving and spending attitudes. Several studies on children's saving behavior indicated differences within age groups, indicating that children's monetary behaviors are simply a function of the requirements from their parents (Akinyede, Owolabi, & Akinola, 2017).

Interestingly, it has been argued that students' saving values seem to be understood as a legitimate, rewarding or valuable behavior, not as an economic function (Furnham, 1999). When the children become adults, those attitudes firmly appear as intentions that influence their spending patterns, perceived ability to spend and normative influences regarding spending. This is reflected on the cases of graduates around the world with credit card debts (Henegar et al., 2013; Limbu, Huhmann, & Xu, 2012; Norvilitis et al., 2006) or individuals facing serious bankruptcy (Deming, Goldin, & Katz, 2018; White, 2017). Meanwhile, university students have reported lacking the ability to practice financial management as they grapple with their spending decisions. Considering the urgent need to conceptually identify student debtors' management money intention, the current validation study is proposed with the main objective of verifying a new screening measure. This measure is

validated by a new concept of personality (i.e. Dark Triad), which has been shown to strongly predict certain values in recent financial studies.

2. Theoretical framework

2.1 Theory of planned behavior

Under the various behavioral theories, money management behavior should be treated as a continuous process. Certain influencing factors, including interactivity, enjoyment, appropriate content and need of participants, should be considered for further evaluation (Black & Rosen, 2011). Notably, past studies on behavioral changes have provided several successful cases that prevented some unhealthy behaviors and supported healthy activities, such as smoking cessation, dieting and physical activities that include targeted financial behaviors (e.g. halal food purchasing in Malaysia and internet banking in Taiwan) (Bezner, Lloyd, & Crixell, 2017; Leem et al., 2017; Shah Alam & Mohamed Sayuti, 2011; Shih & Fang, 2004; Tseng et al., 2017; White Baker, Al-Gahtani, & Hubona, 2007). Those sample studies measured how students' budgeting tendencies had increased and affected their money managing cognition with other consumption factors. Definitely, those findings from past works should be recognized as the present study designs the items in Step I.

Theory of planned behavior (TPB) implicates intention as the proximal determinant of behavior. It posits that cognitive engaged behavior is positively evaluated and mainly determined by attitudes (ATT); positive or negative behavior evaluation or subjective norms (SBN); and acceptable social perception and perceived control or perceived behavioral control (PBC). An added component comes from Theory of Reasoned Action (TRA) (unshaded boxes in Figure 1) through intention (INT). The figure shows the actual beliefs concerning the presence and absence of behavioral facilitators and barriers weighted by the individuals' perceived power. Although the TPB new framework has been integrated and discussed many times in its extension since the beginning of this century, the one shown in Figure 1 is still one of the most referenced models.

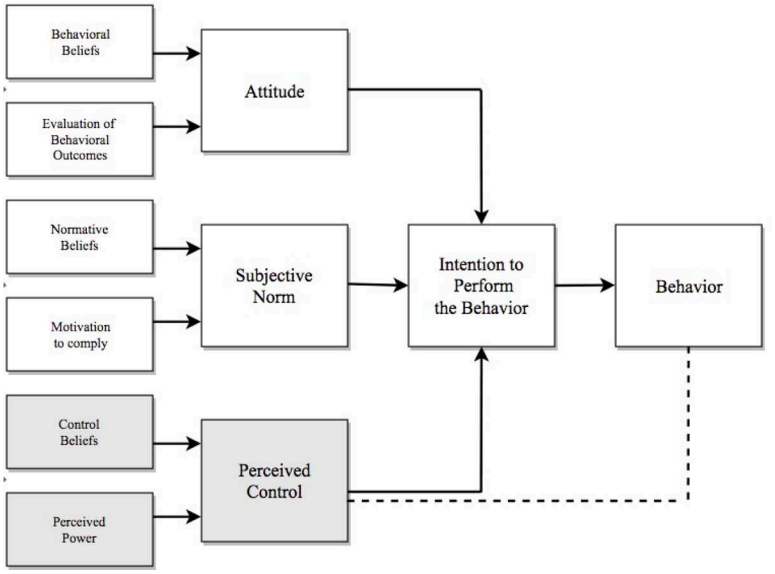

Figure 1.
Theory of reasoned action (unshaded) and the extension in theory of planned behavior

In brief, it is quite challenging to integrate the original concept of healthcare behavior with financial behavior to explain the money management intention. TPB has been selected in the current study, because it is one of the well-known behavioral change theories extending from pure psychological consideration to a more socio-psychological realm (Boonroungrut & Huang, 2018b; Liao, Chen, & Yen, 2007; Magendans, Gutteling, & Zebel, 2017). TPB focuses on the factors impacting an individual's intentions, which eventually influence behavioral changes. Montano and Kasprzyk (2015) reviewed hundreds of studies and found evidence of the successful integration of TRA or TPB and other healthcare models, such as social cognitive theories, Health Belief Model, Theory of Subjective Culture and the Transtheoretical Model of Change. In fact, these theories and models were tackled in the workshops conducted by the US National Institutes of Mental Health, which aimed to develop a theoretical framework and integrate their substantial constructs to be implemented in various research fields. The results of past successful research highlighted TPB's contributions to the field of monetary management and other related fields. For example, the study conducted by Chudry, Foxall, and Pallister (2011) found that TPB can significantly predict debt–consumption intention among student debtors and that the increased variances can be explained by their extended variables, including past behaviors, the involvement of money and individual decision-making styles. Importantly, studies have indicated that intention predicted by its three constructs could lead to the target financial behavior. These include a study on debt management plan (Xiao & Wu, 2008) and a study on risky credit behaviors and credit debts (Xiao, Tang, Serido, & Shim, 2011), among others.

2.2 Relationship between dark triad personality and financial behaviors

Machiavellianism, Narcissism andPsychopathy, namely, the dark personality or Dark Triad is a group of personality traits that many researchers have linked to various financial misbehaviors (Furnham, Richards, & Paulhus, 2013). In a nutshell, having the Dark Triad traits seemed to be as advantageous as other attributes, such as intelligence, physical attractiveness and managing behaviors (Furnham et al., 2013). Currently, especially in this decade, researchers have increased our understanding of the Dark Triad and its link to financially related behaviors. For example, individuals with high narcissism trend to be involved in loan schemes. They often prefer high-risk investments to gain financial success faster, and being high narcissism investors could be the possible cause as to why they are in debt (Foster, Misra, & Reidy, 2009). Meanwhile, individuals with high psychopathy have low planning ability. Similar to high narcissism individuals, they always show extremely impulsive behaviors in decision-making instances. In comparison, Machiavellianism seems to be a good management skill supporting underlying factors that are linked to the likelihood of having lesser debts, because of their preferences to gain long-term selfish gains (Jones & Figueredo, 2013). In any case, Machiavellianism is still associated with antisocial behaviors and can be considered an extroversion trait, which could be recognized as a trigger for spending behaviors (Boonroungrut & Huang, 2018a; Jones, 2013).

To effective change budgeting tendencies in young adults requires changing not only the knowledge but also individuals' attitudes, feelings, habits, perceptions of control, beliefs and intention (Kidwell & Turrisi, 2004). Thus, the present study aims to bridge those grounds by reforming TPB from the healthcare paradigm to indicate students' intention in managing their money as their beginning stage. This could be a scale development stage before creating future monetary interventions or programs to enrich money management intention among loan students.

3. Methodology

This study was divided into four steps: item reduction in Step I, item selection in Step II, item confirmation in Step III and item validation in Step IV. All 919 respondents from 690 Thai undergraduate programs were randomly recruited from two private and three public universities in Bangkok and Nakorn Pathom provinces in Thailand. All participants were loan students with full-time study loads. They were of normal physical and mental states, and their ages ranged from 17 to 32 years ($M = 25.48$, $SD = 5.03$). The minority of respondents, 21.76%, consisted of self-supporting students who had part-time jobs. The samples were assigned to submit the answers through the online platform in their computer centers during mid-2018. A total of 0.8% of the uncompleted dataset was removed. The participants were recruited from Steps I–IV, respectively, but not in the same time. Note that for Step III, the number of 260 and 229 samples were the same groups of students due to the test–retest reliability method; otherwise, they were not the same. This study was approved by the local ethics review board committee or authorized key person in each university. The description of each step is presented in Table 1.

3.1 Step I: item reduction

The pool of 16 items was designed to cover the TPB theoretical framework, excluding behavior outcome, which was represented by attitude, subjective norm, PBC and intention. The objectives of this study were two-fold: to reduce the question items and to retain the substantial framework of the theory.

3.1.1 Methods. The index of item–object congruence (IOC) was applied to the original pool of items. This method was a content validity evaluation at the item development stage. Ranking the score from −1 (not agree), 0 (not sure) and 1 (agree) was required for each item from a team of seven experts with management research experiences. Theoretically, the minimum IOC agreement scores should not be less than 0.6 according to the recommendation of Turner and Carlson (2003). Any low IOC score item was removed if another item could cover the theory conceptually; otherwise, the item content should be edited. This was a delicate combination of rational and empirical considerations. Basically, each designed four-item structure represented one component, as shown in Table 2.

3.1.2 Results. The results indicated that items Q1, Q8, Q13 and Q16 showed scores lower than 0.6. After discussing with experts, those items were not removed; instead, they were reedited for better understanding. Thus, the structures of 16 items in the four components was examined by the factor analysis in the next step.

Table 1. Overall description of each step

Steps	Purpose(s)	Total Participants	No. Male	No. Female	Main analysis or Procedures
Step I	Items Reduction	7 experts	2	5	Item–Object Congruence (IOC)
Step II	Items Selection	116 students	36	80	Confirmatory Factor Analysis
Step III	Items Confirmation	260 students	66	194	Confirmatory Factor Analysis,
		229 retested students	60	169	Test–Retest Reliability
Step IV	Items Validation	314 students	142	172	Concurrent Validation

1. Attitude	1.1. Attitude toward Behavior	Q1. I am a saver, not spender Q2. I think that earning a lot is a good money management
	1.2. Behavioral Belief	Q3. I think saving is a good money management Q4. The ability of manage management can be teachable
2. Subjective Norm	2.1. Subjective Norm	Q5. I would like to support myself Q6. I think self-financial caring is a goal of money planning
	2.2. Normative Belief	Q7. I think separation of income can control spending Q8. My patents have financial control power
3. Perceived Behavior Control	3.1. Perceived Power Control	Q9. When necessary, I can find additional revenue Q10. When not necessary, I can control the expenditure
	3.2. Control Belief	Q11. I prefer monthly money planning to daily spending Q12. I can manage my money properly, even with a minimum salary after graduation
4. Intention	4.1. Intention	Q13. I intend to find a job based on income as the first key criterion Q14. If I have a debt, I intend to pay my debt first Q15. I intend to start my money planning before graduation Q16. I intend to have a certain amount of saving money before graduation

Table 2.
The primitive set of 16 items (in Thai)

3.2 Step II: item selection

The 16-item version was assembled from the IOC analysis as a good starter. Notably, the number of items was balanced in each component after testing their consistent structure in this step.

3.2.1 Participants and methods. To determine the power according to Hair, Black, Babin, Anderson, and Tatham (2010) and MacCallum, Widaman, Zhang, and Hong (1999), in a multivariate analysis, a primary theoretical recommendation for the preliminary study consisted of 5–10 respondents per parameter estimation. The data set was randomly received from 116 samples in this step. The majority were females (69%), under 20 years old (62.1%) and were loan students with no part-time job (73.3%).

To address the internal consistency, the 16-item version was designed with a 5-point Likert scale similar to the study of Montano and Kasprzyk (2015). Any item indicating a low corrected item–total correction item or a higher alpha value was deleted and removed. The confirmatory factor analysis (CFA) with maximum likelihood estimation (MLR), as well as factor variances fixed at 1.0 and freely estimated for factor covariance were applied. The judgment of the CFA model's good fit in this study referred to the recommended indices in Diamantopoulos and Winklhofer (2001) and Hair et al. (2010) studies.

3.2.2 Results. Generally, this 16-item version showed acceptable internal consistency. Alpha coefficients were highly estimated, and the corrected item–total correlation ranged from 0.17 (Q12) to 0.54 (Q3). Low corrected item–total correlation was identified in three items. The item analysis revealed that dropping items Q1, Q12 and Q13 from the structure improved the alpha value to 0.79. In the CFA, the alternative models were compared in terms of the better model fitness. The fits for the initial 16-item version were less acceptable with factor loading lower than 0.30 in items Q1, Q4, Q8 and Q13 ($\chi^2 = 235.42$, $df = 98$; CFI = 0.70; GFI = 0.80; RMSEA = 0.11). Remarkably, the researchers decided to remove one item in

each component to balance the number of items according to their lowest loadings, thus making their correlations free. The 12-item structure showed better fit of all acceptable goodness-of-fit indices using the same judgment as that shown in Figure 2 ($\chi^2 = 51.80$, $df = 44$; CFI = 0.97; GFI = 0.93; RMSEA = 0.03). Thus, this 12-item structure would be additionally validated and confirmed with another group of samples in the next step.

Summarily, items Q1, Q8, Q12 and Q13 were removed because of their poor values; however, Q4 was kept because it defined behavioral belief, which was recognized as the main influence on a certain attitude toward intention. This item could not be covered by another item if it was discarded. Thus, the remaining 12 items were regarded as the final set of the selected items.

3.3 Step III: item confirmation

The objective of this step was to confirm the examined 12-item version properties, not to select or remove any item as in the previous step. This revised 12-item version was validated again by the two experts to prove the content that could cover TPB. Then, the confirmation of the imposed structure would be examined by another group of samples.

3.3.1 Participants and methods. A total of 260 samples were recruited. The majority of the sample consisted of female students (74.6%) who were under 20 years old (71.9%). In the test–retesting, those samples were required to return the same questionnaires after four weeks. The return rate was 88.07% or 229 students who were females (73.8%) under 20 years old (86.4%).

CFA was performed under the same rules together with the presence of internal consistency, reliability and other statistical inspections. The test–retest method was applied to predict differential heritability if state variations in test responses, item ambiguity and sample variance mainly determine reliability (McCrae, Kurtz, Yamagata, & Terracciano, 2011). Furthermore, according to Fornell and Larcker (1981), a measurement structure should contain the average variance extracted (AVE) (ρ_v) higher than 0.5; however, the construct is still adequate at 0.4 when the composite reliability (ρ_c) is higher than 0.6.

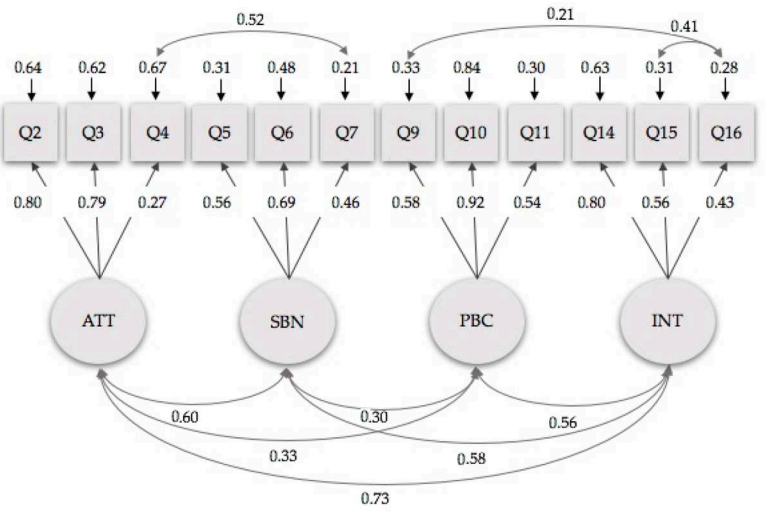

Figure 2.
12-Item CFA modified version

3.3.2 Results. Under the same judgment criteria, Cronbach's alpha measure of internal consistency in all components ranged from 0.73 (PBC) – 0.78 (ATT). The AVE and composite reliability declared that all constructs were adequate. CFA estimation indices virtually showed good fit indices with the data, as indicated in Table 3 ($\chi^2 = 96.44$, $df = 43$; CFI = 0.96; GFI = 0.94; RMSEA = 0.06). Only RMSEA showed acceptability in this analysis and all critical ratios indicated significance. The test–retest reliability results revealed good-to-excellent reliability in all components ranging between 0.66 (SBN) and 0.71 (ATT), all $p < 0.001$, as shown in Table 4. The resolution of the 12-item version structure showed all acceptable-to-good values. They would be labeled in the Money Management Intention Questionnaire (MMIQ-TPB) and then validated with other questionnaires in the next step.

3.4 Step IV: concurrent validation

The MMIQ-TPB was validated with two self-reported measures related to financial literacy to examine its constructs: the Saving Behavior Scale and the Short Dark Triad (SD3-TH) measures.

3.4.1 Participants. The samples in this step consisted of 314 randomly selected undergraduate students with loans. About 57.7% were from the fields of Mathematics and Sciences, 59.6% were under 20 years old and 67.2% had part-time jobs.

3.4.2 Measurements.

The MMIQ-TPB and the following measures were given to the participants for completion.

Latent var.	Manifests var.	*b*	*SE*	*t*	R^2	ρ_v	ρ_c
Attitude	Q2	0.65			0.42	0.44	0.70
	Q3	0.81	0.11	10.69**	0.67		
	Q4	0.77	0.11	10.29**	0.59		
Subjective Norm	Q5	0.61			0.37	0.57	0.80
	Q6	0.80	0.13	9.74**	0.64		
	Q7	0.73	0.12	9.22**	0.53		
Perceived	Q9	0.70			0.49	0.48	0.67
Behavioral	Q10	0.70	0.11	9.24**	0.49		
Control	Q11	0.65	0.11	8.77**	0.42		
Intention	Q14	0.58			0.34	0.58	0.80
	Q15	0.83	0.14	9.22**	0.70		
	Q16	0.71	0.14	8.52**	0.50		

Note: $^{**}p < .01$ (two-tailed)

Table 3. CFA Estimation for the 12-item structure

	TPB						
	1. ATT	2. SBN	3. PBC	4. INT	$\bar{x}$	*SD*	Test–retest
1. Attitude	α0.78				4.09	0.71	0.71
2. Subjective Norm	0.71**	α0.76			4.00	0.72	0.66
3. Perceived Behavioral Control	0.53**	0.60**	α0.73		3.69	0.79	0.67
4. Intention	0.65**	0.57**	0.50**	α0.75	4.10	0.71	0.66

Note: $^{**}p < .01$ (two-tailed)

Table 4. Inter-Correlations, Means, *SDs* and test–retest reliabilities

- The Saving Behavior Scale was a 17-item measure using a five-point Likert scale. There were three components in students' financial behaviors: six items in saving, three items in indifference and eight items in spending. The reliability scores were.69, 0.73 and 0.64, respectively (Sereetrakul, 2014).
- The Short Dark Triad Thai Version (SD3-TH) was first translated and studied in a Thai university student context during mid-2017. It reconstructed some items from the Machiavellianism and Psychopathy subscales containing 15 main items; however, it still consisted of three completed dark personality components. The reliability scores were.87, 0.73 and 0.80 for Machiavellianism, Narcissism and Psychopathy, respectively (Boonroungrut & Huang, 2018a).

3.4.3 Results. As noted in Table 5, each MMIQ-TPB subscale correlated positively with all saving behavior constructs: the highest in saving and INT at 0.82 and the lowest in spending and SBN at 0.28. The indifference subscale surprisingly showed strong correlations with all MMIQ-TPB counterparts ranging from 0.69 (PBC) to 0.76 (ATT). The SD3-TH showed more modest correlations with the MMIQ-TPB, ranging from 0.13 (Psychopathy) to 0.54 (Machiavellianism). On the one hand, Machiavellianism, which showed higher scores than Narcissism and Psychopathy, indicated the strongest correlation with all MMIQ-TPB counterparts. On the other hand, psychopathy indicated the lowest values in all measures. Overall, the MMIQ-TPB presented good values of validity indices and its correspondences with those variables related to financial behaviors.

4. Discussion

The present study supports the use of the MMIQ-TPB in examining the financial behaviors of university students with loans in a college setting. All the MMIQ-TPB subscales showed acceptable reliabilities and good validity, thereby demonstrating an expected alternative structure that describes students' money management intention. The main validation findings indicated that the present construct consists of several facets, which could be combined into a multi-dimensional construct. This suggested that individuals with higher attitudes, subjective norms, PBC and intention are more likely to have higher functional cognition in managing their money. The combination of these present measures offers a methodological template for the future empirical evaluation related to money management in the financial literature. The critique of the performance of the MMIQ-TPB showed that the relationship between intention and other measures seemed to be the same with past

Table 5. Convergent validities among MMIQ-TPB, saving behavior and dark triad personality

	$\bar{x}$	*SD*	α	MMIQ-TPB ATT	SBN	PBC	INT
Saving Behavior							
Saving	3.69	0.89	0.91	0.78**	0.80**	0.71**	0.82**
Indifference	3.67	0.90	0.71	0.76**	0.71**	0.69**	0.76**
Spending	3.02	0.78	0.84	0.33**	0.28**	0.30**	0.23**
SD3-TH							
Machiavellianism	3.31	0.78	0.81	0.55**	0.55**	0.54**	0.50**
Narcissism	3.01	0.85	0.88	0.39**	0.31**	0.36**	0.28**
Psychopathy	2.79	1.00	0.90	0.21**	0.16**	0.22**	0.13**

Note: **$p < .01$ (two-tailed)

studies, which presented the highest values with attitude. Those subscales indicated some implications, especially between PBC and attitude or PBC and intention

The past studies have raised the limitations of the empirical support provided thus far to explain the interaction between PBC and intention. In the reviews of Ajzen and Driver (1991) and Yzer (2012), they pointed out that a conceptual perspective of PBC can be moderated with attitudinal and normative effects on intention. Moreover, the relationships between PBC and attitude or subject norm seemed to be difficult to demonstrate in various types of behaviors, such as condom use, smoking cessation and drug addiction. Although the current research does not present a severely undesirable finding related to PBC, several researchers have recommended conducting more basic research on its moderating role. Interestingly, Ajzen, the theory developer, explained that PBC could be responsible for the considerable variance in intention and target behavior; however, its conceptualization has created uncertainties and impeded progress due to the ambiguities surrounding it. Some recent studies have demonstrated the overarching concept of PBC, which consists of self-efficacy and controllability. These two components could reflect internal and external factors that need to be incorporated within PBC (Ajzen, 2002; Cheung & Chan, 2000). In addition, those factor weights should be varied for different behaviors in varying populations. Although few studies have used the multiple measures of control belief and perceived power to operate PBC, in comparison, many researchers have used the single measure of PBC (Ajzen, 2002) as we did in this study.

As for this study's contributions, several measures related to TPB indicated soundness of usage. However, based on student debtors, we found a possibility that loan students in all the steps studied declared low perceived ability to manage their money. This causes debt control, which is manifested in the low scores on PBC. These results could be interpreted as follows: students have an acceptable attitude in managing their money, but perceive a lack of ability to control their budget. Several studies have indicated similar results among student debtors worldwide (Chudry et al., 2011; Xiao & Wu, 2008).

Notably, two interesting findings emerged in the relationship among the MMIQ-TPB components on the one hand and saving behavior on the other hand. Although the MMIQ-TPB shared the same higher direction with saving behavior and lower in spending logically, the indifference, which refers to the trait of an unambitious person (i.e. the one who does not care about richness or poverty in the future) shared higher association with MMIQ-TPB. A finding of Boonroungrut, Dechporm, Oo, and One (2018) provides a clue regarding the higher saving higher monetary indifference mindset: people showed potential for monetary carelessness when they have higher savings. Nevertheless, this requires further research.

Spending showed positive correlations with all the components. Saving and spending attitudes are not absolute against variables, but borrowing attitude is. Several studies have presented the possible evidence showing that borrowing could be against saving attitudes more than spending psychological mechanisms (Griskevicius et al., 2012; Nyhus & Webley, 2001). If these statements are true, then students with loans are more at risk than self-supporting students to make future financial misbehaviors, because they have already begun the borrowing circulation (Boonroungrut, Huang, & Dechporm, 2021).

Additionally, this validation study supports our understanding of the Machiavellianism advantage in management studies. No doubt, Machiavellianism had the strongest correlation with all the MMIQ-TPB sub-measures than other traits. The review of Rauthmann and Will (2011) supports the evidence that Machiavellianism has a substantial shared-environment component, whereas Narcissism and Psychopathy can be explained by genetic and nonshared environmental factors. Furthermore, individuals acquire this trait to possess enough phenotypic plasticity to adjust to the surrounding environment

(Jones & Paulhus, 2009). Thus, based on the present findings and as a suggestion for future studies, the MMIQ-TPB can be developed for screening either well-management or threat-budget management with other variables related to financial behaviors.

As mentioned in the past studies on improving financial literacy, the designed interventions or programs can be implied to target beliefs. This could affect how people value their intended behaviors and attitudes, subjective norms and PBC toward intention and behavior. There were four suggestions that should be provided for the examined variables using the TPB integrated models:

(1) positive and negative feelings of performing behavior covering experimental attitudes and affect;

(2) positive and negative outcomes and attributes of performing behavior;

(3) whom they supported or opposed in their performing behavior; and

(4) the facilitators and barriers that could make their performing behavior easy or difficult (Montano & Kasprzyk, 2015; Record, Harrington, Helme, & Savage, 2018).

5. Limitations and conclusion

Some implications have also been noted. First, this study randomly selected participants in the general undergraduate level. Thus, generalizing the findings to any specific groups of students might require further research in the future (e.g. including open university students). These students could have higher abilities in managing their budget, because most of them are already working while studying. Second, all samples came from universities in urban areas. Finally, the MMIQ-TPB questions referred to cognitive influence through intention and were designed to include intended preparation and not action stage.

In conclusion, this study presents a reliable and valid structure for measuring money management intention among undergraduate students with loans in a university setting. The MMIQ-TPB, however, is still open for further research on the role of intention in budgeting behavior in various groups of students.

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