

Practice Improves Performance: The Mediating Interaction of Active Management on Financial Literacy and Financial Well-being

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Abstract

What is the relationship between an individual's financial literacy and their perceived financial well-being? Based on the behavioral theories of Bandura and Ajzen, our study examines how financial knowledge affects intermediary behavior factors such as financial management skill, habit, and actions, and how these self-efficacy behaviors improve financial well-being. The findings imply that, along with the demonstrated direct relationship between financial literacy and well-being, the benefit of financial knowledge positively impacts the sense of financial well-being when individuals employ their knowledge in financial decisions and activities. We conclude that benefits from financial literacy on well-being are largely functions of the cultivation of positive financial decisions and actions reinforced through active financial management. Performance and policy implications are discussed.

Keywords

Financial Literacy, Financial Well-being, Self-efficacy, Financial Control, Financial Education, Partial Least Squares-Structural Equation Modeling (PLS-SEM), Mediation, Journal of Economic Literature Classification G-40 & 41

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Do individuals who regularly use sound financial management practices have a greater sense of financial well-being? The study of financial literacy and its impact on financial well-being has been gaining increasing attention among practitioners and academics (Bureau, 2015; Lee, Lee, & Kim, 2020; Lusardi, 2019; Netemeyer, Warmath, Fernandes, & Lynch Jr, 2018). Financial literacy may be defined as the capacity to utilize information and aptitudes to oversee monetary assets adequately for a lifetime of budgetary prosperity (*President's Advisory Council on Financial Literacy*, 2008). Characterizations also found in extant literature include a specific form of financial knowledge applied to the management of financial assets which sustain beneficial and productive financial behavior (Hung, Parker, & Yoong, 2009). Financial well-being is not universally accepted with a specific definition, but the definition which seems to capture a generally applied notion of an individual's concept is the ability to manage and sustain financial activities to meet personal desired financial outcomes (Brüggen, Hogreve, Holmlund, Kabadayi, & Löfgren, 2017; Zyphur, Li, Zhang, Arvey, & Barsky, 2015).

Several studies of financial literacy focus on areas such as understanding the financial literacy of the general population, identifying the least financially savvy population subgroups and evaluating the impact of financial literacy on economic decision-making (Lusardi & Mitchell, 2014). However, financial knowledge alone may not help the consumer achieve a sense of well-being unless regularly practiced. Although there has been a substantial empirical body of work on the economics of education, far less attention has been devoted to the question of how people acquire and deploy financial literacy (Anderson, Baker, & Robinson, 2017; Fernandes, Lynch Jr, & Netemeyer, 2014; Garman, Kim, Kratzer, Brunson, & Joo, 1999; Lusardi, 2019; Lusardi & Mitchell, 2014). To evaluate the benefit of financial literacy, it is important to address how financial literacy influences financial decision-making activities and how those potential influences improve perceived financial well-being.

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It is recognized that financial literacy is becoming more important as financial instruments and programs become more sophisticated (C  l  rier & Vall  e, 2013, 2016; Remund, 2010). While the investment markets are more accessible to retail and individual investors, individuals also rely more on complex financial products and services to improve their economic life (Lusardi & Mitchell, 2014; Remund, 2010). Considerable research has demonstrated the correlation between formally and informally acquired financial literacy and a sense of financial well-being however, questions regarding whether these associations constitute causality have been postured in several studies (Behrman, Mitchell, Soo, & Bravo, 2012; Garman et al., 1999; Kim, 2000; Lusardi, 2019; Lusardi & Mitchell, 2008). Previous studies also identify correlations between financial knowledge and behavior but the direction of the causality is unclear (Hilgert, Hogarth, & Beverly, 2003). What the literature search did not uncover was if the active practice of financial management and use of financial knowledge is a factor in determining an individual's sense of financial well-being. For this reason, our paper seeks to determine if active financial management has such an affect. Therefore, this paper attempts to contribute to the extant literature by addressing the research question with an analysis of active participation in financial management.

We organize the study as follows; the next section reviews the previous research on financial literacy and its implications on financial decision making and well-being. From the extant literature we present our hypothetical propositions and the rationale for their application. Next, we introduce a structural equation model to explain the association between financial literacy, mediation factors in decision making practices and the effect upon perceived financial well-being. The subsequent sections provide discussions of our findings. The final section concludes with our contribution to knowledge and potential applications to practice.

Literature Review

Theoretical Grounding

We endeavored to anchor our propositions on established theory. Extant literature regarding financial literacy and or financial well-being is conspicuously absent of theoretical grounding. Much of the literature reviewed provided causal inferences, but lacked behavioral grounding with few exceptions. To provide a behavioral basis for our research, we rely on the theoretical propositions of self-efficacy (Albert Bandura, 1991; Deci & Ryan, 1985; Ryan, 1982) and locus of control which implies that desired outcomes are actor dependent (I. Ajzen, 2002; Phares, 1976). Perceived self-efficacy suggests that individuals and their decisions impact their confidence in affecting their lives. “Some people regard ability as an acquired skill that can be increased by gaining knowledge and perfecting competencies” (Albert Bandura, 1991). We found the concept of self-efficacy to be well suited for our proposition that those actively practice financial management will likely be more satisfied with their financial well-being and supported (Brüggen et al., 2017; Shim, Xiao, Barber, & Lyons, 2009; Vosloo, 2014). Ample behavioral studies regarding locus of control have dealt with the intrinsic motivation of individuals and their perceived degree of self-efficacy, therefore we believe self-efficacy is an appropriate theoretical foundation for our study.

Financial Literacy and Financial Well-being

Many studies have taken the survey approach to measure people’s financial literacy and evaluate its impact on financial decisions (Hung and et al., 2009). For example, Lusardi and Mitchell (2008) designed a standard set of questions to measure a person’s financial literacy around several fundamental concepts including: (i) numeracy and capacity to do calculations related to interest rates, such as compound interest; (ii) understanding of inflation; and (iii) understanding of risk diversification. Such a survey approach has been implemented in the

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United States and abroad on the subject of financial well-being (e.g., Bucher-Koener et al., 2012; Lusardi and Mitchell, 2011b & 2011c) and on wider topics including financial markets, retirement planning, etc. (e.g., Lusardi and Mitchell, 2011a & 2014). Many studies have generally demonstrated that financial literacy is highly correlated with education (Bucher-Koener & Lusardi, 2011). Additional investigations have been extended to sub-groups of survey populations such as male vs. female, Y-generation, level of education, and despite that financial literacy is highly correlated with formal education, a gender disparity has yet to be shown (Bucher-Koener & Lusardi, 2011; Zyphur et al., 2015). Evidence that human behavior is affected by the individual's perceived ability to interact with generally personal confidence and satisfaction also supports self-efficacy of using financial knowledge (Reich, 2013). Other findings also suggest that financial literacy can have a significant impact on financial behavior (Behrman et al., 2012). Although studies of the relationship between financial literacy and perceived well-being have demonstrated a correlation, the concept of "doing" versus "knowing" has not been established. If well-informed, financially educated consumers are better able to make good decisions, they are more likely to do so (Hilgert et al., 2003; Lusardi, 2006; Lusardi & Mitchell, 2011c).

A study by Lee et. al. (2020) also confirmed the propensity to plan plays a moderating role, which enhances the positive association between financial knowledge and financial well-being. The Organization for Economic Co-operation and Development (OECD) further defines financial literacy not only as the knowledge and understanding of financial concepts and risks, but also the skills, motivation, and confidence to apply such knowledge and understanding to improve the financial well-being of individuals. Thus according to Lusardi, (2019) financial literacy represents both knowledge and behavior but

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also the causal association of financial knowledge and financial well-being. The direction of the correlation, however continues to be debated (Lusardi, 2019; Lusardi & Mitchell, 2008, 2011a). Financial literacy alone, is not sufficient. (Lusardi & Mitchell, 2014). Financial literacy has been demonstrated to make significant difference in financial behavior, but it is not enough to simply be highly educated (Behrman et al., 2012). Such an illustration is supported in a study from Hulbert, et al (2012) by indicating that finance professors and professional money-managers handle their portfolios more actively, and as a result they are less likely to practice naïve diversification strategies and have a more robust perception of their financial well-being. This notion implies that those who practice have a deeper financial knowledge base and as a result enjoy greater perception of financial well-being (Porter, 1990). Arguably, the concept of financial well-being is a perceived notion subject to one's own personal biases and personal feelings of satisfaction (Stutzer & Frey, 2003; Zyphur et al., 2015). "People evaluate their level of subjective well-being with regard to circumstances and comparisons to other persons, past experiences and expectations of the future" (Stutzer & Frey, 2003).

The study of financial well-being faces similar issues in measurement. Because individuals tend to have different priorities, traditional measures such as income or net worth, while important, do not necessarily or fully capture this overall conceptual aspect of financial well-being. The Consumer Financial Protection Bureau (CFPB) suggests financial well-being can be defined as a state of being wherein one has control over their day-to-day finances, have the capacity to absorb a financial shock, are on track to meet financial goals; and have the financial freedom to make the choices (Bureau, 2015, 2017; Porter, 1990).

Several studies have been conducted on the relationship between financial literacy and behaviors. For example, Hilgert, Hogarth, and Beverly (2003) reveal the strong correlation

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between financial literacy and financial management skills. de Bassa Schereberg (2013) shows financial literacy can be linked to holding precautionary savings. Furthermore, people with better numeric and financial literacy are also more likely to take actions and participate in financial markets (Christelis, Jappelli, & Padula, 2010; Lusardi & Mitchell, 2011b; Van Rooij, Lusardi, & Alessie, 2011).

While the literatures suggests the direct relation between financial literacy and well-being is generally accepted, further studies are expected to address how people utilize and benefit from their financial knowledge (Lusardi & Mitchell, 2014). Despite these worthy investigations seeking correlation in financial literacy and the sense of financial well-being, no study was discovered that investigated the correlation of practicing financial knowledge and perceived financial well-being. This investigation attempts to contribute to the extant literature by suggesting that improvement of perceived financial well-being is enhanced by actively exercising financial decision-making. The next section states our work hypotheses and presents our conceptual model.

Hypotheses

Extant literatures extensively extol that financial literacy depends on an individual's understanding of many different finance-related areas. Much effort has been applied to identify causal relations between financial literacy achieved through formal and informal training with some reliability, however other variables such as income, time availability gender, and age, though often discussed have not to date been substantially resolved. As a result of the literature review, the authors recognized the possibility of a mediating effect of being financially literate but not leveraging that knowledge to actions to produce the sense of well-being. Our research hypotheses in support of our research question are as follow:

H1: Financial literacy (FINLIT) is positively associated with financial well-being (FWB).

H1 is broadly supported among the extant literatures, both assumed and established (Garman et al., 1999; Hibbert et al., 2012; Hilgert et al., 2003; Lusardi, 2019; Lusardi & Mitchell, 2011a, 2014; Netemeyer et al., 2018; Taft, Hosein, Mehrizi, & Roshan, 2013; Van Rooij et al., 2011; Vosloo, 2014). Confirming the relationship provides a baseline for the model to ground extant research and extend mediation hypotheses represented in this study.

H2: The skillful utilization of financial knowledge positively mediates the relationship between financial literacy and financial well-being

Several reviewed literatures suggest that the level of financial literacy does have a causal effect on the perceived sense of financial well-being (Anderson et al., 2017; Kim, 2000; Lusardi & Mitchell, 2011c; Vosloo, 2014). Our second Hypothesis posits that financial knowledge alone is insufficient to meet financial goals which produced the sense of financial well-being. It is our intent to demonstrate that skillful utilization of financial knowledge has a mediating impact on the perceived state of financial well-being.

Demonstrating such a relationship will support our proposition that having and using financial knowledge will provide positive enforcement upon the sense of financial well-being as suggested by Bandura's theory of self-efficacy.

H3: There is a complementary mediation of HABIT upon the relation of FINLIT -> FWB.

H3 argues that skill in the utilization of financial knowledge is developed through the systematic exercise of financial management practices (Christelis et al., 2010; de Bassa Scheresberg, 2013; Fernandes et al., 2014). Some literatures suggest this may be so, but

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we found no empirical examples to support the inference. H3 attempts to provide evidence to support that notion.

H4: There is a complementary mediation of ACTION on the relationship of FINLIT ->

FWB.

H4 (action), the execution of routine financial management is an extension of H3, (habit) or systematic, periodic contributions which represent a unique mediation effect. More specifically, financial action may be considered representative of financial practices (Adam, Frimpong, & Boadu, 2017; O'Neill, Sorhaindo, Xiao, & Garman, 2005) vs. habit, which represents frequency and reinforcement of being involved in financial actions (Goyal, Ilmanen, & Kabiller, 2015). The concept is further supported by Ponchio et.al. (2019) with “following a plan to achieve financial goals” and effecting “... “the impact of the individual’s present actions on their financial future”.

H5: There is a complementary mediation of ACTION upon the relationship of SKILL ->

FWB.

We postulate that the frequency of involvement with financial activities produces a refinement of the financial knowledge and skills used to meet individual financial expectation and goals which produce the sense of financial well-being. Hilgert, (2003) suggests that increases in information leads to changes in financial management practices, but does not demonstrate that it also translates to frequency of management activities. Hilgert further suggests, “... the greatest challenges for policy makers, consumer educators, and practitioners in providing financial education is motivating individuals to pursue it (Hilgert et al., 2003). Therefore, we extend that research with H6.

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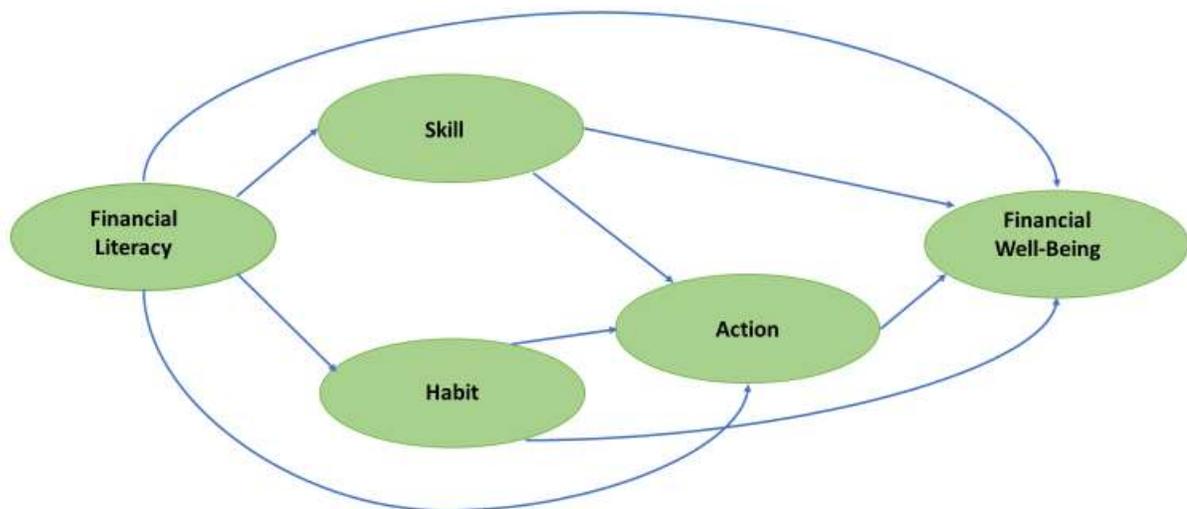
H6: There is a complementary mediation of ACTION upon the relationship of HABIT -> FWB.

When action activities provide successful/positive results, the sense of self-efficacy is enhanced (Icek Ajzen, 2002; Albert Bandura, 1991; A. Bandura, 2006). Self-efficacy and control have been theorized to provide motivation to continue the activities and supports goal-seek activities, in this case achieving a sense of financial well-being.

“...individuals insert personal influence into the cycle of causation by their choices and actions” (A. Bandura, 2006). Leveraging the behavioral expectations of self-efficacy, planned behavior and human agency, we endeavor to make the case for the influence of financial action, regardless of success or outcome creates habitual activities albeit improved or adjusted.

Conceptual Model

The following graphic represents a visual presentation of our theoretical model.



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Methodology

Data Source

Data used for analysis is publicly available through the Consumer Financial Protection Bureau (CFPB). The data used for this study was published in 2106 (Bureau, 2016).

Background

The Dodd-Frank Act of 2010 recognized that consumers of financial products and services need both a safe, transparent marketplace, and more importantly, the financial capability to navigate that marketplace effectively. Numerous provisions of the Dodd-Frank Act charged the CFPB with working to improve the financial literacy of consumers in America. Building on the development and validation of the financial well-being scale, the CFPB fielded the National Financial Well-Being Survey. The 2016 National Financial Well-Being Survey is a representative survey of 6394 adults ages 18 and older in the United States. The survey questions covered a wide range of topics hypothesized to influence a person's level of financial well-being. These topics included financial knowledge, skills, attitudes, and behaviors; individual characteristics; household and family characteristics; income and employment characteristics; savings; safety nets; and financial experiences. The data allows further research of the association between financial well-being and these topics (Bureau, 2015, 2016, 2017).

Equation Modeling

We use PLS-SEM to describe the relation among latent variables (structural model) and the relation between the latent variables and observable responses on related questions (measurement model). According to Castro Gonzolas et al, (2020) PLS is an appropriate technique in this research as "PLS is primarily intended for causal-predictive analysis in

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situations of high complexity but low theoretical information” (Joreskog, 1982). The execution and application of the PLS-SEM follows recommendation procedures leveraging the empirical analysis with R programming (Hair Jr, Sarstedt, Ringle, & Gudergan, 2017; Monecke & Leisch, 2012; Sanchez, 2013). Using the PLS-SEM on the 2015 financial well-being data surveyed by CFPB, we explain the direct relation between financial literacy and financial well-being, and the indirect relation through mediation factors of financial skills, habits, and financial actions. The analysis illustrates the significant intercession of those intermediary factors. The study suggests that the benefit of financial literacy on well-being functions largely through the cultivation of positive financial decisions and activities.

Measurement model

To describe the association between financial literacy (FINLIT) and well-being (FWB), we introduce latent mediation factors of financial skills (SKILL), habits (HABIT), and activities (ACTION). We use the responses from related questions from the CFPB survey responses as reflective indicators for the proposed latent variables. For the convenience of reference, we employ the same terminology as used in the CFPB report (Bureau, 2017). We use financial literacy (FINLIT) as an instance to describe the measurement model. There are multiple associated questions to gauge FINLIT from different financial aspects, such as (i) Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? (ii) When an investor spreads his or her money among different assets, does the risk of losing money increase, decrease or stay the same? (See “Appendix A” for the list of questions used.) The responses to the group of questions, while correlated, are designed to measure different aspects of the same construct. Using the PLS-SEM algorithm, we derive the latent FINLIT construct as the common component shared by those relevant indicators. Such an approach alleviates the issue of

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multicollinearity among the correlated variables (Hair Jr et al., 2017). The validity and reliability of the latent construct is reliant upon the effectiveness of the common construct to explain the individual indicators by the loadings of the latent variable over individual indicators. Using a similar approach, we measure latent constructs of SKILL, HABIT, ACTION, and FWB using the responses to selected questions. With the measurement framework established, we are able to study the direct and indirect relation between financial literacy and well-being.

Structural model

The structural model is designed to explore the relation between the latent constructs. To illustrate the mediation impact, we include two sub-models for comparison. (See Appendix B)

- Model-1 addresses the base model to explain the direct relation between financial literacy (FINLIT) and well-being (FWB), or FINLIT -> FWB.
- Model-2 includes the mediation factors of financial skills (SKILL), habits (HABIT), and actions (ACTION) over the direct relation between FINLIT and FWB.

Table 1 shows the details for the setup of Model-1. FINLIT is extracted from the responses to the finance-related questions, and the row variables FWB is extracted from the responses over the well-being related questions. Table 1-A addresses the direct causal relation of column variable FINLIT over row variable FWB, or FINLIT -> FWB. Table 1-B shows the lists of both finance-related questions and well-being related questions (See Appendix B).

Table 2 illustrates the Model-2 with mediation factors. Table 2-A suggests that FINLIT not only has a direct impact over FWB but also features indirect impact through mediation factors of SKILL, HABIT, and ACTION. (See Appendix B, Table -2).

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Following the studies of Hilgert, Hogarth, and Beverly (2003), de Bassa Scheresberg (2013), and van Rooij, Lusardi, and Alessie (2011), we assume better financial literacy would cultivate better financial habit, skills, and actions. Those improved positive financial habits, skills, and actions will directly improve financial well-being. Using HABIT as an example, we describe the indirect relation as FINLIT → HABIT → FWB, which suggests the HABIT has mediation impact over the relation between FINLIT and FWB. Similarly, we also test the mediation impact of SKILL and ACTION over FINLIT → FWB. Due to reasoning that ACTION could also be the results from positive HABIT and SKILLS, we also ACTION as a mediation factor over SKILL → FWB and HABIT → FWB. Table 2 shows the details of the indirect relations among the latent variables. (See Appendix C)

Analysis and Results

To assess the PLS-SEM analysis, we report both the regression results for the structural model and tests on construct reliability, validity, and discriminant validity. (See Appendix D & validity test results in Appendix E)

Model-1 (Base) on the direct relation

Model-1 explains the direct association between financial literacy and well-being. The regression in Table 3-1 confirms the significant positive relation between literacy and financial well-being (coef = 0.34 with p-value = 0.00). Further test in Table 3-2 confirms the reliability and validity of the latent variables. The Dillon-Goldstein's rho measures the composite reliability at 0.783 for FINLIT and 0.931 for FWB, which is above the satisfactory level of 0.700. The communality reached 0.237 for FINLIT and 0.574 for FWB. This suggests the latent variable FINLIT on average explains about 23.7% of the variance in the responses of literacy-related questions, while the FWB explains about 57.4% of well-being related questions on average. The

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loadings of FINLIT related questions are lower than required 50% due to the wide selection of questions different financial topics and the diverse universe of survey populations. The responses from well-being questions are more correlated with each other. The cross-loading illustrates discriminant validity. The reflective indicators generally load much higher on their designated latent variables than others, which confirms the discriminant validity. Bootstrapping results show that the estimation falls in the 95% interval. The base model confirms the hypothesis (H1) that financial literacy is positively related to the overall financial well-being. However, it only explains about 11.4% of the variance for FWB. The observation suggests other factors are needed to explain the FWB, which leads to our discussion on the mediation factors.

Model-2 with mediation factors

Model-2 incorporates the mediation factors of SKILL, HABIT, and ACTIONS (Appendix F). The regression in Table 4-1 confirms the significant indirect relation between literacy and well-being (coefficient = to .06 with p-value = 0). FINLIT has a direct positive impact on factors of SKILL (coefficient = .22), HABIT (coefficient = .24), ACTION (coefficient = .45), and FWB (coefficient = .06 as previously stated). Meanwhile, SKILL and HABIT have a direct impact on ACTION (coefficient = .09 and .16) respectively. All endogenous latent variables have a positive direct impact on the FWB (Skill coefficient = .35), (Habit coefficient = .23), (Action coefficient = .27). It is worth noting that after we include mediation factors, the direct association of FINLIT->FWB, though still significant (pv= 0.00), is reduced to 0.06. Instead, the indirect impacts through SKILL, HABIT, and ACTION take a much more significant role, as illustrated with the PLS flow chart in Table 4-1. The factors combine to explain 40% of the variance in FWB, which is an improvement over 11.4% r-squared from Model-1. Because variables in PLS-SEM model are standardized, the scale of coefficients

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reflects the effectiveness of the relations. When mediators of SKILL, HABIT, and ACTION are included, the direct relation FLIT -> FWB is reduced to 0.06 from the 0.34 in base Model-1. The observation suggests that the benefit of financial literacy over the well-being largely depends on how we can translate the financial know-how into practical skills and financially positive behavior.

Table 4-2 shows the reliability and validity test. The Dillon-Goldstein's rho measures the composite reliability over the satisfactory threshold of 0.700. The communality test shows that FINLIT and ACTION marginally meet the requirement at 0.237 and 0.575, while SKILL, HABIT, and ACTION show a loading community of 0.505, 0.393, and 0.212. The cross-loading illustrates discriminant validity. We find that SKILL indicators load higher than usual on the HABIT constructs, which suggests some redundancy. Since they are conceptually different, we treated them as different factors. Also, responses on PRODUCE load lower on ACTION, which suggests some redundancy on some questions.

Robustness test with bootstrapping

The bootstrapping results show that the estimation falls in the 95% interval. The results show the significance for both the path between the latent constructs and the total effects which incorporate the indirect effects from all alternative paths. See Appendix G for bootstrapping results.

Summary of Test Results and Findings

To summarize, we review the testing results from the hypotheses. Our results suggest significant mediation impact from the factors of SKILL, HABIT, ACTION upon the relation between financial literacy and financial well-being.

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H1: Financial literacy (FINLIT) is positively associated with Financial well-being (FWB) is confirmed. The analysis demonstrates that there is a significant positive relation from FINLIT -> FWB.

H2: There is a complementary mediation of SKILL of the relation of FINLIT -> FWB is confirmed. The analysis demonstrates that there is a complementary mediation of SKILL over relation FINLIT -> FWB.

H3: There is a complementary mediation of HABIT of the relation of FINLIT -> FWB is confirmed. The analysis demonstrates that there is a complementary mediation of HABIT over relation FINLIT -> FWB.

H4: There is a complementary mediation of ACTION over the relation FINLIT -> FWB is confirmed. The analysis demonstrates that there is a complementary mediation of ACTION over relation FINLIT -> FWB.

H5: There is a complementary mediation of ACTION of the relation of SKILL -> FWB is confirmed. The analysis demonstrates that there is a complementary mediation of ACTION over relation SKILL -> FWB.

H6: There is a complementary mediation of ACTION of the relation of HABIT -> FWB is confirmed. The analysis demonstrates that there is a complementary mediation of ACTION over relation HABIT -> FWB.

The comparison between Model-1 and Model-2 suggests the benefits of FINLIT largely rely on the mediation from SKILL, HABIT, and ACTION.

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Discussion

Financial education programs have been developed and implemented in the US and elsewhere over the years. They are also conducted under different settings and provided through schools, workplaces, libraries, and commercial endeavors. For example, Hira (2010) provides a broad overview of research on financial education over a significant period of time. However, it remains difficult to evaluate the impact of financial education programs on financial well-being (Lusardi & Mitchell, 2014). As discovered and represented in the Literature Review section, even well-educated individuals may be financially knowledgeable to some degree, but some individuals purport a greater sense of financial well-being than others. The depth of financial knowledge and the application of that knowledge may be representative of a *practice makes perfect* variable. A particular study by Hibbert, Lawrence, & Prakash, concludes “We find that compared with English professors, Finance professors allocate a larger share of their retirement savings to equities, they manage their retirement portfolios more actively, and they are less likely to practice naïve diversification strategies.” (Hibbert et al., 2012). It has also been shown that those who are more financially literate are also more likely to undertake retirement planning, and those who plan also accumulate more wealth (Lusardi & Mitchell, 2011a). These discussions and assumptions prompted us to speculate that active financial management will improve the individual’s financial position and correspondingly the sense of financial well-being and effectively contribute to financial literacy. Our mediation analysis illustrates the relation between financial literacy and behavior (habits, skills, and action). The improved financial behavior or decision making is also shown to improve the overall financial well-being. The results lend further implications regarding the CFPB envisioned research issue on the success of interventions/active management. While improved financial literacy remains an important factor

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in improving people's financial well-being, the other equally important area should be coaching consumers to practice their knowledge and cultivate positive financial habits and actions through continuing education, whether formal or informal methods such as trial and error.

Conclusions

This paper uses CFPB survey data to build measures and PLS-SEM to test the important interrelationships between financial literacy, skills, habit, actions, and financial well-being. Our study shows that while financial literacy has an important impact on financial well-being, benefits function largely through equally important intermediary factors, including skills, habit, and positive actions. Financial Literacy is deemed important from a sociological perspective as well as a financial viewpoint. Mental health experts identify a sense of financial well-being. From a health perspective, when individuals are dissatisfied with their financial circumstance presently or future prospects, it can activate stressors leading to depression, lack of self-efficacy and a feeling of a loss of control of one's life. A poor sense of financial security can also lead to physical stressors and the ability to address physical ailments. (Netemeyer et al., 2018; Strömbäck, Lind, Skagerlund, Västfjäll, & Tinghög, 2017; "Why Is Financial Wellbeing So Important?," 2018) It is important to recognize that financial literacy, education, and perceived financial knowledge often produce a sense of financial well-being, but successful active management of financial activities produces a positive impact on financial well-being perceptions. This study further demonstrates that active financial management enhances the leverage of financial literacy and improving the sense of financial well-being. Not unlike a musician or an athlete, performance improvement is attained through disciplined practice. Our mediation results reinforce the concept that active management may act as a mechanism for gaining knowledge, improving financial position, and elevating a sense of financial well-being. Our findings further illustrate how financial knowledge affects intermediary behavior factors like

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skill, habit and actions, and how the behavioral changes improve financial well-being. The study shows that despite the direct positive relation between financial literacy and well-being, the benefit of financial knowledge is more effectively realized when people implement their knowledge in financial decisions and activities.

Contributions to Theory and Practice

This study contributes to literature on financial literacy and financial well-being in several ways. The contribution to theory is twofold. First by anchoring extant research into established behavioral theories of self-efficacy and self-control, we have provided a stronger argument of the relationship of financial knowledge correlation with the perceived notion of financial well-being. Second, we have reinforced the notion that utilization of financial knowledge through active financial management has a likely effect on the sense of financial well-being. This is important for future researchers and opens new areas of investigation for research.

For professional financial managers, the study supports customer inclusion in the active management of their accounts through regular contact and periodic discussion of portfolio activities. The evidence demonstrates that an individuals' financial management involvement leads to an elevated sense of financial well-being. Customer involvement in portfolio activities may also imply that increased participation in investment decisions should result in greater satisfaction with service providers. Additionally, principle participation in financial decisions can provide a path toward continued financial education, an introduction to new and more complex financial instruments, and more sophisticated portfolio performance.

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The study also supports the argument that education is an important element of the future state of financial well-being. As previously discussed, education may be formal, informal, and now demonstrated to include experientially gained knowledge. While many studies have examined the importance of the role of financial literacy education in schools, universities, on the job training and post institutional training, the argument for active participation in financial management is another contribution to dissertation of financial literacy.

Limitations and Opportunities

As with any study, we recognize the limitations of our effort and highlight a few opportunities to expand upon our investigation. To begin, we rely on existing data gathered in 2016. The scale and questions, though widely used and accepted in the field, could be refined and expanded upon. A deeper dive into demographic variations such as age, gender, family size, income levels, stage in life, and access to sophisticated markets could provide additional and important insights (Almenberg & Dreber, 2015). Sub-group analysis might help explain the differences and lend further insight into the relation between financial literacy and well-being. Additional future studies might also encompass the impact advisor-coaches or professional interventions upon perceived well-being when outcomes are positive. Such efforts would also likely provide insights for financial education policy. Directing further investigations that explore additional human behavior theories may also provide new insights into the complex relationships between financial literacy and financial well-being.

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Appendices

Appendix A

Consumer Financial Protection Bureau (CFPB) Financial-Survey Questionnaire

Note: only questions related this paper are included in the table.

reverse	variable	question
1	FINLIT	FINANCIAL LITERACY
1	SKILL	SKILL
1	HABIT	HABIT
1	ACTION	ACTION
1	FWB	FINANCIAL WELL-BEING
1	FWB1_1	1. I could handle a major unexpected expense.
1	FWB1_2	2. I am securing my financial future.
-1	FWB1_3	3. Because of my money situation, I feel like I will never have the things I want in life.
1	FWB1_4	4. I can enjoy life because of the way I'm managing my money.
-1	FWB1_5	5. I am just getting by financially.
-1	FWB1_6	6. I am concerned that the money I have or will save won't last.
-1	FWB2_1	1. Giving a gift for a wedding, birthday or other occasion would put a strain on my finances for the month
1	FWB2_2	2. I have money left over at the end of the month.
-1	FWB2_3	3. I am behind with my finances.
-1	FWB2_4	4. My finances control my life.
1	SHOCKS_1	1. Lost a job
1	SHOCKS_2	2. Had work hours and/or pay reduced or a business I or someone in my household owned had financial difficulty
1	SHOCKS_3	3. Received a foreclosure notice
1	SHOCKS_4	4. Had a major car or home repair
1	SHOCKS_5	5. Had a health emergency
1	SHOCKS_6	6. Got a divorce or separation
1	SHOCKS_7	7. Added a child to the household
1	SHOCKS_8	8. Experienced the death of primary breadwinner
-1	SHOCKS_9	9. Received a large sum of money beyond normal income (such as inheritance, bonus or another windfall)
1	SHOCKS_10	10. Had a child start daycare or college
1	SHOCKS_11	11. Provided unexpected financial support to a family member or friend
1	MATERIALISM_1	1. I admire people who own expensive homes, cars and clothes.
1	MATERIALISM_2	2. The things I own say a lot about how well I'm doing in life.
1	MATERIALISM_3	3. I like to own things that impress people
1	FK1correct	Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

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1	FK2correct	Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?
1	FK3correct	Do you think the following statement is true or false? "Buying a single company's stock usually provides a safer return than a stock mutual fund."
1	KH1correct	Considering a long time period (for example 10 or 20 years), which asset described below normally gives the highest return?
1	KH2correct	Normally, which asset described below displays the highest fluctuations over time?
1	KH3correct	When an investor spreads his or her money among different assets, does the risk of losing a lot of money increase, decrease or stay the same?
1	KH4correct	Do you think the following statement is true or false? "If you were to invest \$1,000 in a stock mutual fund, if you withdraw your money, would be possible to have less than \$1,000 when
1	KH5correct	Do you think the following statement is true or false? "'Whole life' insurance has a savings feature while 'term' insurance does not."
1	KH6correct	Do you think the following statement is true or false? "Housing prices in the US can never go down."
1	KH7correct	Suppose you owe \$3,000 on your credit card. You pay a minimum payment of \$30 each month. At an Annual Percentage Rate of 12% (or 1% per month), how many years would it take to eliminate your credit card debt if you made no additional new charges?
1	KH8correct	If interest rates rise, what will typically happen to bond prices?
1	KH9correct	Do you think the following statement is true or false? A 15-year mortgage typically requires higher monthly interest paid over the life of the loan will be less payments than a 30-year mortgage, but the total
1	FS1_1	1. I know how to get myself to follow through on my financial intentions.
1	FS1_2	2. I know where to find the advice I need to make decisions involving money.
1	FS1_3	3. I know how to make complex financial decisions.
1	FS1_4	4. I am able to make good financial decisions that are new to me.
1	FS1_5	5. I am able to recognize a good financial investment.
1	FS1_6	6. I know how to keep myself from spending too much.
1	FS1_7	7. I know how to make myself save
1	AGECAT	Age category
1	PPINCIMP	PPINCIMP
1	PPEDUC	PPEDUC
1	FINGOALS	FINGOALS
1	FS2_1	1. I know when I do not have enough information to make a good decision involving my money.
1	FS2_2	2. I know when I need advice about my money.
-1	FS2_3	3. I struggle to understand financial information.
1	SAVEHABIT	1. Putting money into savings is a habit for me.
1	FRUGALITY	2. If I can re-use an item I already have, there's no sense in buying something new.
1	FINSOC2_1	1. Discussed family financial matters with me.
1	FINSOC2_2	2. Spoke to me about the importance of saving.

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1	FINSOC2_3	3. Discussed how to establish a good credit rating.
1	FINSOC2_4	4. Taught me how to be a smart shopper.
1	FINSOC2_5	5. Taught me that my actions determine my success in life.
1	FINSOC2_6	6. Provided me with a regular allowance.
1	FINSOC2_7	7. Provided me with a savings account
1	SCFHORIZON	SCFHORIZON
1	SAVEHABIT	1. Putting money into savings is a habit for me.
1	FRUGALITY	2. If I can re-use an item I already have, there's no sense in buying something new.
1	MATERIALISM_1	1. I admire people who own expensive homes, cars and clothes.
1	MATERIALISM_2	2. The things I own say a lot about how well I'm doing in life.
1	MATERIALISM_3	3. I like to own things that impress people
1	FS1_1	1. I know how to get myself to follow through on my financial intentions.
1	FS1_2	2. I know where to find the advice I need to make decisions involving money.
1	FS1_3	3. I know how to make complex financial decisions.
1	FS1_4	4. I am able to make good financial decisions that are new to me.
1	FS1_5	5. I am able to recognize a good financial investment.
1	FS1_6	6. I know how to keep myself from spending too much.
1	FS1_7	7. I know how to make myself save
1	FS2_1	1. I know when I do not have enough information to make a good decision involving my money.
1	FS2_2	2. I know when I need advice about my money.
1	FS2_3	3. I struggle to understand financial information.
1	PRODHAVE_1	1. Checking or Savings Account at a bank or credit union
1	PRODHAVE_2	2. Life Insurance
1	PRODHAVE_3	3. Health Insurance
1	PRODHAVE_4	4. Retirement Account (such as a 401k or IRA)
1	PRODHAVE_5	5. Pension
1	PRODHAVE_6	6. Non-Retirement Investments (such as stocks, bonds or mutual funds)
1	PRODHAVE_7	7. Education Savings Account (such as 529 or Coverdale)
1	PRODHAVE_8	8. Student/Education Loan (for yourself or someone else)
-1	PRODUSE_1	1. Payday Loan or Cash Advance Loan
-1	PRODUSE_2	2. Pawn Loan or Auto Title Loan
-1	PRODUSE_3	3. A reloadable card that is not linked with a checking or savings account.
-1	PRODUSE_4	4. A place other than a bank or credit union to give or send money to relatives or friends outside the US
-1	PRODUSE_5	5. A place other than a bank or credit union to cash a check or purchase a money order
1	PRODUSE_6	
-1	SELFCONTROL_1	1. I often act without thinking through all the alternatives.
1	SELFCONTROL_2	2. I am good at resisting temptation.
1	SELFCONTROL_3	3. I am able to work diligently toward long-term goals

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Appendix B

Table 1: Base model of the direct relation between financial literacy (FLIT) and financial well-being (FWB)

The structural model shows the relationship between the latent variables. The variables on the rows are exogenous, while the variables on the columns are endogenous. A cell with value '1' means the row variable has an impact over the column variable. For example, the first row shows the LITERACY has an impact over FWB. In the measurement model, for each latent construct in the column variable, the indicators are listed below.

Table 1-A: Structural model

Target	FINLIT	FWB
FINLIT	0	0
FWB	1	0

Table 1-B: Measurement model

Constructs	LITERACY	FWB
Indicators	FK1correct	FWB1_1
	FK2correct	FWB1_2
	FK3correct	FWB1_3
	KH1correct	FWB1_4
	KH2correct	FWB1_5
	KH3correct	FWB1_6
	KH4correct	FWB2_1
	KH5correct	FWB2_2
	KH6correct	FWB2_3
	KH7correct	FWB2_4
	KH8correct	FWB2_4
	KH9correct	

Appendix C

Table 2: Model of indirect relation between financial literacy (FLIT) and financial well-being (FWB) through mediation factors

The Structural model shows the relationship between the latent variables. The variables on the rows are exogeneous, while the variables on the columns are endogenous. A cell with value ‘1’ means the column variable has an impact over the row variable. For example, the first column shows the LITERACY has an impact over HABIT, SKILL, ACTION, and FWB. In the measurement model, for each latent construct in the column variable, the indicators are listed below.

Table 2-A: Structural model among Latent Variables

	FINLIT	HABIT	SKILL	ACTION	FWB
FINLIT	0	0	0	0	0
HABIT	1	0	0	0	0
SKILL	1	0	0	0	0
ACTION	1	1	1	0	0
FWB	1	1	1	1	0

Table 2-B: Measurement model between latent variables and reflective indicators

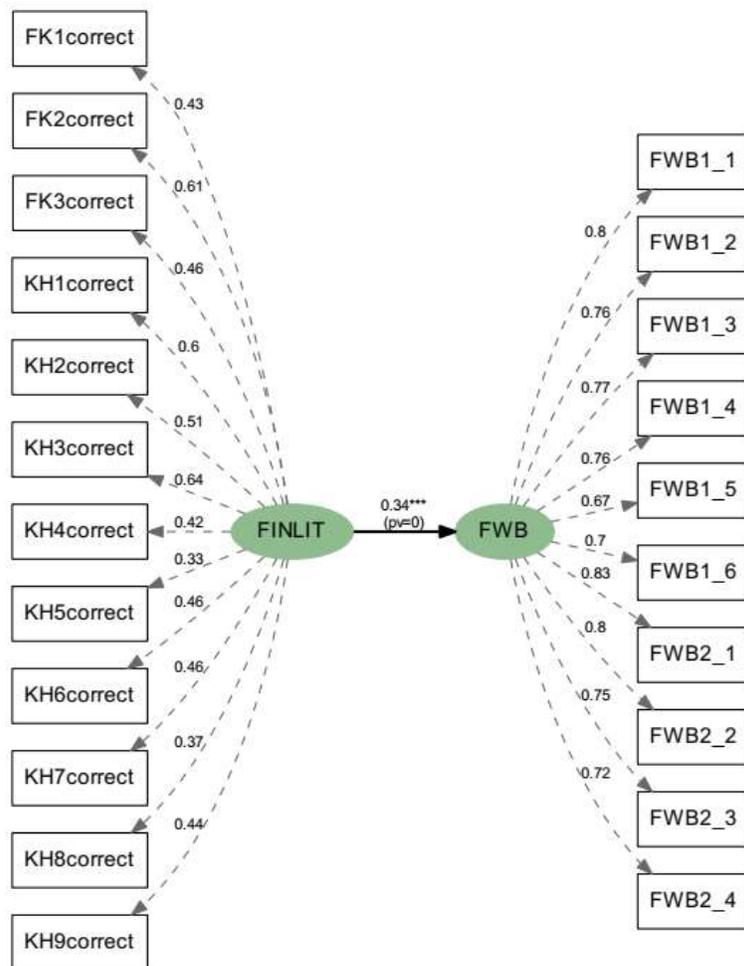
Construct					
	FINLIT	HABIT	SKILL	ACTION	FWB
Indicator					
FK1correct		FRUGALITY	FS1_1	PRODHAVE_1	FWB1_1
FK2correct		SAVEHABIT	FS1_2	PRODHAVE_2	FWB1_2
FK3correct		SELFCONTROL_1	FS1_3	PRODHAVE_3	FWB1_3
KH1correct		SELFCONTROL_2	FS1_4	PRODHAVE_5	FWB1_4
KH2correct		SELFCONTROL_3	FS1_5	PRODHAVE_6	FWB1_5
KH3correct			FS1_6	PRODHAVE_7	FWB1_6
KH4correct			FS1_7	PRODUSE_1	FWB2_1
KH5correct			FS2_1	PRODUSE_2	FWB2_2
KH6correct			FS2_2	PRODUSE_3	FWB2_3
KH7correct			FS2_3	PRODUSE_5	FWB2_4
KH8correct					
KH9correct					

Appendix D

Table 3: Regressions on the Direct relation between FINLIT and FWB

Table 3-1 illustrates both the structural and measurement models for the direct relation between FINLIT and FWB. The latent variables are in the circles, while the observable indicators are in the boxes. The solid lines show the relation between the constructs with path coefficients and their p-value for significance tests. The dashed lines show the relationship between the latent constructs and their reflective indicators with the loading of constructs on indicators. The paths coefficients from regressions are included with their p-value of significance. For the coefficients notation, ***: $p < 0.01$; **: $p < 0.05$; * $p < 0.01$.

Table 3-1: Direct relation between literacy and well-being, flow chart



Appendix E

Table 3-2: Reliability and Validity Test

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	FINLIT	FWB
Endogenous variable		x
MVs	12	10
C.alpha	0.703	0.917
DG.rho	0.785	0.931
Block_Community	0.237	0.574
Mean_Redundancy	0.237	0.574
AVE	0.237	0.574
R2		0.114

Discriminant validity		
Cross loading	FINLIT	FWB
FK1correct	0.429	0.138
FK2correct	0.613	0.175
FK3correct	0.457	0.142
KH1correct	0.604	0.256
KH2correct	0.513	0.129
KH3correct	0.642	0.231
KH4correct	0.424	0.111
KH5correct	0.329	0.106
KH6correct	0.458	0.145
KH7correct	0.457	0.158
KH8correct	0.375	0.160
KH9correct	0.439	0.123
FWB1_1	0.279	0.800
FWB1_2	0.235	0.757
FWB1_3	0.276	0.774
FWB1_4	0.205	0.764
FWB1_5	0.259	0.668
FWB1_6	0.188	0.698
FWB2_1	0.322	0.833
FWB2_2	0.248	0.797
FWB2_3	0.296	0.752
FWB2_4	0.183	0.720

Appendix F

Table 4: Regressions with Mediation Between FINLIT and FWB

Table 4-1: Indirect relation between literacy and well-being, flow chart

The flow chart illustrates the structure model among the latent variables. The path coefficients from regression are included with their p-value of significance. For the coefficients notation, ***: $p < 0.01$; ** $p < 0.05$; * $p < 0.01$.

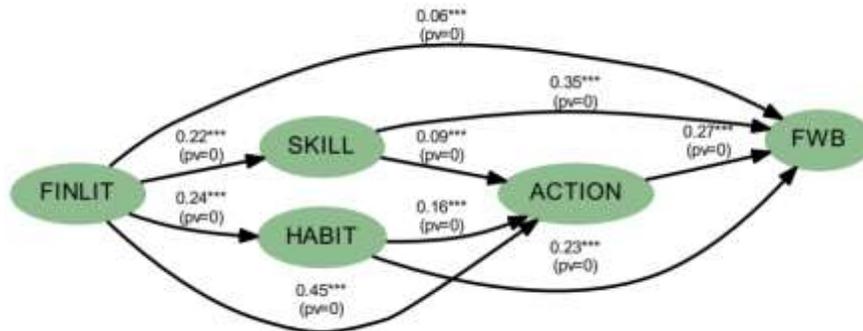


Table 4-2: Reliability and Validity Test

	FINLIT	SKILL	HABIT	ACTION	FWB
Endogenous		x	x	x	x
MVs	12	10	5	10	10
C.alpha	0.700	0.885	0.620	0.560	0.917
DG.rho	0.784	0.908	0.767	0.707	0.931
Block_Community	0.237	0.505	0.393	0.212	0.575
Mean_Redundancy	0.000	0.025	0.022	0.064	0.277
AVE	0.237	0.505	0.393	0.212	0.575
R2		0.049	0.057	0.302	0.483

Corr among constructs					
	FINLIT	SKILL	HABIT	ACTION	FWB
FINLIT	1.00	0.22	0.24	0.51	0.33
SKILL	0.22	1.00	0.63	0.29	0.59
HABIT	0.24	0.63	1.00	0.32	0.55
ACTION	0.51	0.29	0.32	1.00	0.48
FWB	0.33	0.59	0.55	0.48	1.00

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Discriminant validity					
Cross loading	FINLIT	SKILL	HABIT	ACTION	FWB
FK1correct	0.443	0.124	0.123	0.203	0.135
FK2correct	0.613	0.095	0.122	0.300	0.168
FK3correct	0.453	0.070	0.099	0.236	0.137
KH1correct	0.588	0.168	0.179	0.325	0.256
KH2correct	0.527	0.074	0.088	0.276	0.121
KH3correct	0.630	0.149	0.147	0.312	0.228
KH4correct	0.436	0.080	0.085	0.222	0.106
KH5correct	0.345	0.090	0.086	0.183	0.107
KH6correct	0.459	0.083	0.098	0.239	0.138
KH7correct	0.445	0.118	0.111	0.187	0.154
KH8correct	0.356	0.123	0.099	0.185	0.159
KH9correct	0.455	0.071	0.116	0.221	0.121
FS1_1	0.179	0.841	0.552	0.251	0.520
FS1_2	0.191	0.755	0.412	0.262	0.469
FS1_3	0.103	0.776	0.424	0.156	0.372
FS1_4	0.127	0.814	0.471	0.186	0.443
FS1_5	0.120	0.752	0.413	0.170	0.408
FS1_6	0.170	0.754	0.565	0.221	0.468
FS1_7	0.194	0.801	0.629	0.264	0.562
FS2_1	0.122	0.500	0.309	0.137	0.201
FS2_2	0.136	0.493	0.292	0.155	0.218
FS2_3	0.195	0.490	0.266	0.169	0.320
SAVEHABIT	0.180	0.494	0.790	0.313	0.571
FRUGALITY	0.171	0.258	0.461	0.120	0.102
SELFCONTROL_1	0.178	0.274	0.487	0.175	0.205
SELFCONTROL_2	0.072	0.408	0.605	0.114	0.250
SELFCONTROL_3	0.149	0.494	0.723	0.192	0.390
PRODHAVE_1	0.308	0.120	0.150	0.547	0.211
PRODHAVE_2	0.225	0.122	0.149	0.532	0.186
PRODHAVE_3	0.316	0.135	0.152	0.618	0.227
PRODHAVE_5	0.234	0.150	0.163	0.539	0.293
PRODHAVE_6	0.361	0.265	0.264	0.657	0.392
PRODHAVE_7	0.125	0.108	0.108	0.286	0.123

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PRODUSE_1	0.124	0.089	0.106	0.284	0.171
PRODUSE_2	0.121	0.073	0.096	0.277	0.139
PRODUSE_3	0.185	0.052	0.063	0.292	0.115
PRODUSE_5	0.173	0.082	0.116	0.325	0.155
FWB1_1	0.274	0.525	0.469	0.396	0.810
FWB1_2	0.230	0.554	0.491	0.369	0.778
FWB1_3	0.276	0.397	0.389	0.356	0.762
FWB1_4	0.200	0.572	0.490	0.334	0.789
FWB1_5	0.257	0.289	0.306	0.312	0.642
FWB1_6	0.187	0.352	0.320	0.295	0.698
FWB2_1	0.322	0.418	0.422	0.434	0.820
FWB2_2	0.244	0.497	0.483	0.369	0.805
FWB2_3	0.297	0.419	0.426	0.418	0.743
FWB2_4	0.180	0.358	0.342	0.285	0.717

Appendix G

Table 5: Robustness Test with Bootstrapping

Table 5 shows the Bootstrapping test on robustness. For each path, the table includes the total effects between latent variables, the coefficients listed with the average, standard deviation and 95% confidence interval.

Table 5-1: Bootstrapping test on Model-1 with Direction relation

Bootstrapping					
	Coef	boot.avg	boot.std	lower 2.5%	upper 2.5%
Path					
FINLIT->FWB	0.3370	0.3390	0.0110	0.3190	0.3540
Total effects					
FINLIT->FWB	0.3370	0.3390	0.0110	0.3190	0.3540

Table 5-2: Bootstrapping Test on Model-2 with Mediation

Bootstrapping					
	Coef	boot.avg	boot.std	lower 2.5%	upper 2.5%
Path					
FINLIT -> SKILL	0.221	0.223	0.012	0.202	0.247
FINLIT -> HABIT	0.239	0.241	0.011	0.221	0.262
FINLIT -> ACTION	0.447	0.447	0.012	0.425	0.468
FINLIT -> FWB	0.058	0.059	0.011	0.041	0.082
SKILL -> ACTION	0.090	0.089	0.014	0.061	0.115
SKILL -> FWB	0.351	0.350	0.015	0.322	0.376
HABIT -> ACTION	0.157	0.158	0.014	0.130	0.183
HABIT -> FWB	0.232	0.234	0.014	0.208	0.258
ACTION -> FWB	0.271	0.269	0.011	0.250	0.289
Total effects					
FINLIT -> SKILL	0.221	0.223	0.012	0.202	0.247
FINLIT -> HABIT	0.239	0.241	0.011	0.221	0.262
FINLIT -> ACTION	0.505	0.504	0.010	0.488	0.523
FINLIT -> FWB	0.327	0.329	0.010	0.312	0.348
SKILL -> HABIT	0.000	0.000	0.000	0.000	0.000
SKILL -> ACTION	0.090	0.089	0.014	0.061	0.115
SKILL -> FWB	0.375	0.374	0.015	0.347	0.398
HABIT -> ACTION	0.157	0.158	0.014	0.130	0.183
HABIT -> FWB	0.274	0.276	0.014	0.251	0.301
ACTION -> FWB	0.271	0.269	0.011	0.250	0.289

Practice Improves Performance

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