BEYOND FINANCIAL LITERACY: THE PSYCHOLOGICAL DIMENSIONS OF FINANCIAL CAPABILITY

Daniel D Shephard
Juan Manuel Contreras
Jirs Meuris
Aukje te Koat
Simon Bailey
Anna Custers
Nathalie Spencer
Summary: Financial capability behavior (FCB) is affected by more than just financial knowledge or attitudes towards spending, it is also affected by human psychology. In this study, the relative influence of various financial and psychological variables on FCB were tested using a cross-sectional, online survey of 800 respondents in the Netherlands. Our analysis showed that while age, gender, education, financial literacy, and money attitudes explained some of the variance in FCB (adj. R² = 0.15), the addition of the psychological constructs of optimism, non-impulsiveness, goal orientation, financial locus of control, and susceptibility to peer influences explained twice as much variance (adj. R² = 0.29). As hypothesized we also found that higher levels of optimism (adj.R² = 0.16, B(β) = 0.17[0.02], p < 0.01), non-impulsiveness (adj.R² = 0.10, B(β) = 0.12[0.03], p < 0.01), approach goal orientation (adj.R² = 0.18, B(β) = 0.34[0.03], p < 0.01), and internal financial locus of control (adj.R² = 0.15, B(β) = 0.18[0.02], p < 0.01) were each associated with higher FCB. Inversely, avoidance goal orientation (adj.R² = 0.11, B(β) = -0.16[0.03], p > 0.01) and external financial locus of control (adj.R² = 0.11, B(β) = -0.11[0.02], p < 0.01) were associated with lower FCB. However, we found no evidence for a curvilinear relationship between optimism and FCB nor did we find any evidence for an interaction between susceptibility to peer influence and comparison with peers with FCB. Exploratory analysis did not find any substantive moderation effects for age or gender but our exploratory analysis did find that domain-specific (financial) versions of psychological constructs explained more variance in FCB than generic psychological constructs in the case of optimism, non-impulsiveness, and goal orientation. Future research should explore the role of these psychological constructs on financial capability behavior. We also recommend that current and future interventions designed to increase financial capability behavior should consider integrating psychosocial interventions alongside any traditional knowledge-based financial literacy program.
INTRODUCTION

There has been an increased interest in measuring and supporting the financial capabilities of individuals in recent decades. This interest has accelerated since the financial crash of 2008 in which it was clear that people throughout the economy were making suboptimal decisions. This trend has coincided with a focus on the psychological dimensions of behavior more broadly, as captured in the rising influence of behavioral economics, behavioral insights, and behavioral science (OECD 2017; Lunn 2014; Kahneman 2011, Thaler 2015). These trends have merged with an expanding understanding that promoting good financial behavior is about more than knowledge—it’s also about the psychological motivations and biases that drive our behavior (Harshfield et al. 2015; Spencer, Nieber, and Elliott 2015). This paper adds to that literature by investigating how much of people’s financial capability behavior can be explained by psychological factors, specifically optimism, non-impulsiveness, goal orientation, locus of control, and peer susceptibility. The research was conducted among 800 individuals in the Netherlands and is one of the few papers investigating this breadth of psychological structures in one dataset combined with traditional measures of financial knowledge, attitudes, and behaviors. This allows us to test new combinations and interactions to inform future research and practice and confirm previously noted relationships between psychological constructs and financial behavior. While this study is correlational by design, it sheds light on relationships of multiple variables in one sample and highlights the importance of psychological variables that are often overlooked in studies that rely on common economic surveys for their analysis of financial behavior.

DEFINITIONS

It is important to clarify terms used throughout this report due to the variable use of the terms financial literacy and financial capability in the field. Some previous work has used financial literacy to refer to financial knowledge such as understanding how interest and inflation work. Among others, financial literacy has been used as a holistic term that refers to financial knowledge, attitudes, and behaviors. This broader definition is notably used in certain OECD publications (cf. Atkinson 2016). Both narrow and broad definitions have also been applied to financial capability. In narrow cases, financial capability has been used to refer to positive financial behaviors while in broader cases, it has been used to refer to the combination of knowledge, attitudes, and behaviors that are believed to enable a person to successfully navigate their economic life (Taylor 2011). The term has also drawn more explicitly from capability theory and thus sometimes includes facilitating conditions such as financial access or inclusion (Sherraden 2013). For this study, we were explicitly interested in the possible precursors to financial capability behaviors (FCB) especially as we have taken a behavioral approach. As such, the outcomes of interest are financial behaviors. On the other hand, in this report financial literacy is used exclusively in reference to financial knowledge while money attitudes are captured using attitudes towards saving and spending – neither knowledge nor attitudes are included in our measure of financial capability behavior. Finally, the primary predictors of interest in our study are the following five psychological constructs: (1) optimism, (2) non-impulsiveness, (3) goal orientation, (4) locus of control, and (5) peer susceptibility.

Being optimistic and positive about the future can help people be more psychologically resilient (Scheier and Carver 1992) but it can also lead to unrealistic optimism or overconfidence. Previous research on optimism has shown that we have a tendency to be overconfident and that can result in making imprudent decisions (Soel and Thaker 2009; Heath and Odean 2017) including financial decisions such as taking too much risk (Spencer, Nieber, and Elliott 2015; Kahneman 2011). Since there is some evidence that both too much and too little optimism can lead to poor financial decisions such that moderate levels might be ideal for financial behavior (cf. Puri and Robinson 2007), this study tested if there was such a U-shaped relationship between optimism and financial capability behavior to test if those with the lowest financial capability behavior were also those who are overly pessimistic or overly optimistic. Previous authors have also noted that general and financial impulsivity has a negative impact on financial capability behaviors (Fernandes, Lynch, and Netermeye 2015; Celis et al. 2017), such as decreased asset accumulation (Latsikia and Fox 2014) or the increased use of unsecured debt (Parise and Peijnenburg 2017). In line with this previous work our study tested if non-impulsiveness had a positive relationship with financial capability behavior.

Meanwhile, being motivated to approach new or challenging situations or to avoid the risk of failure represent two broad types of goal orientation that drive behavior. An approach orientation (pursuing challenges) has been shown to be positively related to behaviors ranging from education (Richardson, Abraham, and Band 2012) to entrepreneurship (Roach and Hulinik 2015). However, avoidance tends to cause more problems and is conceptually related to the ostrich effect of avoiding negative financial information (Brown and Kagel 2009; Karlsson, Loewenstein, and Sapp 2009). In line with this research, our study tested if respondents with high approach goal orientation had higher levels of financial capability behavior while those with higher avoidance goal orientation had lower levels.

The degree to which we believe we have control over our own fate (versus being at the mercy of chance and the efforts of people more powerful than us) also has a strong influence on behavior, including financial behavior. This trait, known as locus of control, has been found to have an impact on savings and pensions (Cobb-Clark, Kassenboehmer, and Sinning 2016), budgeting (Perry and Morris 2005), and stock investment (Salamanca et al. 2016). Our study builds on this work by seeking to replicate and expand on these previous findings through testing if high internal locus of control is associated with more positive financial capability behavior while a more external orientation has the opposite relationship.
Much work has been done in recent years showing the power of our perceptions of our peers over our own financial behavior. We often want to keep up with the financial situation of neighbors and to catch up with the status of the people near us who are doing better. The effect of our perceptions of our peers has been noted especially in the areas of consumption and more recently with debt (Georgarakos, Haliassos, and Pasini 2014; Bearden, Netemeyer, and Teel 1989; Mangleburg, Doney, and Bristol 2004). This study investigated a unique interaction to extend this previous research. We tested whether those who are more susceptible to peer influences exhibit better financially capable behaviors when they perceive their peers as doing better financially.

**HYPOTHESES**

The five primary hypotheses tested in this study were therefore:

1. Respondents with moderate optimism will have higher levels of financial capability behavior (FCB) compared to those with either extremely low optimism or extremely high optimism resulting in a \( \cap \)-shaped curvilinear relationship.
2. Respondents with higher levels of non-impulsiveness will have higher FCB.
3. Respondents with a stronger approach goal orientation will have higher FCB while those with an avoidance orientation will have lower FCB.
4. Respondents with a more internal locus of control will have higher FCB while those with a more external locus of control will have lower FCB.
5. Respondents who have both a high susceptibility to peer influence in their financial behavior and perceive that their peers have better financial behavior will have higher FCB in their attempt to emulate those peers. Formally, this will test if susceptibility to peer influence interacts with their perception of peer influence in the relationship of those variables with FCB.

**POPULATION**

The respondents to the survey came from the online panel of Dutch residents run by Motivaction, called Stempunt. The panel includes more than 60,000 potential respondents. Random invitations were sent to panel members until a nationally representative number of young people (ages 18 to 24) and a nationally representative sample of adults (ages 25 to 65) was achieved with a total sample of 800. The data were collected between 28 March and 11 April in 2017.

**DEPENDENT VARIABLES**

The dependent variable for the primary analyses in this report is a compound variable called Financial Capability Behavior (FCB). This variable is comprised of 9 items representing financial behavior which were adapted from the behavior questions used by the OECD (Atkinson 2016). While the original instrument treated behaviors separately, we developed a combined scale converting each item into a closed question and then standardizing each to convert to shared scale and averaging those standardized item scores together to create the construct variable. Items included asking respondents if they were responsible for household financial decisions, if they save (formally or informally), if they budget, how many financial products they own, and others (see Table 1). The construct had low to moderate internal validity (\( \alpha = 0.58 \), \( \omega = 0.59 \)).

Due to the moderate internal validity of the outcome variable, the tests of the key hypotheses were also re-run with individual financial behaviors of interest as the dependent variable. More specifically, we estimated the odds that a respondent would report having each of the following financial products:

1. Personal savings for retirement (retire)
2. An investment account (invest)
3. A mortgage (mortgage)
4. A bank loan secured with a property (securedloan)
5. An unsecured bank loan (unsecuredloan)
6. A credit card (credit)
7. A checking account (checking)
8. A savings account (savings)
9. A microfinance loan (microfinance)
10. Insurance other than health insurance (insured)
11. Stocks and shares (stock)
12. Bonds (bonds)
13. Mobile money account (mobile)
14. Pre-paid debit card (prepaid)

**METHODOLOGY**

Table 1: Items Comprising Financial Capability Behavior
The following psychological variables were measured in the survey to test their relationship to the financial capability behavior of respondents: Optimism, Non-Impulsiveness, Approach Goal Orientation, Avoidance Goal Orientation, Internal Locus of Control, External Locus of Control, Peer Susceptibility, and Peer Comparison. Wherever possible we used existing, validated scales, and supplemented them with additional scales where an appropriate scale was lacking. This reliance on existing scales resulted in various Likert scales as noted below.

The following three predictor variables contained both a general and a domain-specific (financial) subscale: Optimism, Non-Impulsiveness, and Goal Orientation (Approach and Avoidance). The other psychological predictors only made use of domain-specific (financial) instruments: Locus of Control (internal and external) and both Peer Effects variables (Susceptibility and Comparison).

Optimism measured the degree that respondents are generally optimistic and financially optimistic. It was developed as a 12-item scale comprised of two other scales. The first underlying scale is based on four items representing general dispositional optimism from Gavrilov-Jerlov (2014). The items were scored on a 4-point Likert scale from completely incorrect (0) to completely correct (3) regarding statements like “I am facing my future in an optimistic way.” This generic optimism variable had acceptable internal validity ($\omega_t = 0.83$).

The second underlying scale was developed for this research and included eight items focusing on financial optimism with a 5-point Likert scale, an example item was “Compared with the average person, how likely or unlikely is it that within 10 years you will lose your job?” (this question was reverse coded). This financial subscale had moderate internal validity ($\omega_t = 0.64$). Summary statistics are provided for the total construct and the generic (Optimism [Gen]) and financial subcomponents (Optimism [Fin]) in Table 4. Because the generic and domain-specific subscales had different levels (4-point and 5-point) they were standardized by dividing the pooled standard deviation and then averaging together with an equal weighting for both subscales ($\omega_t = 0.78$).

Non-Impulsiveness included 10 items, half of which covered general dispositional impulsivity (reverse-coded), and the other half represented financial impulsivity. All items were answered on a 6-point Likert scale from strongly disagree to strongly agree. Four of the five first items were adapted from the work of Fernandes and colleagues and included statements such as “I often act without thinking through all the alternatives” (Fernandes, Lynch, and Netemeyer 2014) ($\omega_t = 0.61$). The other items were developed for this survey and all but one of them were explicitly financial in nature with statements like “I find it difficult to resist buying something that really appeals to me” ($\omega_t = 0.68$). Summary statistics are provided for the total construct and the generic (Non-Impulsiveness [Gen]) and financial subcomponents (Non-Impulsiveness [Fin]) in Table 4. The total combined construct had acceptable internal validity ($\omega_t = 0.75$).

Approach Goal Orientation measured the degree to which an individual is motivated to pursue goals and activities because of a desire to try new things and expand their horizons. The variable included 8 items, six of which were from a generic measure of goal orientation (Elliot and Thrash 2010; Tiernan 2016) with acceptable internal validity ($\omega_t = 0.79$). Two of which were developed for this survey and were explicitly financial ($\omega_t = 0.37$). All items were measured on a 5-point Likert scale. Generic approach items included statements such as “Thinking about the things I want really energizes me” or financial statements for the domain-specific bespoke scale such as “I enjoy thinking about ways to make my money stretch farther.” Summary statistics are provided for the total construct and the generic (Approach [Gen]) and financial subcomponents (Approach [Fin]) in Table 4. The combined total construct had acceptable internal validity ($\omega_t = 0.74$).

Avoidance Goal Orientation measured the opposite goal orientation in which individuals were motivated to avoid failure or uncomfortable situations. The variable was developed in the same way as the approach scale above with 8 other items (6 generic and 2 financial). An example item from the generic subscale is “It doesn’t take much to make me worry” and from the financial subscale, “Sometimes I don’t open letters or answer phone calls in case they are to tell me that I owe money.” Both the generic and financial subscales had good internal validity. The combined total construct had good internal validity ($\omega_t = 0.81$ and $\omega_t = 0.74$ respectively). Summary statistics are provided for the total construct and the generic (Avoidance [Gen]) and financial subcomponents (Avoidance [Fin]) in Table 4. The combined total construct had acceptable internal validity ($\omega_t = 0.76$).

Internal Locus of Control measured an individual’s belief that they can control their own financial fate. The measure included 7 items from the subscale developed by Furnham (1986) as published by Salamanca and colleagues (2016). They were measured on a 7-point Likert scale from completely disagree to completely agree. Respondents provided their agreement to statements such as “Whether or not I get to become wealthy depends mostly on my ability.” The scale’s descriptives can be found in Table 4. The construct had acceptable internal validity ($\omega_t = 0.72$).

External Locus of Control measured the belief that the world is a chaotic place in which chance and external events out of one’s control are the main drivers of our financial situation. It is comprised of six items from the Salamanca scale cited above. Respondents reacted to statements such as “There is little one can do to prevent poverty.” The scale’s descriptives can be found in Table 4. The construct had acceptable internal validity ($\omega_t = 0.69$).

Peer Susceptibility measured how much individuals felt that their financial attitudes and behaviors were influenced by those of others. The scale was adapted from Mangelsberg and colleagues (Mangelsberg, Doney, and Bristol 2004; Swaen, Netemeyer, and Teel 1989) and included 7 items measured on a 7-point scale ranging from strongly disagree to strongly agree. An example statement is “It is important that my friends like the products and brands I buy.” The scale’s descriptives can be found in Table 4. The construct had high internal validity ($\omega_t = 0.91$).

Peer Comparison measured respondents’ beliefs about their relative financial position compared to their peers, described to respondents as their friends, family, colleagues, and neighbors. Respondents answered 7 items on the degree to which they thought they were doing better or worse on topics such as “keeping track of my finances” and “earning money” using a 5-point Likert scale ranging from much worse than my peers to much better than my peers. The scale’s descriptives can be found in Table 4. The construct had acceptable internal validity ($\omega_t = 0.78$).

Constructs were developed by averaging the responses and dropping any missing items within the set (this is equivalent to replacing the missing value with the mean of the other items). The order of the questions on each variable was randomized to avoid order effects (McFarland 1981). Some of the variables above were mixed in their randomization, including: the generic approach and avoidance questions within one block, the four financial approach and avoidance goal orientation items, and randomizing both internal and external locus of control questions in one block.

Economic

The survey collected data on two traditional economic components of financial capability, each representing financial knowledge and attitudes respectively: Financial Literacy and Money Attitudes.

Financial Literacy measured the financial knowledge of respondents using 8 questions from the OECD knowledge questions in Atkinson (2016) that were scored as correct or incorrect and then their number of correct responses were summed together to generate a score with a minimum of 0 and a maximum of 8. Questions covered topics like “If you lend £25 to a friend one evening and he gives you £25 back the next day. How much interest have he paid on this loan?” and risk “[True or False] It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares.” The items for this series of questions were not randomized, to match the ordering of the original instrument

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1 This was reverse coded from an instrument designed to measure mindlessness/impulsivity.
2 The economic construct was developed by averaging the number of questions in each subscale. The ways of constructing the scale did not substantively change any effect sizes or significance levels.
and because some knowledge questions may provide hints regarding the correct answers for other questions.

Money Attitudes included 3 attitudinal questions to measure the degree to which respondents preferred to spend or save their money. The scale was based on the money attitude questions from the OECD in Atkinson (2016) and included items such as “Money is there to be spent” which were answered on a 5-point Likert scale ranging from completely agree to completely disagree such that higher scores are more oriented towards saving for the future instead of spending in the present. The order of the 3 items was randomized.

CONTROL VARIABLES

The models below all control for education, gender, and age. Education is presented on a 3-point scale. The lowest level represents those who have completed the lowest level of secondary education (VMBO (beroepsgymnasium)/MBO-1) or less. Those scoring in the middle of the scale have completed senior secondary education or university preparatory education (Mavo-VWO, MBO-2, -3, -4, or the highest level of VMBO (theoretisch / gemengd) / Mavo). Those with the highest level have completed a Bachelor’s degree or higher (HBO/WO). Age is an integer variable representing years. Gender was a binary variable with female respondents coded as 1 and males as 0.

The variable descriptives are presented in the Appendix (See Table 4).

ANALYSIS

Analyses were completed in Python using the statsmodels 0.8.0 package (Seabold and Perktold 2010) by the second author who was not part of the survey design and replicated by the first author in R using the stats 3.2.1 package. The primary outcome (FCB) was evaluated using ordinary least squares models while the binary outcomes were analyzed using logistic regression models. Tests of statistical significance for secondary analyses were corrected for the false discovery rate using the Benjamin-Hochberg method (1995). Secondary analyses included any outcomes beyond FCB and models evaluating the interaction effects of age and gender which were specified after the data were presented in the first instance. Statistical tests for significance used the traditional cut off point of $p < 0.05$.

RESULTS

The following provides a summary of the findings from the survey. The first section provides the results from the primary hypotheses that were developed prior to analysis. The secondary hypotheses were developed to investigate the data further after having completed the initial analysis. Unless stated otherwise, all of the analyses use the total combined construct (both generic and financial combined) whenever possible.

The total sample included 800 respondents of which 27.12% were youth aged 18 to 24 ($n = 297$) and 62.88% were adults aged 25 to 65 ($n = 503$). The average age was 39 with more women than men (59%). Most of the respondents had a high (29%) or moderate level of education (57%) with 15% having a low education level. This is comparable to statistics reported elsewhere of roughly a third of the Dutch population obtaining a higher educational degree (OECD 2014).

Overall: Psychological factors explain FCB better than traditional economic variables alone

The data indicate that the addition of psychological variables almost doubles the amount of variance in financial capability (28.5%) than can be explained by traditional measures of financial literacy (knowledge) and spending attitudes (15.0%), see Figure 2. An analysis of financial behavior that incorporates psychological variables including optimism, non-impulsiveness, goal orientation, locus of control, and peer susceptibility is much more accurate than one that only accounts for traditional economic factors ($SS = 28.05, p < 0.00$). Both analyses controlled for age, gender, and education and the increased explanatory power was true whether or not domain-specific psychological constructs were included. If only generic psychological variables were included then we could still explain 19.9% of the variance in FCB (significantly more than the traditional model alone). It is also worth noting that the psychological predictors that explained a statistically significant amount of variance in the fully specified model while controlling for other variables were all positively framed, namely: (1) optimism, (2) approach goal orientation, and (3) internal locus of control.

Figure 2: Economic Literacy and Attitudes vs Psychological and Economic Model

11 Because the sample was constructed to be able to test differences between youth and adults, the sample is nationally representative of youth and adults separately. Among youth 27% had a high education, 68% a medium level, and 5% a low level while for adults the percentages were 30%, 51%, and 19% respectively. Youth were oversampled for this study to provide power to conduct analysis on the effect of being a young person on results.
H1: Moderate optimism is related to higher FCB compared with low or high optimism

Those with moderate optimism did not have the highest levels of financial capability. A linear model was built showing a positive relationship between optimism and FCB (F = 30.45, df = 787, adjR2 = 0.16, B(β) = 0.17(0.02), p < 0.01) and this model was then compared to a model with an additional quadratic term representing the ∩-shaped relationship (F = 26.05, df = 786, adjR2 = 0.16). There was no statistically significant improvement in the explanatory power of the model (SS = 0.73, F = 3.54, p = 0.06). The result is that the hypothesized relationship was not found. The takeaway is that optimism was associated with higher financial capability behavior even in cases of over-optimism.

H2: Higher non-impulsiveness is related to higher FCB

Respondents with higher levels of non-impulsiveness also had higher FCB thus confirming the hypothesis. While the overall effect was not large, it was statistically significant with a high degree of confidence. A single-unit increase in average levels of non-impulsiveness on a 6-point scale predicted an increase in financial capability of 0.12 points on the standardized scale (F = 17.75, df = 787, adjR2 = 0.10, B(β) = 0.12(0.03), p = 0.00). Those who are more deliberative and less impulsive are more likely to report positive financial capability behaviors.

H3: Approach goal orientation is positively related to FCB and avoidance is negatively related

The hypothesis was confirmed for both approach goal orientation and avoidance goal orientation. Approach goal orientation was associated with higher financial capability behavior as expected (F = 35.93, df = 787, adjR2 = 0.18, B(β) = 0.34(0.03), p < 0.01) while avoidance goal orientation was associated with lower levels (F = 20.54, df = 787, adjR2 = 0.11, B(β) = -0.16(0.03), p < 0.01). Approach goal orientation had a stronger impact on financial capability behavior compared to avoidance goal orientation with a one point increase in avoidance only translated into a decrease of 0.16. Furthermore, approach goal orientation explained 18% of the variance in FCB while the avoidance only explained 11%.

H4: Internal locus of control is positively related to FCB and external LOC negatively related

The hypothesis was confirmed with higher internal locus of control with regards to finances being strongly associated with higher financial capability behavior (F = 29.31, df = 787, adjR2 = 0.15, B(β) = 0.18(0.02), p < 0.01) with a more external locus of control predicting lower levels (F = 20.32, df = 787, adjR2 = 0.11, B(β) = -0.11(0.02), p < 0.01). As was the case with approach and avoidance, the positive internal locus of control had a stronger association with financial capability compared to the maladaptive external locus of control. The analysis of the relationship of internal LOC with FCB explained 15% of the variance while external LOC explained 11%, with a one unit increase in the average scores of the two resulting in a 0.18 and -0.11 point change on the standardized FCB scale respectively.
Table 2: Predicting Specific Financial Product Behavior from Conscientiousness and Avoidance

This procedure added 14 additional statistical tests of significance, therefore we corrected for multiple tests across these 14 models. After correcting for multiple testing, the only significant interaction was between gender and the peer interaction model (p = 0.01) such that women’s financial capability was more positively impacted by concern about the financial behavior of their peers. However, this interaction only accounted for an additional 1.4% in the variance of financial capability. Therefore, it seems that neither age nor gender have a significant impact on the relationship of these psychological constructs with the outcome of financial capability behavior in this sample.

Use of Specific Financial Products

We then ran the models as logistic regressions to test if the psychological constructs above predicted if respondents reported having a particular financial product as the outcome of interest. This resulted in 14 new statistical tests for each psychological construct resulting in 98 more models in total. The p-values were therefore adjusted within each set of 14 models for each psychological construct. The following provides a summary of the findings.

Higher levels of non-impulsiveness predicted lower odds of having an unsecured loan or using mobile money but higher odds of having a checking account. Having an avoidance goal orientation increased the odds of having an unsecured loan and lowered the odds of having a checking account (See Table 2).

We tested if adding domain-specific questions to a model that had the generic psychological construct explained more variance than the generic psychosocial construct alone. This could be due to a common method bias in which all respondents are answering the questions within the same survey, but it could also highlight the importance of developing and using domain-specific psychological measures for future research or work to identify groups of individuals in need of additional support for enhancing their financial skills.

Table 3: Predicting Specific Financial Product Behavior from Locus of Control

There were no relationships between optimism, approach goal orientation, or peer effects and the use of these products (See Appendix Table 5).

Generic and Domain-Specific Psychological Constructs

We were able to investigate the relative explanatory power of generic and domain-specific variables in the case of optimism, non-impulsiveness, approach goal orientation, and avoidance goal orientation. The section that follows is the only instance where we divided generic and domain-specific versions of the psychological constructs for analysis. In all cases, adding domain-specific financial measures of the psychological construct explained more variance in financial capability behavior than the generic construct alone.

Table 2: Predicting Specific Financial Product Behavior from Conscientiousness and Avoidance

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<td>0.85</td>
<td>-0.58</td>
<td>0.39</td>
<td>-1.49</td>
<td>0.15</td>
</tr>
<tr>
<td>mobile</td>
<td>-0.45</td>
<td>0.17</td>
<td>-2.63</td>
<td>0.00</td>
<td>-0.16</td>
<td>0.18</td>
<td>-0.87</td>
<td>0.39</td>
</tr>
<tr>
<td>prepaid</td>
<td>-0.18</td>
<td>0.22</td>
<td>-0.83</td>
<td>0.72</td>
<td>-0.41</td>
<td>0.23</td>
<td>-1.74</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Notes: All models controlled for education, age, and gender. Coefficients represent the predicted changes in log odds. All p-values have been adjusted using the Benjamini-Hochberg method across all 14 models using the same predictor.

Table 3: Predicting Specific Financial Product Behavior from Locus of Control

There were no relationships between education, age, and gender. Coefficients represent the predicted changes in log odds. All p-values have been adjusted using the Benjamini-Hochberg method across all 14 models using the same predictor.
optimism (SS = 1.36, p = 0.01) and approach goal orientation (SS = 1.29, p = 0.01) but not in the case of non-impulsiveness (SS = 0.21, p = 0.33) or avoidance goal orientation (SS = 0.25, p = 0.30). All eight tests’ p-values were adjusted jointly for multiple testing.

CONCLUSIONS

This study adds additional support for the importance of psychological factors in driving financial behavior. Incorporating respondents’ psychological orientation across the five psychosocial dimensions in this study explained twice the variance in financial capability behavior compared to the explanatory power of financial knowledge and spending attitudes alone. Specifically, when combined with traditional economic measures of knowledge and spending attitudes, optimism, non-impulsiveness, goal orientation, locus of control, and susceptibility to peer influence together explained roughly 29% of self-reported financial capability behavior.

The study confirmed several predicted relationships between psychological orientations and financial capability behavior. Non-impulsiveness, approach goal orientation, and an internal locus of control all were associated with higher FCB while controlling for age, gender, and education. 13 On the other hand, an avoidance goal orientation and an external locus of control were associated with lower FCB. While higher levels of optimism were associate with higher FCB, the relationship did not confirm our hypothesis as the relationship was linear and not U-shaped.

LIMITATIONS

The study is limited by being a cross-sectional analysis using self-reported measures. Since the respondents are responding to the questions on all constructs at one sitting, it is possible that earlier questions prime later responses. It is also possible that part, or all, of the relationship between variables is running in the opposite direction such that higher financial capability behavior results in shifts in psychological orientations; or that both are correlated to an omitted variable. Second, self-reported measures are always imperfect measures of knowledge, attitudes, and behaviors. Correct knowledge answers can be guesses, positive attitudinal responses can be influenced by biases including social desirability bias and priming effects, and self-reported behavior can be clouded by a poor memory or similar biases to those mentioned above. Despite these limitations, this study’s results are robust to different models, different dependent variables, and have made use of several previously validated survey instruments thus increasing the reliability of the results. The findings provide a basis for future research using other measurement methods for additional corroboration.

IMPLICATIONS FOR RESEARCH

This dataset will be made available for future research and analysis. As such, future researchers should investigate relationships between variables not analyzed in this report. In addition, future researchers should continue to investigate the impact of goal orientation on financial behaviors. This psychological construct holds promise both as a malleable construct for intervention research and as a powerful descriptive factor that has not been thoroughly investigated in research on financial behavior. Thirdly, given this study’s finding that different psychological constructs were more or less predictive of the use of different financial products, future research should continue to investigate which cognitive and non-cognitive drivers lead to particular product use and not to assume that the same variable will drive different financial behaviors. Fourthly, lab-based research should conduct prospective, randomized, lab-based experiments to rigorously test the causality and directionality of the relationships identified in this study. Finally, researchers should continue to investigate the relative value of using general psychological constructs when researching financial behavior compared to using domain-specific versions of those psychological variables (such as financial locus of control). This needs to be developed more robustly at the measurement level and at a theoretical level especially given the lack of discriminate validity noted between other psychological constructs (Judge et al. 2002).

IMPLICATIONS FOR POLICY & PRACTICE

This has implications for both the design of financial products and financial education. Those working on developing financial products, or communicating to users of those products, should consider making use of short psychosocial screens as part of their diagnostics. Communication materials that are sent out both by purveyors of products and by consumer protection regimes could be tested to see if financial messaging is more effective if it uses language that primes the psychological constructs that are more strongly associated with a certain product as presented in Table 2 and Table 3 above. It appears that psychological constructs should be given more weight when designing products and regulations of products in the cases of equity (stocks and investing), checking accounts, savings accounts, credit cards, and unsecured loans.

Future work to enhance financial capability behavior – such as financial education – should continue to extend beyond transferring financial knowledge. Such financial education programs should look at ways to shift participants’ optimism, non-impulsiveness, goal orientation, and locus of control. Such characteristics appear to be most malleable at earlier ages, providing arguments for “financial” education of a more psychosocial nature at younger ages that provides the foundation for both well-adapted financial behavior and better outcomes in health, education, and employment (Rouch and Frese 2007; Ashford, Edmunds, and French 2010; Mutton, Brown, and Lent 1991; Pajares 1996; Kautz et al. 2014). With that said, financial knowledge and attitudes towards spending and saving do still account for much of the financial behavior we observe, therefore a complementary approach may be most effective wherein behavior change is the goal. This is in line with the findings from a previous meta-analysis of financial education for children and youth (O’Prey and Shepherd 2014).

SUMMARY

This study adds to the growing literature showing that financial behavior is about more than just financial knowledge and people’s attitudes about spending and saving. Financial behavior affects and is affected by the psychology of a person. Financial products, regulations, and education programs should bear this mind. Future research should continue to investigate this burgeoning area of work, testing various psychological constructs and doing so in increasingly rigorous ways. Hopefully we will begin to move beyond discussions about whether teaching knowledge-based financial literacy is effective to a conversation about how to help citizens obtain and maintain healthy economic behaviors for themselves, their families, and their societies.
Table 4: Variable Descriptive Statistics and Internal Validity

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>mean</th>
<th>sd</th>
<th>Alpha</th>
<th>Omega</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>793</td>
<td>39.19</td>
<td>16.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>793</td>
<td>0.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (High / Med / Low)</td>
<td>793</td>
<td>0.29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low 0.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Capability Behavior (FCB)</td>
<td>800</td>
<td>-0.62</td>
<td>0.50</td>
<td>0.18</td>
<td>0.59</td>
</tr>
<tr>
<td>Optimism Total (Standardized)</td>
<td>800</td>
<td>5.25</td>
<td>0.87</td>
<td>0.77</td>
<td>0.78</td>
</tr>
<tr>
<td>Optimism [Gen]</td>
<td>800</td>
<td>2.92</td>
<td>0.63</td>
<td>0.83</td>
<td>0.83</td>
</tr>
<tr>
<td>Optimism [Fin]</td>
<td>800</td>
<td>3.11</td>
<td>0.53</td>
<td>0.60</td>
<td>0.64</td>
</tr>
<tr>
<td>Non-impulsiveness [Total]</td>
<td>800</td>
<td>4.13</td>
<td>0.64</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>Non-impulsiveness [Gen]</td>
<td>800</td>
<td>3.94</td>
<td>0.72</td>
<td>0.59</td>
<td>0.61</td>
</tr>
<tr>
<td>Non-impulsiveness [Fin]</td>
<td>800</td>
<td>4.33</td>
<td>0.73</td>
<td>0.65</td>
<td>0.68</td>
</tr>
<tr>
<td>Approach Goal Orientation [Total]</td>
<td>800</td>
<td>3.55</td>
<td>0.48</td>
<td>0.73</td>
<td>0.74</td>
</tr>
<tr>
<td>Approach Goal Orientation [Gen]</td>
<td>800</td>
<td>3.49</td>
<td>0.53</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>Approach Goal Orientation [Fin]</td>
<td>800</td>
<td>3.73</td>
<td>0.68</td>
<td>0.37</td>
<td>0.37</td>
</tr>
<tr>
<td>Avoidance Goal Orientation [Total]</td>
<td>800</td>
<td>2.72</td>
<td>0.58</td>
<td>0.76</td>
<td>0.76</td>
</tr>
<tr>
<td>Avoidance Goal Orientation [Gen]</td>
<td>800</td>
<td>3.10</td>
<td>0.71</td>
<td>0.81</td>
<td>0.81</td>
</tr>
<tr>
<td>Avoidance Goal Orientation [Fin]</td>
<td>800</td>
<td>3.60</td>
<td>0.76</td>
<td>0.74</td>
<td>0.74</td>
</tr>
<tr>
<td>Internal locus of Control [Fin]</td>
<td>800</td>
<td>4.53</td>
<td>0.75</td>
<td>0.72</td>
<td>0.72</td>
</tr>
<tr>
<td>Chance locus of Control [Fin]</td>
<td>800</td>
<td>3.64</td>
<td>0.90</td>
<td>0.67</td>
<td>0.69</td>
</tr>
<tr>
<td>Peer Effects [Opinion of Others]</td>
<td>793</td>
<td>3.48</td>
<td>1.19</td>
<td>0.91</td>
<td>0.91</td>
</tr>
<tr>
<td>Peer Effects [Better than Others]</td>
<td>793</td>
<td>3.11</td>
<td>0.58</td>
<td>0.81</td>
<td>0.81</td>
</tr>
<tr>
<td>Money Attitudes</td>
<td>800</td>
<td>2.90</td>
<td>0.73</td>
<td>0.68</td>
<td>0.68</td>
</tr>
<tr>
<td>Financial Literacy (Correct)</td>
<td>800</td>
<td>3.93</td>
<td>1.90</td>
<td>0.77</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Note: Full instruments available upon request.

Table 5: Predicting Specific Financial Product Behavior from Optimism, Approach, and Peer Susceptibility

<table>
<thead>
<tr>
<th>Variable</th>
<th>coef</th>
<th>se</th>
<th>t</th>
<th>p-adj</th>
<th>coef</th>
<th>se</th>
<th>t</th>
<th>p-adj</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retire</td>
<td>0.10</td>
<td>0.06</td>
<td>1.62</td>
<td>0.11</td>
<td>0.19</td>
<td>0.07</td>
<td>2.67</td>
<td>0.00</td>
</tr>
<tr>
<td>Invest</td>
<td>0.18</td>
<td>0.10</td>
<td>1.85</td>
<td>0.08</td>
<td>0.26</td>
<td>0.13</td>
<td>2.17</td>
<td>0.04</td>
</tr>
<tr>
<td>Mortgage</td>
<td>0.08</td>
<td>0.07</td>
<td>1.12</td>
<td>0.26</td>
<td>0.17</td>
<td>0.08</td>
<td>2.08</td>
<td>0.04</td>
</tr>
<tr>
<td>Secured Loan</td>
<td>0.14</td>
<td>0.10</td>
<td>1.32</td>
<td>0.16</td>
<td>0.28</td>
<td>0.06</td>
<td>1.89</td>
<td>0.03</td>
</tr>
<tr>
<td>Unsecured Loan</td>
<td>0.05</td>
<td>0.12</td>
<td>0.41</td>
<td>0.67</td>
<td>0.30</td>
<td>0.77</td>
<td>1.23</td>
<td>0.22</td>
</tr>
<tr>
<td>Credit</td>
<td>0.16</td>
<td>0.07</td>
<td>2.16</td>
<td>0.04</td>
<td>0.42</td>
<td>0.17</td>
<td>2.45</td>
<td>0.01</td>
</tr>
<tr>
<td>Checking</td>
<td>0.25</td>
<td>0.20</td>
<td>1.24</td>
<td>0.24</td>
<td>0.90</td>
<td>0.40</td>
<td>2.25</td>
<td>0.01</td>
</tr>
<tr>
<td>Savings</td>
<td>0.12</td>
<td>0.14</td>
<td>0.94</td>
<td>0.34</td>
<td>0.67</td>
<td>0.26</td>
<td>1.63</td>
<td>0.05</td>
</tr>
<tr>
<td>MCF</td>
<td>0.17</td>
<td>0.18</td>
<td>0.94</td>
<td>0.45</td>
<td>-0.57</td>
<td>0.64</td>
<td>-0.89</td>
<td>0.53</td>
</tr>
<tr>
<td>Insured</td>
<td>0.34</td>
<td>0.10</td>
<td>3.34</td>
<td>0.34</td>
<td>0.31</td>
<td>0.22</td>
<td>1.46</td>
<td>0.33</td>
</tr>
<tr>
<td>Stock</td>
<td>0.19</td>
<td>0.10</td>
<td>1.95</td>
<td>0.28</td>
<td>0.46</td>
<td>0.27</td>
<td>1.71</td>
<td>0.32</td>
</tr>
<tr>
<td>Bond</td>
<td>0.13</td>
<td>0.19</td>
<td>0.68</td>
<td>0.57</td>
<td>0.59</td>
<td>0.46</td>
<td>1.29</td>
<td>0.05</td>
</tr>
<tr>
<td>Mobile</td>
<td>0.14</td>
<td>0.08</td>
<td>1.88</td>
<td>0.32</td>
<td>0.08</td>
<td>0.22</td>
<td>-0.57</td>
<td>0.70</td>
</tr>
<tr>
<td>Prepaid</td>
<td>0.01</td>
<td>0.13</td>
<td>-0.07</td>
<td>0.95</td>
<td>0.43</td>
<td>0.28</td>
<td>1.53</td>
<td>0.33</td>
</tr>
</tbody>
</table>

Notes: All models controlled for education, age, and gender. Coefficients represent the predicted changes in log odds. All p-values have been adjusted using the Benjamini-Hochberg method across all 16 models using the same predictor.

Table 6: Correlation Matrix
REFERENCES


