

OVERCOMING IMPULSIVENESS: IDENTIFYING PRIME TARGETS FOR INTERVENTIONS TO INFLUENCE FINANCIAL BEHAVIOR

Abstract

Previous empirical studies have linked materialism and impulsivity to problematic spending, while financial literacy and future self-continuity have been shown to predict saving behavior. However, no study has explored the combined influences and interactions of these factors on financial behavior. In the proposed study, we ask two questions. First, what are the direct and indirect effects of these individual psychological factors on overall financial behavior? Second, within this framework, which of these factors are both influential and malleable enough to create meaningful behavior change through simple interventions? Results from a structural equation model reveal that time horizon and construal level when thinking about the future may be ideal targets for psychological interventions aimed at helping highly impulsive individuals improve their financial behavior.

Introduction

Conditions affecting retirement planning for US households have shifted dramatically in the past few decades. Life expectancies are rising (Center for Disease Control, 2011), while employee retirement plans have shifted from defined benefit to defined contribution formats, which put more of the burden of saving on the worker (Munnell, Webb, and Golub-Sass, 2009). These two factors alone suggest a need for greater saving and retirement planning on the part of individuals, since they imply a longer time in retirement and a larger responsibility to fund that retirement on the part of the employee. Still, contrary to the demands of the changing financial landscape, savings

rates in America have simultaneously dropped to only 40% of what they were in the 1980's (Caporale, Costantini, and Paradiso, 2013). More than half of Americans are now at risk of not being able to maintain their standard of living in retirement, and this figure gets larger with each successive generation observed (Munell, Webb, and Golub-Sass, 2009).

When considering the retirement planning deficit in America, it is important to recognize that not all consumers are equally able to save. Some earn enough to meet their current needs, and they consistently save enough to ensure a secure future, barring terrible tragedy. Others live hand-to-mouth, stuck in poverty traps that require cultural or institutional change in order to escape (Bowles, Durlauf, and Hoff, 2011). Still others are able to save but still do not adequately prepare for their future needs, as evidenced by the fact that over half of all Americans report having less than \$25,000 saved for retirement (Helman, Copeland and VanDerhei, 2011), and this is an increasing trend (Munnell, Webb and Golub-Sass, 2009). It is with this last group (those that have adequate resources, but exhibit poor financial management behaviors) that this paper is concerned.

In an effort to influence financial actions, consumer researchers have been working for many years to identify the core psychological factors that underlie money management behaviors. Quite a few of these efforts have been targeted at understanding the mind of the spender. We want to know why, for instance, a person might pay more for his cell phone plan than on his child's education, especially when that education could mean the difference between poverty and comfort in the next generation (Moav and Neeman, 2012). Previous research has suggested that the general lack of saving among Americans may be due to factors such as lack of financial knowledge (Opiela, 2003),

cultural norms, and materialism (Shoham and Malul, 2012; Watson, 2003). Several psychological factors have been connected to ‘spenders,’ among them are high levels of impulsivity, ascription to materialistic values, and external locus of control (Britt, Cumbie, and Bell, 2013).

Fewer studies have directly focused on savers, but some meaningful trends have been found nonetheless. For example, people who are more knowledgeable about finance tend to have more emergency savings than those who do not (Babiarz and Robb, 2014), and people who feel more connected to the person they imagine being in ten years’ time accumulate more assets than their peers who feel less connected to their future selves (Hershfield, 2011).

Consumer researchers are getting closer to an understanding of the psychologies that drive spending and saving, but the challenge of discovering the core factors that motivate these behaviors is far from complete. With this paper, we wish to contribute an evidence-based rationale for targeting certain psychological factors that could potentially motivate more saving and investment among people who have adequate resources, but poor financial management behaviors. To this end, we need to identify psychological factors that influence financial behavior and can be readily manipulated through simple interventions. Knowing the relationship between the big five personality factors and financial behavior, for instance, (Nga and Yien, 2013) is useful in identifying potential spenders. However, this knowledge does not help us to change behavior, because personality characteristics are fairly stable, and therefore not easily altered through simple mental exercises. In this paper, we investigate psychological distance and

financial literacy as factors that may moderate financial behavior even in the presence of traits associated with greater spending and debt, such as impulsiveness and materialism.

The remainder of this paper offers a brief overview of how the individual factors of impulsivity, materialism, financial literacy and psychological distance have been shown to relate to financial behavior. We then report the results of an online survey of US adults that was designed to explore these characteristics in relation to one another. A structural equation model reveals that psychological distance between the present and the future may be the ideal target for psychological interventions aimed at changing financial behavior.

Literature Review

Impulsiveness and Financial Behavior

One of the most common psychological traits linked to financial behavior is impulsivity. In economic terms, impulsivity is generally seen as the rate at which a person discounts the future, and is measured based on the premium that an individual requires in order to wait for a reward. In psychology, the term is not tied to monetary outcomes, but refers to a person's level of concern or consideration of future consequences. Psychologists often measure impulsivity through self-reported tests of self-control (or lack thereof) in various situations. In the psychology literature, impulsivity has been linked to indebtedness (Ottaviana and Vandone, 2011), lower GPAs, more psychological problems and lower self-esteem (Tangney, Baumeister, and Boone, 2004), and greater frequency of income shocks and unforeseen expenses (Gathergood, 2012). Unsurprisingly, strong correlations between discounting and impulsivity have been observed. For example, discount rates are higher in populations who demonstrate a

lack of concern for health consequences (high impulsivity) such as cigarette smokers (Bickel and Madden, 1999), and cocaine-addicted individuals (Coffey, Gudleski, Saladin, and Brady, 2003). The connection between impulsiveness and high discounting rates may be at least partially explained by neurology. There is evidence that suggests individuals who are high in self-reported impulsivity actually perceive time differently than their more self-controlled peers, leading to a greater present-bias (Wittman and Paulus, 2008; Wittman et al., 2011).

There is a great deal of crossover and interchanging of the terms ‘discounting’ and ‘impulsivity’ in the consumer psychology literature, but we do not do so here. The main reason for this is that psychological impulsivity is a trait-level characteristic of an individual, but discount rates are often situation-dependent and subject to manipulation in laboratory settings. Personality traits are stable, and not easily changed through simple interventions. The personality trait of impulsivity seems to have a strong influence over a person’s discount rate, but the discount rate itself is merely an indicator of underlying impulsivity, not a robust means of measuring the trait.

Materialism and Financial Behavior

Other research has revealed some interesting links between beliefs, attitudes, perspectives, and financial behaviors. For example, since materialism projects ownership of physical objects as an indication of success or personal value, people who deeply ascribe to materialistic values are more likely to identify as ‘spenders’ (Watson, 2003).

The act of spending money in order to feel better about oneself, a practice often referred to as ‘retail therapy’ in modern vernacular, has its roots in the psychology of ownership. In his landmark paper, Russell Belk showed that, “Our possessions are a

major contributor to and a reflection of our identities,” (Belk, 1988, p.139). The attachment one forms with owned objects is similar to the sense of attachment one forms with close others, demonstrating that we do in fact have a relationship with the things we own.

Through four experiments, Kogut and Kogut (2010) showed that the possession-attachment link that subjects formed directly related to the particular adult-attachment style they had formed during their psychological development. Considering the strong possession-self link in our psyches, it is not surprising that when materialistic values are coupled with feelings of falling short of personal goals, people are more likely to spend money impulsively on items that reflect the qualities of their idealized self (Dittmar & Bond, 2010).

Financial Literacy and Financial Behavior

Assessments of the effectiveness of financial literacy on behavior are mixed. For example, a recent survey found that people who have more financial knowledge or financial confidence are also more likely to report having enough savings to cover 3 months of expenses in case of emergency (Babiarz and Robb, 2014). However, in spite of substantial efforts to improve financial literacy in the US, measures of the effectiveness of these programs on downstream financial knowledge and behavior have returned conflicting results (Hastings, Madrian, and Skimmyhorn, 2013). The National Financial Capability study asks Americans to answer 5 very simple questions about financial topics. In 2009, 58% answered 3 or fewer correctly, and in 2012, the failure rate grew to 61% (FINRA, 2012). A study of the effectiveness of Jump\$tart programs in US schools showed that students who had previously taken a financial literacy course scored no

better on a subsequent financial literacy quiz than those who had not had the class (Mandell, 2009). In contrast, a study of military personnel compared those who had taken an 8-hour financial literacy course to those who had not, and found that those who had the class contributed about twice as much as their peers to their Federal Thrift Savings Plan (Skimmyhorn, 2012). “In the end, we are more concerned with financial outcomes than financial knowledge, per se” (Hastings, Madrian and Skimmyhorn, 2013, p. 359).

Even if financial literacy were unambiguously effective in changing consumer behavior, self-selection bias may be a problem, as demonstrated by a study that compared a group of people who chose to enroll in a free credit-counseling program with those who opted not to enroll. A test of time preferences showed that the people who chose not to enroll discounted the future more sharply than those who opted to take the class (Meier and Sprenger, 2013). Coupled with the connection between impulsivity and discounting, the self-selection bias that was revealed in Meier and Sprenger’s work suggests that the people who might benefit most from financial literacy interventions are also less likely to participate in financial education.

Future Concept and Financial Behavior

We have already mentioned the neurological connection between time perception and discount rates, but other work shows that a strong sense of connectedness and similarity to the person one imagines becoming in the future positively correlates with saving and wealth acquisition (Hershfield, 2011). People who are more future-oriented are more likely to enroll in retirement plans (Howlett, Kees, and Kemp, 2008), and people with longer mental time horizons are more likely to actively save for future expenses (Anong and Fisher, 2013). Results of a study using neuro-imaging showed that

not only do we tend to think of our “future self” as a different person from our “present self”, but the extent to which this happens can predict how deeply we discount the future (Hershfield, Wimmer, and Knutson, 2009). Interestingly, even though our brains conceptualize the future self and present self as different people, if we feel connected to the future self, appeals to save more now in order to provide for “them” later can be effective at increasing retirement account contributions (Bryan and Hershfield, 2013).

The connections between time perception, discounting, and connectedness to the future self all point to the general construct of psychological distance. Psychological distance (the perceived distance between objects and events in mental space) has been identified as an automatic process, but is also intricately involved in conscious representations of scenarios and objects. The subjective nature of psychological distance explains why one person can feel that a three-month wait is painless, while another feels excruciating discomfort at so long a delay. Neurological data has revealed physical differences between individuals with respect to time perception (Wittman and Paulus, 2008; Wittman et al., 2011), but psychological distance is not limited to the perception of time. In fact, there are four commonly studied dimensions of psychological distance affecting our perceptions of scenarios (these are temporal, spatial, social, and hypothetical), and all of them have been shown to have a discounting effect on subjective valuations of outcomes. The decisions we make regarding tradeoffs that involve any of the four dimensions of psychological distance will necessarily be affected by our individual perceptions of time, space, relationships and risk.

Looking through the lens of psychological distance, strong future self-continuity can be thought of as a shorter distance between the present self and the future self. This

closeness may exist due to the perception of time itself (temporal distance), the feeling of connection to the future self (social distance), or both. Since we discount outcomes less when something feels psychologically close, it is possible that people with strong future self-continuity save more money on average because they do not discount the future consequences of their present actions as much. For this reason, we suspect that we may be able to effectively motivate behavioral changes by decreasing the psychological distance between the present and the future.

Best Targets for Intervention

The financial psychology literature can be divided into three general categories of investigation. First, there is work that focuses on traits and personality variables that are nonconscious and stable over time. Second, there is a line of investigation into attitudes, values, and perceptions. The third and most superficial factor is knowledge, which is influenced through education and exposure to new information. The choice to classify financial psychology research into three categories is not an arbitrary one. What we are aiming for is a way of clearly delineating psychological factors of financial management in a manner that helps us to quickly identify their potential for practical interventions that encourage long-term change in financial behaviors. Automatic processes and trait-level characteristics such as impulsiveness may be temporarily manipulated in a laboratory setting, but outside of the laboratory are generally considered stable and not easily altered. Attitudes and beliefs such as materialism and future self-continuity, while still somewhat stable, are arguably more prone to long-term change through intervention than trait-level characteristics. Lastly, knowledge is most easily altered since it is based solely

on information transfer, but the evidence of financial literacy's effect on actual financial behaviors shows mixed results (Madrian and Skimmyhorn, 2013).

Changing a person's personality from an impulsive one to non-impulsive one is beyond the scope of a simple intervention, but mitigating the effects of personality traits on financial behavior may be possible if we can identify other factors (such as time perception or – more generally – psychological distance) that affect behavior, and are more easily altered than personality traits. Since psychological distance has elements that are automatic and elements that are conscious, working with psychological distance on the conscious level might have the ability to affect trait-level factors such as impulsivity.

For example, it makes intuitive sense that a person who feels connected to his or her future will put more weight on the future consequences of present decisions than a peer who feels disconnected from the future. In this way, a conscious psychological factor such as a person's mental conception of their future may have a direct impact on a trait-level factor like impulsiveness. We examine just such a relationship in the current work.

Research Questions and Hypotheses

Previous work, as outlined above, sheds light on how traits, attitudes, and knowledge contribute to financial behavior. However, very little is known about the impacts of these factors relative to one another. Specifically, when considering how to use the insights from financial psychology to motivate better financial decision-making, it would be useful to know if malleable psychological factors like knowledge and one's concept of the future are powerful enough to influence financial behavior even when trait-level characteristics such as impulsivity are present.

In more formal terms, we wish to know whether or not one's future concept affects overall financial behavior, and if this relationship is significant even in the presence of impulsive tendencies. Additionally, since financial literacy has also been linked to saving, we are interested in how large a role financial knowledge plays relative to psychological factors like impulsivity and psychological distance when predicting and influencing financial behavior.

Questions and Hypotheses

RQ 1: When modeled simultaneously, what effects do impulsiveness, materialism, future concept, and financial knowledge have on financial behavior? Based on the previous findings we have overviewed, we expect that impulsiveness and materialism will both have negative impacts on financial behaviors, while financial literacy and a well-developed future concept will have positive effects.

H_{1a}: Impulsiveness will have a direct, significant and negative impact on financial behaviors.

H_{1b}: Materialism will have a direct, significant, and negative impact on financial behaviors.

H_{1c}: Financial knowledge will significantly and positively affect financial behaviors.

H_{1d}: A well-developed future concept will significantly and positively affect financial behavior.

Is there evidence to show that either of these factors can compensate for the effects of trait-level impulsivity on behavior? Since psychological distance between the

present and the future affects the way that costs and benefits are perceived over time, we expect that people who have a more developed sense of the future will weigh the future consequences of present actions more heavily, thereby reducing the tendency toward impulsive behavior. We also expect that an understanding of financial concepts will reduce impulsiveness, since people with more financial knowledge will have a better sense of how financial behaviors affect their future.

H_{2a}: A well-developed future concept will have an indirect effect on financial behavior by reducing impulsivity.

H_{2b}: Thorough knowledge of financial concepts will have an indirect effect on financial behavior by reducing impulsivity.

Can we make a case based on empirical evidence, in favor of psychological interventions that target the future concept and/or financial knowledge? As stated above, we expect that both financial literacy and a well-developed future concept will positively affect financial behaviors. However, considering the mixed results of financial education on behavior, and the consistent effects that time perception has on discounting, we expect that the total effect of the future concept will be greater than that of knowledge.

H₃: The total effect of future conceptualization on financial behavior will be greater than that of financial literacy.

Method

Participants and Design

A survey was conducted through Amazon's Mechanical Turk platform (AMT). We collected 711 surveys with complete responses to all of the measures that were pertinent to the current analysis. One multivariate outlier was later identified through

Mahalanobis distance testing, and was dropped leaving a final N of 710. As with many online survey platforms, the sample collected through AMT is not representative of the general US population. In spite of its limitations, AMT is gaining popularity as an academic research tool due to high response rates, quality of responses, ease of administration, and cost-effectiveness. Given the alternative of surveying undergraduate students (a large percentage of which do not control their own financial lives) we opted for the more diverse, if not quite representative, population of Amazon Turk workers for our study. Our sample was skewed male (56.7% male, 42.7% female). They were more educated than the general US population, with 47% of respondents holding a bachelor's degree or higher (national average is 31%). Additionally, the mean income was lower than the US average. In our sample, 63% earn \$39,999 or less per year, where the 2012 US Census numbers show only 41% of Americans earning \$39,999 or less. We did not collect information on race.

All participants answered questions taken from several pre-established measures of behavior and attitudes as well as questions about how they think about the future.

Measures

Prior to analysis, data was examined for accuracy of data entry, missing values, and for linearity and normality.

Dependent Variable: Financial Behavior

The Financial Management and Behavior Scale (FMBS) was developed and validated using a nationally representative sample in 2011 by Dew and Xiao. The scale asks subjects to indicate how often they have engaged in 17 behaviors in the past six

months. Responses are given on the following scale: (0 = Not applicable to me, 1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = always). Items include behaviors such as, “Began or maintained an emergency savings fund,” “Bought bonds, stocks, or mutual funds,” and “Paid all your bills on time.”

Coding of “not applicable” responses. Several of the items in the FMBS measure were designed by the original researchers with the option to answer ‘not applicable to me.’ These included items pertaining to credit use and to insurance policies. To code “n/a” responses with the numeric value of zero would result in a lower overall money management score for anyone who opts out of the use of credit, and for those who do not purchase life, health or property insurance because they receive it through other means (employer, spouse, federal or state programs, etc). With respect to insurance, it was not possible to ascertain whether or not people answering, “not applicable to me” were otherwise covered or simply not making insurance a priority. A one-way ANOVA with the Income Level as the between groups factor showed that people in lower income categories were significantly less likely to purchase or maintain health insurance than those in the higher income categories ($F(6, 616) = 12.123, p < .001$).

These results could be interpreted to mean that people with lower incomes are going without health insurance, or it could indicate that they are more likely to be covered by state or federal programs. Life insurance is equally befuddling because people who do not have dependents that will survive them may not have a financial need for life insurance. Thus, the lack of a life insurance policy does not necessarily equate a lack of financial savvy. Property insurance (auto, home, rental) is a bit less ambiguous. A lack of property insurance indicates either a lack of property to insure, or a lack of concern for

the loss of that property, both being indicators of poorer financial management.

Considering all of these points, we chose to code “not applicable to me” as missing data for life and health insurance, and as zero for property insurance. In this way only the lack of property insurance would affect the overall financial management score.

Financial behavior v1. For our primary analysis, our sample size was $N = 710$, and our dependent variable was calculated using all 17 financial management items, treating all “not applicable to me” responses as missing data with the exception of property insurance (as explained above) which was coded as zero

The authors of this measure divide the 17 items into four subscales. Scale validity tests with our sample resulted in low reliability for these four subscales (alphas all below 0.8), and subsequent confirmatory factor analysis based on these subscales also showed poor fit ($\chi^2(113, N = 409) = 522.354, p < .001, CFI = .809, RMSEA = .094$). However, a reliability analysis with all 17 items returned a relatively strong result ($\alpha = .839$). For this reason, we chose to take the mean of all 17 items as our Financial Behavior score, and grouped the sample according to credit users and credit non-users to explore any effects of group differences on the direct and indirect effects in the SEM model.

Explanatory Variables

Impulsiveness. To measure impulsivity as a personality trait, we used the Brief Self-Control Scale, or BSCS (Tangney, Baumeister, and Boone, 2004). Participants were asked to indicate how much they agree with 13 statements about their personality and behavior on a scale of 0 -7 (0 = Not at all, 7 = Completely agree). Items include statements like, “I often act without thinking through alternatives,” and, “I say inappropriate things.” The BSCS has been tested and validated in several studies. Tests of

internal validity with our sample returned low alphas for the subscales, and confirmatory factor analysis showed a poor fit using the pre-determined subscales (See Appendix A for details). However, the full 13-item scale had high reliability ($\alpha = .902$, $N = 710$). Based on this, Impulsiveness was calculated as the mean of all 13 items in the BSCS.

Financial literacy. To test financial knowledge, we use the Big Five financial questions from the National Financial Capability Study. Correct answers were coded as 1, and incorrect or “I don’t know” responses were coded as 0. Unanswered items were rare, and these cases were dropped from the sample. Total scores were calculated as the percentage of correct answers (0 = 0, 1 = 20, 2 = 40, etc.).

Future concept. To measure psychological distance between the present and the future self, we focused on time horizon and construal level. As an indication of time horizon, participants were asked, “When you think about the future, how far ahead do you usually picture?” and offered a selection of time frames ranging from, “Less than a month,” to, “More than ten years.” This question allowed us to gauge the individual’s natural tendency to think about the future. A second question measured the construal level of their mental image of the future by asking participants to move a slider to indicate how detailed and clear their mental representation of their future in ten years is. End points were labeled “Extremely vague and without detail,” and “Very clear and detailed.” Construal level is a common proxy for psychological distance. Clarity and detail in one’s mental picture indicates low-level construal and is associated with feelings of psychological closeness. Conversely, abstract and vague concepts are indicative of greater psychological distance. The latent variable approach was selected in this instance because these questions measure different aspects of the future concept, and are not

conducive to a mean-based score. Tests of scale validity confirmed this assumption ($\alpha = .524$, $N = 710$).

Materialism. The 9-item Materialistic Values Scale (MVS) was validated by Richins (2004). Materialistic values have been linked to spending, especially on items that are identity-salient. As with the other scales in this study, reliability analysis and confirmatory factor analysis showed little support for the previously-established subscales (see Appendix A for details). However, the full 9-item scale had an alpha of 0.849, and so we calculated the Materialism score as the mean of all nine items.

Linearity, normality, and outliers. When performing structural equation modeling, it is assumed that all of the explanatory variables are linearly related and normally distributed. Scatterplots of several combinations of the independent variables showed no signs of non-linear relationships. To test for normality and outliers, we examined the residuals from a multiple linear regression of Financial Behavior on Materialism, Future Concept, Impulsiveness and Financial Literacy. The pattern of the residuals followed a normal distribution, indicating the normality of the explanatory variables. A Malhalanobis test identified one outlier, which was dropped from the sample, leaving a final N of 710.

Correlations. Bivariate correlations between the dependent and independent variables are listed in Table 4.

Table 1

Bivariate Correlations Between the Dependent and Independent Variables

		Financial behavior	Materialism	Impulsiveness	Financial literacy	Time horizon	Clarity and detail
Financial behavior	<i>r</i>	—	-.214**	-.396**	.261**	.319**	.267**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
Materialism	<i>r</i>	-.214**	—	.330**	-.143**	-.081*	-.028
	Sig. (2-tailed)	.000		.000	.000	.032	.451
Impulsiveness	<i>r</i>	-.396**	.330**	—	-.045	-.302**	-.345**
	Sig. (2-tailed)	.000	.000		.234	.000	.000
Financial literacy	<i>r</i>	.261**	-.143**	-.045	—	.099**	-.012
	Sig. (2-tailed)	.000	.000	.234		.009	.743
Time horizon	<i>r</i>	.319**	-.081*	-.302**	.099**	—	.376**
	Sig. (2-tailed)	.000	.032	.000	.009		.000
Clarity and detail	<i>r</i>	.267**	-.028	-.345**	-.012	.376**	—
	Sig. (2-tailed)	.000	.451	.000	.743	.000	

**Correlation is significant at the .01 level (2-tailed).

*Correlation is significant at the .05 level (2-tailed).

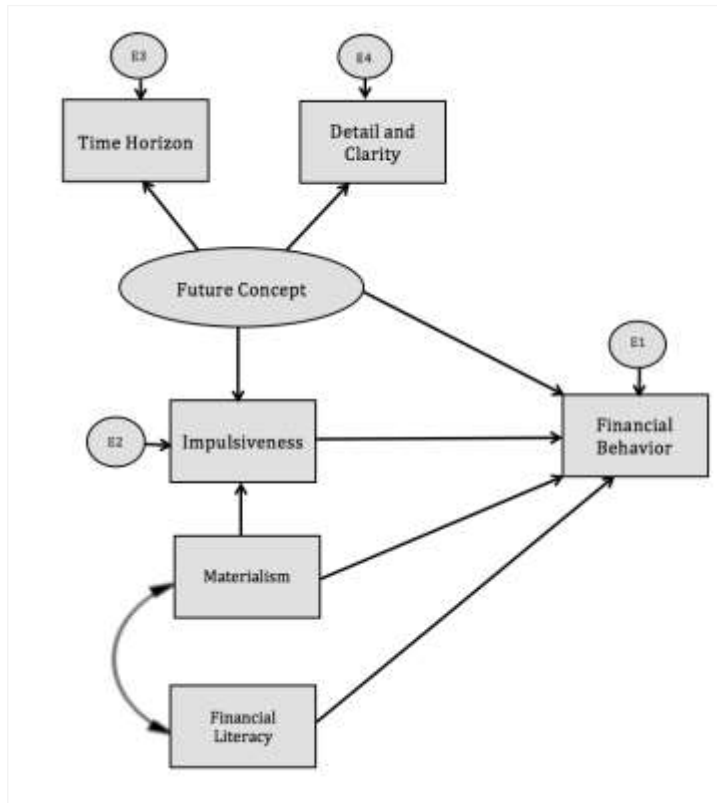
The bivariate correlations show significant relationships between Financial Behavior and all of the explanatory variables, and so we expect significant, direct relationships between each explanatory variable and the dependent variable in our structural equation model. With respect to the correlations between explanatory variables, we will not include non-significant correlations in the path model, or those with an absolute value of $r < 0.1$. The resulting hypothesized path model is shown below.

Model

The hypothesized model examines the predictors of Financial Behavior with Impulsiveness as a mediating variable (Figure 7). Based on the findings from previous studies reviewed earlier, we hypothesize that Materialism, Impulsiveness, Future Concept, and Financial Literacy will all have direct effects on Money Management. Additionally, since Impulsiveness is significantly correlated to both of the Future Concept indicators as well as to Materialism, we expect that Materialism and Future Concept will have indirect effects on money management by affecting the level of impulsiveness. Since no significant correlation is seen between Financial Literacy and Impulsivity, no link appears in the model.

Figure 1

Hypothesized model



To explore the issue of credit non-use, we grouped the responses according to credit users and non-users and performed t-tests on all other financial behavior items as well as on items of impulsivity, materialism, financial literacy, future concept, and demographics. We found that there were significant group differences on several items in both the money management scale and within the measures of our explanatory variables. For example, there were significantly lower saving rates, as measured by the mean of the three savings questions in the FMBS scale, among credit non-users ($M = 2.86$, $SD = 1.22$), than credit users ($M = 3.11$, $SD = 1.13$), $t(709) = -2.58$, $p = .010$. While the group difference is significant, the difference in saving may not reflect poorer financial

management skills among credit non-users. It is not difficult to imagine how a person with access to credit may be able to save more from each paycheck because they can carry a balance on day-to-day purchases, whereas those without access to credit cannot. The practice of carrying balances that accrue high interest rates while simultaneously holding assets in a savings account earning low interest is, in fact, financially detrimental.

There were significant group differences in several of the explanatory variables as well. For example, significantly higher impulsivity was observed among credit non-users ($M = 2.82, SD = 1.29$), than credit users ($M = 2.57, SD = 1.25$), $t(709) = 2.23, p = .026$.

Perhaps those with higher levels of self-reported impulsivity do not use credit because they have not earned access, but it is also possible that these people choose not to use credit as a way of reining in their own tendencies toward impulsive spending. After careful consideration of all of these possibilities, we decided not to penalize credit non-users by coding “n/a” answers as zero. All “n/a” answers for credit questions were coded as missing data. In this way, the non-use of credit neither raises nor lowers a person’s overall financial management score with respect to the overall sample. Any differences in the total score will depend instead on the other money management items such as saving, planning, and investment. To capture the insights that may be available from these group differences, we performed group analysis in our structural equation model with credit use or non-use as the grouping variable.

Results

The hypothesized model had an acceptable fit ($\chi^2(10, N = 710) = 17.810, p = .058, CMin/df = 1.781, CFI = .985, RMSEA = .033$), but the correlation between Financial Literacy and Future Concept was not significant to the model for either group.

After dropping this correlation from the model, we observed a slightly improved fit (χ^2 (12, N = 710) = 19.009, $p = 0.088$, CMin/df = 1.584, CFI = .987, RMSEA = .029). For credit users, all paths in this model are significant. Interestingly, for credit non-users, two paths are not significant to the model. When we remove these non-significant paths in the non-credit model, the overall fit was improved even more (χ^2 (14, N = 710) = 19.546, $p = .145$, CMin/df = 1.396, CFI = .989, RMSEA = .024, PClose = .974). The final structural equation models for the two groups are shown below in Figures 8 and 9. All effects shown are standardized.

Figure 2

Effects of psychological factors on the financial behaviors of credit users

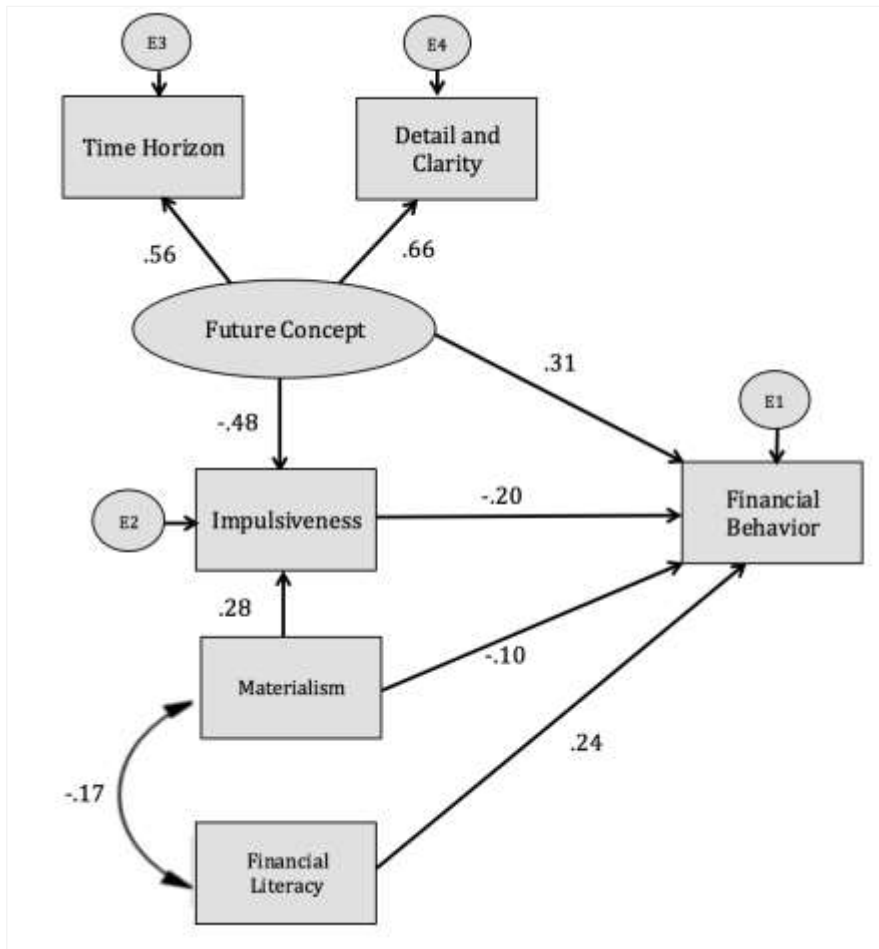
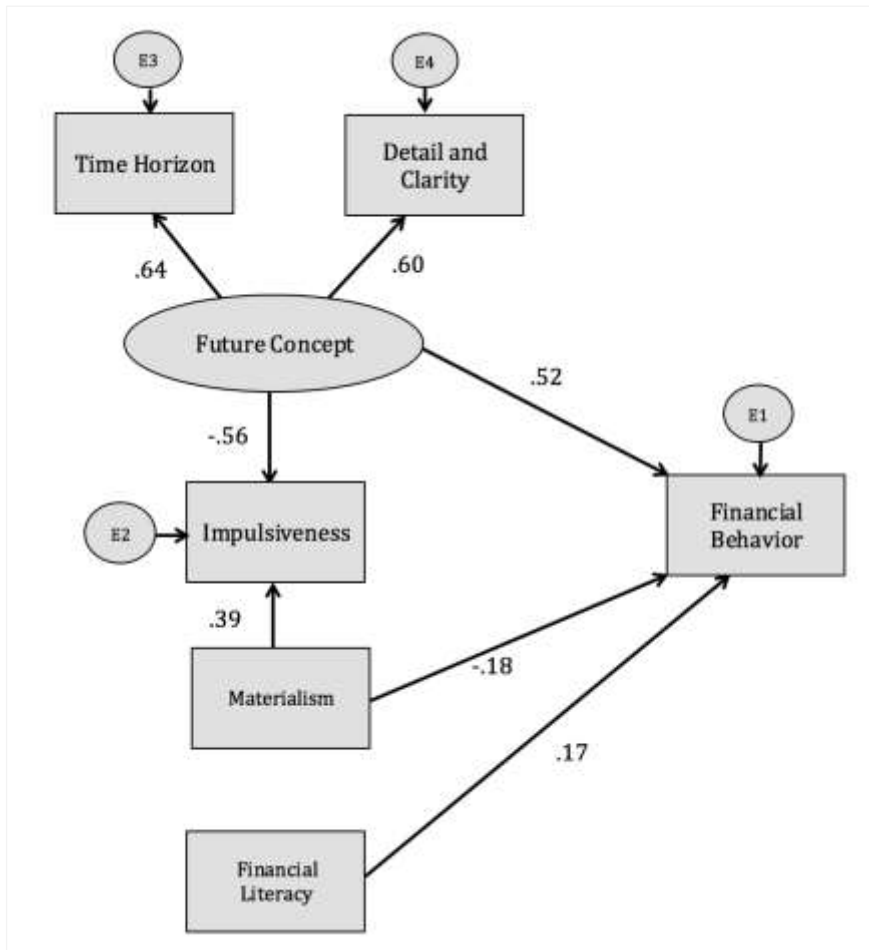


Figure 3

Effects of psychological factors on the financial behaviors of noncredit users



Path Analysis

The standardized direct, indirect, and total effects of each explanatory variable on financial behavior are listed in Table 5. All effects are significant at the $p < 0.05$ level.

Table 2

Standardized Effects on the Financial Behavior of Credit Users and Non-Users

	Future concept	Materialism	Impulsiveness	Financial literacy
Credit users				
Direct	0.31	-0.10	-0.20	0.24
Indirect	0.10	-0.06	0.00	0.00
Total	0.41	-0.15	-0.20	0.24
Credit nonusers				
Direct	0.518	-0.176	0.00	0.171
Indirect	0.00	0.00	0.00	0.00
Total	0.518	-0.176	0.00	0.171

As predicted in $H_{1(a-d)}$, all four explanatory variables had significant direct effects on financial behavior. The effects of Impulsiveness and Materialism were negative, while Future Concept and Financial Literacy had positive effects.

Our results also showed that a strong future concept has an indirect, positive effect on financial behaviors by reducing the effects of impulsiveness, supporting H_{2a} . However, no such indirect effect was observed between Financial Literacy and Financial Behavior. The relationship between Financial Literacy and Impulsiveness was not significant, and so we reject H_{2b} .

Lastly, the results for both groups showed that the total effect of one's Future Concept on Financial Behavior was greater than that of Financial Literacy, supporting H_3 .

As an additional test, we examined whether the model would change for credit non-users if we had decided to code "NA" responses as zero rather than as missing data. A comparison of the correlations between financial behavior and the five explanatory variables (Table 6) show that there is no change to the direction or significance of any of

the paths, with the exception of financial literacy. If we had coded “NA” answers as zero, financial literacy would no longer be significant to the model.

Table 3

Bivariate Correlations for Financial Behaviors

		Materialism	Impulsiveness	Financial literacy	Time horizon	Construal level
“NA” scored as missing data	<i>r</i>	-.230**	-.379**	-.173*	.393**	.261**
“NA” scored as zero	<i>r</i>	-.231**	-.404**	0.132	.388**	.260**

**Correlation is significant at the .01 level (2-tailed).

*Correlation is significant at the .05 level (2-tailed).

Discussion

The way a person conceptualizes the future had a significant effect on their financial behaviors, even when trait-level impulsiveness was present. In both models, we saw that the future concept was significantly and positively related to financial behavior, and negatively related to impulsiveness. People who think further into the future, and who had a clearer mental picture of that future were more likely to report stronger financial behaviors as well as lower levels of impulsivity.

Financial literacy, while significant, was not the strongest predictor of financial behaviors. The combined magnitude of the direct effects of the three other psychological factors, along with the lack of significant relationships between financial literacy and other factors, suggests that high financial literacy alone will not be able to compensate for impulsiveness, materialistic values, or a very weak concept of the future. This raises questions about the effectiveness and appropriateness of financial education as a behavioral intervention. While those who have a strong future concept and high self-

control will likely see an added benefit from learning about financial concepts, it may be more useful, especially among populations known to be higher in impulsivity and present-orientation, to focus intervention efforts on the development of a stronger future concept.

The lack of any significant relationship between financial literacy and impulsiveness is particularly striking. There is an indirect relationship, by way of materialism for those who use credit, but comparisons of fit measures indicated that the model with no correlation between financial knowledge and impulsiveness was a better fit for our data. One's concept of the future, however, did directly affect impulsiveness. Regressing impulsiveness on the two future-concept items showed that a full 15.4% of the variance in impulsiveness scores was explained by these two factors alone ($F(2,709) = 64.281, p < .001, R^2 = .154$). Since thinking about the distant future in fine detail shrinks the psychological distance, it is not difficult to imagine how a strong future concept could reduce impulsiveness by making the future consequences of present actions more salient.

Lastly, and quite unexpectedly, when we looked at those who do not use credit, the path model changed in two important ways. First, the correlation between financial literacy and materialism became non-significant. Second, the direct effect of impulsiveness on financial behavior became non-significant. From a behavioral perspective, this is very interesting. It would seem that the decision not to use credit might be a very effective commitment device for people who struggle with impulsiveness. Whether these people are intentionally not using credit because they know that they are likely to abuse it, or they are simply do not have access to credit because of low income or low credit scores, the non-use of credit cards effectively eliminated out the

effect of impulsiveness on financial management. This suggests that a first line of intervention for better financial health among people who struggle with impulsive tendencies may be to stop the use of credit cards. However, for those unwilling to do so, or those who want to keep their access to credit open so that they can build their credit scores, there is still hope. These results suggest that by helping people to create vivid, detailed mental pictures of their future, which can be attempted with simple visualization and writing tasks, we may be able to help people improve their financial behaviors, and ultimately their lives.

The US government has invested hundreds of millions of dollars into financial literacy programs, but these findings suggest that financial literacy alone may not be optimal as the focus of behavioral interventions, especially among people with high impulsivity. Working with individuals to develop a clearer picture of their future, and to extend their mental time horizon may have a more substantial impact on behavior than simply teaching financial concepts. We do not mean to dissuade financial literacy efforts altogether, as our model did show a clear and positive direct effect of knowledge on behavior. We conclude that a comprehensive approach to financial education that incorporates interventions aimed at developing the future concept deserves further consideration.

Chapter Two References

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