

Three essays on the relationship between emotions and financial resources.

by

Shane Enete

B.S., University of Southern California, 2002
M.S., University of North Carolina, Charlotte, 2010

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Personal Financial Planning
College of Health and Human Sciences

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2020

Abstract

This three-essay dissertation investigated the relationship between emotions and financial resources using a convenience sample of 993 U.S. adults. The broaden and build theory was used in order to predict that emotions help explain variation in the financial resources of U.S. households. Essay one found that emotions were associated with financial resources after controlling for traditional demographic predictors using an ordered logit model. Essay two found that emotions were associated with financial time horizon after controlling for traditional demographic predictors using a structural equation modeling approach. Finally, essay three found that financial time horizon served as a mechanism for helping explain the relationship between emotions and financial resources using a structural equation modeling approach. Results suggest that policymakers, financial professionals, and academics should include emotions as a predictor of financial resources. In addition, future financial positive psychology interventions should use financial time horizon as an important mechanism that may help strengthen the relationship between emotions and financial resources indirectly.

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Approved by:

Major Professor
Martin C. Seay

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Acknowledgements

I won the prize for best dissertation advisory committee. Many thanks to my committee members: Drs. Martin Seay, Sarah Asebedo, David Wang, Megan McCoy, and Maurice MacDonald. This dissertation would not have been possible without all of your helpful feedback and input. I am especially grateful for my major advisor, Dr. Martin Seay, who provided incredible support and instrumental feedback during every step of this dissertation process. Thank you, Dr. David Wang, for teaching me structural equation modeling, and being patient with me as I worked through the SEM analysis for this paper. You were certainly the most encouraging math professor I have ever had. Thank you, Dr. Sarah Asebedo, for allowing me to participate in your PPI research that led to both a publication with the Journal of Positive Psychology, and the dataset being used in this dissertation. Also, thank you for your time and encouragement as I worked through the SEM analysis for this paper. Thank you, Dr. Megan McCoy, for your helpful input and copyediting throughout my draft process, and for your fun encouragement. Finally, thank you Dr. Maurice MacDonald, for your helpful direction, early on, in my dissertation process, and for your encouragement throughout.

Thank you, especially, to my family, for allowing me to simply say, “dissertation,” every time I wanted to duck out of a household chore or avoid changing a diaper.

I would also like to thank the members of my KSU PhD cohort: Andrew, Chris, Ed, Juan, Matt, and Wendy. I already miss our summer days in Manhattan, Kansas. I would also like to apologize to Matt for the emotional hardship I may have caused him by changing my dissertation topic from its original focus on “flow” (the science of optimal experience).

Dedication

To my three great loves: Jesus Christ, Tammy, and my children. To Jesus Christ, for motivating and sustaining me with your grace, love, and truth. To my wife, Tammy, for being an incredible companion, encourager, and helper to me during this long, and often arduous, dissertation process. To my children, Sage and Silas, for your shouts of excitement every time I would come home from work. To Sage, for encouraging me with all of your wonderful abstract paintings that are hanging in my office. To Silas, for your great morning nuzzles that often ushered me into a productive morning of research and writing.

Chapter 1 - Introduction

Statement of Problem

The timeless question, "can money buy happiness?" has been explored extensively (Boyce et al., 2010; Diener & Biswas-Diener, 2002; Diener & Oishi, 2000; Easterlin, 2010; King et al., 2012). Given that prior literature reveals a relatively weak relationship between money and happiness when money is the independent variable and happiness is the dependent variable (Dunn et al., 2011; Easterlin et al., 2010), what about the seldom asked question, "can happiness lead to more money?" (Asebedo et al., 2020; Asebedo & Seay, 2015; Guven, 2012; Hill et al., 2016). Relative to the first question, this question is, perhaps, more appealing since it does not assume that a core measure of human flourishing, like happiness, is simply transactional, and only available to those who acquire wealth. However, this question may still cause some concern since many people see the financial and emotional life as two separated domains. Recent developments in behavioral economics and financial therapy, however, have begun to draw significant conclusions that a person's financial and emotional life are inter-related (Asebedo, 2016; Baker & Ricciardi, 2014; Karademas & Roussi, 2017; Rasure, 2011; Wang & Murnighan, 2014; Whillans et al., 2016). Given the presumption that money and resources are inter-related, this dissertation explored whether financial resources were a function of both emotional and demographic factors.

Purpose

The purpose of this dissertation is to show that emotions matter when it comes to predicting the financial resources of a U.S. household. The dissertation also aims to explain this

relationship between emotions and financial resources through the indirect effect of financial time horizon.

Description of Studies

Essay One

In essay one, the following research question was explored using a convenience sample from Amazon's MTurk platform (993 participants): are emotions useful to include in a model when predicting the financial resources of a household after controlling for traditional demographic predictors of financial resources (e.g., age, race, kids)? The financial resources of an individual were defined as their household's income and net worth. When defining emotions, they tend to be grouped as either "positive" or "negative." Positive emotions tend to be "rather diffuse" (Fredrickson, 1998, p. 300). Frederickson (2009) provided a list of the ten most common positive emotions: joy, gratitude, serenity, interest, hope, pride, amusement, inspiration, awe and love. Negative emotions, by contrast, tend to be more discrete and better defined than positive emotions (Fredrickson, 1998). Newhagen (1998) listed anger, fear, and disgust as the three primal negative emotions.

In order to make the theoretical connection between emotions and financial resources, the broaden and build theory (BBT) was used (Fredrickson, 1998). BBT predicts that positive emotions should result in improved well-being through the building of personal resources such as cognitive skill building (Isen et al., 1987), closer social connectedness (Hutcherson et al., 2008), and expanded time horizon (Cohn & Fredrickson, 2006; Guven, 2012a; Ifcher & Zarghamee, 2011). A corollary of BBT is that negative emotions should result in lower well-being through the loss of personal resources (Fredrickson, 1998). These personal resources were

hypothesized to be associated with financial resources since prior literature has shown an association between cognitive skill building and wealth generation (Lusardi et al., 2017), social loneliness and household incomes (Chen & Chung, 2007) and time horizon and economic decisions (Dow & Jin, 2013).

The following hypotheses were tested using an ordered logit (OL) regression model within a hierarchical analysis approach (see Figure 1.1 below):

H1a: Positive emotions are positively associated with financial resources.

H1b: Negative emotions are negatively associated with financial resources.

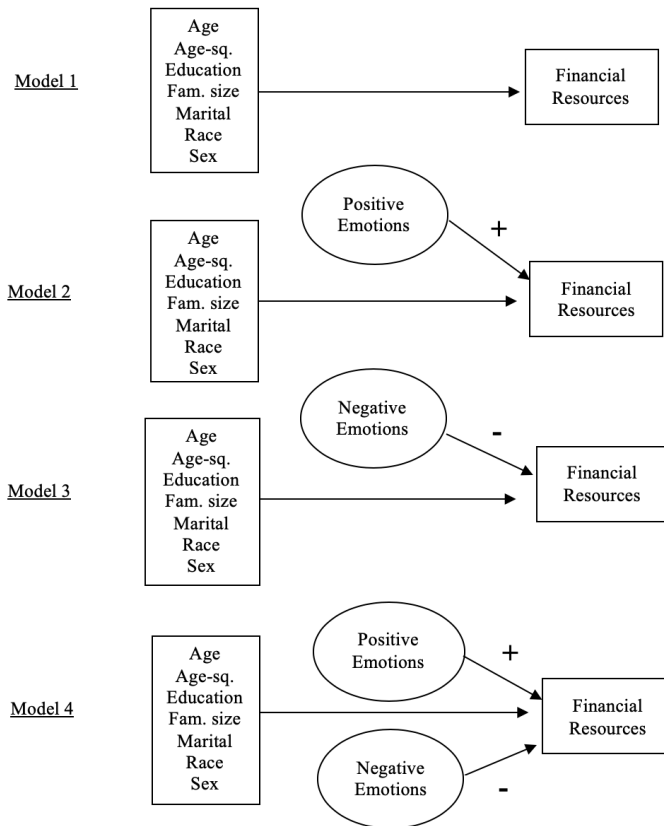
H1c: Positive emotions increase the explanation of variation in financial resources, as compared to only modeling traditional demographic factors.

H1d: Negative emotions increase the explanation of variation in financial resources, as compared to only modeling traditional demographic factors.

H1e: Positive and negative emotions increase the explanation of variation in financial resources, as compared to only modeling traditional demographic factors.

H1f: Model four explains the most amount of variation in financial resources.

Figure 1.1 Essay one structural models with predictions



Essay Two

In essay two, the relationship between emotions and financial time horizon was, first, explored, and, then, tested using a positive psychology intervention (PPI) centered around the benefits of being grateful. Financial time horizon was measured using three separate measurements of an individual's financial planning and saving habits. In order to make the theoretical connection between emotions and financial time horizon, the broaden and build theory (BBT) was used (Fredrickson, 1998). The BBT theory presumes that the experience of positive emotions causes a building of resources and skills. In this way, positive emotions are hypothesized to be associated with an expanded financial time horizon of an individual given that an expanded attention span and time horizon has been shown to occur in the wake of a positive emotion (Cohn & Fredrickson, 2006; Guven, 2012; Ifcher & Zarghamee, 2011).

Negative emotions, in contrast, are hypothesized to be associated with a narrowed financial time horizon given that a narrowed attention span and time horizon have been shown to occur from negative emotions (Basso et al., 1996; Shechner et al., 2012). A convenience sample from Amazon's MTurk platform was used (993 participants), which included a one-week PPI intervention experiment (Asebedo et al., 2020).

For the analysis of this paper, a Structural Equation Model (SEM) approach will be used in order to account for the measurement error associated with the psychological and financial constructs and to conduct a group analysis between the PPI intervention and control groups (Kline, 2011). Within this SEM approach, a hierarchical analysis approach was used in order to determine which model of emotions provided the most predictive power (e.g., high adjusted R^2) when predicting financial time horizon. See structural models below (Figure 1.2).

The following hypotheses were tested:

H2a: Positive emotions are positively associated with financial time horizon.

H2b: Negative emotions are negatively associated with financial time horizon.

H2c: Positive emotions improve the explanation of variation in financial time horizon, as compared to only modeling traditional demographic factors.

H2d: Negative emotions improve the explanation of variation in financial time horizon, as compared to only modeling traditional demographic factors.

H2e: Positive and negative emotions improve the explanation of variation in financial resources, as compared to only modeling traditional demographic factors.

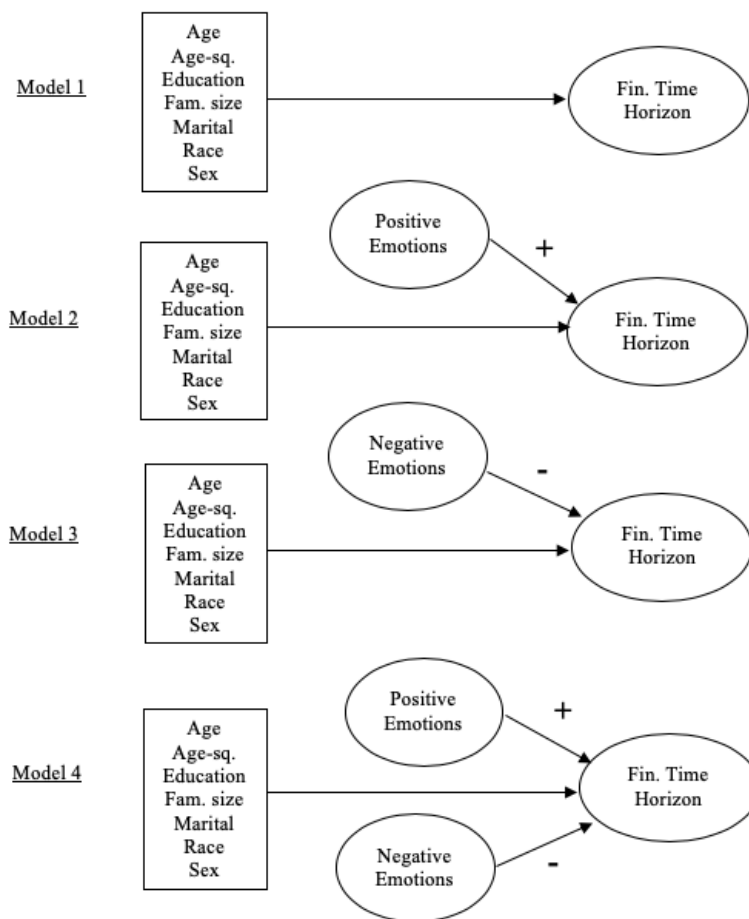
H2f: Adding positive and negative emotions to traditional demographic factors (model four) explains the most amount of variation in financial time horizon, as compared to adding only positive emotions or negative emotions exclusively.

The following hypotheses were tested using a structural equation modeling (SEM) group analysis approach:

H2g: Individuals in the intervention group will have a stronger positive relationship between positive emotions and financial time horizon compared to the no-treatment control group.

H2h: Individuals in the intervention group will have a stronger negative relationship between negative emotions and financial time horizon compared to the no-treatment control group.

Figure 1.2 Essay two structural models with predictions



Essay Three

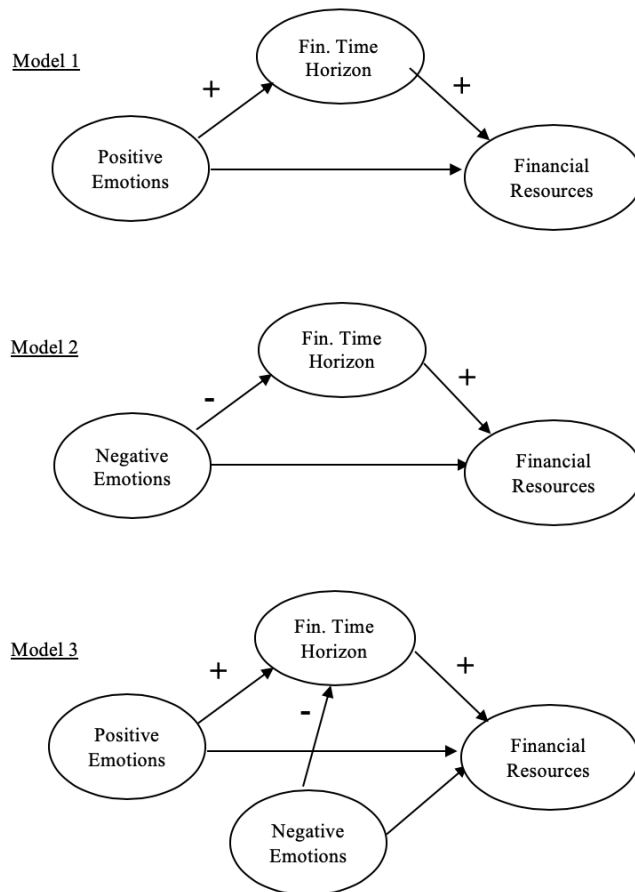
For essay three, the following research question was explored: do emotions indirectly effect financial resources through the mechanism of financial time horizon? Finding a mechanism (i.e., mediating variable) between emotions and financial resources would help explain that relationship. Financial resources were defined as a household's income and net worth. In order to make the theoretical connection between emotions and financial resources, the broaden and build theory (BBT) was used to model the relationship between positive emotions and financial resources (Fredrickson, 1998). Given that prior literature has shown that negative emotions narrow attention span (Basso et al., 1996) and positive emotions expand time horizon (Cohn & Fredrickson, 2006; Fredrickson & Branigan, 2005; Guven, 2012; Ifcher & Zarghamee, 2011), and that time horizon is a critical variable associated with financial resources (Bernheim et al., 2001; Dow & Jin, 2013; Harris & Laibson, 2002; Laibson, 1997; Webley & Nyhus, 2008), emotions were hypothesized to predict financial resources through financial time horizon, which acts indirectly on the relationship between emotions and financial resources.

This hypothesis was tested using survey data from a convenience sample from Amazon's MTurk platform (Asebedo et al., 2020). For the data analysis, a Structural Equation Model (SEM) approach was used in order to account for the measurement error associated with the psychological and financial constructs and to investigate the indirect effect of emotions of financial resources through financial time horizon (Kline, 2011). The following hypotheses were tested:

H3a: There is a positive indirect effect between positive emotions and financial resources through the mechanism of financial time horizon.

H3b: There is a negative indirect effect between negative emotions and financial resources through the mechanism of financial time horizon.

Figure 1.3 Essay three structural models with mediating variable and predictions



Potential Implications and Summary

This dissertation hopes to add to the growing body of studies that are dedicated to providing evidence for the relationship between emotions and financial outcomes (Asebedo et al., 2020; Asebedo & Seay, 2015; Guven, 2012; Hill et al., 2016). If emotions add to the explanatory power of predicting financial resources, then policymakers, financial professionals,

and researchers should all treat emotional states as important inputs when trying to predict the financial resources of their community, clients, and participants, respectively.

In addition, if financial time horizon acts as a mechanism that indirectly explains this relationship between emotions and financial resources, financial positive psychology interventions (PPIs) could be developed that use financial time horizon as a mechanism to strengthen the relationship between emotions and financial resources indirectly. As these financial PPIs are developed, there are implications for policymakers, financial planners, financial counselors/therapists, and researchers. For policymakers, policies could be developed that use financial PPIs to nudge people towards positive emotional states, leading to longer financial time horizons, which would likely stimulate higher savings behavior (Fisher & Montalto, 2010). For financial planners, the use of a financial PPI could potentially broaden the time horizon of their client, which would allow the client to accept and adapt to the long-term comprehensive financial plan that is being recommended to them by their financial planner. Financial counselors and financial therapists, who seek to improve the financial outcomes of their clients through understanding how they emotionally relate to money (Klontz et al., 2016, p. 1), could become leaders in both the development and implementation of financial PPIs. Finally, this dissertation provides potential practical implications for researchers by helping provide theoretical and empirical justification for why emotions are associated with financial outcomes through the mechanism of financial time horizon.

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Chapter 2 - Exploring the Relationship Between Emotions and Financial resources

Introduction

*"A joyful heart is good medicine, but a crushed spirit dries up the bones." Proverbs 17:22
(English Standard Version).*

The timeless question, "can money buy happiness?" has been explored extensively (Boyce et al., 2010; Diener & Biswas-Diener, 2002; Diener & Oishi, 2000; Easterlin, 2010; King et al., 2012). But, what about the seldom asked question, "can happiness lead to more money?" (Asebedo et al., 2020; Asebedo & Seay, 2015; Guven, 2012; Hill et al., 2016). This question presumes that the financial and emotional life are inter-related, which is supported by recent developments in behavioral economics and financial therapy (Asebedo, 2016; Baker & Ricciardi, 2014; Karademas & Roussi, 2017; Rasure, 2011; Wang & Murnighan, 2014; Whillans et al., 2016). For example, Wang and Murnighan (2014) found that an individual's financial and emotional life worked together to influence their ethical judgements and behavior. Karademas and Roussi (2017) found that a couple's financial life influenced their emotional life related to their relationship satisfaction. In a clinical experiment comparing sampled people visiting marital therapists and financial counselors, Aniol and Synder (1997) found that one-third of those who went to financial counselors for financial help reported higher levels of emotional distress related to their relationships while one-third of the sampled people who went to marital therapy for emotional help reported higher levels of financial difficulties. Given the presumption that money and emotions are inter-related, what if the positive impact of a joyful heart (i.e., positive emotions) extend to the financial life of an individual? In addition, what if the negative impact of

a crushed spirit (i.e., negative emotions) go beyond acting as a burden to just the body, and actually serve to burden the individual's financial life as well?

The following research questions were explored in this essay: (1) Are emotions associated with financial resources? (2) Do emotions help increase the explanatory power when modeling the financial resources of a household after controlling for traditional demographic predictors of financial resources (e.g., age, race, kids)? The financial resources of an individual are defined as their household's income and net worth. When defining emotions, they tend to be grouped as either "positive" or "negative." Positive emotions, in general, tend to be "rather diffuse" (Fredrickson, 1998, p. 300). Frederickson (2009) provided a list of the ten most common positive emotions: joy, gratitude, serenity, interest, hope, pride, amusement, inspiration, awe and love. Negative emotions, by contrast, tend to be more discrete and better defined than positive emotions (Fredrickson, 1998). Newhagen (1998) listed anger, fear, and disgust as the three primal negative emotions.

The study of how negative emotions impact human flourishing is very well established; particularly given that negative emotions often produce severe problems that need to be addressed by culture, like violence, suicide, and physical sickness (Fredrickson, 1998). The study of how positive emotions impact human flourishing is relatively new. "Positive psychology," a term introduced by Martin E.P. Seligman and Mihaly Csikszentmihalyi in 1998, is different from traditional psychology as traditional psychology seeks to restore a broken individual back to a neutral state, whereas, positive psychology seeks to elevate a mentally healthy individual into a state of human flourishing (Jørgensen & Nafstad, 2012). Put another way, positive psychology "conducts scientific inquiry into the factors that help individuals, communities and organizations thrive by building on their strengths and virtues" (Waters, 2011, p. 76). Research in positive

psychology has exploded in its first decade of formal existence with over 1,000 articles being published in peer-reviewed journals from 2000 to 2010 (Azar, 2011).

This study continues this ongoing positive psychology research by studying in what ways emotions are associated with the financial resources of a U.S. household. If emotions are found to be associated with financial resources, this would encourage the collection of subjective/emotional data when seeking to improve the financial lives of U.S. households. In addition, drawing a theoretical and empirical connection to emotions and financial resources could, then, encourage the development of positive psychology interventions (PPIs) that would potentially act as positively received "medicine" for many of the financial "illnesses" that are infecting many American individuals today. These illnesses include insufficient retirement savings (Rhee, 2013), higher consumer debt levels (Dunn & Mirzaie, 2016), and insufficient emergency fund reserves (Bhutta & Dettling, 2018).

Literature Review

Emotion Literature

During the 1980s, when trying to understand the nature of emotions, psychologists such as Frijda, Levenson, and Lazarus theorized that emotions tend to be associated with specific action tendencies (Fredrickson, 1998). In other words, whenever an emotion was expressed, it should always lead to a very specific action. For example, the emotion of anger tends to lead to an attack action, and the emotion of fear tends to lead to an escape action. Given that emotions are associated with specific action tendencies, earlier theories of emotions describe the purpose of emotions as "appraisal/control processes" that act in the same way that pain acts for the body -

helping to communicate to the body to run away if something feels bad, or to draw near when something feels good.

Earlier to this work, Simon (1967) argued that negative emotions occur as an interruption towards a certain goal structure, which would then likely lead to a certain level of disengagement, or, at the very least, a reprioritization of goals, leading to a choice of a lower priority reference value. Simon (1967) argued that emotions interrupt the organization of a system that allow a person to change priorities and goal structures. Within every person is a dual monitoring of focal reference values of high priority and lessor reference values of lower priority. Carver and Scheier (1990) generally called this view of emotions by Simon a "control-process" view of emotions.

In a similar vein, Mandler (1984) proposed that emotions were an automatic arousal response from interruptions to a person's expected organized sequence (a type of goal structure). Given that emotions are automatic responses from interruptions, Mandler theorized that the dominate human emotion should be anxiety since most of a person's life is spent vulnerable to interruptions, given limited knowledge and control. Conversely, positive emotions were theorized to only occur when unwelcome interruptions are removed or discovered to be less impactful than expected.

During the late twentieth century, the focus of emotion theories shifted from behavior to biological or evolutionary processes. Solomon (1980) adapted the control-process theory of Simon with an "opponent-process" theory of emotions, which argues that the body of a person who experiences an initial emotional state (state A) will automatically trigger an opposite emotional state (state B) in order to bring back "biological neutrality". This explains why emotional affective states do not last forever. For example, individuals who use drugs initially

experience euphoria (state A), which, then leads to opposing intense withdrawal reactions (state B). In another example, a person who is intentionally tripped while walking on the street will experience anger (state A), which tends to be associated with the specific action tendency of attack. However, this anger does not last indefinitely since the body will initiate an "opponent process" emotion (state B), which serves to return the angered person to a neutral state.

With the rising accessibility of brain scanning technology, evolutionary psychologists have been able to test their theories through observing the brain. Scientists have identified that emotions originate in the limbic system of the brain (Rolls, 2015). Since the limbic system is a highly primitive area of the brain that is fully developed at age three, the purpose of emotions must primarily have been for survival purposes. As a result, evolutionary psychologists often group emotions into three broad action tendencies: approach, avoid, or attack (Stonsey, 2016).

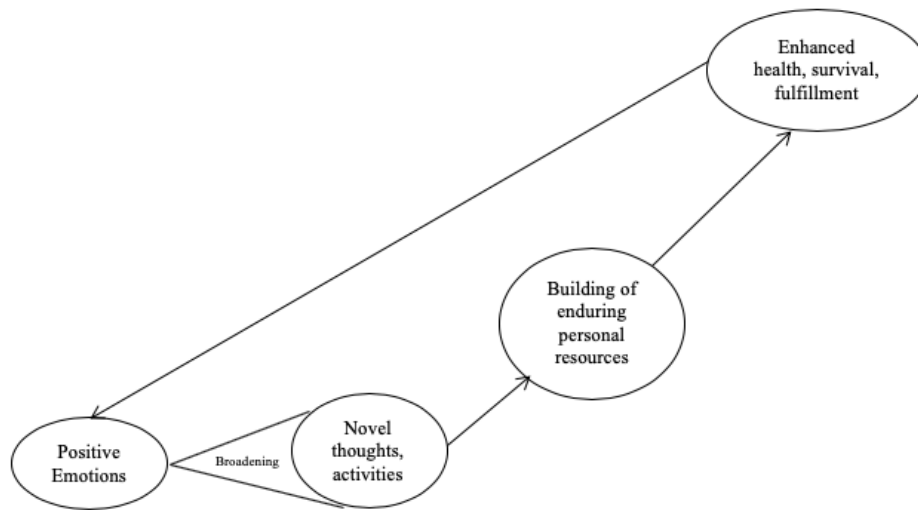
Broaden and Build Theory (BBT)

When critiquing the specific-action theories of emotion, Fredrickson (1998), an evolutionary psychologist, was disappointed with how they tended to not adequately explain positive emotions. For example, joy may be associated with the action of playing, or it may cause a person to rest. And the specific action tendency of the positive emotion of love is highly unpredictable and may cause a whole host of actions that many song writers have suggested resembles mental instability. Also, when it comes to survival, these positive emotions do not seem as immediately useful as the negative emotions of fear, or anger; so most early theories of emotions tended to downplay the significance of positive emotions.

In response to these limitations, Frederickson developed the broaden and build theory (BBT), which suggests that positive emotions are not necessarily associated with urgent specific action tendencies but are associated with a "broadening" of cognitive awareness and curiosity,

which then "builds" resources and skills. This building of resources and skills then create more positive emotions, causing a positive feedback loop. In psychology, a positive feedback loop refers to a psychological system where outputs of emotion are fed back into a system of inputs, increasing the effects of the system (Layous et al., 2017). For example, the positive emotion of joy may lead a person to play, or explore, or socialize, which then creates the building of knowledge, skills, and relational resources, leading to further positive emotions of joy.

Figure 2.1 Broaden-and-Build Theory (BBT)



Well-being Literature

The general study of positive emotions is a subset of positive psychology. Positive psychology seeks to bring a relatively healthy individual into a state of human flourishing (or well-being). But, how does this study of positive psychology define “well-being”? The conceptualization of well-being is difficult and controversial. In general, well-being can be categorized into two frameworks: hedonic and eudaimonic (Ryff & Singer, 2008). Ryff and Singer (2008) define a hedonic paradigm of well-being as happiness through an individual

obtaining pleasures and comforts. Ryff and Singer (2008) define a eudaimonic paradigm of well-being as happiness through an individual striving to obtain meaning in their actions. The word eudaimonic comes from the two Greek words, “eu,” meaning “good,” and, “daimonic,” meaning, “spirit.” So, unlike hedonic activities, which focus on the body feeling good, eudaimonic activities seek for the whole spirit to be good (Steger et al., 2008).

During most of the 20th century, well-being was measured using the hedonic framework (Ryan & Deci, 2001). A person was said to have high well-being if they had less negative affect or more positive affect. This affect was measured using scales based on an individual’s subjective well-being (SWB). More recent research has revealed that psychological well-being is more effectively modeled incorporating both a hedonic and eudaimonic dimension of well-being (Ryff, 2013). For this study, well-being will be defined as "the combination of feeling good and functioning well" (Huppert & Johnson, 2010, p. 264).

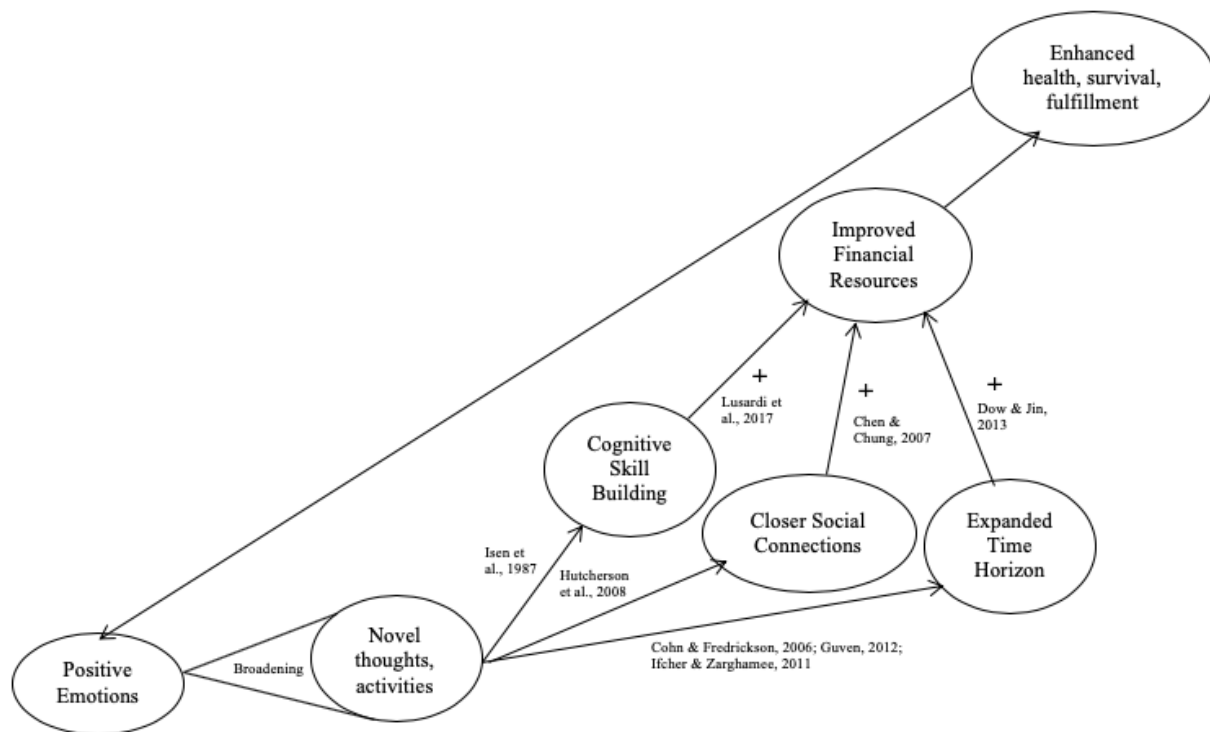
Current models of integrating hedonic and eudaimonic dimensions together into one psychological well-being measure include the Ryff model of psychological well-being (PWB; (Ryff, 2013), Self-Determination Theory (Ryan & Deci, 2000), and the PERMA model of well-being (Seligman, 2018). In the Ryff’s model, six factors are used to measure psychological well-being: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. In Self-Determination Theory, individuals have three intrinsic needs that allow for optimal function and growth: competence, relatedness, and autonomy. Finally, in the most recent theoretical construct, the PERMA model, Seligman (2018) discusses five elements that contribute to an individual's well-being: positive emotion, engagement, relationships, meaning, and achievement.

In these integrated models of psychological well-being, it is possible for individuals to have high well-being with low hedonic feelings (Ryff & Singer, 2008). For example, if the goal is to measure a parent's well-being it should include hedonic well-being questions such as: “In general, how often do you feel happy?” (Asebedo et al., 2020). While also including eudaimonic well-being questions such as: “In general, to what extent do you lead a purposeful and meaningful life?” (Asebedo et al., 2020). The reason you need to include both types of well-being questions is that if you only ask hedonic well-being questions you will discover that parents have low hedonic well-being due to physical exhaustion and marital dissatisfaction (Martinez et al., 2006). Yet, if you ask eudaimonic well-being questions you will discover that parents consistently rank having children as highly satisfying, despite their high cost to their body and marital happiness (Martinez et al., 2006). Martinez et al. (2006) found that 94% of parents agreed to the question, “the rewards of being a parent are worth it despite the cost and work it takes.” Thus, hedonic and eudaimonic questions are needed to truly assess the whole picture of well-being.

In this study, the theory used to model emotions, BBT, combines hedonic and eudaimonic concepts together. The BBT theory presumes that the experience of positive emotions (i.e., a hedonic well-being) cause a satisfying building of resources and skills (i.e., a eudaimonic well-being), which then create more positive emotions (i.e., a hedonic well-being) in a positive feedback loop. Given that building financial resources and skills are likely a crucial component when constructing a person's overall well-being and flourishing (Kim et al., 2003; Lange & Byrd, 1998; Peirce et al., 1994; Taft et al., 2013), positive emotions are hypothesized to be associated with positive financial outcomes (i.e., financial resources) as a part of the building of enduring resources/skills for which the BBT predicts will occur in the wake of a positive

emotion. The expression of positive emotions has been shown to build personal resources in the form of improved cognitive skill building (Isen et al., 1987), closer social connectedness (Hutcherson et al., 2008), and broader time horizon (Cohn & Fredrickson, 2006; Guven, 2012; Ifcher & Zarghamee, 2011). Positive emotions are hypothesized to be positively associated with financial resources given that the building of these personal resources has been shown to be associated with positive financial outcomes: cognitive skill building is required for wealth generation (Lusardi et al., 2017), social loneliness has been shown to predict lower household incomes (Chen & Chung, 2007) and time horizon has been argued as the most important aspect when making economic decisions (Dow & Jin, 2013). See Figure 2.2 below.

Figure 2.2 Adapted Broaden-and-Build Theory (BBT) for Positive Emotions



These predictions presume positive emotions as the independent variable and financial resources as the dependent variable. While it may seem more intuitive to presume a reversal of

this ordering, prior literature reveals a relatively weak relationship between money and happiness (Dunn et al., 2011). One explanation for this weakness is in the human ability to adapt, which acts to quickly diminish any emotional benefits that may occur due to higher levels of income or net worth (Myers, 2000).

Negative Emotions and Well-being Literature

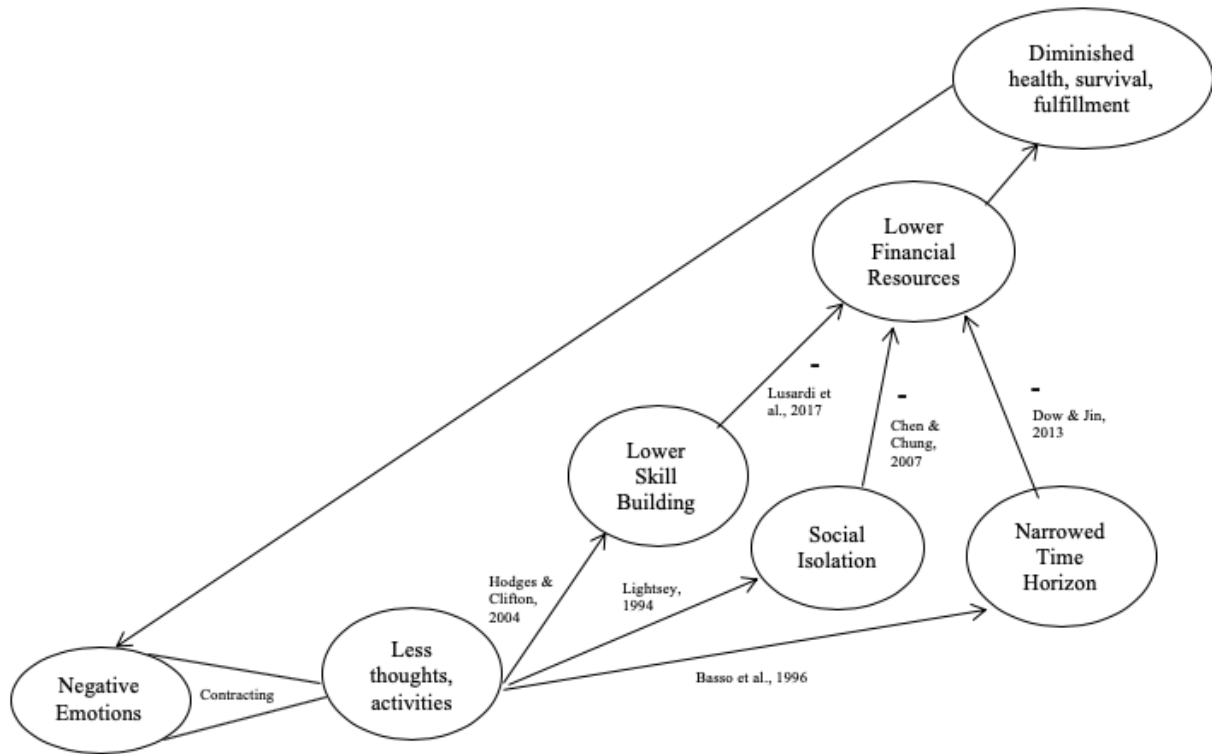
While the study of the impact of positive emotions on human flourishing is relatively new, the study of how negative emotions impact human flourishing is very well established; particularly given that negative emotions often produce severe problems that need to be addressed by culture, like violence, suicide, and physical sickness (Fredrickson, 1998). Research on depression and anxiety far exceed the research output on subjective well-being and psychological well-being (Linley & Joseph, 2012). These studies often show a strong association between negative emotions and various concepts of human floundering (whether hedonic or eudaimonic). In many ways, negative emotions work in the opposite way of positive emotions, serving to narrow and destroy, instead of broaden and build. For example, in a neuropsychological experiment, participants were asked to complete a judgement task involving visual processing. Those individuals exhibiting more of an anxious and depressed affect were associated with a narrowed attention span, while participants exhibiting a positive mood and optimism were associated with an expanded attention span (Basso et al., 1996a).

Negative emotions, like depression, or regret, often trigger certain behaviors that then trigger more negative emotions, locking an individual into a feedback loop that leads to increasing negative effects. For example, anxiety may trigger a narrowed attention span, which then triggers lower exam scores, which then triggers feelings of regret, which, then triggers lower subsequent classroom performance, and, so on (Hodges & Clifton, 2004). In Beck's

(1979) cognitive theory of depression, certain negative automatic thoughts (e.g., "I'm a worthless person") create a vulnerability to depression. In a study of how positive automatic thoughts (PATs) may interact with negative automatic thoughts (NATs), positive automatic thoughts were administered to undergraduate students over a six-week period. The study found that PATs predicted future happiness, and served as a buffer for NATs, while more frequent NATs were associated with greater depression, particularly for those who reported a lower frequency of recent positive events (Lightsey, 1994).

Given that negative emotions tend to narrow human responses instead of “broaden and build” (Fredrickson, 1998), negative emotions are hypothesized to be negatively associated with financial resources given that negative emotions are associated with the loss of important personal resources that have been shown to be associated with positive financial outcomes. See Figure 2.3 below.

Figure 2.3 Adapted Broaden-and-Build Theory (BBT) for Negative Emotions



Not all studies, however, show that negative emotions result in lower well-being. Saffrey et al. (2008) showed that people praised their negative emotions for how they helped them. In this study, regret was listed as the most beneficial negative emotion for its ability to make sense of past experiences, facilitate approached and avoidance behaviors, gain insights into self, and preserve self-harmony. In addition, negative emotions may help allocate precious resources where it is most needed through fear or may act like a specialized computer program that gives humans a competitive advantage through automatically detecting harmful foods through disgust (Muramatsu & Hanoch, 2005). In addition, simply expressing negative emotions has been shown to promote healthier relationships (Graham et al., 2008).

Frederickson, when describing the broaden and build theory (BBT), argued that there does not, necessarily, need to be a comprehensive theory of emotion that covers both positive and negative emotions. In fact, two separate theories for describing positive and negative

emotions could co-exist given that the purpose of negative and positive emotions could be very different from each other. This idea is echoed by many neuropsychologists, as well, who argue that positive and negative affect are "distinctively lateralized in the cerebral hemispheres" and orthogonal to one another, meaning, "the absence of negative mood cannot be inferred to show the presence of positive mood." (Basso et al., 1996, p. 250).

Positive Emotions and Well-being Literature

Many studies have shown a strong association between positive emotions and various concepts of human flourishing (whether hedonic or eudaimonic). The overall balance of positive versus negative emotions have been found to significantly contribute to subjective well-being (Diener et al., 2009). Frederickson, in a controlled experiment that measured participant's cardiovascular effects from positive versus negative emotions, found that positive emotions loosened the hold of negative emotions, which she labeled as the, 'undoing hypothesis' (Fredrickson & Levenson, 1998).

Positive affect states have been associated with both higher general self-efficacy beliefs (Bandura, 1997), as well as higher financial self-efficacy beliefs and saving behavior (Asebedo, 2016). In an experiment where people were given gifts (as compared to a control group), and then asked to solve problems, positive affect was shown to facilitate more creative problem solving (Isen et al., 1987). Stonsey (2016) argued that the positive emotion of intense interest increases the flow of thoughts and ideas while the negative emotion of shame acts in the opposite way. In a later study, Isen (1991), responding to criticism that the enhanced creative problem solving was actually just non-systematic, superficial processing (Mackie & Worth, 1991), through a similar experiment design, provided evidence that medical students in the affect group identified correct cancer patients at an earlier point in time than the control group.

Ashby, Valentin and Turken (2002) found that positive emotions increase brain dopamine levels, which supported the earlier findings by Isen (1987) that positive emotions are able to improve cognitive context. Positive emotions are associated with those who are resilient during loss, hardship, or adversity (Tugade & Fredrickson, 2004), have less stress (Folkman & Moskowitz, 2000), have stronger immune systems (Stone et al., 1994), and have resources to buffer against the advancement of disease and death (Tugade & Fredrickson, 2004).

Negative Emotions and Financial Resources Literature

Muramatsu and Hanoch (2005), referencing a control-process view of emotions, provided a theoretical argument that theories around economic decisions need to incorporate emotions (particularly negative emotions) more explicitly if they are to better understand people's financial choices. Kasser (2012) found that negative mood states have been shown to precede destructive financial behaviors. In one experiment related to negative emotions and financial resources, when participants were made aware of their striving for identity, and how they likely fall short of their ideals, they became more materialistic and less price sensitive (Braun & Wicklund, 1989). In a survey study of three different samples of undergraduate students, participants who showed evidence of self-doubt were associated with a desire to use materialism as a way to cope (Chang & Arkin, 2002).

Wealth has also been shown to be cause destructive emotional states (Kasser, 2012; Kasser & Ahuvia, 2002). For example, clinical psychologists have long studied the "sudden wealth syndrome," where individuals experience intense negative emotional experiences associated with a dramatic increase in wealth (Kasser, 2012). In a study of business students in Singapore, a student's pursuit into materialistic goals, such as money, was associated with lower overall well-being (Kasser & Ahuvia, 2002). Kasser and Ryan (1996) argue that well-being is

negatively associated with external, materialistic pursuits (e.g., money and fame) because having extrinsic goals does not lead to personal growth. Whereas, Kasser and Ryan (1996) argue that intrinsic goals (e.g., prosocial spending and physical fitness) does lead towards a satisfying experience of a more developed, complex self.

Positive Emotions and Financial Resources Literature

Asebedo and Seay (2015) made a theoretical argument that the practice of financial planning should incorporate concepts of positive psychology in order to improve financial outcomes. Positive emotions and financial outcomes have had many positive associations in previous studies. In an empirical study of households in the Netherlands, Guven (2012) found that happier people (using sunshine as an instrument for happiness) save more, spend less, and have lower marginal propensity to consume. Economists are currently working on using smartphones' output of sleep and exercise data in order to measure the effect of financial policies on individuals' well-being (Muaremi et al., 2012). In a longitudinal study involving two waves of 7,108 U.S. adults (1995-96, 2004-06), participants who reported a higher sense of purpose (a measure of eudaimonic happiness) had higher initial and subsequent household incomes and net worth (Hill et al., 2016). In a 15-year longitudinal study of thousands of Australian teenagers, teenage subjective well-being predicted higher incomes and employment as adults (Marks & Fleming, 1999).

Higher income and net worth are correlated with greater autonomy (Inglehart, 1997; Inglehart et al., 2008; Welzel & Inglehart, 2010) and autonomy can be described as a basic human need that must be fulfilled for optimal functioning and overall well-being (Chirkov et al., 2005; Ryan & Deci, 2000). In a clinical experiment involving testing whether participants improved their scope of attention through the watching of different films meant to elicit various

emotional states, Fredrickson found that participants who are in positive emotional states tended to take a “big picture” view (Fredrickson & Branigan, 2005). Fredrickson, in a subsequent paper, theorized that this bigger picture view that participants were taking during her earlier experiment, should lead to a broadening of their time horizon for managing personal resources (Cohn & Fredrickson, 2006).

Regarding research on wealth and subjective well-being (i.e., happiness), many studies have explored the idea that money can "buy" happiness (Boyce et al., 2010; Diener & Biswas-Diener, 2002; Diener & Oishi, 2000; Easterlin, 2010; King et al., 2012). One study compared individuals' goals, finding that those who valued materialistic goals over goals that involved autonomy and relatedness were associated with negative physical and mental outcomes, such as mental illness and alienation (King et al., 2012). Many of the happiness benefits of money soon fade away once a household crosses out of poverty, with the very wealthy showing not much improved happiness as compared to others (R. T. Howell & Howell, 2008). One proposed explanation for the relatively weak association between wealth and happiness is due to the human ability of adaption (Myers, 2000).

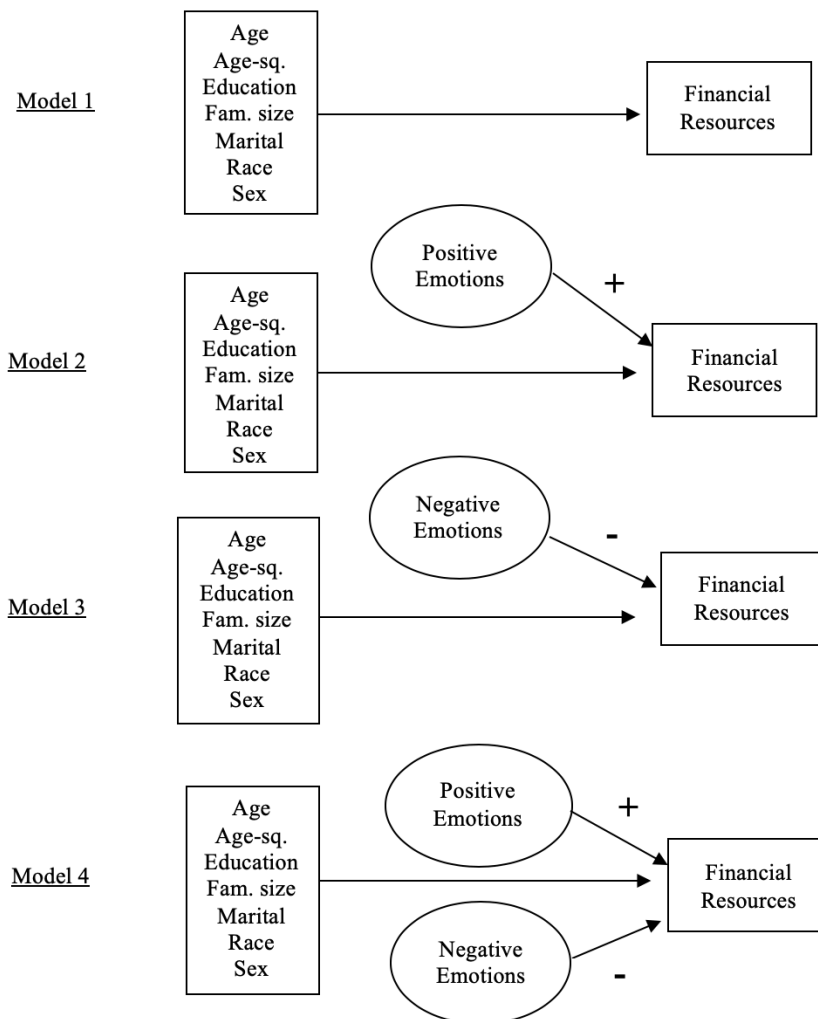
Methodology

Hypotheses

The broaden and build theory (BBT) predicts that positive emotions should result in improved well-being through the building of skills and resources (Fredrickson, 1998). The expression of positive emotions has been shown to build personal resources in the form of improved cognitive skill building (Isen et al., 1987), closer social connectedness (Hutcherson et al., 2008), and expanded time horizon (Cohn & Fredrickson, 2006; Guven, 2012; Ifcher &

Zarghamee, 2011). Frederickson, when formulating the BBT, also argued that negative emotions tended to narrow and contract an individual that would lead to lower resources and diminished well-being (Fredrickson, 1998). Given these relationships established by theory and previous literature, the following structural models with predictions were used.

Figure 2.4 Structural models with predictions



Given these structural models, the following hypotheses were explored:

H1a: Positive emotions are positively associated with financial resources.

H1b: Negative emotions are negatively associated with financial resources.

H1c: Positive emotions increase the explanation of variation in financial resources, as compared to only modeling traditional demographic factors.

H1d: Negative emotions increase the explanation of variation in financial resources, as compared to only modeling traditional demographic factors.

H1e: Positive and negative emotions increase the explanation of variation in financial resources, as compared to only modeling traditional demographic factors.

H1f: Model four explains the most amount of variation in financial resources.

Data

This study will use survey data collected at the end of 2018 by Asebedo et al. (2020). The dataset was funded and supported by Dr. Russell James III, the CH Foundation chair of Personal Financial Planning, Texas Tech University; and the College of Human Sciences at Texas Tech University [n/a]. The purpose of the collected data was to assess attitudes and intentions toward saving in a savings account, investment account, or a retirement account. Participants of the survey were recruited through Amazon's MTurk platform, which is known to provide access to a relatively low-cost, large pool of Americans that approximates the general U.S. population demographics for age and race but may not be representative when predicting religious affiliation or personality (Burnham et al., 2018). In order to qualify for the survey, participants from Mturk needed to have at least a 90% approval rating and at least 500 surveys (i.e., HITs) completed. These constraints were added primarily to lower the probability of survey bots (Dreyfuss, 2018; Miele, 2018). Once survey participants selected to participate in the survey through Mturk, they were sent to Qualtrics, which administered the survey and collected the data. After the survey participants completed the initial survey, they were sent compensation of

\$1.00. For this study, the initial survey of 993 participants will be used (collected on December 10, 2018). This survey dataset is appropriate to use for this study given that it: (a) collected variables related to both emotions and financial resources, (b) is a relatively large dataset (n=993), and (c) is a new and private dataset, so it has not been extensively analyzed by other researchers.

Dependent variable

Financial resources will be used as the dependent variable. Two measures of financial resources were used: household income and net worth. Analyzing both income and net worth is consistent with a previous study that connected positive emotions with financial outcomes (Hill et al., 2016). Although these two different measures are highly correlated with each other (i.e., those with high income often have high net worth), studying income and net worth separately provides a more nuanced picture of a household's financial resources, particularly, given that it is possible for households to be either income rich and asset poor (Sykes, 2003), or, income poor and asset rich (Bradbury, 2010).

Table 2.1 Measurement of Financial Resources Variables

Variable	Measurement Question	Values	
Income	"What is your household annual gross income (before taxes) you use for saving and spending?"	1	No income
		2	Less than \$20,000
		3	\$20,001 – \$40,000
		4	\$40,001 – \$60,000
		5	\$60,001 – \$80,000
		6	\$80,001 – \$100,000
		7	\$100,001 – \$150,000
		8	\$150,001 – \$200,000
		9	\$200,001 – \$250,000
		10	\$250,001 – \$500,000
		11	Over \$500,000
Net Worth	"If you were to sell all your assets today and pay all of your debts, how	1	Less than \$0
		2	\$1 – \$99,999

much will you have left over? In other words, what is your current net worth (assets - liabilities)?"	3	\$100,000 – \$249,999
	4	\$250,000 – \$499,999
	5	\$500,000 – \$749,99
	6	\$750,000 – \$999,999
	7	\$1,000,000 – \$2,499,999
	8	\$2,500,000 – \$4,999,999
	9	Over \$5,000,000

Independent Variables

Positive Emotions

Positive emotions will be operationalized using measures of joy, interest, contentment, and feeling loved. Frederickson (1998), the author of broaden and build theory (BBT), identified joy, interest and contentment as three "maximally distinct" emotions from one another (p. 304). Frederickson (1998) also identified the positive emotion of love as a triggering emotion that leads to other positive emotions (p.306). These emotions will be distinctly modeled, versus creating one positive affect variable, in order to see the unique contribution that each emotion may have on financial resources. These measurements were collected using a PERMA-Profiler tool (Butler & Kern, 2016), which provided a framework for measuring the PERMA theory of well-being (Seligman, 2012). In the PERMA framework, well-being is measured using five elements: Positive emotions, Engagement, Relationships, Meaning and Accomplishment. In the PERMA-Profiler tool, Positive emotions were measured using the three distinct emotions of joy, positivity, and contentment. The other elements were measured using 12 questions, providing a final set of 15 questions that were meant to measure the PERMA theory. In addition to this 15-question set, the PERMA-Profiler tool added eight additional filler items, which assessed overall wellbeing, negative emotion, loneliness, and physical health.

Given that BBT labels joy, interest and contentment as the three maximally distinct positive emotions while the PERMA-Profiler measured positive emotions using PERMA's three

distinct positive emotions of joy, positivity, and contentment, a proxy was used for the positive emotion of "interest." In the PERMA framework, the construct of interest, as explained by the BBT, is most closely associated with the construct of "Engagement" in the PERMA framework (the "E" from PERMA). While the PERMA concept of Engagement does not map exactly to the BBT concept of interest, both seminal papers of BBT and PERMA mention Csikszentmihalyi's (2000) concept of "flow" as an important construct when defining engagement/interest, and Engagement was operationalized in the PERMA-Profiler tool using the word "interest" ("In general, to what extent do you feel excited and interested in things?"). Given this overlap between PERMA's engagement and BBT's interest constructs, the PERMA-Profiler's measurement of Engagement was used as a proxy for BBT's concept of interest. See Table 2.2 below.

Table 2.2 Measurement of Positive Emotions

Variable	Measurement Question	Values
Joy	"In general, how often do you feel joyful?"	Likert scale answering from zero (not at all) to 10 (always)
Interest	"In general, to what extent do you feel excited and interested in things?"	Likert scale answering from zero (not at all) to 10 (completely)
Contentment	"In general, to what extent do you feel contented?"	Likert scale answering from zero (not at all) to 10 (completely)
Loved	"To what extent do you feel loved?"	Likert scale answering from zero (not at all) to 10 (completely)

Negative Emotions

Negative emotions will be operationalized using measures of sadness, anxiety, anger, and loneliness (see Table 2.3 below). While loneliness is not necessarily a negative emotion, it may trigger negative emotions (Cramer & Barry, 1999) in the same way that love may trigger positive

emotions (Fredrickson, 1998). These measurements were collected using a PERMA-Profiler tool (Butler & Kern, 2016). See Table 2.3 below.

Table 2.3 Measurement of Negative Emotions

Variable	Measurement Question	Values
Anger	"In general, how often do you feel angry?"	Likert scale answering from zero (never) to 10 (always)
Anxious	"In general, how often do you feel anxious?"	Likert scale answering from zero (never) to 10 (always)
Sad	"In general, how often do you feel sad?"	Likert scale answering from zero (not at all) to 10 (completely)
Lonely	"How lonely do you feel in your daily life?"	Likert scale answering from zero (not at all) to 10 (completely)

Control Variables

The following traditional demographic control variables are used in this analysis (see Table 2.4). These control variables of age, education, family size, marital status, race and sex have all been established before as explanatory variables for predicting income and net worth (Rauscher & Elliott, 2016).

Table 2.4 Measurement of Control Variables

Variable	Measurement Question	Values
Age	"What is your current age?"	Text
Education	"What is your highest level of education?"	1: No high school diploma or GED; 2: High school graduate or GED; 3: Associates; 4: Bachelors; 5: Masters; 6: Doctorate
Family Size	"Including yourself and spouse/partner (if applicable), how many people live in your household who depend on you (and/or your spouse/partner) for financial support?"	1,2,3,4,5,6+
Marital Status	"How would you best describe your current marital status?"	<i>Recoded to be binary variable:</i> 1: Married, first marriage, or Married, second marriage;

		0: Living with partner, divorced, widowed, or single/never married
Race	"With which racial or ethnic category do you most closely identify?"	<i>Recoded to be binary variable:</i> 1: White; 0: Black, Hispanic, Asian, Native American, or Other
Sex	"What is your sex?"	1: Male; 0: Female

Data Analysis Methodology

In order to test whether emotions are associated with financial resources (H1a-b) and whether emotions add explanatory power when predicting financial resources (H1c-f), a hierarchical approach will be used. Models two (positive emotions), three (negative emotions), and four (positive and negative emotions) will be used to test whether emotions are associated with financial resources (H1a-b). Model one (only demographic variables) will be compared against the three models of emotion (models two-four) in order to test H1c-e. Finally, a pseudo adjusted R^2 of model four will be compared against the pseudo adjusted R^2 of models one, two, and three in order to test H1f. A Bayesian information criterion (BIC) difference test will be calculated, as well, to ensure that the difference in the models is significant. A model with a lower BIC is preferred. A BIC difference test is used, as compared to a chi-squared difference test, because the models being compared are not completely nested (Kline, 2011).

An ordered logit (OL) model will be utilized for this analysis given that both dependent variables are scales. Let Y be one of the three measures of financial resources, which is a function of emotions (E), demographic control variables (K), and an error term (ϵ).

$$Y = \alpha + E\pi + K\beta + \epsilon \quad (1)$$

Every model will test for statistically significant coefficients, $\pi' > 0$ with a null hypothesis expressed as $H_0: \pi' = 0$, and alternative hypotheses as $H_a: \pi' \neq 0$.

Results

Descriptive Statistics

The sample consisted of 993 individuals age 18 and older (average age of 37). The majority of the sample is white (78%) with an associates or bachelor's degree, and average income and net worth levels slightly above \$60,000 and \$100,000, respectively. Reports of feeling “interested” was the top reported positive emotion (6.9 out of 10) while reports of feeling “anxious” was the top reported negative emotion (4.3 out of 10).

Table 2.5 Descriptive Characteristics of Variables (N=993)

Variable (Reference Group)	Mean (Median)	St. Dev.	Min	Max
<i>Financial resources</i>				
Income	4.37 (4.00)	1.74	1	11
Net worth	2.63 (2.00)	1.35	1	9
<i>Positive Emotions</i>				
Joy	6.09	2.45	0	10
Interest	6.88	2.29	0	10
Contentment	6.80	2.56	0	10
Loved	7.29	2.53	0	10
<i>Negative Emotions</i>				
Sad	3.09	2.68	0	10
Anxious	4.29	2.87	0	10
Anger	2.48	2.29	0	10
Lonely	3.59	3.03	0	10
<i>Control Variables</i>				
Age	37.50	10.88	18	77
Education	3.49	1.03	1	6
Family size	2.54	1.37	1	6
Male (Female)	0.51	0.50	0	1
Married (Other)	0.51	0.50	0	1

White (Other)	0.78	0.42	0	1
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Hierarchical Ordinal Logistic Results

A four-model hierarchical ordinal logistic regression was used to test whether emotions are associated with financial resources, after controlling for traditional demographic predictors. Results of the four-model hierarchical ordinal logistic regression can be found in Tables 2.6 and 2.7 below. Overall, the results provide evidence that emotions do influence financial resources, as measured by income and net worth, beyond demographic factors.

Table 2.6 Ordered Logistic Regression of Income Variable (N=993)

Variable (Reference Group)	<u>MODEL 1</u>			<u>MODEL 2</u>			<u>MODEL 3</u>			<u>MODEL 4</u>		
	<i>b</i>	<i>SE</i>	<i>OR</i>	<i>b</i>	<i>SE</i>	<i>OR</i>	<i>b</i>	<i>SE</i>	<i>OR</i>	<i>b</i>	<i>SE</i>	<i>OR</i>
Intercept 1	-2.54	0.87	-	-1.47	0.89	-	-3.72	0.89	-	-2.46	0.95	-
Intercept 2	1.23	0.72	-	2.42	0.75	-	0.08	0.74	-	1.38	0.82	-
Intercept 3	2.57	0.73	-	3.82	0.76	-	1.47	0.74	-	2.80	0.82	-
Intercept 4	3.70	0.73	-	4.99	0.76	-	2.63	0.75	-	3.98	0.83	-
Intercept 5	4.62	0.74	-	5.93	0.77	-	3.58	0.75	-	4.93	0.83	-
Intercept 6	5.42	0.74	-	6.75	0.78	-	4.41	0.76	-	5.76	0.83	-
Intercept 7	6.75	0.76	-	8.09	0.79	-	5.74	0.77	-	7.10	0.85	-
Intercept 8	7.70	0.78	-	9.04	0.81	-	6.69	0.79	-	8.05	0.87	-
Intercept 9	8.60	0.83	-	9.95	0.86	-	7.60	0.85	-	8.96	0.92	-
Intercept 10	10.55	1.24	-	11.91	1.27	-	9.57	1.25	-	10.92	1.30	-
Positive Emotions												
Joy				0.06	0.04	1.06				0.05	0.04	1.05
Interest				-0.01	0.04	1.00				-0.02	0.04	0.98
Contentment				0.11***	0.04	1.11				0.09**	0.04	1.10
Loved				0.03	0.03	1.04				0.02	0.03	1.02
Negative Emotions												
Sad							-0.01	0.04	0.99	0.03	0.04	1.03
Anxious							-0.10***	0.03	0.90	-0.09***	0.03	0.91
Anger							-0.01	0.04	0.99	-0.03	0.04	0.97
Lonely							-0.04	0.02	0.96	-0.02	0.03	0.98
Control Variables												
Age	0.04	0.03	1.04	0.05	0.03	1.05	0.02	0.03	1.02	0.03	0.03	1.03
Age-squared	-0.00	0.00	1.00	-0.00	0.00	1.00	-0.00	0.00	1.00	-0.00	0.00	1.00
Education	0.42***	0.06	1.53	0.41***	0.06	1.50	0.46***	0.06	1.58	0.43***	0.06	1.54

Family size	0.20***	0.05	1.22	0.18***	0.05	1.19	0.20***	0.05	1.22	0.19***	0.05	1.21
Male (Female)	0.19*	0.12	1.21	0.19	0.12	1.20	0.10	0.12	1.10	0.13	0.12	1.14
Married (Other)	1.06***	0.13	2.90	0.92***	0.14	2.52	1.09***	0.14	2.98	1.00***	0.14	2.72
White (Other)	0.02	0.14	1.02	0.04	0.14	1.04	-0.04	0.14	0.96	0.02	0.14	1.02
Model Fit												
<i>R</i> ² McFadden (adj.)	0.054			0.068			0.067			0.073		
<i>R</i> ² Cox-Snell	0.185			0.228			0.226			0.242		
BIC	3,692			3,666			3,669			3,676		

BIC diff vs. model 1	-			-26 $\phi\phi\phi$			-23 $\phi\phi\phi$			-16 $\phi\phi\phi$		
BIC diff vs. model 2	26 $\phi\phi\phi$			-			3 ϕ			10 $\phi\phi$		
BIC diff vs. model 3	23 $\phi\phi\phi$			-3 ϕ			-			7 $\phi\phi$		
BIC diff vs. model 4	16 $\phi\phi\phi$			-10 $\phi\phi$			7 $\phi\phi$			-		

Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. For BIC differences, $\phi\phi\phi$, $\phi\phi$, ϕ denote very strong, strong, and positive evidence for model difference (Raftery, 1995).

Table 2.7 Ordered Logistic Regression of Net worth Variable (N=993)

Variable (Reference Group)	MODEL 1			MODEL 2			MODEL 3			MODEL 4		
	<i>b</i>	<i>SE</i>	<i>OR</i>	<i>b</i>	<i>SE</i>	<i>OR</i>	<i>b</i>	<i>SE</i>	<i>OR</i>	<i>b</i>	<i>SE</i>	<i>OR</i>
Intercept 1	0.66	0.77	-	1.07	0.80	-	0.34	0.79	-	1.08	0.87	-
Intercept 2	3.09	0.78	-	3.54	0.81	-	2.84	0.80	-	3.60	0.88	-
Intercept 3	4.07	0.78	-	4.52	0.82	-	3.84	0.80	-	4.60	0.88	-
Intercept 4	5.15	0.79	-	5.62	0.82	-	4.94	0.81	-	5.72	0.89	-
Intercept 5	5.95	0.80	-	6.42	0.83	-	5.75	0.82	-	6.53	0.90	-
Intercept 6	6.73	0.81	-	7.20	0.84	-	6.54	0.83	-	7.32	0.91	-
Intercept 7	8.01	0.88	-	8.48	0.91	-	7.82	0.90	-	8.60	0.98	-
Intercept 8	9.80	1.27	-	10.28	1.29	-	9.62	1.28	-	10.40	1.34	-
Positive Emotions												
Joy				0.05	0.04	1.06				0.04	0.04	1.04
Interest				0.00	0.04	1.00				0.00	0.05	1.00
Contentment				0.11***	0.04	1.11				0.09**	0.04	1.10
Loved				-0.10***	0.03	0.91				-0.06	0.04	0.94
Negative Emotions												
Sad							-0.07*	0.04	0.93	-0.04	0.04	0.96
Anxious							-0.13***	0.03	0.88	-0.12***	0.03	0.89
Anger							0.17***	0.04	1.19	0.15***	0.04	1.16
Lonely							0.05**	0.03	1.06	0.06**	0.03	1.06
Control Variables												
Age	0.01	0.04	1.01	0.02	0.04	1.01	0.01	0.04	1.01	0.02	0.04	1.02
Age-squared	0.00	0.00	1.00	0.00	0.00	1.00	-0.00	0.00	1.00	0.00	0.00	1.00
Education	0.39***	0.06	1.48	0.37***	0.06	1.44	0.37***	0.06	1.45	0.35***	0.06	1.41
Family size	0.01	0.05	1.01	-0.00	0.05	1.00	-0.02	0.05	0.98	-0.02	0.05	0.98
Male (Female)	0.75***	0.12	2.12	0.73***	0.12	2.07	0.63***	0.13	1.87	0.64***	0.13	1.89

Married (Other)	0.66***	0.14	1.93	0.61***	0.14	1.84	0.67***	0.14	1.94	0.62***	0.14	1.86
White (Other)	-0.20	0.14	0.82	-0.18	0.14	0.83	-0.11	0.15	0.90	-0.07	0.15	0.93
Model Fit												
<i>R² McFadden (adj.)</i>	0.046			0.053			0.059			0.063		
<i>R² Cox-Snell</i>	0.132			0.150			0.165			0.176		
<i>BIC</i>	3,002			3,008			2,991			3,005		

BIC diff. vs. model 1	-			6 ϕ			-11 $\phi\phi$			3 ϕ		
BIC diff. vs. model 2	-6 ϕ			-			-17 $\phi\phi$			-3 ϕ		
BIC diff. vs. model 3	11 $\phi\phi$			17 $\phi\phi$			-			14 $\phi\phi$		
BIC diff. vs. model 4	-3 ϕ			3 ϕ			-14 $\phi\phi$			-		

Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. For BIC differences, $\phi\phi\phi$, $\phi\phi$, ϕ denote very strong, strong, and positive evidence for model difference (Raftery, 1995).

Income

When looking at Table 2.6, model one predicts income of a household using traditional demographic controls of age, age-squared, family size, sex, marital status, and race. Results show that participants were more likely to have higher incomes with more education (OR=1.53), more children (OR=1.22), as male (OR=1.21), and with a married status (OR=2.90). Using the odds ratio, this means that the odds of reporting higher income were 53% for those participants with an additional step in their educational achievement, 22% greater for those participants with one additional child in their family size, 21% greater for male than female, and 190% greater for married than non-married participants, holding all else constant.

Model two predicts income of a household through adding positive emotions to the traditional demographic controls of age, age-squared, education, family size, sex, marital status, and race. Results show that participants who reported feeling contentment were more likely to have higher incomes (OR=1.11). Using the odds ratio, this means that the odds of reporting higher income were 11% higher for those who reported a one-point increase in feeling content, in general, holding all else constant.

Model three predicts income of a household through adding negative emotions to the traditional demographic controls of age, age-squared, education, family size, sex, marital status, and race. Results show that participants who reported feeling anxious were likely to have lower incomes ($OR=0.90$). Using the odds ratio, this means that the odds of reporting higher income were 10% lower for those who reported a one-point increase in feeling anxiety, in general, holding all else constant.

Finally, model four predicts income of a household through adding both positive and negative emotions to the traditional demographic controls of age, age-squared, education, family size, sex, marital status, and race. Results show that participants who reported feeling content were more likely to have higher incomes ($OR=1.10$), and participants who reported feeling anxious were less likely to have higher incomes ($OR=0.91$). Using the odds ratio, this means that the odds of reporting higher income were 10% higher for those who reported a one-point increase in feeling contentment, in general, and 9% lower for those who reported a one-point increase in feeling anxious, in general, holding all else constant.

When looking at model fit scores, results show that the adjusted McFadden pseudo r -squared was higher for model two versus model one (0.068 vs. 0.054), model three versus model one (0.067 vs. 0.054), model four versus model one (0.073 vs. 0.054), and model four versus models one, two, and three (0.073 vs. 0.054, 0.068, 0.067, respectively).

Net worth

When looking at Table 2.7, model one predicts net worth of a household using traditional demographic controls of age, age-squared, family size, sex, marital status, and race. Results show that participants were more likely to have higher net worth with more education ($OR=1.48$), as male ($OR=2.12$), and with a married status ($OR=1.93$). Using the odds ratio, this

means that the odds of reporting higher net worth were 48% for those participants with an additional step in their educational achievement, 112% greater for males than females, and 93% greater for married than non-married, holding all else constant.

Model two predicts net worth of a household through adding positive emotions to the traditional demographic controls of age, age-squared, education, family size, sex, marital status, and race. Results show that participants who reported feeling contentment were more likely to have higher net worth ($OR=1.11$). Quite surprisingly, participants who reported feeling loved were more likely to have lower net worth ($OR=0.91$), which is not in support of hypothesis 1a. Using the odds ratio, this means that the odds of reporting higher net worth were 11% higher and 9% lower for those who reported a one-point increase in feeling content and loved, respectively, holding all else constant.

Model three predicts net worth of a household through adding negative emotions to the traditional demographic controls of age, age-squared, education, family size, sex, marital status, and race. Results show that participants who reported feeling sad or anxious were likely to have lower net worth, respectively ($OR=0.93$ and 0.88 , respectively). Using the odds ratio, this means that the odds of reporting higher net worth were 7% and 12% lower for those who reported a one-point increase in feeling sad or anxious, respectively. Quite surprisingly, participants who reported feeling angry or lonely were likely to have higher net worth, respectively ($OR=1.19$ and 1.06 , respectively), which does not support hypothesis 1b. Using the odds ratio, this means that the odds of reporting higher net worth were 19% and 6% higher for those who reported a one-point increase in feeling angry or lonely, respectively

Model four predicts net worth of a household through adding both positive and negative emotions to the traditional demographic controls of age, age-squared, education, family size, sex,

marital status, and race. Results show that participants who reported feeling content were more likely to have a higher net worth ($OR=1.10$, respectively) and participants who reported feeling anxious were less likely to have higher net worth ($OR=0.89$). Using the odds ratio, this means that the odds of reporting higher net worth were 10% higher and 11% lower for those who reported a one-point increase in feeling contentment and anxious, respectively. Evidence was found in contradiction to hypotheses 1a and 1b given that participants who reported angry or lonely are more likely to have a higher net worth ($OR=1.16$, and 1.06 , respectively). Using the odds ratio, this means that the odds of reporting higher net worth were 16%, and 6% higher for those who reported a one-point increase in feeling anger or loneliness, respectively, holding all else constant.

When looking at model fit scores, results show that the adjusted McFadden pseudo r -squared was higher for model two versus model one (0.053 vs. 0.046), higher for model three versus model one (0.059 vs. 0.046), higher for model four versus model one (0.063 vs. 0.046), and higher for model four versus models one, two, and three (0.063 vs. 0.046 , 0.053 , 0.059 , respectively).

Discussion

Essay one explored whether emotions are associated with financial resources, after controlling for traditional demographic predictors. The broaden and build theory (BBT; Fredrickson, 1998) provided the theoretical framework for predicting that both positive and negative emotions should be associated with financial resources. In line with the BBT, emotions were found to be a significant explanatory construct when explaining the financial resources of a household.

Results provided evidence in support of hypothesis 1a since participants who reported feeling content were more likely to have higher incomes and higher net worth. While it may be tempting to argue that these results are endogenous since those with higher financial resources are more likely to achieve contentment relative to those with lower financial resources, Schwartz and Ward (2012) argue that more financial resources do not necessarily make a person more content given that people adapt to new resources rather quickly. Instead of becoming satiated, as individuals achieve higher standards of living, they often are put on a “hedonic treadmill” given the diminishing marginal utility of new financial resources (Schwartz & Ward, 2012). In addition, as individuals achieve greater financial resources, they often experience feelings of regret and paralysis given the unexpected proliferation of new choices (Schwartz & Ward, 2012).

Quite surprisingly, participants who reported feeling loved were more likely to have lower net worth, which is not in support of hypothesis 1a. One explanation for this result may be that those who are in a community are more likely to feel loved, which creates incentives to invest in that community in such a way that lowers their overall reported net worth. This has been shown to be true in the Latino community who are often rich in community relations, but much less rich in net worth relative to White households (Ibarra & Rodriguez, 2006).

Results provided evidence in support of hypothesis 1b since participants who reported feeling anxious were likely to have lower incomes and net worth and participants who reported feeling sad were likely to have lower net worth. However, in contradiction to hypothesis 1b, the negative emotions of anger and loneliness were found to be positively associated with the financial resource of net worth. One explanation for these results could be that anger is a different category of negative emotion. Unlike sadness and anxiety, anger has been shown to be an “activating emotion” that triggers an individual towards specific action tendencies (Lerner &

Tiedens, 2006). Activating emotions may create positive financial behaviors. In support of this hypothesis, Gambetti and Giusberti (2012) found that anger predicted a willingness to invest money in different kinds of stocks while anxiety predicted decisions to avoid investing and only invest in safe, interest-bearing accounts. Regarding loneliness being positively associated with net worth, it is harder to find an explanation for this result. Wealth has been shown to facilitate social engagement, which would serve to decrease loneliness (Niedzwiedz et al., 2016). In addition, financial distress in older adults has been shown to be associated with loneliness and isolation (Loibl, 2018). One possible explanation for this result is that loneliness has been found to be positively associated with materialism (Ang et al., 2014), which may trigger a type of constructive materialism that builds wealth in order to pursue materialistic endeavors.

Results confirm that emotions provide additional explanatory power beyond traditional demographic variables. For both income and net worth, the adjusted McFadden R^2 statistic of all three models of emotion (models two-four) was statistically significantly higher than the traditional demographic model one, helping provide evidence in support of H1c-f (the BIC difference test confirmed that the difference in R^2 was significant for all model difference across both income and net worth models). As hypothesis 1f predicted, the model that included both positive and negative emotions added the most explanatory power.

Limitations

The questions that were used to measure emotions required participants to self-report how often they felt certain emotions. This self-reported assessment may not truly represent the individuals true emotional experience, introducing issues of construct validity into this study. In addition, the measurement of income and net worth have been informed over a long period of

time, whereas, the measurement of the emotion variables will likely not match this same time period of reference. This limitation was dealt with by asking the participants, “in general” how often do they feel certain emotions, thus, creating more stability in the emotion variables.

The interaction between the closely related positive emotions of joy, interest, and contentment may have diluted the individual emotional beta coefficients. Given that positive emotions are, in general, "rather diffuse" (Fredrickson, 1998, p. 300), it would be better to model joy, interest, and contentment as one construct. For this reason, essays two and three use a structural equation modeling approach that allows for one positive emotion latent variable to include all of the shared variance between the three manifest positive emotions. While this interaction limitation may also be true of the three negative emotions, sadness, anxiety, and anger, it would likely be less impactful given that negative emotions have historically shown as more distinct from one another (Frederickson, 1998).

A convenience MTurk sample was used, which may not be fully representative to the U.S. adult population (Mortensen et al., 2018). However, certain studies have shown that MTurk convenience samples are fairly representative (Burnham et al., 2018; Huff & Tingley, 2015). In a recent meta-analytic review of three separate MTurk samples, Burnham et al. (2018) found that demographic characteristics of workers closely approximated the general US population. However, the study cautioned that there could be small differences when studying personality or religion.

Finally, two events occurred during the Amazon MTurk sampling period that could potentially influence how the participants responded to their surveys. The first event was a U.S. stock correction (the value of the S&P 500 Index declined 15% during December 2018). The second event was the holiday shopping season. Both of these events would likely impact

individuals' emotions in a non-systematic way (i.e., randomly), which would limit the influence of these events on the results of the study.

Implications and Conclusion

Essay one adds to the growing body of studies that are dedicated to providing evidence for the relationship between emotions and financial outcomes (Asebedo et al., 2020; Asebedo & Seay, 2015; Guven, 2012; Hill et al., 2016). As the results show, knowing an individual's emotional state is an important piece of the puzzle for predicting a household's income or net worth level. This has important implications for policyholders, financial planners, financial counselors/therapists, and researchers. For example, policyholders who track the anxiety and contentment levels of their constituents will more effectively model the financial resources of those constituents. Financial planners, who seek to improve the financial resources of their clients, can better predict those financial resources through treating the emotional states of their clients as meaningful inputs in their comprehensive financial plan. These results have implications for financial therapists and financial counselors given that it affirms their mission to address the emotional, interior aspects, of financial health, namely, "what clients believe about money and the way they emotionally relate to it" (Klontz et al., 2016, p. 1). Finally, researchers are better able to model financial resources through including emotion variables. A model that includes both the positive and negative emotions of an individual will explain the variation of their household's income and net worth better than a model that only includes traditional demographic variables.

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Chapter 3 - Exploring and Testing the Relationship Between Positive Emotions and Financial Time Horizon

Introduction

“You see I had this crazy dream last night, this man he talked to me. He told me everything that's good and bad about my history. But he said that you are, you are the future; He said that you are, you are the future; And the future looks good The future looks good.” (One Republic, 2016)

As an individual enters into a positive emotional state, does he/she naturally broaden out their time horizon since it is likely that “the future looks good” to them. By contrast, as an individual enters into a negative emotional state, does he/she naturally narrow their time horizon since it is likely that they cannot see past today? In this essay, the relationship between emotions and financial time horizon will be, first, explored, and, then, tested using a positive psychology intervention (PPI) centered around the benefits of being grateful. In order to make the theoretical connection between emotions and financial time horizon, the broaden and build theory (BBT) was used (Fredrickson, 1998). The BBT theory presumes that the experience of positive emotions causes a building of resources and skills. In this way, positive emotions are hypothesized to be associated with an expanded financial time horizon of an individual given that an expanded attention span and time horizon has been shown to occur in the wake of a positive emotion (Cohn & Fredrickson, 2006; Guven, 2012; Ifcher & Zarghamee, 2011). Negative emotions, in contrast, are hypothesized to be associated with a narrowed financial time horizon given that a narrowed attention span and time horizon have been shown to occur from

negative emotions (Basso et al., 1996; Shechner et al., 2012). A convenience sample from Amazon's MTurk platform was used (993 participants), which included a one-week PPI intervention experiment (Asebedo et al., 2020). The following research questions were explored: (1) How do emotions impact financial time horizon? (2) Do positive and (or) negative emotions help to explain the variation in financial time horizon, as compared to only modeling traditional demographic factors? And (3) Can a PPI strengthen the relationship between emotions and financial time horizon?

The purpose of this essay is to explore the relationship between emotions and financial time horizon. Finding a relationship between emotions and financial time horizon would lead to two important implications. First, the prediction of financial time horizon would improve. This is important in the area of personal finance because financial time horizon has been argued as the most important aspect when making economic decisions (Dow & Jin, 2013), and an expanded financial time horizon has been shown to lead to many positive financial outcomes (Bernheim et al., 2001; Harris & Laibson, 2002; Laibson, 1997; Webley & Nyhus, 2008). Second, if a relationship is found between emotions and financial time horizon, this could aid in the development of a “financial PPI” that strengthens the relationship between emotions and financial time horizon. This financial PPI could potentially alleviate many of the financial problems that exist in American households because of inadequate financial time horizons, including a crisis in inadequate American retirement savings (Rhee, 2013) and insufficient emergency fund reserves (Bhutta & Dettling, 2018).

While PPIs have already been successful in improving outcomes in health, school satisfaction, workplace satisfaction, and overall wellbeing outcomes (Lyubomirsky et al., 2005; Sin & Lyubomirsky, 2009), they have rarely been tried in the personal finance domain (Asebedo

et al., 2020). Many other financial literacy "medicines" that have been proscribed for improving financial outcomes have been largely unsuccessful in actually changing financial behavior (Fernandes et al., 2014). Perhaps helping others achieve a positive emotional state should be a necessary component of financial literacy curriculums to more effectively heal the financial ailments affecting many American households today?

Literature Review

Time Horizon

An individual's time horizon can be thought of as a function of their ability to conceptualize the future, in terms of the timing and ordering of personalized future events (Wallace, 1956). The behavioral life cycle hypothesis (BLCH), created by Thaler and Shefrin, argues that every person is conflicted by two different time horizons within them: a "doer" and a "planner" (Shefrin & Thaler, 1988). The doer, who only has a short time horizon, seeks to maximize the utility of the present moment (e.g., staying up too late, drinking too much, etc.), while the planner, who only has a long time horizon, seeks to maximize their utility over their expected life period, which tends to require the exertion of a costly willpower that restricts the consumption of the present resources (Shefrin & Thaler, 1988). Given that most people lack the required willpower to consistently overpower their fun-loving "doer," the BLCH hypothesizes that most people lack the willpower (i.e., self-control) to be able to sufficiently save for retirement without some kind of help. A lack of self-control has been shown as a key determinant for lower wealth accumulation (Ameriks et al., 2003).

Emotions and Time Horizon

Given a positive emotional state, individuals are able to conceptualize their future differently through taking a “big picture” view (Fredrickson & Branigan, 2005) and having a broadened time horizon (Cohn & Fredrickson, 2006). By contrast, the negative emotions of anxiety and depression have both been connected to a narrowed attention span (Basso et al., 1996; Shechner et al., 2012). In one neuropsychological experiment, participants were asked to complete a judgement task involving visual processing. Those individuals exhibiting more of an anxious and depressed affect were associated with a narrowed attention span, while participants exhibiting a positive mood and optimism were associated with an expanded attention span (Basso et al., 1996). While attention spans are different than time horizons, time horizons are likely to be influenced in the wake of an expanded attention span given that positive emotions “orient our physiology, attention, and cognition away from short-term personal survival and toward cumulative long-term benefits” (Cohn & Fredrickson, 2006, p.39).

In one experiment, college students viewed films that either elicited positive emotions (e.g., amusement, contentment), or negative emotions (e.g., anger, anxiety; Fredrickson & Branigan, 2005). The measured attention was broader for college students in a positive emotional state than for those in a negative, or neutral, emotional state. In another experiment, adults were given candy in order to induce them into a positive emotional state (Kahn & Isen, 1993). Those that were given candy exhibited greater diversity in their subsequent choices (i.e., they showed greater variety-seeking behavior). Greater variety-seeking behavior was evidence that the positive emotional state had broadened the cognitive ability of the participants. While a broadened cognitive ability does not directly mean that participants now have a broadened sense of time, it can be thought of as an important precursor (Bell & Kozlowski, 2002). However, in

another study measuring positive emotions and attention span, Gable and Harmon-Jones (2008) found that positive affect only expanded attention span if the positive-affect state was low in approach motivation. Approach motivation is the urge to move towards an object. In their experiment, the attention span of participants of those who watched a film about cats in humorous situations (low-approach) was compared against participants who watched a film about delicious desserts (high-approach). The participants who watched the high-approach film actually experienced a narrowed attention span after their intervention, even though they had been induced into a positive emotional state, providing a more nuanced view of how positive emotions influence an individual's attention span.

More recently, Ifcher and Zarghamee (2011) conducted an experiment where participants were paid to fill out questions related to their time preference. A treatment group that would watch a film that was meant to induce a positive affect was randomly assigned and compared against a control group where no treatment was given. The positive affect treatment group was found to have a significantly lower time preference over money (i.e., a lower internal discount rate). This would suggest that positive emotions caused an expanded financial time horizon. Following up on this experiment, Guven (2012) used sunshine as an instrument for happiness and found that happier households in the Netherlands expect a longer life and seem more concerned about the future.

Broaden and Build Theory (BBT)

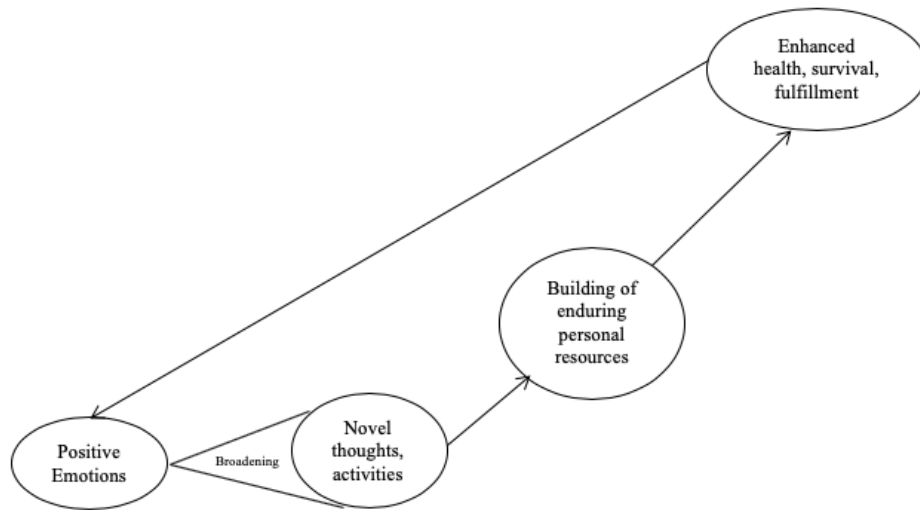
For many decades, researcher, Alice Isen, studied how positive emotions tended to broaden the cognitive abilities of people (Fredrickson, 1998). This contrasts with negative emotions, which tend to narrow human responses to just three responses: escape, attack, expel (Fredrickson, 1998). Through clinical experiments, Isen and her colleagues were able to show

that people who experience positive affect are more open to information (Estrada et al., 1997) and tend to accept a broader array of behavioral options (Kahn & Isen, 1993), among many other things.

Barbara Fredrickson used the work of Isen to build a theory of how positive emotions tend to “broaden and build” a person in a positive feedback loop. She called this theory the Broaden and Build Theory (BBT). Under BBT theory, all positive emotions can be grouped into three primary categories: joy, interest, and contentment. An individual who experiences these emotions will be more open to new thoughts, activities, and relationships, which then encourages a building of resources and skill-building (Fredrickson, 1998, 2009; Fredrickson & Branigan, 2005).

Building resources and broadening identity tends to induce new positive emotions of joy, interest and contentment, which create a positive feedback loop (Layous et al., 2017). For example, participants in a clinical study were asked to recall a previous purchase made for either themselves or someone else, and then choose whether to spend a monetary windfall on themselves or someone else. Participants who were asked to recall a purchase made for someone else reported feeling significantly happier than participants who were asked to recall a purchase made for themselves. Participants who recalled a purchase made for someone else were also shown to want to engage in that same act again because of the happiness that they were feeling. So that the happier an individual became, the more likely they were going to spend their current windfall on someone else in the near future. This experiment provided evidence that positive emotions created a positive feedback loop (Aknin et al., 2011).

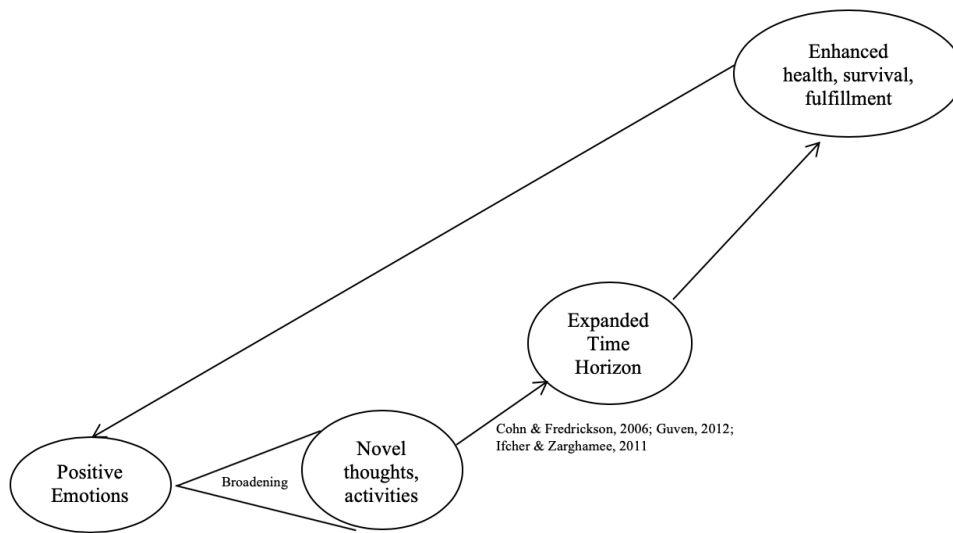
Figure 3.1 Broaden-and-Build Theory (BBT)



Given the conceptual model of BBT, a PPI that is meant to generate positive feelings, or affect, should be expected to improve a participant's overall well-being, as participants are cognitively and emotionally broadened, which, then, leads to the building of skills and resources. Historically well-being was defined solely using subjective well-being, a self-reported measure of how good a participant was feeling (Ryan & Deci, 2001). More recently, though, the concept of well-being has expanded to: ‘the combination of feeling good and functioning well’ (Huppert & Johnson, 2010, p. 264). In this essay, any mention of well-being will refer to this expanded definition.

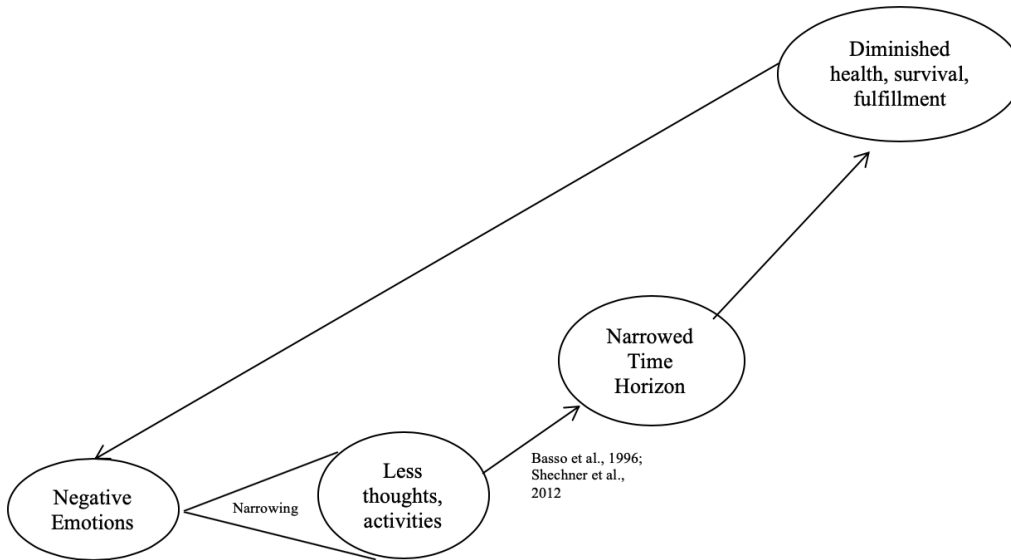
The BBT theory presumes that the experience of positive emotions (i.e., a hedonic well-being) cause a satisfying building of resources and skills (i.e., a eudaimonic well-being), which then create more positive emotions (i.e., a hedonic well-being) in a positive feedback loop. Given that positive emotions have been shown to expand a person’s attention and time horizon (Cohn & Fredrickson, 2006; Guven, 2012; Ifcher & Zarghamee, 2011), positive emotions are hypothesized to be associated with an expanded financial time horizon. See Figure 3.2 below.

Figure 3.2 Adapted Broaden-and-Build Theory (BBT) for Positive Emotions



By contrast, negative emotions tend to narrow human responses instead of broaden and build (Fredrickson, 1998). Negative emotions, like depression, or regret, often trigger certain behaviors that then trigger more negative emotions, locking an individual into a downward spiral. For example, anxiety may trigger a narrowed attention span, which then triggers lower exam scores, which then triggers feelings of regret, which, then triggers lower subsequent classroom performance, and, so on (T. D. Hodges & Clifton, 2004). Given that negative emotions have been shown to narrow attention and time horizon (Basso et al., 1996; Shechner et al., 2012), they are hypothesized to be negatively associated with financial time horizon. See Figure 3.3 below.

Figure 3.3 Adapted Broaden-and-Build Theory (BBT) for Negative Emotions



Defining PPI

Over the last twenty years, many PPIs have been developed that use positive emotions to improve the health, survival, and fulfillment of individuals (Parks & Biswas-Diener, 2013), as predicted by the BBT. However, these PPIs are diverse and eclectic in their approach and implementation. According to Parks and Biswas-Diener (2013) there is no definitive definition of a “positive intervention,” and no clear set of guidelines for classifying interventions as “positive.” (p. 2). Three existing definitions of “positive intervention” were given, which Parks and Biswas-Diener said needed to be combined and refined into one comprehensive definition:

(1) “keep the positive aspects of the clients’ lives in the forefront of their minds... and to strengthen already existing positive aspects.” (Seligman et al., 2006, p. 780),

(2) “aimed at cultivating positive feelings, positive behaviors, or positive cognitions” (Sin & Lyubomirsky, 2009, p. 467),

(3) “improve rather than to remediate” (Seligman, Parks, et al., 2005, p. 1379).

These definitions need to be integrated and improved because they allow for self-indulgent (e.g., binge drinking) or avoidant behaviors (e.g., procrastinating) and, in addition, there is nothing that would stop the PPI from using non-grounded self-help methods with no empirical evidence. Parks and Biswas-Diener (2013) provided the following three criteria in order to integrate and refine the three existing definitions of what it means to be a "positive intervention": (1) The primary goal of the intervention is to build some "positive" variable or variables (e.g. subjective well-being, positive emotion, meaning), (2) Empirical evidence exists that the intervention successfully manipulates the above target variable(s), and (3) Empirical evidence exists that improving the target variable will lead to positive outcomes for the population in which it is administered (p. 4).

The first known psychological intervention (PPI) was done by Fordyce (1977) when he asked individuals to "act like a happy person". The results showed that the intervention groups reported significantly higher happiness than the control groups. Since this initial study, there have been 100s of articles published on PPI's in peer-reviewed journals from 2000 to 2010 (Azar, 2011). Towards the end of this first decade of positive psychology research, Sin and Lyubomirsky (2009) published a meta-study of over 50 PPIs involving over 4,266 individuals, finding that PPIs made a difference for increasing well-being ($r=.29$) and decreasing depressive symptoms ($r=.31$).

The success of producing PPI research may have come too quickly. Parks and Biswas-Diener (2013) argued that, "research on positive interventions was well underway before anyone attempted to infuse it with theory, and so the research follows no common theoretical thread." (p. 144). When trying to connect theory to PPIs, Lyubomirsky (2005) provided a useful conceptual model to account for the link between happiness and success, arguing that success makes people

happy, but, just as importantly, the characteristics of positive affect (e.g., confidence, optimism, and self-efficacy) tend to cultivate success. The framework for their conceptual model was primarily built on research by Alice Isen and Barbara Frederickson on how positive emotions impact behavior.

Over the last 20 years, most PPIs were designed to improve overall well-being. Other PPIs have been more specific, targeting specific populations, like the clinical populations (Parks et al., 2015), or student populations (Waters, 2011). Alternatively, they have targeted changing certain specific outcomes of well-being, like health or work satisfaction (Sin & Lyubomirsky, 2009). Only one PPI, to this author's knowledge, has used a PPI that targeted changing specific financial outcomes. Asebedo et al. (2020) asked survey participants to keep a diary of the three good financial things that occurred to them each day, over a seven-day period, targeting a change in financial satisfaction and financial self-efficacy. The study found evidence that those who participated in the financially based PPI were more likely to report higher financial satisfaction and higher financial self-efficacy than the control group.

The following is a brief summary of types of PPIs with category labels provided by Parks and Biswas-Diener (2013), who provided a useful overview of what has been done in PPI research. An additional category label, treatment, will be added, which involves PPIs that are meant to treat problematic behavior/situations, such as smoking or chronic pain.

Strengths PPIs

A strength PPI involves identifying, and then developing, an individual's strength (Parks & Biswas-Diener, 2013). This contrasts with traditional psychology interventions, which seek to identify an individual's broken system, and restore it to health (e.g., Alcoholics Anonymous). In the first empirical study to test a strength PPI, participants were asked to complete an "inventory

of character strengths" survey online where they were then given their top five strengths. Subsequently, they were then asked to use one of these top strengths in a new and different way every day for one week. This intervention resulted in lower depression and increased happiness at the one-month follow-up (Seligman et al., 2005)

In a relatively small study of 18 participants, only strengths known to the participants (i.e., known strengths) were asked to be used during the course of the study, resulting in increases in psychological well-being and engagement, but not life satisfaction. While participants who were asked to use unrealized strengths (i.e., newly identified strengths) experienced increases in life satisfaction and engagement, but not psychological well-being (Quinlan et al., 2012). Any future PPI asking a participant to use their strengths should make sure both known, and newly identified strengths are being utilized in the study.

In a meta-study on strength PPIs, Quinlan et al. (2012) reviewed eight studies and found that the results on overall well-being were moderate, at-best. One primary criticism of strength PPIs was that they tended to "promote strengths knowledge but not all of them successfully translate into increased strengths use and well-being" (p. 1,160). One suggestion given by Quinlan et al. (2012) for improving the efficacy of strength PPIs was to identify a best strengths list in the context of certain situations (e.g., work, home, church), and not simply use a universal, "best strengths" classification that is meant to apply to all situations of life.

Gratitude PPIs

In their meta-analysis paper on gratitude PPIs, Wood et al. (2010) describes the defining of gratitude as a controversial variable among researchers. The most used definition for gratitude is "an emotion that is always directed towards appreciating the helpful actions of other people" (Wood et al., 2010, p. 891). However, this definition fails to account for certain moments of

gratitude that do not involve the actions of people, such as the feeling of gratitude from a restful sleep, or beautiful, sunny morning. Wood et al. (2010) proposed that gratitude should be more thought of as a "life orientation towards noticing and appreciating the positive in the world" (p. 890). Although, difficult to precisely define, Wood et al. (2010) provided ample research literature that closely linked gratitude with the following outcomes: well-being, personality types (extroverted, agreeable, open, and conscientiousness, and less neurotic), lower psychopathological conditions (depression, anxiety disorder, phobia, nicotine dependence, drug abuse), positive relationships, eudemonic well-being (i.e., the good life), and health.

One of the first gratitude PPI involved participants writing down five things they were grateful for in a weekly gratitude journal (Emmons & McCullough, 2003). Those who wrote down what they were thankful for ended up with better emotional and physical scores relative to participants who wrote about difficult or neutral events. These findings have since been replicated many times over (Kaczmarek et al., 2015). For example, the Three Good Things journal asked participants to write down in a nightly journal the three good things that went well during the day (Seligman et al., 2005). Other variations of gratitude PPI include asking participants to deliver gratitude letters to individuals or keep gratitude reports of things that they appreciate about significant others (Parks & Biswas-Diener, 2013).

Forgiveness PPIs

Forgiveness has long been associated with greater psychological well-being (Karremans et al., 2003). Forgiveness can be defined as "the willful giving up of resentment in the face of another's (or others') considerable injustice and responding with beneficence to the offender even though that offender has no right to the forgiver's moral goodness" (Baskin & Enright, 2004, p. 80). In a meta-study of nine published studies in forgiveness PPIs, Baskin and Enright

(2004) found mixed results on the emotional health and forgiveness of participants, depending on whether the participants were in a process-based or decision-based intervention. A decision-based intervention treats the process of forgiveness as single decision that is made. These interventions focus on the act of forgiving and the benefits that occur from this act. In the process-based intervention, forgiveness is viewed as a longer process that goes beyond a simple decision. In these interventions, that act of forgiving is less emphasized while the process of moving through stages of grief and emotional healing processes are more heavily discussed. Interventions that were process-based showed significant improvements in emotional health and forgiveness, while those that were decision based showed no effect.

Social Connections PPIs

PPIs aimed at strengthening social connections typically involve facilitating participants in "acts of kindness," meant to connect them to their community around them. While there are certain variations in experimental design for facilitating an act of kindness, most social connection PPIs involve pro-socially spending for others. Prosocial spending refers to spending money on others (Aknin et al., 2011). Prosocial spending has been shown to generate positive emotions in many different ways. First, prosocial spending has been shown to create stronger relationships, which is a key predictor of happiness (Myers, 2000). In line with the broaden-and-build theory (BBT), happier people have been shown to engage in more helping behavior, which creates a positive feedback loop between prosocial spending and the positive emotion of happiness (Aknin et al., 2011; Piliavin, 2003). Prosocial spending has been shown to improve health (Aknin et al., 2011), and healthy people are largely associated with many positive emotions, such as lower depression (Diener & Seligman, 2002), less social phobia (Kashdan &

Roberts, 2004), higher satisfaction with health (Lyubomirsky et al., 2006), higher mental health (Phillips, 1967), higher perceived quality of life (Collins et al., 1992).

Prosocial spending has been shown to be associated with the positive emotion of gratitude, which, in turn, has been shown to create and strengthen social bonds (Algoe et al., 2008; Emmons & McCullough, 2003), which, in turn, are a key aspect of overall psychological well-being (Ryff & Singer, 2008). Other studies have more directly linked prosocial behavior with overall well-being (Aderman, 1972; Cunningham et al., 1980; Lucas, 2001; Lyubomirsky et al., 2005; Rosenhan et al., 1974; Williams & Shiaw, 1999).

In addition, previous literature has also found an association between prosocial spending and financial resources. At the turn of the century, Thorstein Veblen wrote his book, *The Theory of the Leisure Class*, where he argued that prosocial spending encouraged others to be industrious. “This non-invidious residue of the religious life - the sense of communion with the environment, or with the generic life process - as well as the impulse of charity or of sociability, act in a pervasive way to shape men’s habits of thought for the economic purpose.” (Veblen, 1994, p. 222). Arthur Brooks (2007) analyzed data from the 2000 Social Capital Community Benchmark Survey and found evidence that giving does influence income in a positive way (Brooks, 2007). George Gilder and Steve Forbes (2012) argued that giving is “the vital impulse and moral center of capitalism,” stimulating financial resources in individuals through a mutual investment in each other (p.35).

In one prosocial spending PPI, the individuals who spent a windfall gain (either \$5 or \$20) on others influenced happiness levels to a greater degree than those who spent money on themselves (Dunn et al., 2008). One of the most interesting findings of this study was that the majority of participants reported that spending money on themselves would make them happier.

This shows that, unlike PPIs related to gratitude or forgiveness, prosocial spending PPIs will experience a largely unexpected benefit to the participant.

Meaning PPIs

In a meta-study of published studies in meaning PPIs, Steger (2012) defines meaning in life as "being comprised of people's comprehension of the world around them and their investment in a self-concordant purpose" (p. 1). Steger's review demonstrated a strong association between greater meaning in life and greater well-being, lesser psychopathology, and more beneficial experiencing of spirituality. One of the earliest meaning PPI involved a Best Possible Self (BPS) exercise where participants are asked to write about a future version themselves who is their best possible self. King (2001) asked 81 undergraduate students to write about their BPS for 20 minutes a day over the course of 4 days. After three weeks, results indicated that writing about BPS was associated with decreased illness compared with controls and was associated with the same health benefits as writing about trauma. Prior to the advent of PPIs, writing about trauma was an established intervention tool under the umbrella of narrative therapy. In Narrative Therapy interventions participants view their psychological problems as an opportunity for them to rewrite their story, which acts as a catalyst to infuse their self-image as an empowered person who has meaning, versus a helpless victim who lacks any meaning (Steger, 2012).

These BPS exercises are not limited to a writing exercise. In a four-week study, Sheldon & Lyubomirsky (2006) found that participants who simply thought about their BPS at least twice a week produced an immediate increase in positive affect. Another variation of BPS involves asking participants to write a "Life Summary" that outlines life goals, and, subsequently, ways they are drawing closer, or farther away from, those goals (Parks & Biswas-Diener, 2013). In a

word of caution, Parks and Biswas-Diener (2013) warned that participants who are worrying about the future (i.e., prone to anxiety), or believe there is no hope in the future (i.e., prone to depression), may be triggered when asked to build an imagined life narrative of their future.

Empathy PPIs

Empathy may be defined as "the cognitive awareness of another person's internal states (thoughts, feelings, perceptions, intentions" (Hoffman, 1985, p. 103). Empathy can be considered a subset of overall emotional intelligence, which is defined in Cain and Carnellor (2008) as having "self-awareness and impulse control, persistence, zeal and self-motivation, empathy and social deftness" (p. 56). Previous research has argued that the skills of emotional intelligence can be taught and will contribute significantly to well-being (Wu, 2000).

While not as popular as other PPIs, most PPIs that try to improve empathy have focused on enabling participants to take on the perspective of other individuals. This "perspective taking" has been shown to cause people to behave "more acceptably, more admirably and more prosocially" (Hodges et al., 2011, p. 194). Perspective taking is said to be closely linked to open mindedness, kindness, social intelligence, forgiveness, fairness, self-control, and spirituality (Stewart & McHugh, 2013).

The benefits of perspective taking were known to psychologists well before the advent of PPIs. Piaget and Inhelder (1956) found children who were able to realize the perspective of another person on the opposite side of a 3D model were more likely to take on social perspective-taking tasks and prosocial behavior (Hodges et al., 2011). Many clinical empathy PPIs related to perspective taking use a complex therapeutic technique called Acceptance and Commitment Therapy (ACT), which tries to disentangle the effect language has on individuals'

sense of self through the use of metaphors, mindfulness practices, and many other techniques (Hayes et al., 2006).

Packaged PPIs

A packaged PPI involves using more than one type of intervention, which more closely mirrors how the average individual would more naturally approach daily living (Parks & Biswas-Diener, 2013). The design of a packaged PPI will either involve participants choosing a PPI from a list of options, or having the participant alternate between different PPIs throughout the experiment duration. For example, in one study, participants downloaded a happiness app and were able to choose between eight different "happiness-increasing" activities while subsequently reporting their happiness and mood (Parks & Biswas-Diener, 2013). The results of this packaged PPI showed that the more participants used the happiness app, the more variety of activities they would practice, which also strongly correlated with greater happiness and mood.

In an example of a packaged PPI that rotates the type of intervention, Seligman et al. (2006) delivered a set of activities over a six-week period to an intervention and control group of individuals experiencing symptoms of mild or severe depression. For every week, a new activity was introduced, and the previous activity is discussed and processed. The sequence of activities included: strengths (identifying and using top five strengths), three good things (journaling three things that went well and processing why the good things happened), gratitude letter (write a letter to someone they have not properly thanked and then read the letter to them in person), savoring (practice savoring techniques two to three times a day for a week), active constructive responding (respond to other's good news with excitement and positivity), life summary (a version of writing about our best possible selves), and maintenance (participants are asked to practice their one to two of their favorite activities regularly for the next several months)

(Seligman cited from Parks et al., 2015). Results of this experiment showed significantly decreased depression symptoms relative to the control group.

Treatment PPIs

The traditional PPI seeks to bring an individual from a neutral state to a flourishing state through the generation of positive emotions (Seligman et al., 2005). By contrast, Treatment PPIs focus on eliminating certain negative emotions of a pre-identified population through the generation of positive emotions. The packaged PPI treating individuals with depression symptoms is an example of a treatment PPI where the positive emotions are meant to lower negative emotions. The idea that positive emotions may serve to treat, or reverse, the detrimental effects of negative emotions follows Fredrickson's "undoing hypotheses" where positive emotions are predicted to "restore autonomic quiescence following negative emotional arousal" (Fredrickson, 1998, p. 311).

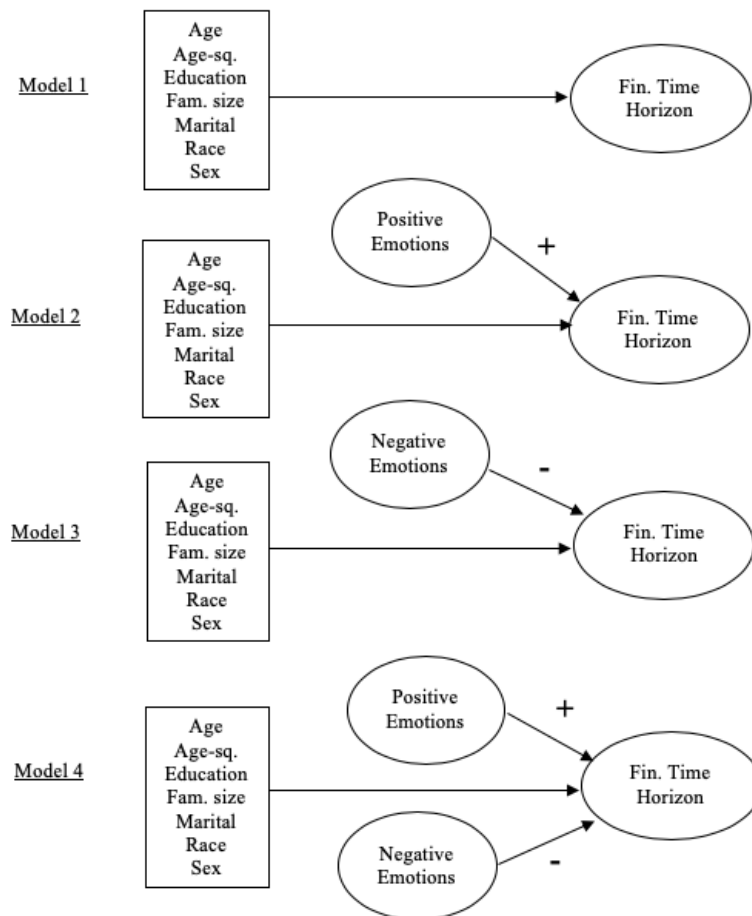
Methodology

Hypotheses

The BBT theory presumes that the experience of positive emotions causes a building of resources and skills. In this way, positive emotions are hypothesized to be associated with an expanded financial time horizon of an individual given that an expanded attention span and time horizon has been shown to occur in the wake of a positive emotion (Cohn & Fredrickson, 2006; Guven, 2012; Ifcher & Zarghamee, 2011). Negative emotions, in contrast, are hypothesized to be associated with a narrowed financial time horizon given that a narrowed attention span and time horizon have been shown to occur from negative emotions (Basso et al., 1996; Shechner et al.,

2012). Given these relationships established by theory and previous literature, the following structural models, with predictions, were used.

Figure 3.4 Structural models with predictions



Given these structural models, the following hypotheses will be explored:

H2a: Positive emotions are positively associated with financial time horizon.

H2b: Negative emotions are negatively associated with financial time horizon.

H2c: Positive emotions improve the explanation of variation in financial time horizon, as compared to only modeling traditional demographic factors.

H2d: Negative emotions improve the explanation of variation in financial time horizon, as compared to only modeling traditional demographic factors.

H2e: Positive and negative emotions improve the explanation of variation in financial time horizon, as compared to only modeling traditional demographic factors.

H2f: Adding positive and negative emotions to traditional demographic factors (model four) explains the most amount of variation in financial time horizon, as compared to adding only positive emotions or negative emotions exclusively.

The following hypotheses will be tested using a structural equation modeling (SEM) group analysis:

H2g: Individuals in the intervention group will have a stronger positive relationship between positive emotions and financial time horizon compared to the no-treatment control group.

H2h: Individuals in the intervention group will have a stronger negative relationship between negative emotions and financial time horizon compared to the no-treatment control group.

Data

This study will use survey data collected at the end of 2018 by Asebedo et al. (2020). The dataset was funded and supported by Dr. Russell James III, the CH Foundation chair of Personal Financial Planning, Texas Tech University; and the College of Human Sciences at Texas Tech University [n/a]. The purpose of the collected data was to assess attitudes and intentions toward saving in a savings account, investment account, or a retirement account. Participants of the survey were recruited through Amazon's MTurk platform, which is known to provide access to a relatively low-cost, large pool of Americans that approximates the general U.S. population

demographics for age and race but may not be representative when predicting religious affiliation or personality (Burnham et al., 2018). In order to qualify for the survey, participants from Mturk needed to have at least a 90% approval rating and at least 500 surveys (i.e., HITs) completed. These constraints were added primarily to lower the probability of survey bots (Dreyfuss, 2018; Miele, 2018). Once survey participants selected to participate in the survey through Mturk, they were sent to Qualtrics, which administered the survey and collected the data. Once the survey participants completed the initial survey, they were sent compensation of \$1.00. For this study, the initial survey collected 993 participants on December 10, 2018.

In addition to this initial survey, participants were invited to participate in a PPI intervention over a seven-day period. The PPI intervention was a gratitude PPI that used the Three Good Things exercise, which has been shown to improve well-being and depression (Seligman et al., 2005). Assuming survey participants agreed to continue beyond the initial survey, they were then randomly assigned to one of four groups, where they would be asked to do the following journal exercise, every day, for seven days:

Group One: Write down three good things.

Group Two: Write down three good financial things.

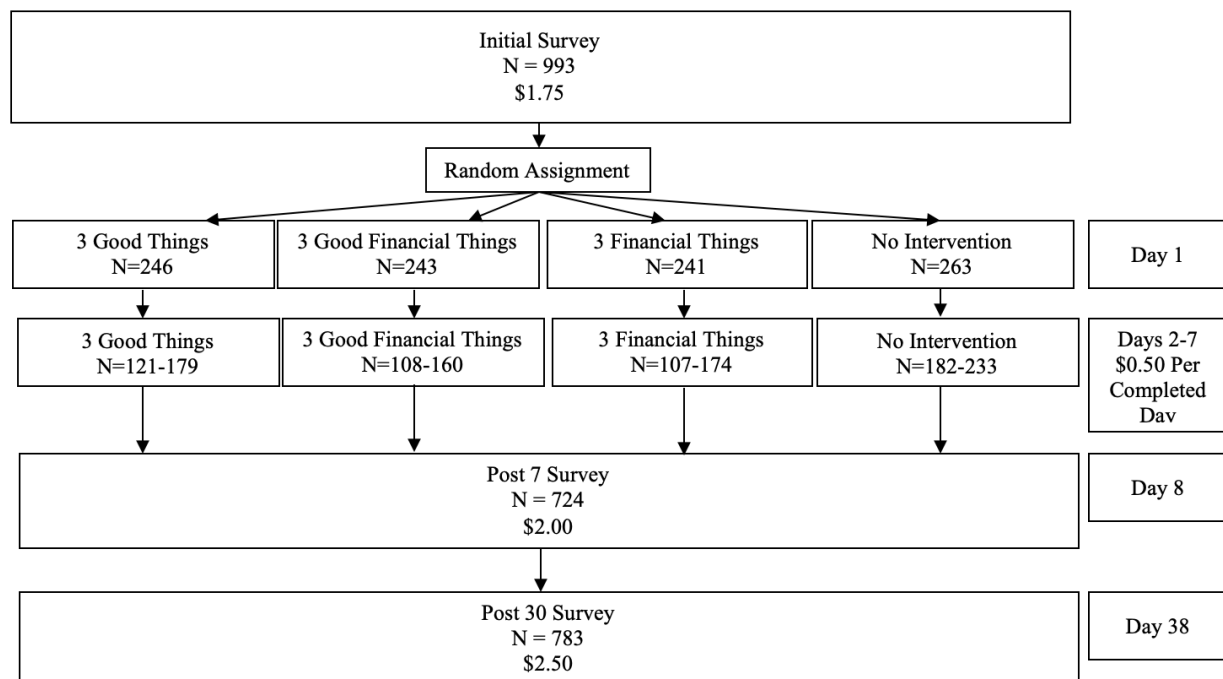
Group Three: Write down three financial things.

Group Four: No journal entries required (control group).

In this experimental design, researchers split the PPI group into two groups (three good things and three good financial things) to test whether a gratitude PPI would be more effective for the financial outcome variables of financial satisfaction and financial self-efficacy if the gratitude task was written in the financial domain. Along with the journal exercises, every group completed questions related to their level of happiness, financial satisfaction, and financial self-

efficacy. The day one intervention group filled out their journal entries immediately after completing the initial survey. After six subsequent days, the intervention was complete, and respondents completed both a post-seven and post-thirty day follow up survey. See Figure 3.5 for more details regarding survey design of the gratitude PPI. This survey dataset is appropriate to use for this study given (a) it collected variables related to both emotions and financial resources, (b) it is relatively large dataset (n=993), (c) it includes a PPI, and (d) it is a relatively new and private dataset, so it has not been fully explored by other researchers.

Figure 3.5 Survey Design



Dependent Variable

Financial time horizon was the primary outcome variable. An individual's time horizon was operationalized using three different questions that were expected to share variance and

provide a more complete picture of a survey participants' view of time than just one single manifest variable. See Table 3.1 for more details.

Table 3.1 Measurement of Financial Time Horizon Latent Variable

Variable	Measurement Question	Values
Planning Period	"In planning or budgeting your saving and spending, which of the following time periods is most important to you (and your {husband/wife/partner if applicable})?"	1: The next few days or weeks; 2: The next few months; 3: The next year; 4: The next few years; 5: The next 5 to 10 years; 6: Longer than 10 years.
Budget Success	"Over the past year, would you say your (and your {husband/wife/partner if applicable}) spending was less than, more than, or about equal to your income? Please do not include the purchase of a new house or car, or other big investments you may have made."	1: Spending less than you earn; 2: Spending more than income; 3: About equal to income. This question was recoded so that (2=0), (3=1), and (1=2).
Currently Saving	People have different reasons for saving and maintaining savings, even though they may not be saving all the time. What are your most important reasons for saving and/or maintaining your savings? Please place these reasons for saving in the order of most to least important to you. If you are not currently saving any money, please place "None of the above, I am not currently saving any money" at the top of the list.	This question was then coded as being one if participants communicated that they are currently saving, and zero if they communicated that they are not currently saving.

The first two manifest variables asked respondents their self-reported financial time horizon in two different ways. The third question asked participants to rank, from one-eight, how important certain reasons for saving were to participants. This question was then coded as being one if participants communicated that they are currently saving, and zero if they communicated that they are not currently saving. Participants who are currently saving are likely to have a longer time horizon than those who are not currently saving since the practice of saving requires looking beyond present self to a future self's needs (Thaler & Shefrin, 1981). This is consistent with other studies which have linked saving behavior to financial time horizon (Fisher & Anong, 2012; Fisher & Montalto, 2010; Lee et al., 2000).

Independent variables

Emotions

The three primary positive emotions of BBT are joy, interest and contentment. Direct measures of a participants perceived joy, interest, and contentment were used. Given that positive emotions often overlap, and tend to highly correlate with each other (Fredrickson, 1998, p. 306), all three positive emotions were combined into one latent variable called 'Positive Emotions'. See Table 3.2 for details of how each individual positive emotion manifest variable was operationalized. While the positive emotion variable, 'loved' was used in paper one, it will not be used in the positive emotion latent variable in order to improve CFA model fit. For negative emotions, direct measures of anger, anxiety, and sadness were used to form one latent variable called 'Negative Emotions'. See Table 3.3 for details of how each individual negative emotion manifest variable was operationalized. While the negative emotion variable, 'lonely' was used in paper one, it will not be used in the negative emotion latent variable in order to improve CFA model fit.

Table 3.2 Measurement of Positive Emotion Latent Variable

Variable	Measurement Question	Values
Joy	"In general, how often do you feel joyful?"	Likert scale answering from zero (not at all) to 10 (always)
Interest	"In general, to what extent do you feel excited and interested in things?"	Likert scale answering from zero (not at all) to 10 (completely)
Contentment	"In general, to what extent do you feel contented?"	Likert scale answering from zero (not at all) to 10 (completely)

Table 3.3 Measurement of Negative Emotion Latent Variable

Variable	Measurement Question	Values
Anger	"In general, how often do you feel angry?"	Likert scale answering from zero (never) to 10 (always)

Anxious	"In general, how often do you feel anxious?"	Likert scale answering from zero (never) to 10 (always)
Sad	"In general, how often do you feel sad?"	Likert scale answering from zero (not at all) to 10 (completely)

Control Variables

The following traditional demographic control variables are used in this analysis (see Table 3.4). These control variables of age, education, marital status, race and sex have been previously established as explanatory variables for predicting financial time horizon (Dow & Jin, 2013). Regarding family size, an increase in household size will likely impact the financial time horizon of household decision makers (Davis & Carr, 1992).

Table 3.4 Measurement of Control Variables

Variable	Measurement Question	Values
Age	"What is your current age?"	Text
Education	"What is your highest level of education?"	1: No high school diploma or GED; 2: High school graduate or GED; 3: Associates; 4: Bachelors; 5: Masters; 6: Doctorate
Family Size	"Including yourself and spouse/partner (if applicable), how many people live in your household who depend on you (and/or your spouse/partner) for financial support?"	1,2,3,4,5,6+
Marital Status	"How would you best describe your current marital status?"	<i>Recoded to be binary variable:</i> 1: Married, first marriage, or Married, second marriage; 0: Living with partner, divorced, widowed, or single/never married
Race	"With which racial or ethnic category do you most closely identify?"	<i>Recoded to be binary variable:</i> 1: White; 0: Black, Hispanic, Asian, Native American, or Other
Sex	"What is your sex?"	1: Male; 0: Female

Data Analysis Methodology

This study used a Structural Equation Model (SEM), utilizing STATA version 15 in order to account for the measurement error associated with the psychological and financial constructs, and to conduct a group analysis (Kline, 2011). In order to conduct analysis on a SEM, a two-step rule was followed to test the structural models (Bollen, 1989). First, a Confirmatory Factor Analysis (CFA) will be conducted to determine if the measurement model fits the data. Details of acceptable model fit criteria is provided in Table 3.5 below. Given that the CFA model will have at least two factors with at least two indicators per factor, the model is identified per the two-indicator rule and the marker method was used (Kline, 2011, p. 138). Second, once the measurement model is determined to fit appropriately, a full SEM model will be calculated. Controls will be added to the full structural model using the full partial method (Little, 2013). For this method, controls are regressed on both predictor and outcome variables. Once the controls have been added, all insignificant paths involving control variables will be dropped (i.e., pruned) to improve the model fit (Little, 2013). When building out the full SEM model from the measurement model, BBT provided the theoretical frameworks for how each latent variable should be connected. Namely, emotions are expected to have a direct effect on financial time horizon.

Table 3.5 Fit Indices for Measurement and Structural Models

Index	Suggested Cut Off Values
χ^2	Non-significant. Sensitive to sample size. Models with > 400 cases will mostly result in significant model chi-square <i>exact fit</i> test (Kline, 2011).
RMSEA	Excellent fit < .01, good fit < .05, mediocre fit < .08 (MacCallum et al., 1996).

90% Confidence Interval for RMSEA	Lower bound close to zero. Upper bound < .05 to pass not-close-fit test. Upper bound < .10 to pass poor-fit test (Kline, 2011).
CFI	< .90 poor fit, .90 - .95 marginal, > .95 good (Kenny, 2015).
TLI	< .90 poor fit, .90 - .95 marginal, > .95 good (Kenny, 2015).
SRMR	< .08 good fit (Hu & Bentler, 1999).

In order to test hypotheses 2a-f, a hierarchical approach will be used. Models two, three, and four will be used to test whether there is a relationship between emotions and time horizon (H2a-b). Model one will be compared against models two, three, and four in order to test whether emotions improve the explanation of the variation in financial time horizon (H1c-e). In order to test whether model four explains the most variation (H1f), an adjusted R^2 will be calculated with a Chi-squared difference test to ensure that the difference in adjusted R^2 is significant.

When testing hypotheses 2g and 2h, a multi-group analysis method will be used (Hirschfeld & Von Brachel, 2014). For this method, two subgroups in the data will be modeled separately: an intervention (N=159) and control group (N=219). The intervention group will be made up of those participants who experienced a three good financial things intervention. The measurement model that will be analyzed will be using questions asked to participants after a seven-day gratitude journal intervention was completed. Given that less participants completed the post seven-day survey versus the initial survey (378 vs. 506), the 128 missing participant data is a limitation of this study, but will be addressed by using a maximum likelihood procedure in STATA so that the total sample size of the combined group will be the original sample size of 506 participants. This group invariance test assumes that the emotional traits of participants are relatively stable over the seven-day period. A correlation analysis of the stability between the various emotion manifest variables will be provided in order to test this assumption. A limitation

to this study is that the gratitude journal intervention was not consistent in how often participants completed their daily journal entry (\$0.50 was given per day), asking them to journal three good financial things that happened to them that day. Some participants did seven once-a-day gratitude journals, while other participants only completed one gratitude journal during the first day.

Each group will be analyzed using further maximum likelihood procedures to analyze covariance matrices and obtain structural parameter estimates separately. Next, the two subgroup SEM models will be analyzed to determine that the model fit is appropriate. Finally, assuming reasonable model fit, parameter estimates will then be compared, and equality constraints applied to the pathway between emotions and time horizon in order to examine whether the parameter estimates are invariant between the intervention and control groups. Group invariance related to the parameter estimate for the emotion to financial time horizon pathway would provide evidence in support of hypotheses 2g and 2h.

Results

Descriptive Statistics

The sample is 993 individuals age 18 and older (average age of 37). The majority of the sample is white (78%) with an associates or bachelor's degree. The average planning period is between "a year" and "many years," and 84% of the participants said that they are regularly saving. Reports of feeling anxious is the top reported negative emotion (4.3 out of 10) while reports of feeling "interested" is the top reported positive emotion (6.9 out of 10). Regarding those characteristics of those participants who were randomly assigned to complete a three good financial things gratitude journal intervention (N=243) versus a control group (N=263), most

descriptive variables are similar between the two groups. However, the intervention group is slightly more female (48% vs. 46%) and less married (44% vs. 54%) than the control group.

Table 3.6 Descriptive Characteristics of Variables

Variable (Reference Group)	Intervention (N=243) Mean <i>Initial Survey</i>	Control (N=263) Mean <i>Initial Survey</i>	Total (N=993) Mean	Total (N=993) Dev.	Total (N=993) Min	Total (N=993) Max
<i>Financial Time Horizon</i>						
Planning period	3.40	3.26	3.33	1.55	1	6
Budget	1.18	1.21	1.20	0.76	0	2
Save	0.83	0.86	0.86	0.35	0	1
<i>Positive Emotions</i>						
Joy	5.83	6.03	6.09	2.45	0	10
Interest	6.62	6.80	6.88	2.29	0	10
Contentment	6.73	6.81	6.80	2.56	0	10
<i>Negative Emotions</i>						
Sad	3.25	3.20	3.09	2.68	0	10
Anxious	4.42	4.37	4.29	2.87	0	10
Anger	2.53	2.67	2.48	2.29	0	10
<i>Control Variables</i>						
Age	38.08	37.56	37.50	10.88	18	77
Education	3.37	3.55	3.49	1.03	1	6
Family size	2.54	2.51	2.54	1.37	1	6
Male (Female)	0.52	0.54	0.51	0.50	0	1
Married (Other)	0.44	0.54	0.51	0.50	0	1
White (Other)	0.77	0.77	0.78	0.42	0	1

Structural Equation Modeling (SEM) Results

A SEM approach was used in order to test the relationship between emotions and financial time horizon. Data analyses for SEM will follow a two-step rule to test the structural models (Bollen, 1989). First, a Confirmatory Factor Analysis (CFA) will be conducted to determine if the measurement model fits the data, then, second, a full SEM model will be calculated. Controls will be added to the full structural model using the full partial method

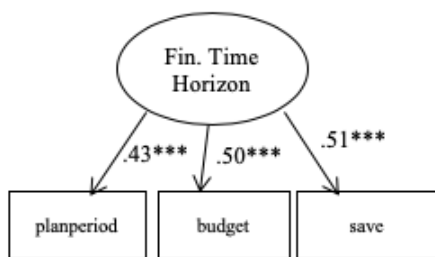
(Little, 2013). For this method, controls are regressed on both predictor and outcome variables. Once the controls have been added, all insignificant paths involving control variables will be dropped (i.e., pruned) to improve the model fit (Little, 2013). When building out the full SEM model from the measurement model, BBT provided the theoretical frameworks for how each latent variable should be connected. Namely, emotions are expected to have a direct effect on financial time horizon.

Confirmatory Factor Analysis Results

Results of the CFA for models one, two, three, and four are provided in Figure 3.6 below. In addition, correlations between all manifest variables are provided in Table 3.7. All manifest variables loaded on to their respective latent variable in a statistically significant way using a 0.01 alpha level. All measurement models have an acceptable model fit given a root mean-squared error of approximation (RMSEA) less than 0.08 (MacCallum et al., 1996) and standardized root mean squared residual (SRMR) less than 0.08 (Hu & Bentler, 1999).

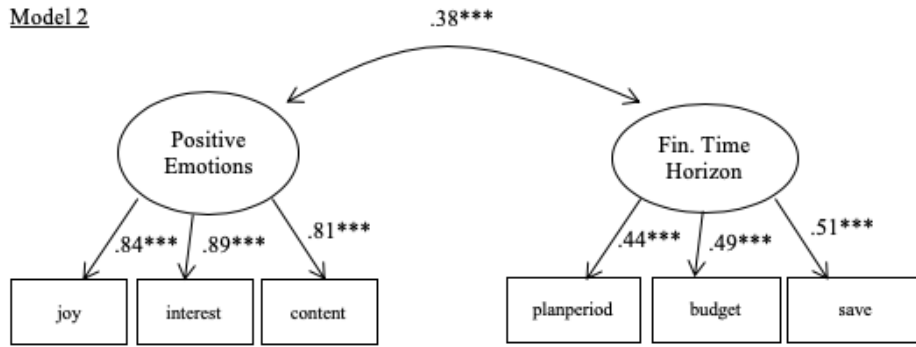
Figure 3.6 Confirmatory Factor Analysis Diagrams (N = 993)

Model 1



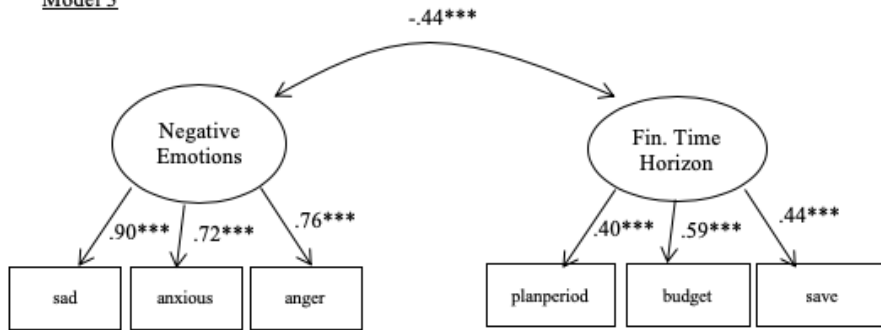
Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(0) = 0.000$ p =.; RMSEA = .000, 90% CI [.000, .000 (1.00)], CFI = 1.000, TLI = 1.000, SRMR = 0.000.

Model 2



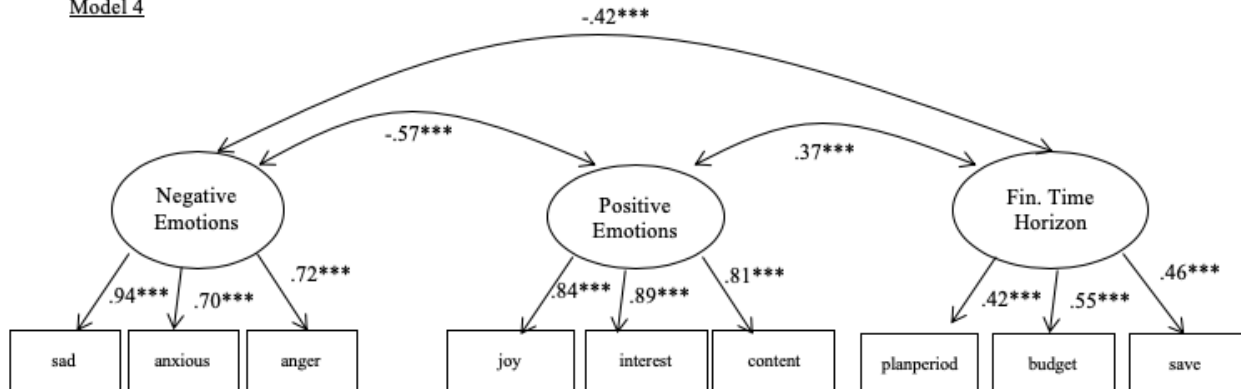
Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(8) = 4.449$ $p = .815$; RMSEA = .000, 90% CI [.000, .023], CFI = 1.000, TLI = 1.004, SRMR = 0.009.

Model 3



Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(8) = 18.658$ $p = .015$; RMSEA = .037, 90% CI [.015, .059], CFI = 0.992, TLI = 0.986, SRMR = 0.025.

Model 4



Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(24) = 101.265$ $p = <.001$; RMSEA = .057, 90% CI [.046, .069], CFI = 0.978, TLI = 0.966, SRMR = 0.038.

Table 3.7 Correlations for CFA and SEM Analyses

Observed Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. joy	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. interest	0.75	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-
3. content	0.68	0.72	1.00	-	-	-	-	-	-	-	-	-	-	-	-
4. sad	-0.45	-0.49	-0.47	1.00	-	-	-	-	-	-	-	-	-	-	-
5. anxious	-0.35	-0.39	-0.38	0.64	1.00	-	-	-	-	-	-	-	-	-	-
6. anger	-0.22	-0.26	-0.25	0.69	0.54	1.00	-	-	-	-	-	-	-	-	-
7. planperiod	0.16	0.15	0.14	-0.15	-0.14	-0.10	1.00	-	-	-	-	-	-	-	-
8. budget	0.17	0.15	0.14	-0.25	-0.25	-0.21	0.21	1.00	-	-	-	-	-	-	-
9. save	0.15	0.16	0.17	-0.13	-0.16	-0.10	0.35	0.22	1.00	-	-	-	-	-	-
10. age	-0.01	0.06	0.06	-0.18	-0.19	-0.19	-0.06	0.02	-0.08	1.00	-	-	-	-	-
11. education	0.06	0.05	0.09	0.06	0.04	0.14	0.17	0.10	0.09	-0.03	1.00	-	-	-	-
12. famsize	0.11	0.09	0.17	-0.04	0.04	0.08	-0.01	0.01	-0.01	-0.00	-0.05	1.00	-	-	-
13. male	0.02	0.02	0.01	-0.05	-0.11	0.05	0.08	-0.01	-0.01	-0.12	0.06	-0.19	1.00	-	-
14. married	0.17	0.15	0.23	-0.08	0.02	0.07	0.11	0.08	0.03	0.14	0.05	0.50	-0.10	1.00	-
15. white	-0.04	0.01	0.02	-0.16	-0.05	-0.19	-0.07	0.04	0.01	0.21	-0.14	0.06	-0.11	0.06	1.00

Note. Variables were standardized to have a mean of 0 and a standard deviation of 1. CFA = confirmatory factor analysis. N = 993; M = 0; SD = 1.

Structural Model Results

Full structural model fit scores (Table 3.8) show acceptable fit for models one-four.

Model two (positive emotions) was the strongest fitted model with RMSEA, CFI, and SRMR scores all showing better fit scores relative to the other models. Looking at the R^2 results from Table 3.9, models two, three, and four explained more amount of variation in financial time horizon than model one (0.088, 0.085, 0.164 vs. 0.037, respectively). Model four explained the most amount of variation in financial time horizon using R^2 (0.164). Results for a chi-squared model difference test of significance for all four models (Table 3.10) confirm that the difference in models is significant.

Table 3.8 Fit Indices for Full Structural Equation Model

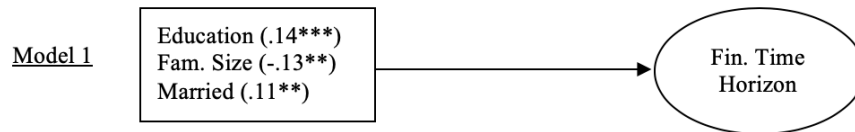
Index	Model 1 Value Model 2 Value Model 3 Value Model 4 Value	Indication of Fit	Suggested Cut Off Values
-------	--	-------------------	--------------------------

χ^2	16.649 (p<.001) 61.382 (p<.001) 131.217 (p<.001) 251.717 (p<.001)	Poor fit Poor fit Poor fit Poor fit	Non-significant. Sensitive to sample size. Models with > 400 cases will mostly result in significant model chi-square <i>exact fit</i> test (Kline, 2011).
RMSEA	0.042 0.036 0.062 0.056	Good fit Good fit Mediocre fit Mediocre fit	Excellent fit < .01, good fit < .05, mediocre fit < .08 (MacCallum et al., 1996).
90% Confidence Interval for RMSEA	(.019, .067) (.024, .048) (.052, .073) (.049, .063)	Marginally good fit Marginally good fit Marginally good fit Marginally good fit	Lower bound close to zero. Upper bound < .05 to pass not-close-fit test. Upper bound < .10 to pass poor-fit test (Kline, 2011).
CFI	0.936 0.982 0.933 0.948	Marginal fit Good fit Marginal fit Marginal fit	< .90 poor fit, .90 - .95 marginal, > .95 good (Kenny, 2011).
TLI	0.873 0.974 0.904 0.931	Poor fit Good fit Marginal fit Marginal fit	< .90 poor fit, .90 - .95 marginal, > .95 good (Kenny, 2015).
SRMR	0.028 0.026 0.036 0.039	Good fit Good fit Good fit Good fit	< .08 good fit (Hu & Bentler, 1999).

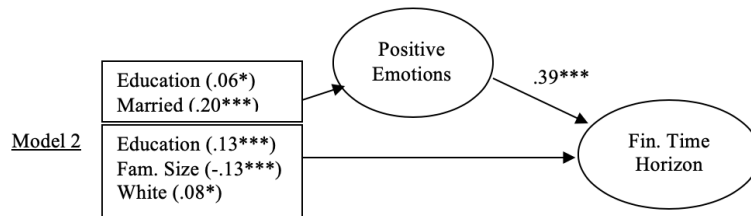
The standardized beta factor loadings for the emotion latent variables regressed on financial time horizon were all statistically significant (see Figure 3.7). More specifically, results from model one show that the control variables of education, family size, and marital status were statistically significant variables when predicting financial time horizon (+0.14 β , -0.13 β , +0.11 β , respectively). Results from model two show that positive emotions were positively associated with financial time horizon (+0.39 β), and that the control variables of education, family size, marital status, and race were significant predictors. Results from model three show that negative emotions were negatively associated with financial time horizon (-0.45 β), and that the control variables of education, family size, sex, and race were significant predictors. Finally, results from model four show that positive emotions were positively associated with financial time horizon

(+0.19 β), negative emotions were negatively associated with financial time horizon (-0.37 β), and control variables of education, family size, marital status, sex, and race were significant predictors.

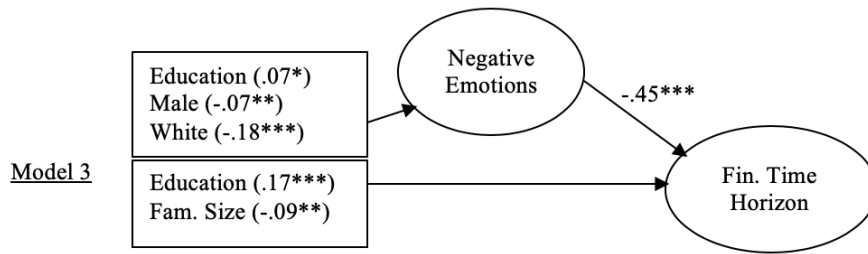
Figure 3.7 Structural Models for Predicting Financial Time Horizon (N = 993)



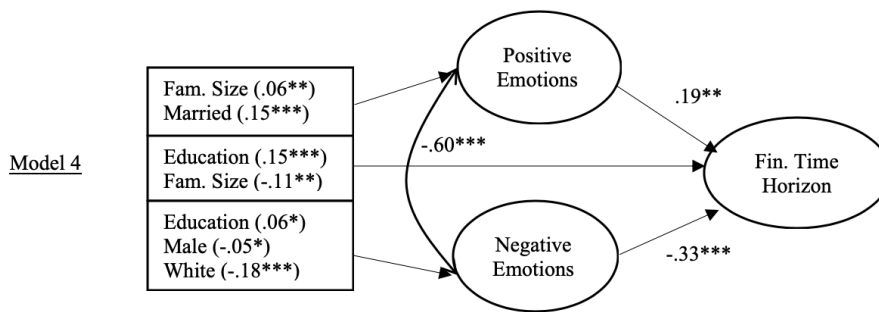
Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(6) = 16.649$ $p < .001$; RMSEA = .042, 90% CI [.019, .067], CFI = 0.936, TLI = 0.873, SRMR = 0.028. The structural model was estimated with indicators from the measurement model for the latent variables (see Figure 4.5), and controls for age, age-squared, education, family size, gender, marital status, and race. Insignificant control paths were dropped (Little, 2013).



Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(27) = 61.382$ $p < .001$; RMSEA = .036, 90% CI [.024, .048], CFI = 0.982, TLI = 0.974, SRMR = 0.026. The structural model was estimated with indicators from the measurement model for the latent variables (see Figure 4.5), and controls for age, age-squared, education, family size, gender, marital status, and race. Insignificant control paths were dropped (Little, 2013).



Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(27) = 131.217$ $p < .001$; RMSEA = .062, 90% CI [.052, .073], CFI = 0.933, TLI = 0.904, SRMR = 0.036. The structural model was estimated with indicators from the measurement model for the latent variables (see Figure 4.5), and controls for age, age-squared, education, family size, gender, marital status, and race. Insignificant control paths were dropped (Little, 2013).



Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(61) = 251.717$ $p < .001$; RMSEA = .056, 90% CI [.049, .063], CFI = 0.948, TLI = 0.931, SRMR = 0.039. The structural model was estimated with indicators from the measurement model for the latent variables (see Figure 4.5), and controls for age, age-squared, education, family size, gender, marital status, and race. Insignificant control paths were dropped (Little, 2013).

Table 3.9 Direct Effects with Financial Time Horizon (N = 993)

Parameter (Reference Group)	b (Unstandardized)	SE (Unstandardized)	β (Standardized)	R ²
MODEL 1				0.037
Education	0.09	0.03	0.14***	
Famsize	-0.06	0.03	-0.12**	
Married (Other)	0.15	0.06	0.11**	
Planperiod	1.00	-	0.44***	
Budget	0.54	0.09	0.48***	
Save	0.26	0.04	0.51***	
MODEL 2				0.088
Positive Emotions	0.13	0.02	0.39***	
Education	0.10	0.03	0.15***	
Famsize	-0.07	0.02	-0.13***	
Married (Other)	0.11	0.02	0.08***	
White (Other)	0.13	0.07	0.08*	
Education → PE	0.13	0.07	0.06*	
Married (Other)→ PE	0.84	0.14	0.20***	

Planperiod	1.00	-	0.44***	
Budget	0.55	0.08	0.50***	
Save	0.25	0.01	0.50***	
MODEL 3				0.085
Negative Emotions	-0.12	0.02	-0.45***	
Education	0.10	0.03	0.17***	
Famsize	-0.04	0.02	-0.09**	
Education → NE	0.16	0.08	0.07	
Male (Female) → NE	-0.33	0.16	-0.07**	
White (Other) → NE	-1.02	0.20	-0.18***	
Planperiod	1.00	-	0.41***	
Budget	0.70	0.11	0.58***	
Save	0.25	0.03	0.44***	
MODEL 4				0.164
Negative Emotions	-0.09	0.02	-0.33***	
Positive Emotions	0.06	0.02	0.19***	
Education	0.09	0.03	0.14***	
Famsize	-0.05	0.02	-0.11***	
Education → PE	0.14	0.07	0.07**	
Famsize → PE	0.09	0.05	0.06*	
Married (Other) → PE	0.63	0.13	0.15***	
Education → NE	0.14	0.08	0.06*	
Male (Female) → NE	-0.24	0.14	-0.05*	
White (Other) → NE	-1.06	0.17	-0.18***	
Planperiod	1.00	-	0.42***	
Budget	0.65	0.10	0.55***	
Save	0.25	0.03	0.46***	

*Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively.

Table 3.10 Chi-Squared Model Difference Test of Significance

Chi-Squared Difference	MODEL 1 (revised)	MODEL 2 (revised)	MODEL 3 (revised)	MODEL 4 (revised)
MODEL 1 (original)	-	45***	115***	235***
MODEL 2 (original)	-45***	-	70***	190***
MODEL 3 (original)	-115***	70***	-	121***
MODEL 4 (original)	-235***	190***	121***	-

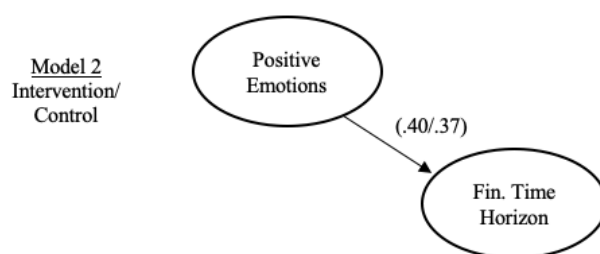
Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively.

Group In-variance Results

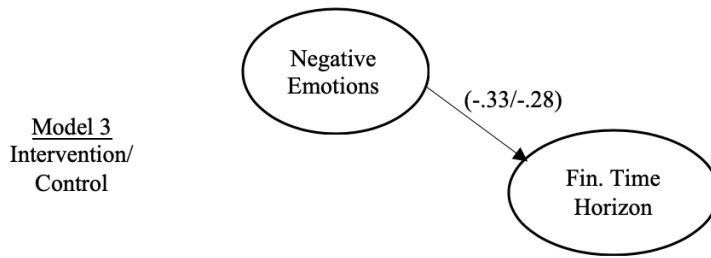
A Wald chi-squared test of group invariance was conducted on models two, three, and four to test whether individuals in the intervention group will have a stronger relationship between their emotions and financial time horizon versus the no-treatment control group (H2g and H2h). Results for models two, three, and four show that the relationship between emotions

and financial time horizon were not significantly impacted by the intervention. For model two, the intervention group's standardized beta factor loading for positive emotions on financial time horizon was +0.37 versus +0.40 for the control group. A group invariance test of the 0.03 difference in the beta coefficients between groups confirmed that the difference was statistically insignificant, which means the gratitude PPI did not strengthen the relationship between positive emotions and financial time horizon for those who participated in the intervention. For model three, the intervention group's standardized beta factor loading for negative emotions on financial time horizon was -0.33 versus -0.28 for the control group. A group invariance test of the 0.05 difference in the beta coefficients between groups confirmed that the difference was statistically insignificant, which means the gratitude PPI did not strengthen the relationship between negative emotions and financial time horizon for those who participated in the intervention. Model four results were consistent with the results of model two and model three.

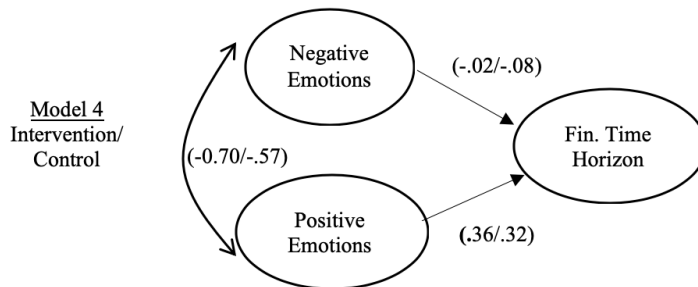
Figure 3.8 Group-invariance Test (N=506)



Note: A Wald chi-squared test of group invariance was conducted between the intervention and control group. The symbols ***, **, * denote significant group in-variance results at the 1, 5, and 10 % level, respectively. Includes control variables of age, age-squared, education, family size, gender, marital status, and race. Emotion and financial time horizon variables were measured after the three financial things gratitude journal intervention in the post-7 survey (N=378) while control factors were measured in the initial survey (N=506). Maximum likelihood approaches were used to account for the missing data, which allowed for the initial sample size of 506 participants to be maintained.



Note: A Wald chi-squared test of group invariance was conducted between the intervention and control group. The symbols ***, **, * denote significant group in-variance results at the 1, 5, and 10 % level, respectively. Includes control variables of age, age-squared, education, family size, gender, marital status, and race. Emotion and financial time horizon variables were measured after the three financial things gratitude journal intervention in the post-7 survey (N=378) while control factors were measured in the initial survey (N=506). Maximum likelihood approaches were used to account for the missing data, which allowed for the initial sample size of 506 participants to be maintained.



Note: A Wald chi-squared test of group invariance was conducted between the intervention and control group. The symbols ***, **, * denote significant group in-variance results at the 1, 5, and 10 % level, respectively. Includes control variables of age, age-squared, education, family size, gender, marital status, and race. Emotion and financial time horizon variables were measured after the three financial things gratitude journal intervention in the post-7 survey (N=378) while control factors were measured in the initial survey (N=506). Maximum likelihood approaches were used to account for the missing data, which allowed for the initial sample size of 506 participants to be maintained.

This group invariance testing assumes that the emotional traits of participants are relatively stable over the seven-day period. A correlation analysis of the stability between the various emotion manifest variables is found in Appendix A. Results of this correlation analysis show that emotional traits of participants ranged between 0.6 to 0.8. These results suggest that the stability of the emotional traits of participants was not entirely stable, which potentially limits the validity of the group invariance results.

Discussion

This essay explored the relationship between emotions and financial time horizon. The broaden and build theory (Fredrickson, 1998) provided the theoretical framework for predicting that both positive and negative emotions should influence financial time horizon. Results of the structural models show that positive emotions were positively associated with financial time horizon (hypothesis 2a), and negative emotions were negatively associated with financial time horizon (hypothesis 2b). This result was expected given that prior literature has shown that positive emotions tend to expand attention and time horizon (Cohn & Fredrickson, 2006; Guven, 2012; Ifcher & Zarghamee, 2011) while negative emotions tend to narrow attention and time horizon (Basso et al., 1996; Shechner et al., 2012).

Using the R^2 statistic, evidence was found in support of hypothesis 2c since model two explained more amount of variation in financial time horizon than model one (0.088 vs. 0.037). Evidence was found in support of hypothesis 2d since model three explained more amount of variation in financial time horizon than model one (0.085 vs. 0.037). Evidence was found in support of hypothesis 2e since model four explained more amount of variation in financial time horizon than model one (0.164 vs. 0.037). Finally, evidence was found in support of hypothesis 2f since model four explained the most amount of variation in financial time horizon (using R^2). Results for a chi-squared model difference test of significance for all four models (Table 3.10) confirm that the difference in models is significant, which further supports hypothesis 2c-2f. These results provide evidence in support of the BBT's argument that emotions should help to explain the variation in an individuals' time horizon (Cohn & Fredrickson, 2006).

Finally, hypothesis 2g and 2h were not supported given that the intervention group that completed a three good financial things gratitude journal intervention did not show a statistically

different factor loading versus the non-intervened control group. One possible explanation for this result is that the intervention was originally designed to impact financial satisfaction and savings behavior (not financial time horizon), and the variables used for financial time horizon should not be expected to change over a seven-day intervention period (e.g., whether a household spends more than they earn). Results may have been different if a participant's internal discount rate was used in order to operationalize financial time horizon since it has been shown to be more malleable to change through experimental interventions (Neef et al., 2001; Reed & Martens, 2011).

Limitations

The questions that were used to measure financial time horizon required participants to self-report their ability to set long-term financial goals, their budget time period, and whether they are engaged in a saving behavior. The self-reported assessments by the individual may not truly represent their actual financial time horizon, introducing issues of construct validity into this study. In addition, the questions that were used to measure emotions required participants to self-report how often they felt certain emotions. This self-reported assessment may not truly represent the individuals true emotional experience, introducing issues of construct validity into this study.

A convenience MTurk sample was used, which may not be fully representative to the U.S. adult population (Mortensen et al., 2018). However, certain studies have shown that MTurk convenience samples are fairly representative (Burnham et al., 2018; Huff & Tingley, 2015) . In a recent meta-analytic review of three separate MTurk samples, Burnham et al. (2018) found that demographic characteristics of workers closely approximated the general US population.

However, the study cautioned that there could be small differences when studying personality or religion.

As mentioned before, the PPI tested in this study was not originally designed to impact a participant's financial time horizon. Instead, the PPI was designed to use a gratitude journal to impact the financial satisfaction and savings behavior of participants. Although this essay hypothesized that emotions would impact financial time horizon, it is less likely that emotions generated from a seven-day gratitude journal intervention would likely impact the measures used for financial time horizon, such as planning period and keeping a budget. A future PPI intervention on emotions impacting financial time horizon should use a measure of a participant's internal discount rate to measure financial time horizon, which has been shown to be more malleable to change through experimental interventions (Neef et al., 2001; Reed & Martens, 2011).

For the group analysis, less participants in the intervention and control groups completed the post seven-day intervention survey (159 intervention group + 219 control group = 378) versus the initial survey (243 intervention group + 263 control group = 506), which created 128 missing participant values. Missing data was addressed by using a maximum likelihood procedure in STATA so that the total sample size of the sample of analysis was restored to the initial sample of 506 participants. Another limitation of the group analysis was that the intervention was not consistent among the 243 intervention participants. Some participants completed seven once-a-day gratitude journals while other participants only completed one gratitude journal during the first day. This inconsistency was introduced because the SEM analysis required a sample size of sufficient size and parceling out the intervention group to be

consistent across amount of journal days would have diminished the sample size to a level where the maximum likelihood procedure would not have converged.

Implications and Conclusion

Essay two adds to the growing body of studies that are dedicated to providing evidence for the relationship between emotions and financial outcomes (Asebedo et al., 2020; Asebedo & Seay, 2015; Guven, 2012; Hill et al., 2016). As the results show, an individual's emotional state is associated with their financial time horizon. Financial time horizon has been argued as the most important aspect when making economic decisions (Dow & Jin, 2013), so these results have important implications for parties interested in predicting the economic decisions of individuals, such as policyholders, financial planners, financial counselors/therapists, and academics. For policymakers, predicting the financial time horizon of their constituents is important given that many of their financial policies, such as tax refunds, rely on knowing whether individuals will budget the money within a narrow, or expanded, financial time horizon (Zivney et al., 2002). Policyholders who track the joy, interest, contentment, sadness, anxiety and anger levels of their constituents will more effectively model the financial time horizon of those constituents.

These results have implications for academics and researchers. Academics can more accurately model financial time horizon through including emotion variables since emotions have been shown to matter when predicting financial time horizon. A model that includes both the positive and negative emotions of an individual will explain the variation of their household's financial time horizon better than a model that only includes traditional demographic variables.

These results have implications for financial planners. Given that emotions have been shown to be a significant predictor of financial time horizon, a financial planner who learns the emotional states of their clients would more effectively analyze and evaluate the client data they have collected. This is consistent with the *Practice Standards* of the CFP Board, which considers the collection of a client's financial time horizon as an important data component to gather during the second step of the financial planning process (CFP Board, 2013, p. 21).

Finally, these results have implications for financial therapists and financial counselors. These results provide support for their mission to address the emotional, interior aspects, of financial health (Klontz et al., 2016) since individual emotions are shown to help predict a crucial component of financial health, namely the financial time horizon of individuals (Dow & Jin, 2013).

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Chapter 4 - Explaining the Relationship Between Emotions and Financial resources

Introduction

"I can see clearly now, the rain is gone. I can see all obstacles in my way...It's gonna be a bright, bright sun-shiny day." (Nash, 1972, track B1)

While it is important to establish that a moderating relationship exists between emotions and financial resources (see essay one), an explanation of this relationship is also needed. It is not enough to know that two things are associated with each other. For example, if researchers had discovered that sunshine was associated with less car accidents, this is good to know, but it would be even more useful to know that it is because of the mechanism of allowing drivers to see more clearly. Given that a relationship was established between emotions and financial resources in essay one and between emotions and financial time horizon in essay two, the following research question was explored in this essay three: do emotions indirectly effect financial resources through the mechanism of financial time horizon? In the same way that sunshine allows drivers to see more clearly, leading to less accidents, positive emotions are hypothesized to lead to individuals "seeing more clearly" in the form of an expanded financial time horizon, which leads to greater financial resources.

Why should emotions be associated with financial resources? One particular positive emotion, interest, may be the most theoretically connected with financial wealth in that it allows for a person to see past their immediate needs (Fredrickson, 1998), which leads to an expanded planning horizon (Cohn & Fredrickson, 2006). If an emotion influences the financial time horizon of an individual, this carries an important financial consequence since a longer financial planning horizon has been shown to lead to higher financial wealth (Bernheim et al., 2001;

Harris & Laibson, 2002; Laibson, 1997; Webley & Nyhus, 2008). Given this potential broadening of a financial time horizon through the emotion of interest, the primary hypothesis of essay three is that there is an indirect effect between emotions and financial resources through the mechanism of financial time horizon.

Are all emotions equally as important as predictors for financial resources? Given the relationship between emotions and financial resources established in essay one, policymakers and financial professionals need more guidance for how to take advantage of this relationship. Finding the mechanism (i.e., mediating variable) for how emotions are associated with financial resources could help guide academics, financial therapists, and policymakers towards the creation of a financial positive psychology intervention (PPI) tool. Knowing that financial time horizon is serving as the mechanism of influence between emotions and financial resources could lead to the development of a PPI tool that could potentially empower more Americans to engage in important planning-based activities, such as budgeting (only practiced by one-in-three Americans; Jacobe, 2013), retirement planning (insufficient; Rhee, 2013), or debt repayment (destructive consumer debt is on the rise; Dunn & Mirzaie, 2016).

Literature Review

Theories of Emotion

Emotions tend to be grouped as either “positive” or “negative.” Fredrickson (1998) identified the three primary positive emotions as joy, interest, and contentment. Newhagen (1998) identified the three primal negative emotions as anger, fear, and disgust as the three primal negative emotions. The study of how negative emotions impact human flourishing is very well established; particularly given that negative emotions often produce severe problems that

need to be addressed by culture, like violence, suicide, and physical sickness (Fredrickson, 1998). For example, research on depression and anxiety far exceed the research output on subjective well-being and psychological well-being (Linley & Joseph, 2012). Theories on how negative emotions impact human flourishing vary from being behavioral (negative emotions are a part of an appraisal/control process that provides information for how to adapt to uncertainties; Moors, Ellsworth, Scherer, & Frijda, 2013), to biological (negative emotions are an opponent-process state that is meant to bring the body back to a biological neutrality; Solomon, 1980), to evolutionary (negative emotions protect the human species from extinction; Darwin, 1865). A control-process view of emotions (Carver & Scheier, 1990; Simon, 1967) has been used before to theoretically map economic decision making to emotions using an adapted theory of bounded rationality (Muramatsu & Hanoch, 2005). Under the control-process theory of emotions, positive (negative) emotions are feedback mechanisms that allow individuals to know that they are moving towards (away from) their goals. Negative emotions, then, are a result of a discrepancy between two different reference values that are monitored, and the negative emotion is a call for an individual to reprioritize towards the less focal reference value (Simon, 1967), leading to avoidant processing and choices (Selten & Gigerenzer, 2002). For example, when consumers were asked to make a purchase decision between a car that was safe or cheap, the negative emotions that were generated as these two reference values were in conflict resulted in avoidance behavior as consumers consistently chose the option that was closest towards their "status quo" (Luce, 1998).

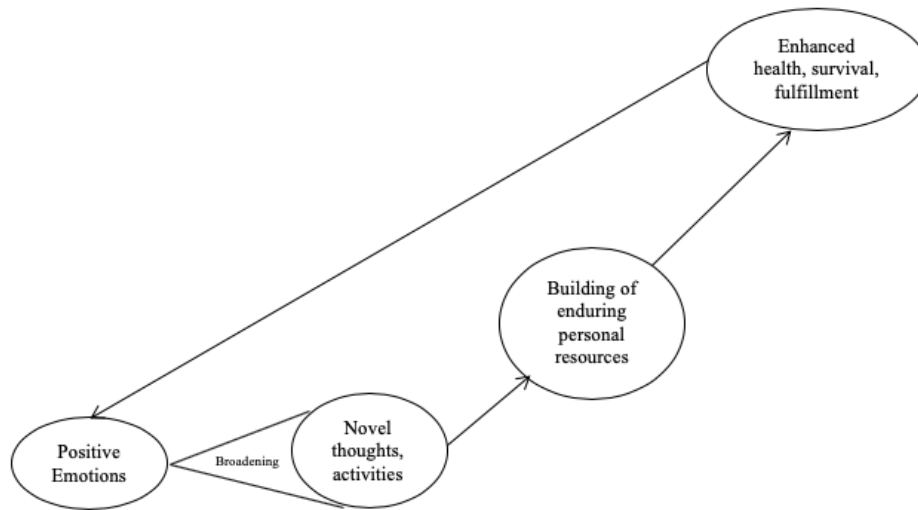
Regarding positive emotions, for many decades, researcher, Alice Isen, studied how positive emotions tended to broaden the cognitive abilities of people (Isen, 1984; Isen et al., 1987). This contrasts with negative emotions, which tend to narrow human responses to just

three responses: escape, attack, expel (Fredrickson, 1998). Through clinical experiments, Isen and her colleagues have shown that people who experience positive affect are more open to information (Estrada et al., 1997) and tend to accept a broader array of behavioral options (Kahn & Isen, 1993).

Barbara Fredrickson used the work of Isen to build a theory of how positive emotions tend to “broaden and build” a person in a positive feedback loop. She called this theory the broaden and build theory (BBT). Under BBT theory, all positive emotions can be grouped into three primary categories: joy, interest, and contentment. An individual who experiences these emotions will be more open to new thoughts, activities, and relationships, which then encourages a building of resources and skill-building.

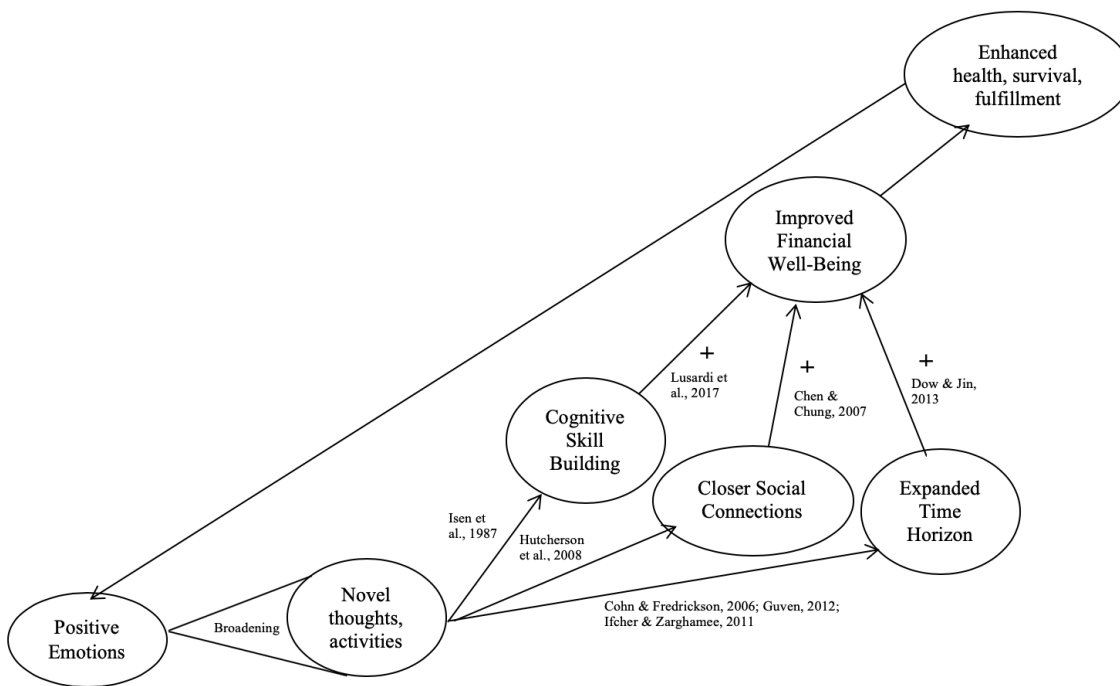
Building resources and broadening identity tends to induce new positive emotions of joy, interest and contentment, which create a positive feedback loop (Layous et al., 2017) For example, participants in a clinical study were asked to recall a previous purchase made for either themselves or someone else, and then choose whether to spend a monetary windfall on themselves or someone else. Participants who were asked to recall a purchase made for someone else reported feeling significantly happier than participants who were asked to recall a purchase made for themselves. Participants who recalled a purchase made for someone else were also shown to want to engage in that same act again because of the happiness that they were feeling. So that the happier an individual became, the more likely they were going to spend their current windfall on someone else in the near future. This experiment provided evidence that positive emotions created a positive feedback loop (Aknin et al., 2011).

Figure 4.1 Broaden-and-Build Theory (BBT)



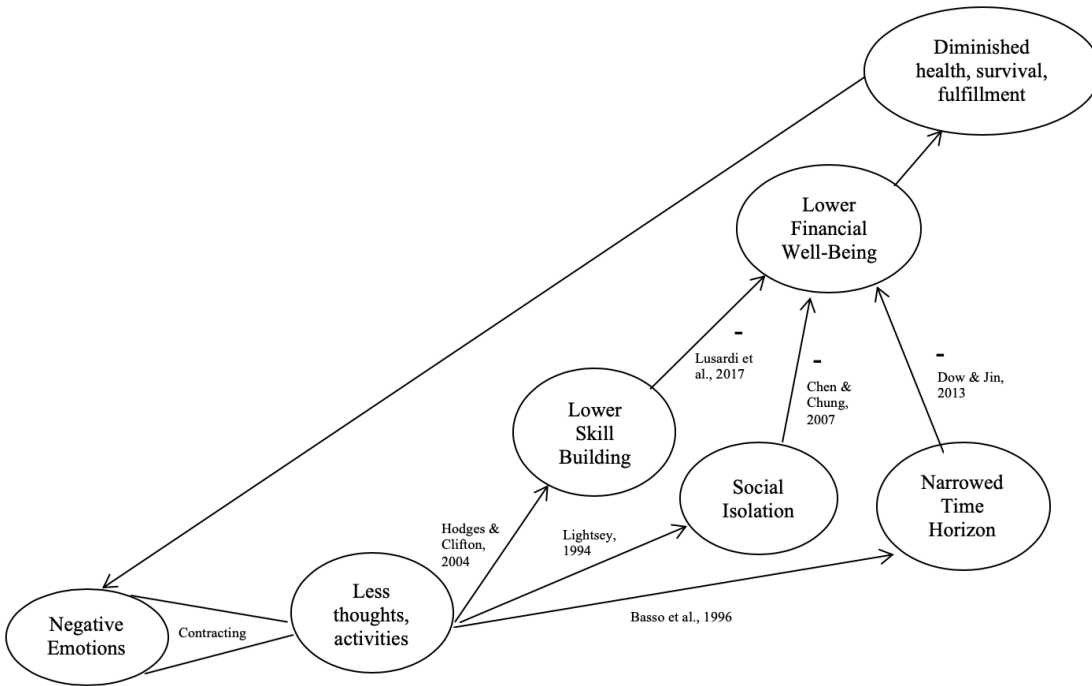
Given that building financial resources and skills are likely a crucial component when constructing a person's overall well-being and flourishing (Kim et al., 2003; Lange & Byrd, 1998; Peirce et al., 1994; Taft et al., 2013), positive emotions are hypothesized to be associated with positive financial resources as a part of the building of enduring resources/skills for which the BBT predicts will occur in the wake of a positive emotion. The expression of positive emotions has been shown to build personal resources in the form of: improved cognitive skill building (Isen et al., 1987), closer social connectedness (Hutcherson et al., 2008), and expanded time horizon (Cohn & Fredrickson, 2006; Guven, 2012; Ifcher & Zarghamee, 2011). Positive emotions are hypothesized to be positively associated with financial resources given that the building of these personal resources has been shown to be associated with positive financial outcomes: cognitive skill building is required for wealth generation (Lusardi et al., 2017), social loneliness has been shown to predict lower household incomes (Chen & Chung, 2007) and time horizon has been argued as the most important aspect when making economic decisions (Dow & Jin, 2013). See Figure 4.2 below.

Figure 4.2 Adapted Broaden-and-Build Theory (BBT) for Positive Emotions



By contrast, negative emotions tend to narrow human responses instead of broaden and build (Fredrickson, 1998). Negative emotions, like depression, or regret, often trigger certain behaviors that then trigger more negative emotions, locking an individual into a downward spiral. For example, anxiety may trigger a narrowed attention span, which then triggers lower exam scores, which then triggers feelings of regret, which, then triggers lower subsequent classroom performance, and, so on (T. D. Hodges & Clifton, 2004). Given that negative emotions have been shown to narrow attention and time horizon (Basso et al., 1996; Shechner et al., 2012), they are hypothesized to be negatively associated with financial time horizon and financial resources. See Figure 4.3 below.

Figure 4.3 Adapted Broaden-and-Build Theory (BBT) for Negative Emotions



Finding a mechanism that broadens an individuals' time horizon is very important given the importance of an individual's time horizon of financial income and wealth. In a study on the determinants of financial planning horizon, Dow and Jin (2013, p. 148) argued that the ability to plan about finances into the future is one of the most important areas that impact financial resources. Likewise, many studies have associated expanded time horizon with higher financial wealth (Bernheim et al., 2001; Harris & Laibson, 2002; Laibson, 1997; Webley & Nyhus, 2008).

Emotions and Financial resources

Muramatsu and Hanoach (2005) provided a theoretical argument that theories predicting economic decisions need to incorporate emotions more explicitly if they are to better understand people's financial choices. Bounded rationality, for example, needs to be adapted to incorporate the complex role that emotions play in shaping human financial thinking and decisions. Asebedo

and Seay (2015) made a theoretical argument that the practice of financial planning should incorporate concepts of positive psychology in order to improve financial resources. Both financial planning and positive psychology have the same objective of moving an individual into a place of flourishing, so the two domains may join together in a process known as positive financial planning (Asebedo & Seay, 2015).

This connection between emotions and financial resources has been shown empirically, as well. Negative mood states have been shown to precede destructive financial behaviors (Kasser, 2012). In a longitudinal study involving two waves of 7,108 U.S. adults (1995-96, 2004-06), participants who reported a higher sense of purpose had higher initial and subsequent household incomes and net worth (Hill et al., 2016). In a 15-year longitudinal study of thousands of Australian teenagers, teenage subjective well-being predicted higher incomes and employment as adults (Marks & Fleming, 1999). In an empirical study of undergraduate American students, Xiao et al. (2009) found that positive financial behaviors contributed to financial satisfaction and financial satisfaction, in turn, contributed to life satisfaction.

Emotions and Time Horizon

In clinical experiments, Fredrickson has shown that people who are in positive emotional states tended to take a “big picture” view (Fredrickson & Branigan, 2005) and have a broadened time horizon (Cohn & Fredrickson, 2006). Related to the broadening of time horizons, Frederickson has also found that positive emotions broaden out an individual’s perspective-taking skills (Fredrickson & Joiner, 2016), social support network (Cohn & Fredrickson, 2006), sense of self to include others (Waugh & Fredrickson, 2006).

Many experiments have shown that positive emotions broaden out a person’s attention span (Basso et al., 1996; Fredrickson & Branigan, 2005; Gable & Harmon-Jones, 2008; Kahn &

Isen, 1993). While a broadened attention span is not the same thing as a broadened time horizon, it may be considered an important precursor (Cohn & Fredrickson, 2006). Anxiety and depression have both been connected to a narrowed attention span (i.e., narrowed time horizon; Basso et al., 1996; Shechner et al., 2012). In one neuropsychological experiment, participants were asked to complete a judgement task involving visual processing. Those individuals exhibiting more of an anxious and depressed affect were associated with a narrowed attention span, while participants exhibiting a positive mood and optimism were associated with an expanded attention span (Basso et al., 1996). In one experiment, college students viewed films that either elicited positive emotions (e.g., amusement, contentment), or negative emotions (e.g., anger, anxiety; Fredrickson & Branigan, 2005). The measured attention was broader for college students in a positive emotional state than for those in a negative, or neutral, emotional state. In another experiment, adults were given candy in order to induce them into a positive emotional state (Kahn & Isen, 1993). Those that were given candy exhibited greater diversity in their subsequent choices (i.e., they showed greater variety-seeking behavior). Greater variety-seeking behavior was evidence that the positive emotional state had broadened the cognitive ability of the participants. While a broadened cognitive ability does not directly mean that participants now have a broadened sense of time, it can be thought of as an important precursor (Bell & Kozlowski, 2002).

However, in another study measuring positive emotions and attention span, Gable and Harmon-Jones (2008) found that positive affect only expanded attention span if the positive-affect state was low in approach motivation. Approach motivation is the urge to move towards an object. In their experiment, the attention span of participants of those who watched a film about cats in humorous situations (low-approach) was compared against participants who watched a

film about delicious desserts (high-approach). The participants who watched the high-approach film actually experienced a narrowed attention span after their intervention, even though they had been induced into a positive emotional state, providing a more nuanced view of how positive emotions influence an individual's attention span.

More recently, Ifcher and Zarghamee (2011) conducted an experiment where participants were paid to fill out questions related to their time preference. A treatment group that would watch a film that was meant to induce a positive affect was randomly assigned and compared against a control group where no treatment was given. The positive affect treatment group was found to have a significantly lower time preference over money (i.e., less demand for immediacy). This would suggest that positive emotions caused an expanded financial time horizon. Following up on this experiment, Guven (2012) used sunshine as an instrument for happiness and found that happier households in the Netherlands expect a longer life and seem more concerned about the future.

Time Horizon and Financial resources

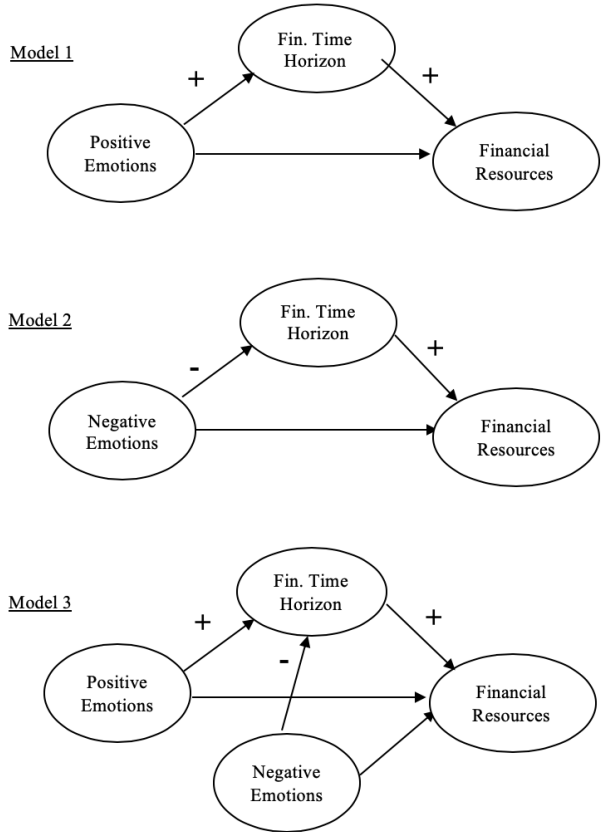
Previous literature has established a strong association between an individual's time preference (i.e., how they value time) and their overall income and net worth (i.e., financial resources). Dow and Jin (2013) considered financial time horizon as the most important area of economy decision making. How households report their investing time horizon has been shown to influence the asset allocation of that household (Dow, 2008). Davis and Carr (1992) found that expanding households were more likely to have a written budget while retirees' view of their budget stretched out longer than non-retirees. Households who reported longer saving horizons have been shown to have different saving motives than those with shorter saving horizon, and were much more likely to actively save (Fisher & Montalto, 2010).

Methodology

Hypotheses

What explains the relationship between emotions and financial resources? Given that prior literature has shown that emotions impact time horizon (Cohn & Fredrickson, 2006) and that time horizon is a critical variable associated with financial resources (Bernheim et al., 2001; Dow & Jin, 2013; Harris & Laibson, 2002; Laibson, 1997; Webley & Nyhus, 2008), it is hypothesized that positive emotions will be associated with higher financial resources through an expanded financial time horizon, which acts as a mechanism between their relationship. Given these relationships established by theory and previous literature, the following structural models, with predictions, were used.

Figure 4.4 Structural models with predictions



Given these structural models, the following hypotheses were explored:

H3a: There is a positive indirect effect between positive emotions and financial resources through the mechanism of financial time horizon.

H3b: There is a negative indirect effect between negative emotions and financial resources through the mechanism of financial time horizon.

Data

This study will use survey data collected at the end of 2018 by Asebedo et al. (2020). The dataset was funded and supported by Dr. Russell James III, the CH Foundation chair of Personal Financial Planning, Texas Tech University; and the College of Human Sciences at Texas Tech University [n/a]. Participants of the survey were recruited through Amazon's MTurk platform,

which is known to provide access to a relatively low-cost, large pool of Americans that approximates the general U.S. population demographics for age and race but may not be representative when predicting religious affiliation or personality (Burnham et al., 2018). In order to qualify for the survey, participants from Mturk needed to have at least a 90% approval rating and at least 500 surveys (i.e., HITs) completed. These constraints were added primarily to lower the probability of survey bots (Dreyfuss, 2018; Miele, 2018). Once survey participants selected to participate in the survey through Mturk, they were sent to Qualtrics, which administered the survey and collected the data. Once the survey participants completed the initial survey, they were sent compensation of \$1.00. For this study, the initial survey collected 993 participants on December 10, 2018. Although, this sample includes a subsequent longitudinal component related to the testing of a PPI, the longitudinal data will not be utilized. The purpose of the collected data was to assess attitudes and intentions toward saving in a savings account, investment account, or a retirement account. This survey dataset is appropriate to use for this study given (a) it collected variables related to emotions and financial outcomes, (b) it is relatively large dataset (n=993), and (c) it is a relatively new and private dataset, so it has not been fully explored by other researchers.

Dependent Variable

Financial resources will be used as the dependent variable. Two measures of financial resources were used: household income and net worth. Analyzing both income and net worth is consistent with a previous study that connected positive emotions with financial outcomes (Hill et al., 2016). Although these two different measures are highly correlated with each other (i.e., those with high income often have high net worth), combining income and net worth together into a latent variable will capture more variation in the financial resources of a participant's

household; particularly, given that it is possible for households to be either income rich and asset poor (Sykes, 2003), or, income poor and asset rich (Bradbury, 2010).

Table 4.1 Measurement of Financial Resources Latent Variable

Variable	Measurement Question	Values	
Income	"What is your household annual gross income (before taxes) you use for saving and spending?"	1	No income
		2	Less than \$20,000
		3	\$20,001 – \$40,000
		4	\$40,001 – \$60,000
		5	\$60,001 – \$80,000
		6	\$80,001 – \$100,000
		7	\$100,001 – \$150,000
		8	\$150,001 – \$200,000
		9	\$200,001 – \$250,000
		10	\$250,001 – \$500,000
		11	Over \$500,000
Net Worth	"If you were to sell all your assets today and pay all of your debts, how much will you have left over? In other words, what is your current net worth (assets - liabilities)?"	1	Less than \$0
		2	\$1 – \$99,999
		3	\$100,000 – \$249,999
		4	\$250,000 – \$499,999
		5	\$500,000 – \$749,99
		6	\$750,000 – \$999,999
		7	\$1,000,000 – \$2,499,999
		8	\$2,500,000 – \$4,999,999
		9	Over \$5,000,000

Independent Variables

Emotions

Emotions were measured using the PERMA-Profiler tool (Butler & Kern, 2016), which provided a framework for measuring the PERMA theory of well-being (Seligman, 2012). In the PERMA framework, human flourishing, or well-being, is measured using five elements: Positive emotions, Engagement, Relationships, Meaning and Accomplishment. In the PERMA-Profiler

tool, positive emotions were measured using three distinct emotions of joy, positivity, and contentment. The other elements were measured using 12 questions, providing a final set of 15 questions that were meant to measure the PERMA theory. In addition to this 15-question set, the PERMA-Profiler tool added eight additional filler items, which assessed overall wellbeing, negative emotion, loneliness, and physical health.

In previous studies that included both positive emotion and financial research variables, positive emotions were often measured using a life satisfaction question (e.g., "I am satisfied with my life"; Hill et al., 2016; Howell et al., 2006; Lucas et al., 2004) or life satisfaction scale (e.g., SWLS; Diener et al., 1985; Howell et al., 2006). Given that positive emotions often overlap, and tend to highly correlate with each other (Fredrickson, 1998, p. 306), positive emotions were combined into one latent variable called Positive Emotions (see Table 4.2). For negative emotions, a latent variable was formed using measurements of anger, anxiety, and sadness (see Table 4.3).

Table 4.2 Measurement of Positive Emotions Latent Variable

Variable	Measurement Question	Values
Joy	"In general, how often do you feel joyful?"	Likert scale answering from zero (not at all) to 10 (always)
Interest	"In general, to what extent do you feel excited and interested in things?"	Likert scale answering from zero (not at all) to 10 (completely)
Contentment	"In general, to what extent do you feel contented?"	Likert scale answering from zero (not at all) to 10 (completely)

Table 4.3 Measurement of Negative Emotions

Variable	Survey	Measurement Question	Values
Anger	Post Seven-Day	"In general, how often do you feel angry?"	Likert scale answering from zero (never) to 10 (always)

Anxious	Post Seven-Day	"In general, how often do you feel anxious?"	Likert scale answering from zero (never) to 10 (always)
Sad	Post Seven-Day	"In general, how often do you feel sad?"	Likert scale answering from zero (not at all) to 10 (completely)

Time Horizon

In previous studies, time horizon has been measured using questions about an individual's self-reported financial planning period ("What is your primary financial planning horizon?"; Dow & Jin, 2013), their internal discount rate ("Would you rather have \$200 today or \$250 in nine months?"; Herrnstein, 1990; Keren & Roelofsma, 1995), and, even, whether they smoke, as a sign that the participant does not think far into the future given the health risks (Robbins & Bryan, 2004).

For this study, an individual's time horizon was operationalized using three different questions that were expected to share variance and provide a more complete picture of a survey participants' view of time than just one single manifest variable. Table 4.4 shows the three manifest variables that were used to measure a financial time horizon latent variable. The first two manifest variables asked respondents their self-reported financial time horizon in two different ways. The third question asked participants to rank, from 1-8, how important certain reasons for saving were to participants. This question was then coded as being one if participants communicated that they are currently saving, and zero if they communicated that they are not currently saving. Participants who are currently saving are likely to have a longer time horizon than those who are not currently saving since the practice of saving requires looking beyond present self to a future self's needs (Thaler & Shefrin, 1981). This is consistent with other studies which have linked saving behavior to financial time horizon (Fisher & Anong, 2012; Fisher & Montalto, 2010; Lee et al., 2000; Lusardi, 2000).

Table 4.4 Measurement of Financial Time Horizon Latent Variable

Variable	Measurement Question	Values
Planning Period	"In planning or budgeting your saving and spending, which of the following time periods is most important to you (and your {husband/wife/partner if applicable})?"	1: The next few days or weeks; 2: The next few months; 3: The next year; 4: The next few years; 5: The next 5 to 10 years; 6: Longer than 10 years.
Currently Saving	People have different reasons for saving and maintaining savings, even though they may not be saving all the time. What are your most important reasons for saving and/or maintaining your savings? Please place these reasons for saving in the order of most to least important to you. If you are not currently saving any money, please place "None of the above, I am not currently saving any money" at the top of the list.	This question was then coded as being one if participants communicated that they are currently saving, and zero if they communicated that they are not currently saving.
Budget Success	"Over the past year, would you say your (and your {husband/wife/partner if applicable}) spending was less than, more than, or about equal to your income? Please do not include the purchase of a new house or car, or other big investments you may have made."	1: Spending less than you earn; 2: Spending more than income; 3: About equal to income. This question was recoded so that (2=0), (3=1), and (1=2).

Control Variables

The following traditional demographic control variables are used in this analysis (see Table 4.5). The control variables of age, marital status, race and sex have been previously established as explanatory variables for predicting financial time horizon (Dow & Jin, 2013). Regarding family size, an increase in household size will likely impact the financial time horizon of household decision makers (Davis & Carr, 1992). Age, family size, marital status, race and sex have all been established before as explanatory variables for predicting income and net worth (Rauscher & Elliott, 2016).

Table 4.5 Measurement of Control Variables

Variable	Measurement Question	Values
Age	"What is your current age?"	Text

Education	"What is your highest level of education?"	1: No high school diploma or GED; 2: High school graduate or GED; 3: Associates; 4: Bachelors; 5: Masters; 6: Doctorate
Family Size	"Including yourself and spouse/partner (if applicable), how many people live in your household who depend on you (and/or your spouse/partner) for financial support?"	1,2,3,4,5,6+
Marital Status	"How would you best describe your current marital status?"	<i>Recoded to be binary variable:</i> 1: Married, first marriage, or Married, second marriage; 0: Living with partner, divorced, widowed, or single/never married
Race	"With which racial or ethnic category do you most closely identify?"	<i>Recoded to be binary variable:</i> 1: White; 0: Black, Hispanic, Asian, Native American, or Other
Sex	"What is your sex?"	1: Male; 0: Female

Data Analysis Methodology

For the analysis, a Structural Equation Model (SEM) approach will be used, utilizing STATA version 15 in order to account for the measurement error associated with the psychological and financial constructs and to investigate the potential for a mediating variable (Kline, 2011). Within the SEM approach, the two-step rule will be followed (Bollen, 1989). First, a Confirmatory Factor Analysis (CFA) was conducted to determine if the measurement model fit the data. Details of acceptable model fit criteria is provided in Table 4.6 below. Given that the CFA model will have at least two factors with at least two indicators per factor, the model is identified per the two-indicator rule and the marker method will be used (Kline, 2011, p. 138). Second, once the measurement model is determined to fit appropriately, a full SEM

model was calculated. Controls will be added to the full structural model using the full partial method (Little, 2013). For this method, controls are regressed on both predictor and outcome variables. Once the controls have been added, all insignificant paths involving control variables will be dropped (i.e., pruned) to improve the model fit (Little, 2013). When building out the full SEM model from the measurement model, the BBT provided the theoretical framework for how each latent variable should be connected. Namely, emotions are expected to have an indirect effect on financial resources through the mediating effect of time horizon.

Table 4.6 Fit Indices for Measurement and Structural Models

Index	Suggested Cut Off Values
χ^2	Non-significant. Sensitive to sample size. Models with > 400 cases will mostly result in significant model chi-square <i>exact fit</i> test (Kline, 2011).
RMSEA	Excellent fit < .01, good fit < .05, mediocre fit < .08 (MacCallum et al., 1996).
90% Confidence Interval for RMSEA	Lower bound close to zero. Upper bound < .05 to pass not-close-fit test. Upper bound < .10 to pass poor-fit test (Kline, 2011).
CFI	< .90 poor fit, .90 - .95 marginal, > .95 good (Kenny, 2011).
TLI	< .90 poor fit, .90 - .95 marginal, > .95 good (Kenny, 2015).
SRMR	< .08 good fit (Hu & Bentler, 1999).

To test the significance of the indirect effect, a bootstrapping approach was used with 2,000 iterations and generated a confidence interval (Wang et al., 2013). A material indirect effect would exist if the confidence interval of the indirect effect did not include zero. The chi-square test, comparative fit index (CFI) and root mean-squared error of approximation (RMSEA) indices were also used to assess the model fit. Nonsignificant χ^2 , higher than 0.9 for CFI and

lower than 0.08 for RMSEA indicate a good model fit. The data was initially compiled and reviewed in Microsoft Excel, then analyzed in STATA version 15.

Results

Descriptive Statistics

The sample consisted of 993 individuals age 18 and older (average age of 37). The majority of the sample is white (78%) with an associates or bachelor's degree, and average income and net worth levels slightly above \$60,000 (4.37) and \$100,000 (2.63), respectively. The average planning period was between a year and many years (3.33). 86% of the participants stated that they are regularly saving. Reports of feeling "interested" was the top reported positive emotion (6.9 out of 10) while reports of feeling "anxious" was the top reported negative emotion (4.3 out of 10).

Table 4.7 Descriptive Characteristics of Variables (N=993)

Variable (Reference Group)	Mean	St. Dev.	Min	Max
<i>Positive Emotions</i>				
Joy	6.08	2.45	0	10
Interest	6.88	2.28	0	10
Contentment	6.80	2.56	0	10
<i>Negative Emotions</i>				
Sad	3.09	2.68	0	10
Anxious	4.29	2.86	0	10
Anger	2.48	2.86	0	10
<i>Financial Time Horizon</i>				
Planning period	3.33	1.55	1	6
Budget	1.20	0.76	0	2
Save	0.86	0.35	0	1
<i>Financial resources</i>				
Income	4.37	1.74	1	11
Net worth	2.63	1.35	1	9

Control Variables

Age	37.50	10.88	18	77
Education	3.49	1.03	1	6
Family size	2.54	1.37	1	6
Male (Female)	0.51	0.50	0	1
Married (Other)	0.51	0.50	0	1
White (Other)	0.78	0.42	0	1

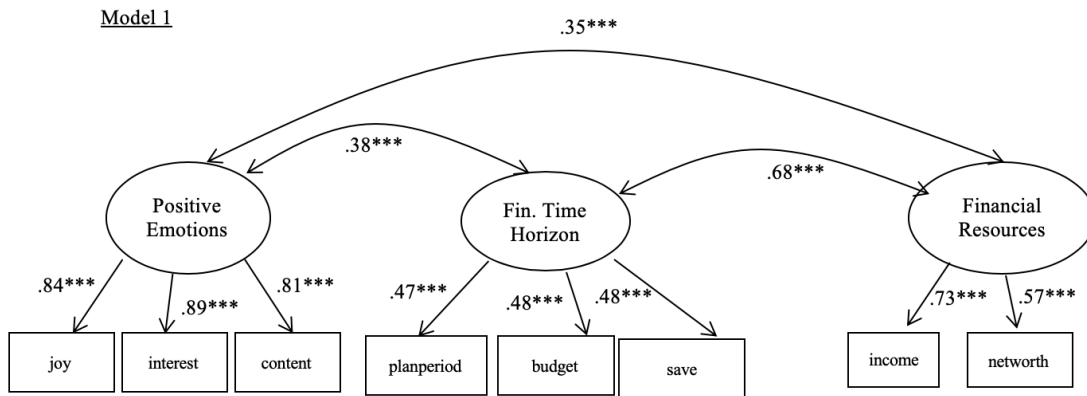
Structural Equation Modeling (SEM) Results

A SEM approach was used to test the mediating relationship of financial time horizon between emotions and financial resources. Data analyses involving structural equation modeling typically has two stages. In the first stage, a two-step rule is used to test the structural models (Bollen, 1989). First, a Confirmatory Factor Analysis (CFA) will be conducted to determine if the measurement model fits the data, then, second, a full SEM model will be calculated. When building out the full SEM model from the measurement model, BBT provided the theoretical frameworks for how each latent variable should be connected. Namely, emotions are expected to have a direct effect on financial time horizon.

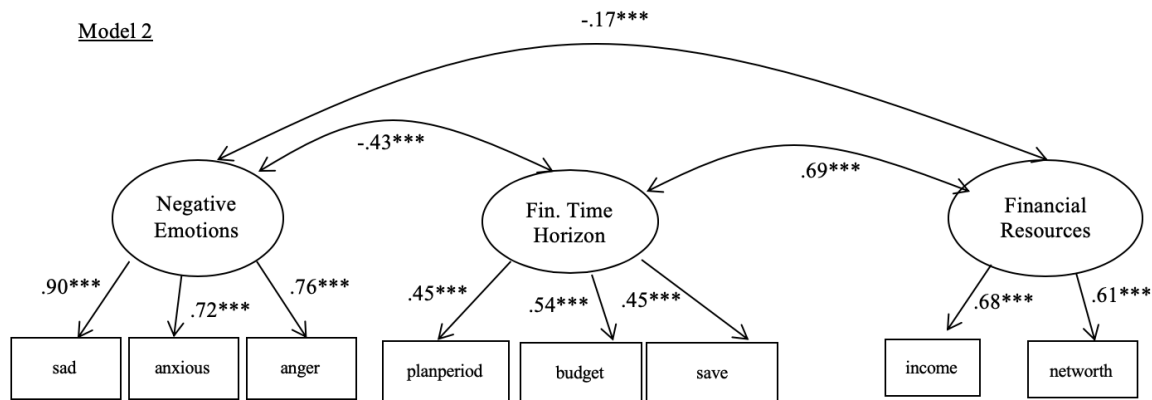
Confirmatory Factor Analysis Results

Results of the CFA for models one, two, and three are provided in Figure 4.5 below. In addition, correlations between all manifest variables are provided in Table 4.8. All manifest variables loaded onto their respective latent variable in a statistically significant way using a 0.01 alpha level. All measurement models have an acceptable model fit given a root mean-squared error of approximation (RMSEA) less than 0.08 (MacCallum et al., 1996) and standardized root mean squared residual (SRMR) less than 0.08 (Hu & Bentler, 1999).

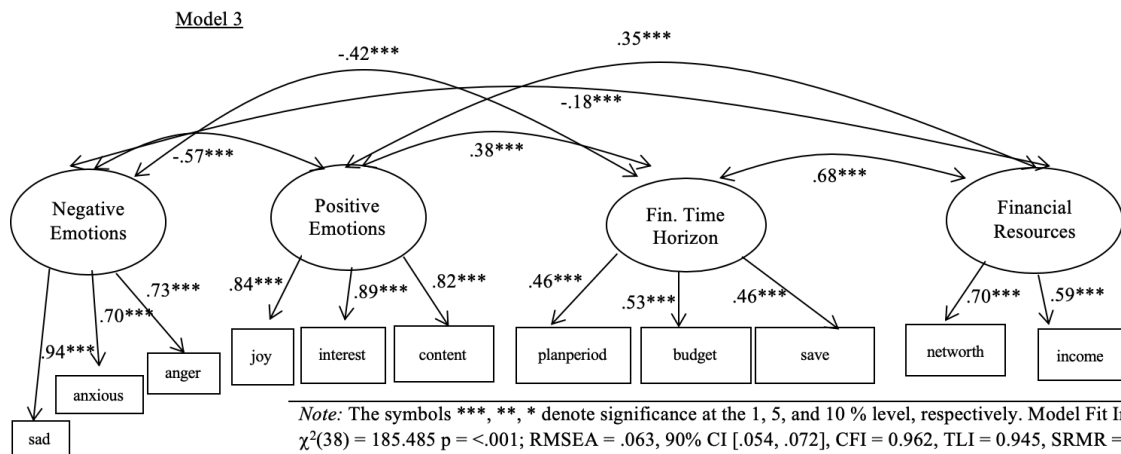
Figure 4.5 Confirmatory Factor Analysis for Measurement Model



Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(17) = 36.993$ $p = .003$; RMSEA = .034, 90% CI [.019, .050], CFI = 0.991, TLI = 0.985, SRMR = 0.022.



Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(17) = 99.255$ $p < .001$; RMSEA = .070, 90% CI [.057, .083], CFI = 0.955, TLI = 0.925, SRMR = 0.045.



Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(38) = 185.485$ $p < .001$; RMSEA = .063, 90% CI [.054, .072], CFI = 0.962, TLI = 0.945, SRMR = 0.044.

Table 4.8 Correlations for CFA and SEM Analyses

Observed Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. joy	1.00	-	-	-	-	-	-	-	-	-	-	-
2. interest	0.76	1.00	-	-	-	-	-	-	-	-	-	-
3. content	0.74	0.72	1.00	-	-	-	-	-	-	-	-	-
4. sad	-0.45	-0.49	-0.47	1.00	-	-	-	-	-	-	-	-
5. anxious	-0.35	-0.39	-0.38	0.64	1.00	-	-	-	-	-	-	-
6. anger	-0.22	-0.27	-0.25	0.69	0.54	1.00	-	-	-	-	-	-
7. planperiod	0.16	0.15	0.14	-0.15	-0.14	-0.11	1.00	-	-	-	-	-
8. budget	0.17	0.15	0.14	-0.25	-0.25	-0.21	0.21	1.00	-	-	-	-
9. save	0.15	0.16	0.17	-0.13	-0.16	-0.10	0.22	0.25	1.00	-	-	-
10. income	0.23	0.21	0.28	-0.17	-0.17	-0.06	0.26	0.20	0.22	1.00	-	-
11. networth	0.13	0.13	0.15	-0.04	-0.11	0.10	0.18	0.24	0.18	0.42	1.00	-
12. age	-0.01	0.06	0.07	-0.19	-0.19	-0.19	0.02	0.03	-0.08	0.00	0.14	1.00
13. education	0.06	0.05	0.09	0.06	0.04	0.14	0.10	0.03	0.09	0.23	0.25	-0.03
14. famsize	0.11	0.09	0.17	-0.04	0.04	0.08	0.01	-0.11	-0.02	0.24	0.04	-0.00
15. male	0.02	0.02	0.01	-0.05	-0.12	0.05	-0.01	0.08	-0.01	0.02	0.12	-0.12
16. married	0.17	0.15	0.23	-0.08	0.02	0.07	0.08	-0.03	0.03	0.33	0.17	0.14
17. white	-0.04	0.01	0.02	-0.16	-0.05	-0.19	0.04	0.03	0.01	-0.00	-0.06	0.21
	13	14	15	16	17							
13. education	1.00											
14. famsize	-0.05	1.00										
15. male	0.06	-0.19	1.00									
16. married	0.05	0.50	-0.10	1.00								
17. white	-0.14	0.06	-0.11	-0.07	1.00							

Note. Variables were standardized to have a mean of 0 and a standard deviation of 1. CFA = confirmatory factor analysis. N = 993; M = 0; SD = 1.

Structural Model Results

Full structural model fit scores (Table 4.9) show acceptable fit for all three models.

Results of these SEM models are on Figure 4.6. Results from model one show that positive emotions are positively associated with financial time horizon (+0.39 β), financial time horizon is positively associated with financial resources (+0.63 β), and positive emotions are not associated with financial resources (0.00 β). Given that essay one demonstrated that there is often a positive relationship between positive emotions and financial resources, these results suggest an indirect effect between positive emotions and financial resources through the mechanism of financial time horizon. This indirect effect of positive emotions on financial

resources through the mechanism of financial time horizon is confirmed as significant in Table 4.10 (a bootstrap approach with 2,000 iterations was used that produced a statistically significant standardized beta of 0.25 and a 95% confidence interval that did not include zero (0.17, 0.31)).

Results from model two show that negative emotions are negatively associated with financial time horizon (-0.45β), financial time horizon is positively associated with financial resources ($+0.67 \beta$), and negative emotions are slightly associated with financial resources ($+0.11 \beta$). Given that essay one demonstrated that there is often a negative relationship between negative emotions and financial resources, these results suggest an indirect effect between negative emotions and financial resources through the mechanism of financial time horizon. This indirect effect of negative emotions on financial resources through the mechanism of financial time horizon is confirmed as significant in Table 4.10 (a bootstrap approach with 2,000 iterations was used that produced a statistically significant standardized beta of -0.30 and a 95% confidence interval that did not include zero ($-0.39, -0.22$)).

Results from model three show that positive emotions are positively associated with financial time horizon (0.19β) and negative emotions are negatively associated with financial time horizon (-0.33β), financial time horizon is positively associated with financial resources ($+0.66$), positive emotions are not associated with financial resources ($+0.07 \beta$), and negative emotions are positively associated with financial resources ($+0.14 \beta$). Given that essay one demonstrated that there is often a positive (negative) relationship between positive (negative) emotions and financial resources, these results suggest an indirect effect between positive (negative) emotions and financial resources through the mechanism of financial time horizon. This indirect effect is confirmed as significant in Table 4.10 (a bootstrap approach with 2,000 iterations was used that produced a statistically significant standardized beta of 0.13 for the

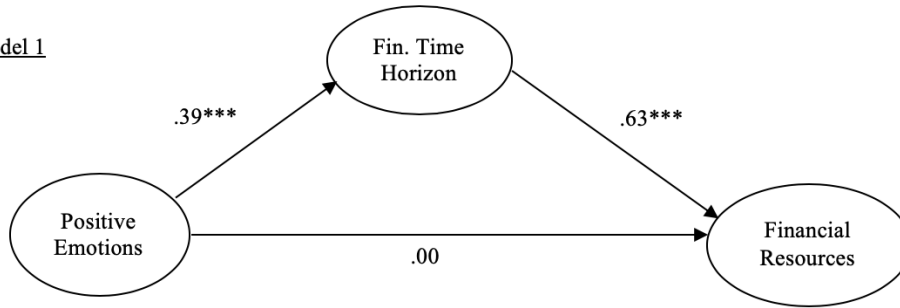
indirect effect of positive emotions on financial resources through financial time horizon and - 0.30 for the indirect effect of negative emotions on financial resources through financial time horizon. Both 95% confidence intervals for these indirect effects did not include zero).

Table 4.9 Fit Indices for Full Structural Equation Model

Index	Model 1 Value (PosEm) Model 2 Value (NegEm) Model 3 Value (AllEm)	Indication of Fit	Suggested Cut Off Values
χ^2	106.342 (p<.001) 236.665 (p<.001) 338.598 (p<.001)	Poor fit Poor fit Poor fit	Non-significant. Sensitive to sample size. Models with > 400 cases will mostly result in significant model chi-square <i>exact fit</i> test (Kenny, 2011).
RMSEA	0.040 0.064 0.057	Good fit Mediocre fit Mediocre fit	Excellent fit < .01, good fit < .05, mediocre fit < .08 (MacCallum et al., 1996).
90% Confidence Interval for RMSEA	(.031, .049) (.056, .072) (.050, .063)	Marginally good fit Marginally good fit Marginally good fit	Lower bound close to zero. Upper bound < .05 to pass not-close-fit test. Upper bound <.10 to pass poor-fit test (Kline, 2011).
CFI	0.974 0.913 0.940	Good fit Marginal fit Marginal fit	< .90 poor fit, .90 - .95 marginal, > .95 good (Kenny, 2011).
TLI	0.962 0.874 0.918	Good fit Poor fit Marginal fit	< .90 poor fit, .90 - .95 marginal, > .95 good (Kenny, 2011).
SRMR	0.033 0.044 0.043	Good fit Good fit Good fit	< .08 good fit (Hu & Bentler, 1999)

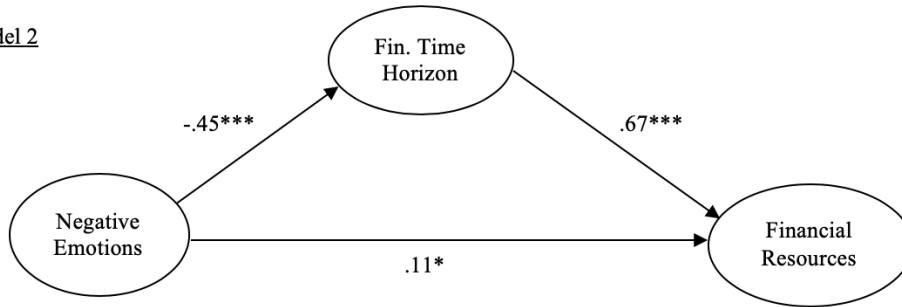
Figure 4.6 Structural Indirect Effect Models

Model 1



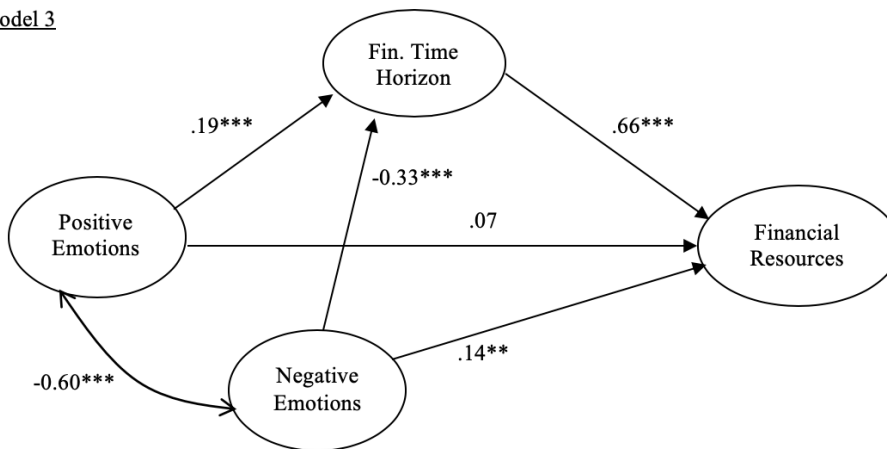
Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(41) = 106.342$ $p < .001$; RMSEA = .040, 90% CI [.031, .049], CFI = 0.974, TLI = 0.962, SRMR = 0.033. The structural model was estimated with indicators from the measurement model for the latent variables (see Figure 4.5), and controls for age, age-squared, education, family size, gender, marital status, and race. Insignificant control paths were dropped (Little, 2013).

Model 2



Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(47) = 236.665$ $p < .001$; RMSEA = .064, 90% CI [.056, .072], CFI = 0.913, TLI = 0.874, SRMR = 0.044. The structural model was estimated with indicators from the measurement model for the latent variables (see Figure 4.5), and controls for age, age-squared, education, family size, gender, marital status, and race. Insignificant control paths were dropped (Little, 2013).

Model 3



Note: The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively. Model Fit Indices: $\chi^2(102) = 338.598$ $p < .001$; RMSEA = .057, 90% CI [.050, .063], CFI = 0.940, TLI = 0.918, SRMR = 0.043. The structural model was estimated with indicators from the measurement model for the latent variables (see Figure 4.5), and controls for age, age-squared, education, family size, gender, marital status, and race. Insignificant control paths were dropped (Little, 2013).

Table 4.10 Results from Full Structural Equation Model (N=993)

R ²	Outcome	Predictor	Direct relations			Indirect relations through Time Horizon			
			β (Std.)	SE	95% CI	β (Std.)	SE	95% CI	RID
0.47	<u>MODEL 1</u>								
0.68	Fin. Resources	Time Horizon	0.63***	0.06	(0.51, 0.75)	0.24***	0.04	(0.16, 0.32)	145.87
		Pos. Emotions	0.00	0.05	(-0.10, 0.10)				
		Education	0.25***	0.04	(0.17, 0.32)				
		Famsize	0.20***	0.04	(0.12, 0.29)				
		Male	0.11***	0.03	(0.04, 0.17)				
		Married	0.29***	0.04	(0.21, 0.36)				
0.18	Time Horizon	Pos. Emotions	0.39***	0.05	(0.30, 0.48)				
		Education	0.11**	0.04	(0.03, 0.20)				
		Famsize	-0.13***	0.05	(-0.22, -0.04)				
0.05	Pos. Emotions	Education	0.06*	0.03	(-0.00, 0.13)				
		Married	0.20***	0.03	(0.14, 0.27)				
0.48	<u>MODEL 2</u>								
0.68	Fin. Resources	Time Horizon	0.67***	0.07	(0.54, 0.81)	-0.30***	0.05	(-0.40, -0.21)	2.86
		Neg. Emotions	0.11*	0.06	(-0.01, 0.22)				
		Education	0.24***	0.04	(0.15, 0.32)				
		Famsize	0.22***	0.05	(0.13, 0.31)				
		Male	0.11***	0.03	(0.04, 0.17)				
		Married	0.27***	0.04	(0.19, 0.36)				
0.23	Time Horizon	Neg. Emotions	-0.45***	0.05	(-0.54, -0.36)				
		Education	0.17**	0.04	(0.08, 0.26)				
		Famsize	-0.12***	0.05	(-0.22, -0.02)				
		Married	0.08*	0.05	(-0.01, 0.18)				
0.04	Neg. Emotions	Education	0.07**	0.03	(0.00, 0.13)				
		Male (Female)	0.20***	0.03	(0.14, 0.27)				
		Male (Other)	-0.18***	0.03	(-0.24, -0.11)				
0.51	<u>MODEL 3</u>								
0.69	Fin. Resources	Time Horizon	0.66***	0.07	(0.53, 0.79)	0.13***	0.04	(0.05, 0.21)	1.74
		Pos. Emotions	0.07	0.06	(-0.04, 0.18)				
		Neg. Emotions	0.14**	0.06	(0.02, 0.26)				
		Education	0.23***	0.04	(0.15, 0.31)				
		Famsize	0.20***	0.04	(0.12, 0.29)				
		Male	0.11***	0.03	(0.04, 0.17)				
		Married	0.29***	0.04	(0.21, 0.36)				
		Pos. Emotions	0.19***	0.06	(0.07, 0.31)				
	Time Horizon	Neg. Emotions	-0.33***	0.06	(0.06, 0.23)				
		Education	0.15**	0.04	(0.06, 0.23)				
		Famsize	-0.11**	0.04	(-0.20, -0.03)				
		Married	0.15***	0.03	(0.09, 0.22)				
0.04	Pos. Emotions	Education	0.07**	0.03	(0.01, 0.14)				
		Famsize	0.06*	0.03	(-0.00, 0.13)				
0.04	Neg. Emotions	Married	0.15***	0.03	(0.09, 0.22)				
		Education	0.06*	0.03	(-0.01, 0.12)				
		Male (Female)	-0.05*	0.03	(-0.10, 0.01)				
		White (Other)	-0.18***	0.03	(-0.23, -0.12)				

Note: RID, ratio of indirect to direct effect, CI, confidence interval. The symbols ***, **, * denote significance at the 1, 5, and 10 % level, respectively.

Discussion

This essay explored whether emotions indirectly impact financial resources through the mechanism of financial time horizon. The broaden and build theory (Fredrickson, 1998) provided the theoretical framework for this research question. The BBT predicts that positive emotions should result in improved well-being (including financial well-being) through the building of skills and resources (Fredrickson, 1998).

Looking at the model one results in Table 4.10, a statistically significant positive indirect effect between positive emotions and financial resources through the mechanism of financial time horizon (+0.24 standardized β) provides evidence in support of hypothesis 3a. This indirect effect is especially strong since the direct effect between positive emotions and financial resources is zero. The strength of this indirect effect (i.e., mediating effect), as measured using the RID ratio (indirect effect/direct effect), is 146. This strong indirect effect helps to explain the relationship between emotions and financial resources. For example, happiness has been shown to be associated with an individual who has an expanded time horizon (Guyen, 2012; Ifcher & Zarghamee, 2011), this association then acts as a mechanism that indirectly impacts financial resources since financial time horizon is positively associated with incomes (Bernheim et al., 2001; Dow & Jin, 2013; Harris & Laibson, 2002; Laibson, 1997; Webley & Nyhus, 2008).

Similar results were found for models two and three. Looking at the model two results, a statistically significant negative indirect effect between negative emotions and financial resources through the mechanism of financial time horizon (-0.30 standardized β) provides evidence in support of hypothesis 3b. This indirect effect is especially strong since the direct

effect between negative emotions and financial resources is positive (+0.11 β), whereas, the original correlation between the two variables is negative (-0.17). This remaining positive direct relationship between negative emotions and financial resources may have to do with the positive relationship between net worth and anger (correlation of +0.10). Anger, unlike sadness and anxiety, may be considered a different category of negative emotion. Anger has been shown to be an “activating emotion” that triggers an individual towards specific action tendencies (Lerner & Tiedens, 2006). Activating emotions may create positive financial behaviors (Gambetti & Giusberti, 2012).

Finally, results from model three were consistent from the results from models one and two, providing further evidence in support of hypotheses 3a and 3b. The indirect effect of time horizon for positive and negative emotions on financial resources is +0.13 and -0.22, respectively. Both of these indirect effects should be considered strong effects given the direct effect between positive emotions and financial resources is zero and the direct effect between negative emotions and financial resources is positive (+0.14).

Limitations

The questions that were used to measure financial time horizon required participants to self-report their ability to set long-term financial goals, their budget time period, and whether they are engaged in a saving behavior. The self-reported assessments by the individual may not truly represent their actual financial time horizon, introducing issues of construct validity into this study. And, as mentioned before, it is also not likely that these measures of financial time horizon used in this study would change after a seven-day PPI.

The questions that were used to measure emotions required participants to self-report how often they felt certain emotions. This self-reported assessment may not truly represent the individuals true emotional experience, introducing issues of construct validity into this study. In addition, the measurement of income and net worth have been informed over a long period of time, whereas, the measurement of the emotion variables will likely not match this same time period of reference. This limitation was dealt with by asking the participants, “in general” how often do they feel certain emotions, thus, creating more stability in the emotion variables.

A convenience MTurk sample was used, which may not be fully representative to the U.S. adult population (Mortensen et al., 2018). However, certain studies have shown that MTurk convenience samples are fairly representative (Burnham et al., 2018; Huff & Tingley, 2015). In a recent meta-analytic review of three separate MTurk samples, Burnham et al. (2018) found that demographic characteristics of workers closely approximated the general US population. However, the study cautioned that there could be small differences when studying personality or religion.

Finally, two events occurred during the Amazon MTurk sampling period that could potentially influence how the participants responded to their surveys. The first event was a U.S. stock correction (the value of the S&P 500 Index declined 15% during December 2018). The second event was the holiday shopping season. Both of these events would likely impact individuals’ emotions in a non-systematic way (i.e., randomly), which would limit the influence of these events on the results of the study.

Implications and Conclusion

Essay three provides evidence that financial time horizon acts as a mechanism that helps to explain the relationship between emotions and financial resources. As the relationship between emotions and financial resources is better explained and modeled, the development of effective intervention tools become possible. PPIs have already been successfully used to improve health, school satisfaction, workplace satisfaction, and overall wellbeing outcomes (Lyubomirsky et al., 2005; Sin & Lyubomirsky, 2009) while PPIs designed to improve financial outcomes are rare (Asebedo et al., 2020). This essay hopes to encourage the development of more financial PPIs that are meant to improve the financial resources of households. These financial PPIs could use the knowledge that financial time horizon is an important mechanism (or mediator) between emotions and financial resources in order to help strengthen the relationship between emotions and financial resources indirectly. For example, a best possible selves (BPS) meaning PPI could be used where participants are asked to write about a future version of themselves who is their best possible self (King, 2001). In addition, a “Life Summary” PPI could be used that asks participants to outline life goals, and, subsequently, ways that they are drawing closer, or farther away from, those goals (Parks & Biswas-Diener, 2013). For both of these PPIs, the combination of explicitly discussing an individual’s time horizon while generating positive emotions through the exercises of the intervention will likely create an effective PPI that will impact financial resources. In addition, the BPS and Life Summary PPIs could be combined to create a packaged PPI, which has been shown to be more effective than just one type of treatment (Parks & Biswas-Diener, 2013).

The development of an effective financial PPI has implications for policymakers, financial planners, financial counselors/therapists, and researchers. For policymakers, policies

could be developed that use financial PPIs to nudge people towards positive emotional states, leading to positive financial outcomes, such as higher savings behavior (Fisher & Montalto, 2010). For financial planners, the use of a financial PPI could help alleviate the tension between planner and client when the planner often asks the client to sacrifice their present needs for their future wants through the development of a comprehensive financial plan. As the positive emotions of their clients are bolstered, financial professionals will likely experience less friction as their clients develop a longer financial time horizon. Financial counselors and financial therapists, who seek to improve the financial outcomes of their clients through understanding how they emotionally relate to money (Klontz et al., 2016, p. 1), could become leaders in both the development and implementation of financial PPIs. Finally, this essay provides practical implications for researchers by helping provide theoretical and empirical justification for why emotions are associated with financial outcomes through the mechanism of financial time horizon.

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Chapter 5 - Conclusion

The purpose of this dissertation was to explore the relationship between emotions and financial resources. If emotions add to the explanatory power of predicting financial resources, then policymakers, financial professionals, and researchers should all treat emotional states as important inputs when trying to predict the financial resources of their community, clients, and participants, respectively. This purpose was accomplished through three separate essays. Each essay utilized data from an Amazon MTurk convenience sample of 993 U.S. adults. The broaden and build theory (BBT) served as the primary theoretical framework for this dissertation. The BBT predicts that positive emotions should result in improved well-being through the building of skills and resources (Fredrickson, 1998). The expression of positive emotions has been shown to build personal resources in the form of improved cognitive skill building (Isen et al., 1987), closer social connectedness (Hutcherson et al., 2008), and expanded time horizon (Cohn & Fredrickson, 2006; Guven, 2012; Ifcher & Zarghamee, 2011). In addition, the BBT predicts that negative emotions tend to narrow and contract an individual, which would lead to lower resources and diminished well-being (Fredrickson, 1998).

Essay One

Essay one explored whether emotions were associated with financial resources after controlling for traditional demographic predictors. Positive and negative emotions were found to be associated with financial resources. Contentment, love, sadness, anxiety, anger, and loneliness were all found to be significant when modeling financial resources. Of the four models used, the three models that included emotion variables (models 2-4) did a better job of explaining the variation of financial resources than the model only using demographic variables (model one).

These results provide evidence that knowing the emotional state of individuals will help to better predict their financial situation. Quite surprisingly, being angry or lonely was found to be associated with higher household net worth, suggesting that not all negative emotions should be considered something to eliminate when trying to improve the financial situation of a household.

Essay Two

Since the BBT theory presumes that the experience of positive emotions causes a building of resources and skills, including an expanded time horizon (Cohn & Fredrickson, 2006), essay two explored whether emotions are associated with financial time horizon after controlling for traditional demographic variables. As predicted, positive emotions of joy, interest, and contentment, as a latent variable, were found to be positively associated with financial time horizon. As predicted, negative emotions of sadness, anxiety, and anger, as a latent variable, were found to be negatively associated with financial time horizon. Of the four models used, the three models that included emotion variables (models two-four) did a better job of explaining the variation of financial time horizon than the model only using demographic variables (model one). These results provide evidence that knowing the emotional state of individuals will help to better predict their financial time horizon. Finally, a gratitude PPI was tested to see if it strengthened the relationship between financial time horizon and emotions. No evidence was found that a gratitude PPI could strengthen the relationship between emotions and financial time horizon.

Essay Three

This essay explored whether emotions indirectly impact financial resources through the mechanism of financial time horizon. As predicted, financial time horizon did serve as a mechanism for helping to explain the relationship between emotions and financial resources. In

all three structural models the indirect effect was significantly larger than the direct effect, which helps affirm that financial time horizon is a significant mechanism when explaining the relationship between emotions and financial resources.

Implications

This dissertation hopes to add to the growing body of studies that are dedicated to providing evidence for the relationship between emotions and financial outcomes (Asebedo et al., 2020; Asebedo & Seay, 2015; Guven, 2012; Hill et al., 2016). If emotions add to the explanatory power of predicting financial resources, then policymakers, financial professionals, and researchers should all treat emotional states as important inputs when trying to achieve improved financial resources for their community, clients, and participants, respectively. Influencing an individual's emotional state may be an important piece of the puzzle for increasing a household's income or net worth level.

This dissertation provided evidence that emotions are associated with both financial resources and financial time horizon and do add explanatory power when predicting a household's financial time horizon and financial resources. In addition, results provide evidence that financial time horizon acts a mechanism that indirectly explains this relationship between emotions and financial resources. Future financial positive psychology interventions should use financial time horizon as an important mechanism that may help strengthen the relationship between emotions and financial resources indirectly.

The development of an effective financial PPI has implications for policymakers, financial planners, financial counselors/therapists, and researchers. For policymakers, policies could be developed that use financial PPIs to nudge people towards positive emotional states,

leading to positive financial outcomes, such as higher savings behavior (Fisher & Montalto, 2010). For financial planners, the use of a financial PPI could help alleviate the tension between planner and client when the planner often asks the client to sacrifice their present needs for their future wants through the development of a comprehensive financial plan. As the positive emotions of their clients are bolstered, financial professionals will likely experience less friction as their clients develop a longer financial time horizon. Financial counselors and financial therapists, who seek to improve the financial outcomes of their clients through understanding how they emotionally relate to money (Klontz et al., 2016, p. 1), would most effectively implement a financial PPI for their clients given their training in conducting emotion-based interventions. Finally, this essay provides practical implications for researchers by helping provide theoretical and empirical justification for why emotions are associated with financial outcomes through the mechanism of financial time horizon.

Future Direction

Positive psychology interventions (PPIs) have successfully been used to improve health, school satisfaction, workplace satisfaction, and overall wellbeing outcomes (Lyubomirsky et al., 2005; Sin & Lyubomirsky, 2009). PPIs designed to improve financial outcomes are rare (Asebedo et al., 2020). This essay hopes to encourage the development of more financial PPIs that are meant to improve the financial resources of households. These financial PPIs could use the knowledge that financial time horizon is an important mechanism (or mediator) between emotions and financial resources in order to develop certain PPIs that center around a person's time horizon. The gratitude PPI that was tested in essay two was not shown to be effective in strengthening the relationship between financial time horizon and emotions. Future studies need

develop a PPI that is more likely to strengthen the relationship between financial time horizon and emotions by: (a) measuring financial time horizon using a variable that is more malleable to change through experimental interventions, such as a participant's internal discount rate (Neef et al., 2001; Reed & Martens, 2011) and (b) using a packaged PPI (includes more than one type of intervention) that asks participants to engage their time orientation. For example, a best possible selves (BPS) meaning PPI could be used where participants are asked to write about a future version of themselves who is their best possible self (King, 2001). In addition, a "Life Summary" PPI could be used that asks participants to outline life goals, and, subsequently, ways that they are drawing closer, or farther away from, those goals (Parks & Biswas-Diener, 2013). For both of these PPIs, the combination of explicitly discussing an individual's time horizon while generating positive emotions through the exercises of the intervention will likely create an effective PPI that will impact financial resources. In addition, the BPS and Life Summary PPIs could be combined to create a packaged PPI, which has been shown to be more effective than just one type of treatment (Parks & Biswas-Diener, 2013).

Finally, future research should improve upon the measurement of emotional states of participants. The questions that were used to measure emotions required participants to self-report how often they felt certain emotions. This self-reported assessment may not truly represent the individuals true emotional experience. Future studies should measure the emotions of participants through biological (e.g., saliva) and neurological (e.g., fMRI) methods. These methods would likely measure the actual emotional experience of clients, which would improve the validity of any results exploring the relationship between emotions and financial resources.

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Appendix A – Correlation Analysis of Emotion Variables (Chp. 3)

Table 0.1 Correlation Analysis of Emotion Variables

Initial Survey (N=993)	Post-7 Survey (N=508)	Post-7: Intervention Group (N=243)	Post-7: Control Group (N=263)
joy	0.8190	0.8293	0.8181
interest	0.7806	0.7761	0.7460
content	0.8020	0.8582	0.7732
sad	0.7929	0.8482	0.7422
anxious	0.7919	0.7630	0.7990
anger	0.7147	0.6421	0.7636