

2021

Investigating Financial Biases that Can Increase Impact on Paying Bills and Saving

Lucy M. Delgadillo Ph.D.
Utah State University

Follow this and additional works at: <https://newprairiepress.org/jft>

 Part of the [Counseling Commons](#), [Counseling Psychology Commons](#), [Family, Life Course, and Society Commons](#), [Home Economics Commons](#), [Social Psychology Commons](#), and the [Social Work Commons](#)



This work is licensed under a [Creative Commons Attribution-Noncommercial 4.0 License](#)

Recommended Citation

Delgadillo, L. M. (2021). Investigating Financial Biases that Can Increase Impact on Paying Bills and Saving. *Journal of Financial Therapy*, 12 (2) 7. <https://doi.org/10.4148/1944-9771.1267>

This Article is brought to you for free and open access by New Prairie Press. It has been accepted for inclusion in Journal of Financial Therapy by an authorized administrator of New Prairie Press. For more information, please contact cads@k-state.edu.

Investigating Financial Biases that Can Increase Impact on Paying Bills and Saving

Cover Page Footnote

This paper was supported by Utah Agricultural Experiment Station, Grant UTAO-1355.

Investigating Financial Biases That Can Increase Impact on Paying Bills and Saving

Lucy M. Delgadillo, Ph.D.
Utah State University

This article explores financial biases and their relation to financial management behaviors. Using cognitive, evolutionary psychology, and behavioral finance theories, this study suggests that biases can be intentionally used to our benefit. The study shows statistically significant associations between some biases and financial management practices such as paying bills on time and saving regularly in the surveyed sample. The study provides insights into intentionally using financial biases to increase impact and success by helping individuals commit to the best course of action or choose the least costly financial alternative.

Keywords: behavioral finance; financial biases; saving; spending plan

INTRODUCTION

Most research on financial biases has explored the relationship between biases and investing behaviors of private individuals and financial institutions (Filbeck et al., 2017; Sahi, 2016). In some cases, these studies have demonstrated that financial biases could be detrimental to investing (Bailey et al., 2011; Baker & Ricciardi, 2015). However, the association between financial biases and basic financial management practices (the necessary steps before investing) has received little attention.

This study assumes that all humans face financial biases in their decision-making process. This assumption is supported by behavioral economic theory, which claims that humans do not behave rationally. Humans have limited time and brainpower (bounded rationality) to process information (Thaler, 2015). Furthermore, behavioral economic and cognitive psychology theories assume that errors and biases are wired into our brains. Its appeal can explain much, if not all, of our behavior to internal psychological mechanisms (Evans, 2010). Some scholars in evolutionary psychology even claim that biases are necessary for survival (Haselton et al., 2009). But again, it is unknown if this is also the case for essential finances.

This paper was supported by Utah Agricultural Experiment Station, Grant UTAO-1355.

Financial biases ingrained in the decision-making process do not mean that humans are irrational (Kahneman, 2011). Instead, it means that humans are susceptible to cognitive shortcuts and emotional tendencies when forming beliefs and making financial choices (Elliehausen, 2018; Tversky & Kahneman, 1974). Humans do not have perfect information. Even if they did, they still use heuristics—or shortcuts—due to limited mental energy when considering all possible variables (Altman, 2008).

This study explores questions based on empirical observations of decision-making processes in a financial counseling clinic that mainly serve low-income clients. Efforts in the behavioral finance field have focused on studying the relationship between financial biases and investor behaviors, leaving a financial literacy gap on the relationship between biases and basic financial practices. This paper has taken the first step to fill that gap. The contribution of this study to the economic literature is twofold. The first contribution is to meet the knowledge gap by presenting empirical results on how financial biases are associated with paying bills and saving. The second contribution is to provide insights into how financial educators, counselors, coaches, advisors, planners, and therapists can intentionally use economic biases to increase impact and success by helping clients and families they serve choose their best course of action. Three theories of cognitive biases, namely, prospect theory, dual-process theory, and error management theory, will inform the intentional application of biases in specific financial management practices.

Within this context, this paper has the following objectives: (a) identify what financial biases exist in the surveyed sample, (b) empirically describe the association among biases and between financial biases and basic financial practices (e.g., paying bills, saving), and (c) informed by behavioral finance and theories of cognitive biases, provide insights on how to address biases intentionally with clients. The primary audience for this paper is professionals in the financial field, including financial counselors, educators, coaches, advisors, and financial and mental health therapists collaborating directly with clients or patients in formal and nonformal settings. The findings will help professionals understand the role of biases in paying bills and increasing savings and how to use biases to create positive outcomes or correct tendencies that may preclude their clientele from achieving financial health.

LITERATURE REVIEW

Financial Biases and Financial Practices

The word *bias* has its origin circa the mid-16th century, and it comes from the French *biais*, perhaps based on the Greek word *epikarsios*, which means *oblique* (Macmillan Dictionary, n.d.). An oblique line is neither horizontal nor vertical. If something is *oblique*, it has a slanting position or direction. In figurative use, *bias* means a *preference* or an *inclination* for something, mostly a choice, that inhibits impartial judgment.

According to Pompian (2012), behavioral biases are systematic errors due to faulty thinking or emotional factors. There are cognitive and emotional biases. Cognitive biases include belief perseverance and information processing biases. Belief perseverance biases

make persons hold on to original beliefs, react selectively to new information, or base conclusions on opinion rather than validity (Evans et al., 1983). Information processing biases stem from basic information processing, memory errors, and faulty reasoning.

Emotional biases arise from impulse or intuition and may be influenced by feelings to avoid pain or seek pleasure. Emotional biases are deeply rooted in personal experiences that influence decision-making (Baker et al., 2019). Some researchers believe that emotional biases are usually ingrained in investors' psychology and are generally more challenging to overcome than cognitive biases (Pompian, 2012). However, emotional biases are not necessarily errors. For example, investors' conservatism bias may help them make a more protective and suitable decision for themselves (e.g., become more conservative in their investment portfolio as they approach retirement).

Thaler (2015) claims that cognitive errors and biases are systemic and predictable in our daily lives and, therefore, impact our financial decisions. Financial biases are not isolated but are context and culture-bound (Van Boven et al., 2000). Altman (2008) indicated that the environment in which individuals make financial decisions is always less than ideal and complicated; e.g., it is easier to decide between a negative and a positive economic choice than between two adverse financial outcomes.

There are hundreds of behavioral biases, but this study is limited to ten common biases that professionals in the financial field are likely to encounter regularly (Pompian, 2012). The following section includes the definition of each bias and hypothetical relationships between paying bills and saving. The researcher cannot produce expected directional hypotheses between biases and the financial practices being investigated in this study because research on financial biases and paying bills on time and saving is very sparse. Hence, the extant literature on biases and investing behavior provides the foundation to inform this section.

Anchoring: When asked to estimate a value with unknown magnitude, individuals generally begin by envisioning an initial default number - an anchor- which they then adjust up and down to reflect subsequent information and analysis (Pompian, 2012). The anchoring effect serves as a heuristic when making judgments under uncertainty (Tversky & Kahneman, 1974). Kahneman (2011) described that anchoring effects are common in decisions individuals make about money, such as choosing how much money they are willing to pay or contribute to a cause. Anchors would work as reference points to estimate how much to pay in bills or contribute to savings.

Mental Accounting: Mental accounting occurs when money—physically or mentally—is put into separate categories even though money is fungible (Tversky & Kahneman, 1974). Matsumoto et al. (2012) claimed that individuals create mental compartments for dealing with monetary operations. Mental compartments help pay bills and set aside money for saving.

Cognitive Dissonance: When newly acquired information conflicts with preexisting knowledge or beliefs, individuals often experience mental discomfort (Pompian, 2012).

Investigating Financial Biases That Can Increase Impact on Paying Bills and Saving

Festinger (1957) argued that the struggle to harmonize new information with a previous action might cause cognitive dissonance. When cognitions are dissonant, an individual seeks to reduce that dissonance by changing the behavior or environment or adding a new mental element. For example, in the saving arena, cognitive dissonance is a bias that could create motivation to save because by saving—even if a small amount—the individual could avoid the stressful feeling (mental discomfort) of not having any reserves in an emergency. An individual may experience a similar situation with paying bills on time. Cognitive dissonance may increase motivation to pay bills on time, decrease stress, and increase tranquility.

Conservatism: Conservatism tends to maintain prior views or forecasts by inadequately incorporating new information that arises (Pompian, 2012). Conservatism as an investing strategy prioritizes the preservation of capital. In this sense, conservatism might help with savings.

Hindsight: Hindsight is one of the most frequently cited cognitive biases. Hindsight occurs when we see past events as predictable and reasonable to expect (Pompian, 2012). Roese and Vohs (2012) have studied different levels of hindsight bias. One of those levels is the foreseeability level, which is inherently subjective, centering on beliefs about one's knowledge and ability (e.g., *I knew it all along*). In this sense, hindsight bias may help with paying bills on time and saving regularly (e.g., *I knew if I did not pay my bills on time, I would pay late fees; or I knew if I did not have any savings, I would have to use credit*).

Self-attribution: Mishra and Matilda (2015) have defined self-attribution as tendencies of individuals to ascribe their success to innate skills and talents while often blaming failures on outside influences, such as bad luck. The authors claimed that an investor susceptible to the self-attribution bias would attribute the rise in the value of an investment to their ability. Still, if the investment comes down in price, it would be attributed to market forces. They explained that self-attribution bias has both a cognitive and a motivational component. For example, self-attribution bias might help pay bills and save if individuals are doing well in both activities because that would help them maintain their self-esteem and feel good about themselves.

Overconfidence: Pompian (2012) defined overconfidence as an unwarranted faith in intuitive reasoning, judgment, and cognitive ability. There are two different views on the role of overconfidence and financial practices, including investing. One thought sustains that a client may underestimate risk and overtrading (Pompian, 2012), which could be detrimental. The other view maintains that believing one is better than others is a self-fulfilling prophecy. In this regard, Kyle and Wang (1997) have said that overconfidence acts as a reassurance to act assertively. Therefore, overconfidence bias might help with paying bills and savings.

Status quo: Thaler (2015) defined status quo as an emotional bias and inclination to prefer things as they are instead of making a change. Kahneman (2011) claimed that individuals like the status quo to avoid losses resulting from change or when faced with conflicting choice alternatives. In the lack of conflicting options, individuals may prefer to continue paying their bills on time and adding to savings.

Regret Aversion: Pompian (2012) indicated that clients suffering from regret aversion bias hesitate most at moments that merit aggressive behavior. Regret aversion seeks to avoid emotional pain associated with poor decision-making. Regret averse clients avoid distress arising from errors of commission and omission. This focal presumption may suggest that regret-averse clients would keep saving and paying bills on time.

Endowment Effect: Individuals value assets or goods more when they have possession or right to them than when they do not (Pompian, 2012). Endowment effect experiments have revealed that individuals tend to stick with what they have (Thaler, 2015). Individuals would value savings more when they already have money in the bank.

Theories on Cognitive Biases

Three psychology theories provide the conceptual framework for this study: prospect theory, dual processing theory, and error management theory. These exploratory theories enhance the understanding of decision-making processes in everyday life. The first, prospect theory, is a descriptive and empirical theory of behavioral economics and behavioral finance developed by Daniel Kahneman and Amos Tversky in 1979. The second, dual-process theory, describes a dual process in decision making. Today, the psychology of thinking calls this idea "the dual-process theory of thought" (Evans, 2010) or fast vs. slow thinking systems (Kahneman, 2011). Finally, error management theory is an extensive theory of perception and cognition biases created by Martie Haselton and David Buss (2000).

Prospect theory. One critical tenet in prospect theory is creating subjective reference points or anchors in decision making (Kahneman, 2011). Depending on the reference point selected, an outcome is perceived as positive or negative, relying on context. Prospect theory claims biases are context dependent (Thaler, 2015). The context allows for adjustments in risk attitude depending on probabilities within that context; for instance, one can be a risk-taker in one financial context and be risk-averse in another. Prospect theory explains several behavioral biases, including anchoring, regret aversion, endowment effect, and hindsight.

Dual-process theory. This theory of human cognition postulates that reasoning and decision-making are functions of both an intuitive, experiential, affective system called System 1, and an analytical, deliberative processing system called System 2 (Evans & Stanovich, 2013, Kahneman, 2011). The two operating systems may explain how humans think and make financial decisions using heuristics and biases (Evans, 2010). Because System 1 processes execute more quickly than System 2, System 1 forms the basis of an initial, automatic response, which may or may not be altered by subsequent deliberation in System 2 (Kahneman, 2011, Thompson, 2014). System 1 always uses heuristics or shortcuts. Individuals do not evaluate financial ideas, choices, or beliefs based on what will provide the best (or optimal) financial outcome. Instead, they simplify the matter by going with what is familiar or habitual (status quo). The dual-process theory maintains that individuals cannot always avoid biases because System 2 may not recognize them (Kahneman, 2011). Thus, the dual-process theory helps explain conservatism, overconfidence, and status quo biases.

Error management theory (EMT). EMT is an extensive theory of perception and cognition biases. EMT suggests that the way humans think and make decisions using heuristics and biases is embedded in the human brain (Evans 2010, Haselton & Buss, 2000, Haselton et al., 2009). Error management training uses this theory. The objective is to encourage trainees to examine their errors and reflect on them with hindsight, understand the causes of those errors, and identify suitable strategies to avoid making them in the future (Keith & Frese, 2008). Mistakes in EMT might be the result of overconfidence.

Even though biases are natural and sometimes "flawed," many biases are more effective in creating positive outcomes than decision-making models suggest (Haselton & Buss, 2000). Furthermore, the following section describes experimental studies from evolutionary theories that have reexamined biases differently. Thus, the shift in paradigm goes from focusing on biases as flaws to describing biases as neurological paths ingrained in our brains.

A Paradigm Shift

The general tendency in behavioral finance literature that studies investing behavior assumes that financial biases—either cognitive or emotional—may result in irrational behaviors or suboptimal outcomes. In alignment with evolutionary theories, this study does not equate cognitive biases to irrational actions in the economic sense. Gigerenzer (2008) found that common heuristics linked to biases perform well in some contexts. As Betsch (2008) and Evans (2010) pointed out, heuristics and anchors used in finances result from intuition. Betsch (2008) defined *intuition* as a process of thinking where "the input is processed automatically and without conscious awareness" (p.4). March (1978) noted that irrational actions might be "very rational and intelligent for some individuals in some contexts if one digs a bit below the surface" (p. 589). After all, following intuition is more natural and somehow more pleasant than acting against it (Todd & Gigerenzer, 2012). Betsch (2008) concluded that emotions, biases, and intuition are not obstacles to decision making, but they are part of it.

Herbert Simon (1978) led the way in researching behavioral finance and decision making consistent with real human beings endowed with limited processing capacity, little memory, and real-world environmental constraints. Simon pointed out a new perspective that departed from the traditional economic model. The classical economic theory claims that individuals tend to maximize their economic utility (Altman, 2008). Simon tweaked one word in that claim, and by so doing, he changed a whole perspective in economic decision-making. He claimed that individuals do not seek to *maximize* their utility in real-world financial decisions but to *satisfy* outcomes. This simple change from *maximizing* to *satisfying* has important implications for financial education. Elliehausen (2018) found that consumers simplify and take shortcuts in financial decision-making, but those shortcuts tend to be purposive and deliberate. Satisficing is also a way of making choices when we think it is not feasible to thoroughly compare the benefits of all possible options. In essence, satisficing is a way of efficiently getting something good enough for the purpose, although this solution may not be deemed necessarily economically optimal (Bawden & Robinson, 2020).

Individuals seek satisfying outcomes to their economic reality, a reality that is different for everyone, as opposed to maximizing economic outputs. Humans do not always reference their financial choices to some external objective standards of rationality but against internal criteria, such as a subjective anchor, their confidence levels (Cummins & Nistico, 2002), their knowledge, attitude, personality, values, lifestyle, culture, family, and context (Blackwell et al., 2006). Sahi et al. (2003) claimed that all biases reveal the investor's mind's design rather than flaws of the investor's mind. Thinking of human biases as flaws may be counterproductive in counseling and educating clients.

In summary, research from cognitive sciences and behavioral economics provides a new perspective on how to see and deal with cognitive and emotional biases that can help inform practices for professionals in the field. Biases are not considered flaws by these theorists. On the contrary, they are considered essential to being human (Sahi, 2016). The current study stands on evolution theories that consider biases as neurological paths ingrained in our brains instead of flaws. In addition, the benchmarks used in behavioral finance recognize that emotional and intuitive factors are part of the complex decision-making of the evolved human brain that helps generate effective (Sahi, 2016) and satisfying choices (Simon, 1978).

METHODS

Sample Selection

This study is a quantitative, descriptive, non-experimental cross-sectional survey study. The population of interest for the study included adults where a university financial clinic is located. The primary reason to justify the interest in surveying this population—as opposed to collecting a national sample—was to understand the target audience the clinic directly serves. In addition, Blackwell et al. (2006) stated that culture plays a role in biases and behaviors. Therefore, the survey captured cultural idiosyncrasies in the subjects' responses.

To calculate a minimum sample size needed for the study, G-Power software 3.1.97 was used with the following parameters: an alpha level of 0.05, a beta power ($1 - \beta$) of 0.90, and a medium effect size for non-parametric tests. The G-power output indicated that the study needed a random sample of $n = 183$ to comply with the specified parameters.

Data Collection

An online pilot survey was created and evaluated in 2019 with about 10 participants, which provided critical feedback on the questions' validity. Upon evaluating the pilot results, the survey went from 25 to 18 items. Because biases are automatic responses to stimuli in the environment, respondents recorded the first impression that came to mind when filling out the survey. This request aimed to prevent participants from engaging in a deliberative process or providing a socially acceptable response. A national survey company received the final version of the Qualtrics survey with the request to survey about 200 female adults and 200 male adults (18-75 years old) from Utah. The sample resembled the state in terms of

racial and ethnic representation. The survey was open for four weeks, from mid-February to mid-March 2020. The final sample included 370 responses, more than double the recommended sample size yielded from G-power ($n = 183$).

There were roughly between 2.7%-5.1% of files in which participants missed questions. An analysis verified that all missing data were indeed random cases. Although there is no standard cutoff regarding an acceptable percentage of missing data in a data set, Schafer (1997) asserted that a 5% or less missing rate is inconsequential. Therefore, the data analysis did not use any imputation methods. By default, the SPSS software excludes cases listwise, which means that if a person has a missing value for any of the variables, they are excluded from the analysis.

Variable Measurement

Dependent Variables. The outcomes of interest for the analysis were paying bills on time and saving. The item used for paying bills was *I paid my bills on time every month*. The item for saving was *I add to my savings regularly*. There were four possible responses ranging from 1 = *Never*, 2 = *Sometimes*, 3 = *Most of the Time*, 4 = *Always*. Both variables were initially recoded as 0 = *Never*, and other responses as 1. However, the paying bills on time variable only had three cases in the *Never* category. Therefore, the paying bills dependent variable was recoded as *Never* or *Sometimes* = 0; *Most of the Time* or *Always* = 1.

Independent Variables: The ten cognitive and emotional biases questions were adapted from the Pompian (2012) bias identification quiz (see Table 2 for each item description). A four-point Likert-type scale ranged from 1 (*Strongly Disagree*) to 4 (*Strongly Agree*). The four possible responses were later recoded as a nominal variable with two values: those who disagreed or strongly disagreed were coded 0 (No), and those who agreed or strongly agreed were coded 1 (Yes).

Demographic Variables. Demographic variables were collected to verify that the sample represented the state's population. The variables included employment status, income, age, race, and ethnicity. Table 1 presents a description of each demographic variable. Questionnaire data were analyzed using the quantitative Statistical Package for Social Sciences (SPSS) software version 25.

Research Questions and Hypotheses

RQ.1. Which financial biases exist in the sample? For RQ.1, for each bias, the null hypothesis was "no bias," that is, the expected percentage responding "1" would be 50%. Therefore, to assess if the observed frequency responding "1" in each bias was different from an expected frequency of 50%, a goodness-of-fit Chi-square (χ^2) test was used (Carlson & Winqvist, 2022). The existence of a bias corresponds to a large χ^2 -statistic for an observed percentage significantly greater than 50%.

RQ.2. What are the associations among the biases? Spearman Rho was used to measure the strengths and direction of the inter-correlations between each two biases. For each pair of biases, the null hypothesis stated that the (true) correlation was 0, and thus, no statistically significant correlations existed between each pair of observed biases.

RQ.3. *What is the association between money biases and paying bills on time and saving?* Little is known about how money biases relate to basic financial practices—outside the realm of investing. Only one general null hypothesis was written for the ten biases in the study because there is no robust literature yet to specify directional hypotheses for each. Accordingly, the null hypothesis for RQ.3 was as follows: there is no association between financial biases and paying bills, nor financial biases and saving. A test of independence was used to assess the null hypothesis. The phi coefficient is used to measure the association between two binary or dichotomous variables (Field, 2013). Like Pearson correlation coefficient, a phi coefficient takes on values between -1 and 1 where -1 indicates a perfect negative relationship between the two variables; 0 shows no association between the two variables, and 1 indicates a perfect positive relationship. According to Field (2013), a phi coefficient could have a small effect size (0.1), moderate effect size (0.3), or large (0.5).

RQ.4. What is the relationship of statistically significant biases with the dependent variables, paying bills on time, and saving when controlling for income and age? In addition to descriptive and bivariate analysis, the last statistical procedure was to run a multivariate logistic regression. Since the goal was to carefully evaluate the inclusion of predictors to create a parsimonious model, only those significantly associated with the dependent variables were included in the logistic models. The bivariate analysis did not find employment and race/ethnicity statistically associated with paying bills on time or saving (alphas $>.005$). Logistic regression uses a binary dependent variable and does not assume normality or homoscedasticity (Field, 2013).

RESULTS

Table 1 presents a summary of the demographics of the sample. Again, there was nearly a 50/50 split of males and females. Most participants (63.6%) were 18–30 years old, followed by 31–54 years old (25.9%) and 55 years or older (5.90%). More than three-fourths of the participants (82.4%) reported themselves as non-Hispanic White, and (76.6%) were employed full-time.

Table 1.

Descriptive Statistics for Sample (n = 397)

Variables	Measurement	Descriptive Mean (SD)
Financial Practices Before Coding (1 – 4 Likert Scale)		
Paying bills	I pay my bills on time every month	3.73 (0.59)
Savings	I add to my savings on a regular basis	2.88 (1.0)
Demographic Variables		
Employment status	Not employed	3.9%
	Employed part-time	17.6%
	Employed full time	76.6%
Income	< than \$20,000	19.0%
	\$20,000 to \$40,000	44.8%
	\$40,000 or more	34.2%
	No income	2.0%
Age	What is your age? (Range: 18-72)	Mean: 30 Median: 27
Gender	Male (0)	52.6%
	Female (1)	47.40%
Race/Ethnicity	White	82.4%
	Non-White Race or ethnicity	14.80%
	Prefer not to answer	2.8%

Note. All variables are nominal scales except age.

To answer RQ.1, “What financial biases exist?” the goodness-of-fit Chi-square (χ^2) results for each bias are provided in Table 2. Results in Table 2 showed that conservatism and endowment effect supported the null hypothesis with an observed percentage responding “Yes” (i.e., “1”) not differing significantly from the expected null percentage of 50%. Eight biases rejected the null hypothesis at $\alpha = 0.05$. This sample found six positively oriented biases (i.e., percentage responding agrees or strongly agrees significantly above 50%): anchoring, mental accounting, cognitive dissonance, hindsight, overconfidence, and status quo. Interestingly, respondents did not seem to share self-attribution, with 74.24% of participants surveyed reporting strongly disagree or disagree, nor regret aversion with 72.14% strongly disagreeing or disagreeing with regret aversion.

Table 2.*Behavioral Biases Item Description and Goodness-of-fit Chi-square Values*

Bias	Item Description	YES (%)	NO (%)	Goodness-of-fit χ^2 (<i>p</i> -value)
Anchoring	When thinking about selling something, the initial price you paid for the item is a big factor in deciding what price you are willing to sell it.	78.89	21.11	120.17***
Mental accounting	I tend to categorize my money with different labels	60.16	39.84	15.04***
Cognitive dissonance	When making decisions, I tend to focus on the positive aspects of my decision rather than on what might go wrong with the decision	55.96	44.04	5.12*
Conservatism	I do not easily change my views about financial decisions once they are made.	50.83	49.17	0.02
Hindsight	When reflecting on past mistakes, I see some of them could have been avoided.	66.30	33.70	84.83***
Selfattribution	I often found that most of my successful actions can be attributed to my own decisions, while those that did not work were based on the guidance of others.	25.76	74.24	38.46***
Over-Confidence	Relative to others my age, I am confident that my financial knowledge is above average.	73.97	26.03	83.90***
Status quo	When considering changing something about my finances, I spend time thinking about options, but I often change little or nothing.	63.61	36.39	26.78***
Regret aversion	I have made financial decisions in the past that I regret.	27.86	72.14	70.42***
Endowment effect	I keep possessions because I already own them, but given the chance to redo the decision perhaps, I would purchase something else.	47.09	52.91	1.22

Note. Items adapted from the Pompian (2012) Bias Identification Quiz, p. 95-100.

Significance levels: * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.

To answer RQ.2., the intercorrelation among biases was examined using the non-parametric correlation coefficient Spearman's rho. Results showed that most of the biases did not have a statistically significant correlation with each other. The only biases that yielded statistically significant positive correlations were anchoring with mental accounting and hindsight with status quo. The biases with negative statistically significant correlations involved overconfidence with status quo and hindsight (See Table 3). Effect sizes fell at the low end of the "moderate" category.

Table 3.

Summary of Spearman’s Rho Inter-Biases Correlations

Biases	Direction	Coefficient	n size
Anchoring and mental account	Positive	0.152**	362
Hindsight and Status quo	Positive	0.154**	358
Overconfidence and status quo	Negative	-0.167**	365
Overconfidence and hindsight	Negative	-0.144**	361

Note. Significance levels: ** $p \leq .01$

In answer to RQ.3, “What is the association between each money bias and “paying bills on time” and “saving regularly?” the null hypothesis of no association between financial biases and “paying bills” and “saving” was not rejected for anchoring, mental accounting, hindsight, and cognitive dissonance. Data in Table 4 shows that a positive, statistically significant association was found between overconfidence and paying bills (phi coefficient 0.282, $n = 365$, $p = 0.00$), and a negative relationship was found between status quo and paying bills (phi coefficient -0.101, $n = 360$, $p = 0.05$.) The results also showed that the null hypothesis was rejected in the case of overconfidence and saving (phi coefficient = 0.261, $n = 365$, $p = 0.00$), and status quo and saving, which had a negative statistically significant association (phi coefficient = -0.127, $n = 365$, $p = 0.016$).

Table 4.

Phi Coefficient Statistic for Biases and Financial Practices.

	Item’s Mean	Standard deviation	Paying Bills	Saving
Anchoring	2.90	.807	.061	.017
Mental accounting	2.58	.965	-.081	-.025
Hindsight	2.96	.773	-.032	-.081
Cognitive dissonance	2.72	.873	-.020	-.042
Overconfidence	2.94	.822	.282***	.261***
Status quo	2.67	.719	-.101*	-.127*

Note. Significance levels: * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

The later step in the analysis was to conduct a multivariate logistic regression to assess RQ.4. When controlling for income and age, what is the relationship of statistically significant biases with the dependent variables, "paying bills on time" and "saving"? Two logistic regressions investigated whether one or more of overconfidence, status quo, income, and age were significant predictors of (the odds of) paying bills on time (Model 1) or saving (Model 2). Tables 5 and 6 present the results from the logistic regression models.

For (logistic regression) Model 1, the outcome of interest was (the odds of) "paying bills on time." The Hosmer-Lemeshow goodness-of-fit indicated no significant lack of fit for the specified model ($p > 0.05$). In addition, the model showed that status quo and age were not statistically significant ($p > 0.05$), adjusted for other model effects. However, overconfidence and income were significant. The relationship between overconfidence and the dependent variable was positive, indicating that when overconfidence changed from 0 to 1 and the values of the other predictors remained constant, the odds of paying bills increased by a factor of (about) 13.8. The income variable increased odds by a factor of 1.2.

Table 5.

Logistic Regression Model 1 With Paying Bills as Dependent Variable

Predictors	B	S.E.	Exp (B)
Overconfidence	2.630	.657	13.87***
Status quo	-.547	.681	.579
Income	.199	.094	1.22**
Age	-.041	.024	.960
Model chi-square	34.689 ($df = 4$)		

Note. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$, $n = 351$

Results of logistic regression Model 2 are presented in Table 6. The Hosmer-Lemeshow goodness-of-fit was not statistically significant ($p > 0.05$), indicating adequate fit of the specified model. As shown in Table 6, one can see the estimated odds of savings increased by a factor of 3.75 when overconfidence moved from 0 to 1, other things being equal. The sign of the relationship between overconfidence and saving was as expected (positive). However, the predictor age was negatively associated with saving. This result was surprising as one may expect that the ability to save increases with age. Therefore Model 2 was rerun (now Model 2.1) with only the statistically significant predictor *overconfidence* and *age* entered as a categorical variable. The categories for the age variable included category 1 (ages 18-22), category 2 (ages 23-32), category 3 (ages 33-37), category 4 (38-42), category 5 (43-51), and category 6 (52 and 72) acting as reference category. Results of Model 2.1. (Table 7) showed that only the category with participants ages 43-51 was statistically significant relative to all other age categories. The beta sign is still negative, indicating that the odds of saving for participants in category 5 (43-51) are significantly less than the reference category (participants between ages of 52-72). Model 2.1 also increased the odds of savings for the overconfidence from a factor of 3.75 to a factor of 5.4.

Table 6.

Logistic Regression Model 2 With Saving as Dependent Variable

Predictors	B	SE	Exp (B)
Overconfidence	1.323	.334	3.75***
Status Quo	-.581	.393	.559
Income	.093	.058	1.09
Age	-.035	.016	.966
Model chi-square	30.197*** (<i>df</i> = 4)		

Note. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$, $n = 351$

Table 7.

Logistic Regression Model 2.1 With Saving as Dependent Variable

Predictors	B	S.E.	Exp (B)
Overconfidence	1.691	.350	5.42***
Ages 18-22	.311	.828	1.36
Ages 23-32	.136	.713	1.14
Ages 33-37	.405	.827	1.49
Ages 38-42	-.067	.882	.935
Ages 43-51	-1.99	.814	.136**
Model chi square	30.197*** (<i>df</i> = 4)		

Note. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$, $n = 354$

DISCUSSION

This study investigated which were the most likely biases present in the sample. In addition, it assessed the potential statistical association among financial biases and between financial biases and two financial practices paying bills and saving regularly.

Based on the analysis of 370 surveys, findings from the goodness of fit showed that the most likely biases present in the sample were anchoring, mental accounting, cognitive dissonance, hindsight, confidence, and status quo. No findings in this study supported the presence of conservatism, self-attribution, regret aversion, or endowment effect.

Spearman's rho correlation allowed us to explore how the biases were interrelated to each other. Anchoring and mental accounting showed statistically significant positive correlations, which means that these two biases move in tandem. However, they do not move precisely at a constant rate, as in linear relationships. The positive relationship indicates that subjects who use anchors in finances are also more likely to use mental accounting bias. The anchoring effect serves as a heuristic when making judgments under uncertainty (Tversky & Kahneman, 1974). Kahneman (2011) described that anchoring effects are commonly

found in financial decisions. Prospect theory also indicates that individuals classify money in categories or "mental accounts" for their expenses, savings, and the decision to pay by cash or credit. Mental accounting helps maintain many clients' focus on monthly payments while simultaneously preventing the depletion of funds held for emergencies (Elliehausen, 2018).

Hindsight and status quo showed a positive, statistically significant association, which means if a subject in the sample had a hindsight bias, that subject was also more likely to have a status quo bias. These results are not surprising. Thaler (2015) defined the *status quo* as an emotional bias in which individuals prefer things as they are instead of making a change. Kahneman (2011) claimed that the preference for the status quo is to avoid losses resulting from adjustments. Hindsight is known as the knew-it-all-along phenomenon or determinism. Hindsight can lead clients to conclude that they can predict events. When we combine the reluctance to change (status quo bias) with the possible hindsight bias in clients, we may encounter situations in which clients would claim, *No, I do not want to change because every time I change, something goes wrong*. A skilled professional may realize that this automatic, faulty reasoning generated in System 1 can be overridden by adequate deliberation in System 2.

Overconfidence and status quo, and overconfidence and hindsight had a negative statistically significant correlation. The correlations between these two biases go in opposite directions. As overconfidence increases, status quo and hindsight decrease. One tenet of this study is the assumption that biases can work to our benefit. Prospect theory, dual-process theory, and error management support this statement. Financial educators, counselors, coaches, planners, advisors, and therapists can utilize clients' beliefs that their financial knowledge is above average compared to others their age. The more clients believe their financial knowledge is above average, the more likely they seek engagement in economic actions.

The phi coefficient analysis results showed that only two biases (overconfidence and status quo) are statistically associated with paying bills. A significant, positive association between overconfidence and paying bills indicates that individuals who claim overconfidence bias are more likely to pay their bills on time. The phi coefficient between status quo and paying bills showed a negative association at the 0.05 alpha level, meaning that individuals who reported a status quo bias were more likely never to pay bills on time or just sometimes. The phi coefficient for overconfidence and savings showed a positive association, thus suggesting that participants who claimed to be overconfident were also more likely to save always or most of the time. Furthermore, the phi coefficient almost reached a moderate effect size ($\phi = 0.261$). This finding departs from studies that have examined the relation between overconfidence and investing, which usually shows negative correlations in the investing arena (Bailey et al., 2011; Pompian, 2012). Status quo was statistically significantly associated with saving. However, the direction of the relation was negative (-0.127), indicating that those participants who did not report a status quo bias always saved or saved most of the time. The remaining biases did not show any statistically significant association with paying bills or saving.

Comparable to the results obtained in the bivariate analysis, when the two statistically significant biases identified in the phi coefficient functioned as predictors of paying bills or saving and controlling for income and age, the logistic regression results mirrored the similar findings. In the case of paying bills, overconfidence and income were positive and statistically significant. For saving, only overconfidence bias and age were statistically significant, but age showed a negative coefficient. Further descriptive analysis of the variable age in this sample demonstrated that participants between the ages of 43-51 are less likely to save than the other age categories. The average saving rate for all other participants between the ages 18-42 is about 83.88%, but participants between the ages 43-51 had a considerable drop in savings (only 26.67%). The saving rate increased again for participants 52 and older to about 79%.

IMPLICATIONS

The study provides empirical evidence that overconfidence and status quo are associated with paying bills and savings. The status quo variable was not statistically significant when income and age were used as predictors in the logistic regression. The implication section focuses on the two financial biases statistically associated with paying bills on time or saving. Understanding behavior requires articulating the cognitive bias related to the behavior. Each bias is explained by referring to one of the theories discussed in this paper: behavioral finance, prospect theory, dual-process theory, or error management theory. These theories consider biases as design features of human minds. Thus, this section expands on the usefulness of findings to financial educators, counselors, coaches, planners, advisors, and therapists.

Overconfidence Bias

Overconfidence bias was positively associated with both paying bills on time and saving. Overconfidence bias has aspects of both cognitive and emotional errors but is classified as emotional because the bias is primarily the result of emotions. Error management theory explains that overconfidence—a prime bias—may help us succeed at some tasks in some contexts but could be detrimental in others.

Contrary to the relationship between overconfidence and investing, this study demonstrates that overconfidence is positively associated with paying bills on time and saving regularly. One view of overconfidence sustains that believing one is better than others in managing finances is a self-fulfilling prophecy. Kyle and Wang (1997) said that overconfidence acts as a reassurance to act assertively. Therefore, overconfidence would be an excellent bias to utilize when counseling, coaching, advising, or educating clients about savings and paying bills on time.

In general, participants believed they had more financial knowledge than their peers. Financial educators, counselors, coaches, planners, advisors, and therapists want to nurture overconfidence in their client's ability to pay bills and save. To perform well, we need to be confident in our ability to do a task and feel like what we do is important. Overconfidence can work in a person's interest. Those who are overconfident in managing basic financial

practices do it, and in the process of doing it, they increase their efficacy. Overconfidence creates a positive illusion – a placebo effect - that can become a reality, almost like a self-fulfilling prophecy—if I believe I can, I can. Financial coaching is an area that frequently taps into overconfidence. By looking at a strength approach instead of a weakness approach, overconfidence can function as a motivating agent to achieving financial success.

Status Quo Bias

Status quo was negatively associated with paying bills and saving. Prospect theory states that the status quo is maintained when no apparent problem requires a decision. Error management theory claims that we are naturally afraid to try new things (Betsch, 2008), avoid mistakes, and preserve the status quo.

The status quo bias could be beneficial because it helps clients stick with good established financial habits *if they already have them*, and the client wants to preserve good financial practices. However, in a different context, the status quo preference may bias an individual against changing their habits of not paying bills on time and not saving. In helping clients, it is crucial to explore whether the status quo bias is due to personal traits, like indecisiveness, decision avoidance, or lack of knowledge. Explore what strategies clients can use to avoid automatic status quo choices that are counterproductive and deliberately choose status quo if status quo helps them reach money harmony and balance.

A good understanding of cognition and emotion in how clients or patients manage their financial matters is fundamental to training future or current financial educators, counselors, coaches, advisors, planners, and therapists and designing intervention strategies that account for our human nature. The following considerations offer insights on how to go about doing this. This list is by no means exhaustive.

- Ask open-ended questions to discover critical financial biases and intrinsic motivators. Open-ended questions challenge automatic thinking (System 1) and facilitate deliberative processes in System 2.
- Use transformative questioning that encourages new thinking habits based on biases (for example, ask questions like, *what does hindsight bias mean to you? How can you use it [or adjust it] to your benefit?*).
- Utilize simple, engaging techniques to shift the client from an automatic response (System 1) to a resource response (System 2).
- Apply approaches that encourage self-awareness and recognition of biases and how we can use them to our benefit. The best defense against hurtful tendencies is to be aware of them.
- Gain rapport with clients that seem to hold different money biases than your own.
- Establish and maintain an environment that promotes the client's self-discovery in a judgment-free environment.
- Transform the effects of negative internal monologues or ANTs (automatic negative thoughts) into PETs (positive enhancing thoughts).
- Understand when to educate, counsel, advise or coach and when to refer to a financial therapist.

- Refer to a financial therapist if the client or patient desires to focus on the childhood or past experiences that might be the root of specific financial biases in their lives.

CONCLUSION, LIMITATIONS, AND FUTURE RESEARCH

The study found that biases are present in the random sample, and some biases are statistically intercorrelated and can move in tandem or opposite directions.

The main contribution of this study is that it offers evidence that some biases may work in our clients' favor if we know when and how to use them. For example, on the one hand, the overconfidence bias, which has received so much negative attention in the realm of investing, may prove helpful in basic financial practices such as paying bills on time and adding to saving accounts. On the other hand, financial counselors, educators, coaches, planners, advisors, and therapists should pay close attention to inertia or status quo bias. Unless clients are doing sound financial practices, the status quo seems to work against clients in both basic money management practices and investing.

A limitation of the study was the self-reported ratings. It is unknown if participants responded to each item with the socially acceptable response instead of what they believed or honestly behaved. Another limitation is that the measurement statements used for the various behavioral biases may not necessarily measure those concepts. Lastly, the study used cross-sectional data that does not provide temporal relationships between biases and outcomes. It is impossible to establish evidence for a cause-and-effect relationship without longitudinal data. Additionally, the results are specific to the unique population in Utah and are not generalizable to the broader population.

More research is needed to understand the role of other biases not included in this study and the association with basic financial behaviors. One area that merits attention is characterizing useful and unhelpful biases in financial management and investing. Another area is the need to develop valid and reliable assessments to diagnose clients' biases and then develop evidence-based tools to adopt, discard, or adjust biases. Furthermore, experimental or quasi-experimental studies are needed to compare whether a bias-based approach to financial education, counseling, coaching, advising, or planning is more productive than an intervention that ignores cognitive and emotional biases. Finally, it would be interesting to examine how these biases may change by locality, age, gender, income, and ethnicity.

Behavioral finance and cognitive theories bring hope and new approaches to family and individual finances. However, integrating behavioral biases to produce positive outcomes in essential financial management is still at its early stages of development. Therefore, more empirical, experimental, or quasi-experimental studies are needed to bridge the gap between the theory of cognitive biases and evidence-based practices. This paper is a starting point by providing evidence from a survey study and suggesting how we can intentionally use biases to benefit clients. After all, biases will not go away, and financial educators, counselors, coaches, planners, advisors, and therapists remain with an indisputable reality, which is the fact that we all collaborate with humans who are susceptible to biases.

REFERENCES

- Altman, M. (2008). Behavioral economics, economic theory, and public policy. *Behavioral Economics, Economic Theory and Public Policy*, 5(1), 1-55. <https://doi.org/10.2139/ssrn.1152105>
- Bailey, W., Kumar, A., & Ng, D. (2011). Behavioral biases of mutual fund investors. *Journal of Financial Economics*, 102(1), 1-27. <https://doi.org/10.1016/j.jfineco.2011.05.002>
- Baker, H., Kumar, S., Goyal, N. & Gaur, V. (2019). How financial literacy and demographic variables relate to behavioral biases. *Management Finance*, 45(1), 124-146. <https://doi.org/10.1108/MF-01-2018-0003>
- Baker, H. K., & Ricciardi, V. (2015) Understanding behavioral aspects of financial planning and investing. *Journal of Financial Planning*, 28(3), 22-26.
- Betsch, T. (2008). The nature of intuition and its neglect in research on judgment and decision making. In H. Plessner, C. Betsch & T. Betsch (Eds.), *Intuition in judgment and decision making* (pp. 3-22). Psychology Press.
- Blackwell, R., Mineard, P., & Engel, J. (2006). *Consumer Behavior* (10th ed.). Thompson Southwestern.
- Bawden, D., & Robinson, L. (2020). *Information overload: An introduction*. In *Oxford Encyclopedia of Political Decision Making*. Oxford University Press. <https://doi.org/10.1093/acrefore/9780190228637.013.1360>
- Carlson, K., & Winquist, J. R. (2022). *An Introduction to Statistics*. (3rd ed.). Sage.
- Cummins, R., Nistico, H. (2002). Maintaining life satisfaction. The role of positive cognitive bias. *Journal of Happiness Studies* 3, 37-69. <https://doi.org/10.1023/A:1015678915305>
- Ellehausen, G. (2018). Behavioral economics, financial literacy, and consumer's financial decisions. Retrieved December 09, 2020. <https://doi.org/10.1093/oxfordhb/9780198824633.013.26>
- Evans, J. (2010). Intuition and reasoning: A dual-process perspective. *Psychological Inquiry*, 21(4), 313-326. <https://doi.org/10.1080/1047840X.2010.521057>
- Evans, J., Stanovich, K. (2013). Dual-process theories of higher cognition: Advancing the debate. *Perspective on Psychological Sciences*, 4(3), 223-241. <https://doi.org/10.1177/1745691612460685>
- Evans, J., Barston, J., & Pollard, P. (1983). On the conflict between logic and belief in syllogistic reasoning. *Memory & Cognition* 11, 295-306. <https://doi.org/10.3758/BF03196976>
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford University Press.
- Field, A. P. (2013). *Discovering statistics using IBM SPSS statistics: And sex and drugs and rock 'n' roll*. Sage.
- Filbeck, G., Ricciardi, V., Evensky, H. R., Fan, S. Z., Holzhauer, H. M., & Spieler, A. (2017). Behavioral finance: A panel discussion. *Journal of Behavioral and Experimental Finance*, 15, 52-58. <https://doi.org/10.1016/j.jbef.2017.07.008>
- Gigerenzer, G. (2008). Why heuristics work. *Perspectives on Psychological Sciences*, 3(1), 20-29. <https://doi.org/10.1111/j.1745-6916.2008.00058.x>
- Haselton, M., Bryant, G., Wilke, A., Frederick, D., Galperin, A., Frankenhuis, W., & Moore, T. (2009). Adaptive rationality: An evolutionary perspective on cognitive bias. *Social Cognition*, 27(5), 733-763. <https://doi.org/10.1521/soco.2009.27.5.733>

Investigating Financial Biases That Can Increase Impact on Paying Bills and Saving

- Haselton, M., & Buss, D. (2000). Error management theory: A new perspective on biases in cross-sex mind reading. *Journal of Personality and Social Psychology*, 78(1), 81–91. <https://doi.org/10.1037/0022-3514.78.1.81>
- Kahneman, D. (2011). *Thinking fast, thinking slow*. Farrar, Straus and Giroux.
- Kyle, S., & Wang, A. (1997). Speculation duopoly with agreement to disagree: Can overconfidence survive the market test? *The Journal of Finance*, 52(5), 2073-2090. <https://doi.org/10.1111/j.1540-6261.1997.tb02751.x>
- Keith, N., & Frese, M. (2008). Effectiveness of error management training: a meta-analysis. *The Journal of Applied Psychology*, 93(1), 59-69. <https://doi.org/10.1037/0021-9010.93.1.59>
- MacMillan Dictionary. (n.d.). Bias. Retrieved December 09, 2020, from <https://www.macmillandictionaryblog.com/bias>
- March, J. (1978). Bounded rationality, ambiguity, and the engineering of choice. *Bell Journal of Economics*, 9, 587-608. <http://dx.doi.org/10.2307/3003600>
- Matsumoto, A., Fernandes, J., Bourahli, A., Tozetti, A. (2012). Mental accounting and framing: Verifying the disposition effect in financial decision making. *Review of Business Research*, 12(2), 135.
- Mishra, K., & Metilda, M. (2015). A study on the impact of investment experience, gender, and level of education on overconfidence and self-attribution bias. *IIMB Management Review* 27, 228-239. <http://dx.doi.org/10.1016/j.iimb.2015.09.001>
- Pompian, M. (2012). Behavioral finance and investor types. Managing behavior to make better investment decisions. John Wiley and Sons. <https://doi.org/10.1002/9781119202417>
- Roese, N., & Vohs, K. (2012). Hindsight bias. *Perspectives on Psychological Science*, 7(5), 411-426. <https://doi.org/10.1177/1745691612454303>
- Sahi, S. (2016). Psychological biases of individual investors and financial satisfaction. *Journal of Consumer Behavior* 16, 511-535. <https://doi.org/10.1002/cb.1644>
- Schafer, J. (1997). *Analysis of incomplete multivariate data*. Chapman and Hall/CRC.
- Simon, H. (1978). Rationality as a process and as a product of thought. *American Economic Review* 70, 1-16.
- Thaler, R. (2015). *Misbehaving: The making of behavioral economics*. Norton and Company.
- Todd, P., & Gigerenzer, G. (2012). What is ecological rationality? In P. Todd, G. Gigerenzer, & ABC Research Group (Eds.), *Ecological Rationality: Intelligence in the world* (pp. 3-32). Oxford. <https://doi.org/10.1093/acprof:oso/9780195315448.003.0011>
- Tversky, A., Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185, 1124-1131. <https://doi.org/10.1126/science.185.4157.1124>
- Thompson, V. (2014). What intuitions are... and are not. *Psychology of Learning and Motivation* 60, 35-75. <https://doi.org/10.1016/B978-0-12-800090-8.00002-0>
- Van Boven, L., Dunning, D., & Loewenstein, G. (2000). Egocentric empathy gaps between owners and buyers: Misperceptions of the endowment effect. *Journal of Personality and Social Psychology*, 79(1), 66–76. <https://doi.org/10.1037/0022-3514.79.1.66>