




## RESEARCH ARTICLE

# Determinants of financial worry

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## Abstract

Grounded in the transactional stress-coping theory and the Tallis and Eysenck (1994) model of non-pathological worry, the present study sought to advance the conceptual and empirical understanding of financial worry (FW). We positioned objective financial stressors (OFS), subjective financial stressors (SFS), and coping resources as key variables in understanding the determinants of financial worry (FW). The cross-sectional data consisted of responses from a representative sample of 19,385 adults, aged 18 and older, drawn from a large U.S. survey. Hierarchical linear regression results revealed that OFS, SFS, household income, and financial capability (FC) are all key determinants of FW. Furthermore, the results revealed adverse effects of OFS and SFS on FW. These effects were moderated by household income, FC, age, and gender. Implications for future research, employers, practitioners, and policymakers are discussed.

## KEYWORDS

coping resources, financial capability, financial worry, moderators, objective and subjective financial stressors, perceived threat

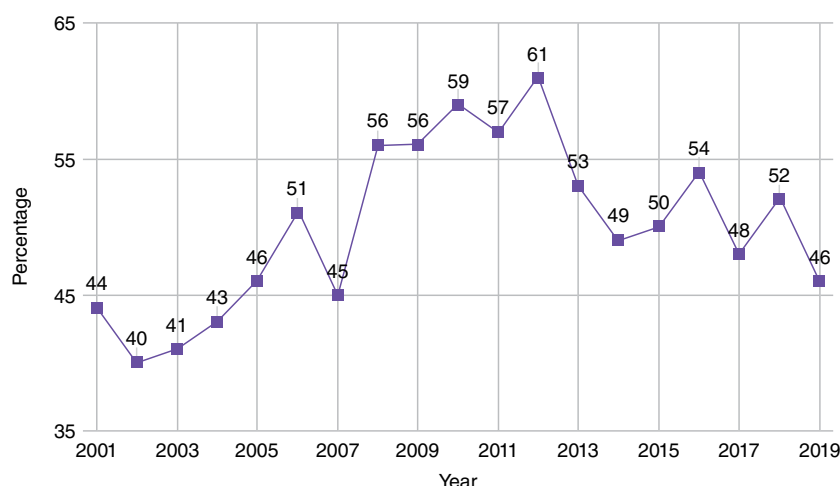
## 1 | INTRODUCTION AND BACKGROUND

Financial worry (FW) is a major issue for many consumers in developed economies. In Canada, adults aged 18 and older spend at least 1.40 hours a day worrying about their finances (Scotia Bank, 2019). In Australia, 55% of adults aged 18 and older reported that not having financing for retirement was their greatest financial worry (NAB, 2020). In the United Kingdom (UK), 36% of employees reported having financial worries (Salary Finance, 2020). In the United States, according to Gallup (2019), 46% of Americans reported being moderately or highly worried about their finances, and 54% reported not having enough money for retirement as their number one financial worry. Figure 1 illustrates the percentage of Americans reporting high or moderate financial worry between 2001 and 2019.

Given the high prevalence of FW among consumers, two important questions arise: first, does the high prevalence matter, and second, what factors contribute to the high prevalence? Research studies to date are in unequivocal agreement about the detrimental effects of FW. Consumers with elevated levels of FW reported poor self-rated health (Lenton & Mosley, 2008), poor psychological health (Salari & Zhang, 2006), low financial satisfaction (Hira & Mugenda, 1998), low financial well-being (Bayuk & Altobello, 2019), low life satisfaction (Tay et al., 2017), and saved less for retirement (Neukam & Hershey, 2003). Furthermore, they performed poorly at work (Meuris & Leana, 2018), showed reduced cognitive capacity (Mani et al., 2013; Meuris & Leana, 2018), and greater difficulties processing retirement concepts (Gutierrez & Hershey, 2013). This paper investigates the determinants of FW, and thus answers the second question posed above.

FW is a concept within the broader construct of worry. Worry, a pervasive human activity, is broadly defined as repetitive negative thoughts about uncertain future events (Borkovec, 1994; Borkovec et al., 1983) and exists on a continuum from low to high (Olatunji et al., 2010). Based on Borkovec et al.'s (1983) conceptualization of worry, de Bruijn and Antonides (2020) defined FW as negative repetitive thoughts about the uncertainty of one's future financial situation. Defined this way, FW is conceptually related to, though it is not identical with financial well-being, conceptualized by Netemeyer et al. (2017) as consisting of two components: (1) current money management stress, "which encompasses feelings of being stressed/worried about one's current financial situation" and (2) expected future financial security, "which encompasses perceptions of having financially secure future and meeting financial goals" (p. 71). There is emerging evidence for a relationship between FW and financial well-being. For instance, in a recent study, Bayuk and Altobello (2019) found that FW was negatively related to financial well-being. Consumer financial well-being has received increased attention from policymakers (Netemeyer et al., 2017) who have stressed the importance of investigating psychological factors to better understand consumer financial well-being (e.g., Consumer Financial Protection Bureau, 2015). We posit that one such factor is FW. Thus, it is clearly of importance to examine the determinants of FW.

The nascent body of literature on FW is incommensurate with its prevalence and the range of negative outcomes for individuals. Although FW has not received serious prior attention from consumer researchers, the present interest (e.g., de Bruijn & Antonides, 2020; DeRigne et al., 2019; Kiso et al., 2019; Weissman et al., 2020) suggests that this is starting to change. Another indicator of this growing research interest is the voluminous research on FW during the global pandemic of COVID-19 (e.g., Horesh et al., 2020; Wilson et al., 2020). Although there is growing research interest in FW, most studies (1) examined FW without offering a definition of the concept; (2) lack a theoretical framework and thus did not explain the phenomenon of



**FIGURE 1** Percentage of Americans reporting high or moderate financial worry. The data were obtained from Gallup (2013) and Gallup (2019)

FW; (3) did not simultaneously consider the effect of objective financial stressors<sup>1</sup> (OFS) and subjective financial stressors (SFS); and (4) failed to examine the moderating role of coping resources. Our study seeks to fill these important gaps in the understanding of the phenomena of FW.

There are several reasons why it is important to study the phenomena of FW. First, to date, little remains known about the phenomena of FW, with the existing studies (e.g., Hershey et al., 2010; Kiso et al., 2019; Litwin & Meir, 2013; Lusardi & de Bassa Scheresberg, 2017) mostly being atheoretical and descriptive in nature. Second, there is increasing recognition among policymakers such as the Consumer Financial Protection Bureau of the importance of consumer financial well-being and the need for enhanced understanding of the psychological factors (e.g., FW) that influence financial well-being. Prior research (Bayuk & Altobello, 2019) has indicated that high FW is associated with lower consumer financial well-being. Third, enhancing understanding of the factors that influence FW may help to identify factors that are most crucial to target during interventions designed to reduce FW. For example, since our results indicate that higher financial capability (FC) is associated with reduced FW, financial professionals (e.g., advisers, counselors, and coaches) and consumer educators could set reducing FW as one of their client outcomes and implement interventions that enhance financial self-efficacy (FSE), a component of FC that is malleable to interventions (Modestino et al., 2019). Prior research has indicated that interventions such as financial coaching<sup>2</sup> (Modestino et al., 2019) can enhance FSE. Finally, the high prevalence of FW among consumers and its associated negative outcomes (e.g., low life satisfaction and low financial well-being), suggests that FW is a concept worthy of study in its own right.

In order to achieve our research aims, we conducted an empirical study that developed a transactional conceptual model of FW that is theoretically grounded in both the transactional theory of stress and coping (TTSC; Lazarus & Folkman, 1984) and a theoretical model of normal or nonpathological worry<sup>3</sup> developed by Tallis and Eysenck (TEMW, 1994). We then tested the hypotheses of the current study using a nationally representative sample of US adults age 18 and above.

Our study makes several contributions to the existing literature. First, we develop a transactional conceptual model of FW and as such introduce a transactional perspective to FW that enhances the understanding of how cognitive appraisals initiate FW (Matthews & Funke, 2006) and provide an explanation of why financial worry occurs. In spite of the growing literature on FW (e.g., Hershey et al., 2010; Kiso et al., 2019; Litwin & Meir, 2013; Lusardi & de Bassa Scheresberg, 2017), a notable limitation is that most studies are largely atheoretical and descriptive and as such lack a theoretical framework with which to explain the phenomena of FW.

Second, our conceptual model differentiates between OFS and SFS to allow us to simultaneously examine the influence of OFS and SFS on FW. Although the stress (e.g., Pearlin et al., 1990; Solomon et al., 1987) and financial stress (e.g., Conger et al., 1990; Sinclair et al., 2010) literatures have considered both OFS and SFS, the handful of studies on FW (e.g., de Bruijn & Antonides, 2020; Lenton & Mosley, 2008; Owen & Wu, 2007; Tay et al., 2017) have only considered one of the two. Given the nature of OFS and SFS, one could potentially expect that they have differential associations with FW. Although researchers often treat financial stressors as one variable, this makes it difficult to ascertain the individual contributions of OFS and SFS to the outcome of interest. Thus, by examining OFS and SFS simultaneously, we advance the understanding of the influence of financial stressors in the FW process by providing a detailed picture of the relationships among OFS, SFS, and FW. Furthermore, we respond to the call by Bredemeier and Berenbaum (2020) for additional research “to confirm the robustness of the association between perceived threat and worrying across different populations” (p. 37).

Third, we examine the previously unexplored relationship between FW and FC, a major life skill for consumers that has attracted increasing attention from policymakers and governments across the world seeking to improve their citizens' well-being, and has generated an enormous of research over the past decade (Luukkanen & Uusitalo, 2019). We contribute to these research efforts by positioning FC as a coping resource that individuals can draw upon when experiencing financial stressors. Thus, we build on prior evidence on the role of FC as a coping resource from a recent study by Xiao and Kim (2020) that reported a negative association between FC and FW.

Fourth, we examine the ability of coping resources (i.e., FC and household income) and individual factors (i.e., age and gender) to moderate the effects of financial stressors on FW. Identifying potential moderators may inform who and what should be targeted in interventions aimed at reducing financial stress. This is important because American adults are experiencing elevated levels of financial stress with nearly two-thirds (64%) of American adults reporting money as a source of significant stress (American Psychological Association, 2018) while nearly six-tenths (59%) report that financial matters caused them the most stress in their lives (PwC (US), 2019). Furthermore, identifying moderators of the relationship between financial stressors and FW is particularly important in cases where directly influencing financial stressors or FW is not possible. Finally, examining moderating effects contributes to literature by responding to calls by researchers (e.g., Pearlin & Bierman, 2013; Zlomke & Jeter, 2014) for more research into moderators of stress. For example, Pearlin and Bierman (2013, 333) called for more research into “which resources serve as effective moderators of what kinds of stressors, for what kinds of people, and under what kinds of conditions” and Zlomke and Jeter (2014) called for “moderational research” to provide insights into the association between stress and worry.

Finally, our study follows Berenbaum et al.'s (2018) suggestion that researchers “explore how and why perceptions of threat lead to (or fail to lead to) the initiation of worrying”

(Berenbaum et al., 2018, 10). Specifically, we investigated why certain individuals with low SFS scores report high levels of FW and conversely, why certain individuals with high SFS scores report low levels of FW. We dichotomized the FW and the SFS indexes based on median splits to produce four categories: (1) low SFS and low FW (LoSFS/LoFW), (2) low SFS and high FW (LoSFS/HiFW), (3) high SFS and low FW (HiSFS/LoFW), and (4) high SFS and high FW (HiSFS/HiFW) that we examined through bivariate and multivariate tests.

The structure of this article is as follows: First, we begin with a brief overview of FW. Second, we provide brief explications of the theoretical lens for the current study: the TTSC (Lazarus, 1991; Lazarus & Folkman, 1984) and the TEMW (Tallis & Eysenck, 1994). Third, to achieve a greater understanding of the FW process, we develop and test a conceptual model with a national dataset ( $N = 19,385$ ) using hierarchical ordinary least squares regression to examine the influence of (1) OFS, (2) SFS, (3) and coping resources on FW, as well as the moderating effects of coping resources on the association between financial stressors and FW. Finally, we conclude with a discussion of the main findings of the paper and their theoretical and practical implications, as well as future research directions.

## 2 | FINANCIAL WORRY

Although there is growing interest in the concept of FW, our literature review revealed that, to date, no consensus definition of FW has emerged in the literature. However, there is consensus that worry is a multidimensional construct with five major domains: relationships, lack of confidence, aimless future, work, and financial (Tallis et al., 1992). Worry, a complex phenomenon experienced by nearly everyone (Tallis & Eysenck, 1994) represents repetitive negative thoughts about uncertain future events (Borkovec, 1994; Borkovec et al., 1983), exists on a single continuum from low to high (Olatunji et al., 2010) and is a “common response to stressful events” (Brosschot et al., 2006, 113). According to MacLeod et al. (1991), worry is “concerned with future events where there is uncertainty about the outcome, the future being thought about is a negative one, and this is accompanied by feelings of anxiety” (MacLeod et al., 1991, 478). Following these descriptions of worry, for this study, similar to de Bruijn and Antonides (2020), we define FW as negatively emotion-laden repetitive thoughts about the uncertainty of one’s future financial situation.

Now that we have defined FW, we turn to the important matter of differentiating it from two related concepts: financial well-being and financial security. Although there is no consensus on the definition of financial well-being, the various definitions (e.g., Netemeyer et al., 2017; Salignac et al., 2020) are aligned regarding a two-component model of financial well-being represented by current and expected future financial situations. For example, according to Salignac et al. (2020), financial well-being “is when a person is able to meet expenses and has some money left over, is in control of their finances and feels financially secure, now and in the future” (p. 16). In these conceptualizations, financial well-being is a perceived state of an individual’s finances. We therefore argue that FW and financial well-being are related but distinct concepts. Recent empirical evidence (e.g., Bayuk & Altobello, 2019) that established a negative association between these two concepts supports our view.

FW is conceptually distinct from financial security. Although there is no generally accepted definition of financial security (Lee & Kim, 2015), it is considered to be the opposite of financial vulnerability, defined by Sherraden et al. (2018) as “a condition in which people have low incomes; are financially insecure; and are exposed to financial risks, shocks, and stress”

(p. xxiii). A range of indicators have been used in the extant literature to measure financial security including the absence of material hardship (e.g., Despard et al., 2018; Sherraden et al., 2018) defined by (Beverly, 2001) as difficulty meeting basic needs for housing, food, clothing, and health care, and financial measures such as the adequacy of emergency funds, changes in net worth, healthcare expenditures, debt levels, solvency, frequency of missed debt payments, and skipped or late bills (Lee & Kim, 2015; Sherraden et al., 2018).

Given the definitions of financial well-being and financial security discussed above, we argue that both financial well-being and financial security are perceived states of an individual's financial situation, and therefore distinct concepts from FW, which represents repetitive thoughts about a future undesirable financial situation. Thus, we posit that the presence of high financial well-being or financial security does not necessarily mean the absence of FW, and vice versa. In other words, FW and financial well-being are not opposite poles of a single continuum of financial well-being, and neither are FW and financial security.<sup>4</sup>

### 3 | THEORY AND HYPOTHESES DEVELOPMENT

The current study is theoretically grounded in both the TTSC (Lazarus & Folkman, 1984) and the TEMW, a theoretical model of worry developed by Tallis and Eysenck (1994). This theoretical grounding provides a dynamic perspective on the initiation, maintenance, and termination of worry. According to the TTSC, cognitive appraisal and coping processes mediate the perception and subsequent experience of a stressor. In the TTSC, cognitive appraisal is defined as “the process of categorizing an encounter, and its various facets, with respect to its significance for well-being” (p. 31) while coping is defined as a dynamic process of cognitive and behavioral efforts to manage psychological stress. Cognitive appraisal processes consist of primary appraisal, which reflects perceptions of the significance of the threat posed by a situation and secondary appraisal, which reflects perceptions of options and resources for coping with the situation. The TTSC specifies two types of primary appraisals for anticipated stressful events (i.e., stressor): threat, and challenge. Of relevance to this study are threat appraisals in which the perceived threat exceeds the perceived resources to cope with the stressor. The TTSC suggests that threat appraisals are associated with perceptions of anticipated harm or loss and are “characterized by negative emotions such as fear, anxiety,<sup>5</sup> and anger” (Lazarus & Folkman, 1984, p. 33). A fundamental principle of the TTSC is the idea that cognitive appraisal rests on the individual's subjective construal of the stressor. Thus, two individuals may appraise the same stressor differently.

Rooted in the TTSC and drawing heavily on its conceptualization of threat appraisals and coping, the TEMW models worry as comprising three stages: (1) threat appraisal, (2) worry activation, and (3) worry maintenance and termination. The TEMW proposes that worry serves as an alarm that alerts the individual to potential threats<sup>6</sup> and is activated in two steps that involve an appraisal of threat significance (primary appraisal), and an appraisal of available coping resources (secondary appraisal). The TEMW posits that threat appraisal is relatively automatic<sup>7</sup> (i.e., unconscious) and that the “the primary appraisal of threat is determined by estimates of cost [i.e., goal violation], imminence and likelihood” (Tallis & Eysenck, 1994, p. 41). Consider, the likely effects of the event of foreclosure to the major life goal of homeownership among most Americans. Such an event with the potential to violate a major goal, and that is likely to occur, typically within a few months will be construed as threatening (i.e., perceived as costly, imminent and likely). Although an event might be construed as threatening, if coping resources



(i.e., factors that may protect against the threat) are deemed adequate to manage the event, worry will not be initiated. However, if coping resources are deemed inadequate, worry will be initiated.

According to the TEMW, inappropriate problem-solving accounts for the preservation of threat perceptions and maintenance of worry. Thus, appropriate problem-solving through the adoption of effective coping strategies is posited as the primary method by which worry is terminated.<sup>8</sup> The TEMW gives a central role to perceived self-efficacy, suggesting that an individual's perceived self-efficacy is a major resource that lowers the perceptions of threat during threat appraisals. A similar position was proposed by Lazarus and Folkman (1984) who argued that self-efficacy beliefs are part of cognitive appraisal processes.

The current study investigates only the initiation of FW. There are both theoretical and practical reasons for this decision. Theoretically, the TEMW proposes that initiation, maintenance and termination of worry are distinct phases of the worry process. This is supported by Berenbaum et al.'s (2018) recent findings that the initiation and termination of worry are distinguishable and “differentially associated with potentially important antecedents and correlates of worry” (p. 8). Practically, the cross-sectional nature of the data used in this study only allows us to investigate the initiation of FW.

In summary, the TEMW draws heavily on the TTSC to develop an evidence-based model that explains the initiation, maintenance and termination of worry (Davis & Montgomery, 1997). The TTSC establishes a relationship between stress and worry as follows. The TTSC contends that threat appraisals are associated with emotions (e.g., anxiety, anger, and worry) and that an event is appraised as stressful when primary appraisals of threat exceed secondary appraisals of coping resources. Furthermore, the TTSC suggests that “appraisal ...is what generates emotions” (Lazarus & Folkman, 1984, p. 273), meaning emotions are a response to perceptions of stress. In other words, the temporal sequence is that emotions (e.g., anxiety, anger, and worry) occur in response to perceptions of stress. This suggests that stress and worry are intrinsically related. A question arises as to whether OFS, SFS and FW are distinct concepts. Thus, based on the TTSC, we propose:

**Hypothesis 1.** OFS, SFS, and FW have discriminant validity.

### 3.1 | Perceived threat

A perceived threat is defined as “the subjective recognition of a potential (but uncertain) future undesirable outcome” (Bredemeier & Berenbaum, 2020, p. 25) and is a necessary condition for worry to occur (Bredemeier & Berenbaum, 2020; Tallis & Eysenck, 1994). When evaluating the threat of a stressor, individuals focus on the ways the stressor may threaten their sense of identity, values, and goals (Lazarus & Folkman, 1984). Although the literature provides several approaches to operationalize perceived threat (see, for discussion, Bredemeier & Berenbaum, 2020), the use of a secondary dataset for the current study limits us to measuring perceived threat (i.e., primary appraisal) indirectly by assuming, a priori, that financial stressors would on average be experienced as threats to well-being by most people. This approach is consistent with other researchers who have measured primary appraisal (e.g., Tuckey et al., 2015). Because individuals may appraise the same stressor differently, it is possible that some individuals may appraise financial stressors as a challenge<sup>9</sup> in which perceived resources are deemed

adequate to cope with the stressor (Lazarus & Folkman, 1984). However, a considerable amount of research has demonstrated the deleterious effects of financial stressors on well-being (see, for review, French & Vigne, 2019). Thus, providing support for our assumption. Further support comes from studies by Folkman et al. (1986) that assessed primary appraisal directly by asking individuals what was at stake in specific stressful encounters. In these studies, respondents reported “a strain on your [their] financial resources” as a salient threat to their well-being.

In this study, consistent with other researchers (e.g., Conger et al., 1990; Sinclair et al., 2010), financial stressors (i.e., perceived threat) were categorized objectively (e.g., loss of income, outstanding debt repayments) and subjectively as an individual's negative perceptions of their financial situation (e.g., difficulty paying bills, I have too much debt). The TEMW proposes that perceived threat is positively related to worry (for studies that provide evidence for this relationship, see, Bredemeier & Berenbaum, 2020). Prior research has established an association between financial stressors and FW. For example, research has found a positive relationship between financial stressors and FW (de Bruijn & Antonides, 2020; Lenton & Mosley, 2008; Lusardi & de Bassa Scheresberg, 2017; Owen & Wu, 2007; Tay et al., 2017; Xiao & Kim, 2020). Furthermore, other studies (e.g., Bridges & Disney, 2010; Frankham et al., 2020) have shown that SFS is an important predictor of mental health after controlling for OFS. Thus, based on the predictions of the TEMW and results from prior research, we propose:

**Hypothesis 2A.** OFS is positively associated with FW.

**Hypothesis 2B.** SFS is positively associated with FW.

### 3.2 | Coping resources

A primary interest of this study is to investigate how financial stressors interact with coping resources to initiate FW. Coping resources are factors individuals may draw upon to counter threats in their environments (Lazarus & Folkman, 1984; Pearlin & Schooler, 1978). Lazarus and Folkman (1984) categorize resources as being internal or external to the individual and their system. Internal resources refer to resources that reside within the person such as health, energy, positive beliefs, problem-solving and social skills (i.e., competencies) while external resources refer to environmental resources such as social support, social networks, and money.

Stress models (e.g., Lazarus & Folkman, 1984; Pearlin et al., 1981) theorize several functions for coping resources. First, coping resources may influence the occurrence of stressors, or the perception of events as stressors. For example, perceptions of adequate coping resources may prevent financial stressors such as difficulty paying bills or unexpected large drop in income from being appraised as stressors (or major stressors). That is, perceptions of adequate coping resources may influence the appraisal of stressors as less threatening. Second, compared to people with more coping resources, those with less may experience higher exposure to stressors. Third, coping resources may have a direct effect on well-being regardless of the level of exposure to stressors. That is, the effects of coping resources on well-being are not contingent on the level of exposure to stressors. Finally, coping resources may have a moderating function (i.e., buffering) in the relationship between stressors and well-being such that the effect of stressors is weaker for people with high levels of coping resources, and coping resources play a more salient role at high levels of exposure to stressors than at low levels. This study investigates the direct effects of two coping resources (i.e., FC and household income) on FW as well



as their moderating function. We will now briefly introduce these coping resources and discuss their proposed relationship with FW.

Although household income is often the most important financial resource (Mirowsky & Ross, 1999), its function as a coping resource has largely been ignored by researchers (Lazarus & Folkman, 1984; Thoits, 1995). However, recently a few researchers (e.g., Netemeyer et al., 2017), have examined the buffering function of income on the association between financial stress and well-being.

Although, as mentioned in the introduction, over the last decade, FC has received increasing attention from policymakers, practitioners, and researchers, there is still no consensus on its definition (Huang et al., 2015; Nam & Loibl, 2021). For this study, our definition of FC is based on the theoretical framework of FC developed by Johnson and Sherraden (2007) and Sherraden (2013) that contends that FC is a state in which individuals possess “knowledge and competencies, *ability to act* [italics added] on that knowledge, and *opportunity to act* [italics added]” (Johnson & Sherraden, 2007, p. 122). In this framework, financial knowledge and competencies are considered the “ability to act” while financial access is considered the “opportunity to act.”

According to Sherraden (2013), the combination of financial knowledge and competencies and financial access enables individuals to be confident in their financial decision-making and engage in desirable financial behaviors that enhance their financial well-being. In summary, the FC framework contends that financially capable individuals: (1) have access to financial products, services, and institutions, and (2) are financially knowledgeable, competent in managing their finances, confident in their financial decision-making, and practice desirable financial behaviors.

In this study, our operationalization of FC only includes the “ability to act” component due to lack of variables for the “opportunity to act” component in the dataset used for this study. Furthermore, although FC is a multidimensional concept that includes dimensions such as FSE, financial knowledge, and financial behaviors, in this study we are only interested in examining the general association between FC and FW, rather than among its individual dimensions and FW. Thus, we used a single measure of FC. However, we acknowledge that the individual dimensions of FC may differ in their effects on FW.

Previous studies have found negative associations between household income and FW (e.g., Kiso et al., 2019; Xiao & Kim, 2020). Research on the relationship between FC and FW is limited. To the best of our knowledge, to date, only one study by Xiao and Kim (2020) examined this relationship. The authors reported negative associations between FC and FW. Although there is limited prior evidence on the association between FC and FW, previous research has found that FC is positively related to psychological health (Taylor et al., 2011), implying a negative association between FC and FW. Based on these findings, the foregoing discussion on the functions of coping resources, and predictions of the TEMW, we propose:

**Hypothesis 3A.** Household income is negatively associated with FW.

**Hypothesis 3B.** FC is negatively associated with FW.

The TTSC defines stress as “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her wellbeing” (Lazarus & Folkman, 1984, p. 19). According to Norris and Murrell (1984), “Empirically, this imbalance would be expressed as an interaction between resources and [stressful] events...” (p. 426). We interpret this as suggesting that the association between

stressors and stress is moderated by coping resources. Because the TTSC proposes that emotions (e.g., anxiety, anger, and worry) are a response to perceptions of stress, we argue that the TTSC's premise of the moderating effect of coping resources applies to the relationship between stressors and emotions as well. There is some evidence of this: Xiao and Kim (2020) reported that FC moderated the association between financial stressors (i.e., debt delinquencies) and FW while Netemeyer et al. (2017) reported that household income moderated the association between financial stress and well-being. Based on these findings and the predictions of the TTSC and TEMW, we propose the following hypotheses. Because of the lack of robust empirical evidence, we did not make specific predictions regarding the proposed moderating effect of household income and FC.

**Hypothesis 4A.** The association between OFS and FW, is moderated by household income.

**Hypothesis 4B.** The association between OFS and FW, is moderated by FC.

**Hypothesis 4C.** The association between SFS and FW, is moderated by household income.

**Hypothesis 4D.** The association between SFS and FW, is moderated by FC.

The TTSC posits that individual difference factors (e.g., age, gender, and personality) and the environment interact to determine the degree to which an individual perceives a stressor as a threat as well as the psychological health associated with the stressor. This suggests that the association between stressors and psychological health may depend on individual difference factors such as age and gender. Indeed, previous research has found that age (Brown et al., 2017; Kahn & Pearlin, 2006; Mirowsky & Ross, 2001; Ren et al., 2020) and gender (Tran et al., 2018) moderate the relationship between financial stressors and psychological health. Based on these findings and the predictions of the TTSC and TEMW, we propose the following hypotheses. Because of the lack of robust empirical evidence, we did not make specific predictions regarding the proposed moderating effects of age and gender.

**Hypothesis 5A.** The association between OFS and FW, is moderated by age.

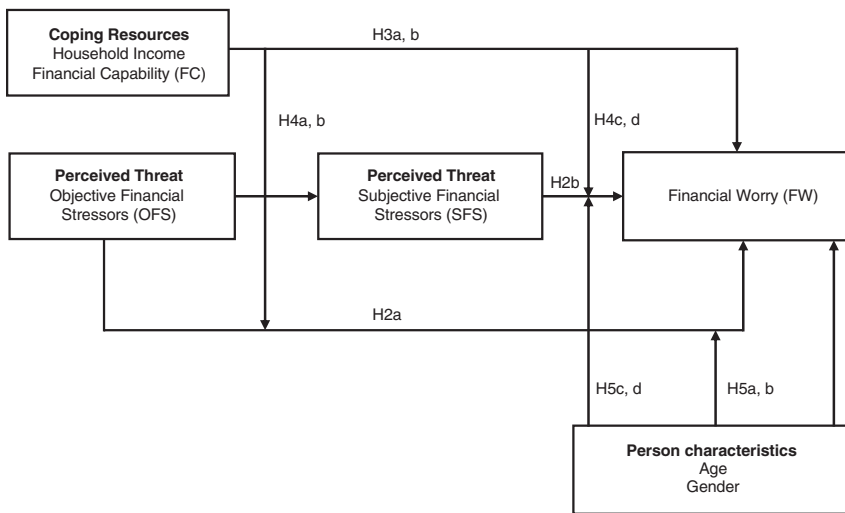
**Hypothesis 5B.** The association between OFS and FW, is moderated by gender.

**Hypothesis 5C.** The association between SFS and FW, is moderated by age.

**Hypothesis 5D.** The association between SFS and FW, is moderated by gender.

The TEMW model suggests that its main concepts, perceived threat (i.e., financial stressors) and coping resources add significantly to the explanatory power of the model. Hence, we propose:

**Hypothesis 6.** All three blocks of variables (i.e., OFS, SFS, and coping resources) uniquely explain additional variance in FW after controlling for sociodemographic factors and other blocks of variables.



**FIGURE 2** Conceptual model of hypothesized processes

To summarize, this study developed a conceptual model of FW based on the TEMW, a theoretical model of worry that draws heavily from the TTSC. A fundamental principle of the TEMW is the idea that cognitive appraisal processes are central to the initiation, maintenance and termination of FW. This study's focus was the initiation of worry. Specifically, the TEMW contends that worry is initiated when the demands of the perceived threat outweigh the individual's perceived coping resources. We hypothesized that OFS, SFS and FW would show discriminant validity and that high levels of financial stressors would be associated with high levels of FW. We further hypothesized that high levels of FC and household income would be related with lower levels of FW. In addition, we hypothesized that coping resources (i.e., household income and FC) and individual factors (i.e., age and gender) moderated the association between financial stressors and FW. We also hypothesized that financial stressors and coping resources would uniquely explain additional variance in FW, after controlling for sociodemographic variables. Figure 2 is a conceptual model, which summarizes the various hypotheses from the present study.

## 4 | METHOD

### 4.1 | Sample

The dataset for this study came from the 2018 National Financial Capability Study (NFCS), which was funded by the Financial Industry Regulatory Authority (FINRA) Investor Education Foundation and conducted by Applied Research and Consulting. The NFCS began in 2009, comprises triennial surveys, and is extensively used by consumer researchers. The 2018 NFCS comprises 27,091 adults aged 18 years or older. From the original 27,091 respondents, our analytic sample was limited to 19,385 respondents after we removed all cases with “prefer not to say” and “do not know” responses in order to control for missing data. The NFCS provides a survey weight to make the data representative of the US population in terms age, gender, ethnicity, and education.

## 4.2 | Missing data

The level of missing data ranged from 0.76% to 6.76%; averaged 2.88% among variables with missing data; and were handled through listwise deletion. Ownership of IRA/Keogh accounts (6.76%), retirement savings calculation (4.89%), emergency savings (4.55%), confidence to achieve financial goals (4.54%) and financial fragility (3.95%) were the independent variables with the highest proportions of missing data. We performed the two steps recommended by Schlomer et al. (2010) to determine the pattern of the missing data. The results suggested that missing data pattern was either missing at random (MAR) or not missing at random (NMAR) and that the missingness did not dependent on FW, our outcome variable. Listwise deletion produces unbiased estimates of regression slopes under all missing data mechanisms, provided that the missingness depends on predictor variables and not on the dependent variable (Allison, 2001). Thus, listwise deletion was deemed to be an appropriate approach for handling missing data for the present study.<sup>10</sup>

## 4.3 | Measures<sup>11</sup>

All items used to construct indexes were subjected to exploratory factor analysis (EFA) using principal component factoring with promax (oblique) rotation. EFA is a statistical technique for data reduction whereby multiple items measuring variables are combined into summary indexes (Floyd & Widaman, 1995). Both the Kaiser (1960) criterion (eigenvalue  $\geq 1$ ) and Cattell's (1966) scree plot test were used to guide the number of factors to retain. If the factor loading was  $\geq 0.30$  for that factor, and was  $< 0.30$  for the other, an item was said to load on a given factor. The cutoff of 0.30 was chosen for two reasons: (1) Costello and Osborne (2005) recommend it as a good rule of thumb, (2) compared to items with lower loadings, items with loadings of at least 0.30 were more readily interpretable. In addition, if the factor loading for an item was  $\geq 0.30$  for more than one factor,<sup>12</sup> the item was dropped from the factor analysis provided there were other items loading onto the factors with factor loading of at least 0.50 (Costello & Osborne, 2005). Table 1 provides a summary of the results of the EFA for items measuring financial stressors and FW. Table 2 provides a summary of the results of the EFA for the components of FC. Cronbach's alpha was used to measure the internal consistency of the indexes. Cronbach's alpha for the SFS and FW indexes that were constructed as a sum of the z-scores of the items making up the index were 0.79, 0.89, respectively. The Cronbach's alpha for the summated OFS index was 0.71.

*Financial worry* was measured by summing the z-scores of the three indicators<sup>13</sup>: (1) "I worry about running out of money in retirement," (2) "Thinking about my personal finances make me feel anxious," and (3) "Discussing my finances can make my heart race or make me feel stressed." Respondents rated their agreement on a 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*).

*Financial stressors* were measured using the following eight items that have been used by other researchers (e.g., Robb et al., 2019; Woodyard & Robb, 2016).

1. "Have you been contacted by a debt collection agency in the past 12 months?"

**TABLE 1** Explanatory factor analysis: financial stressors and financial worry

Items	Factor loading		
	OFS	SFS	FW
Contacted by debt collector	<b>0.64</b>	0.11	−0.05
Past due medical debt	<b>0.60</b>	0.12	−0.04
Student loan ownership	<b>0.42</b>	−0.14	0.14
Unexpected large drop in income	<b>0.30</b>	0.14	0.10
Perceptions of carrying too much debt	<b>0.37</b>	0.14	0.23
Difficulty paying bills (R)	0.15	<b>0.57</b>	0.13
Just getting by financially	0.00	<b>0.56</b>	0.28
Financial fragility	−0.01	<b>0.69</b>	0.02
Feeling anxious	0.02	0.03	<b>0.87</b>
Feeling stressed	0.05	0.03	<b>0.82</b>
Worry about running out of money	0.00	0.06	<b>0.69</b>

Note: R = item was reversed; loading in bold indicates the factor with which each item is associated.

2. “Do you currently have any unpaid bills from a healthcare or medical service provider (e.g., a hospital, a doctor’s office, or a testing lab) that are past due?”
3. “In the past 12 months, have you/your household experienced a large drop in income which you did not expect?”
4. “Do you currently have any student loans?” (The three preceding items were coded with 1 for yes, otherwise 0.)
5. “In a typical month, how difficult is it for you to cover your expenses and pay all your bills?” Respondents rated their level of difficulty on a three-point scale (1 = *very difficult*, 2 = *somewhat difficult*, and 3 = *not at all difficult*). This item was reversed so that a higher score reflected a higher level of difficulty.
6. “I have too much debt right now.”<sup>14</sup> Respondents rated their agreement on a seven-point scale (1 = *strongly disagree* to 7 = *strongly agree*).
7. “I am just getting by financially.” Respondents rated their agreement on a five-point scale (1 = *does not describe me at all* to 5 = *describes me completely*).
8. “How confident are you that you could come up with \$2000 if an unexpected need arose within the next month?” Respondents were asked to respond on a four-point scale: (1 = *I am certain I could come up with the full \$2000*; 2 = *I could probably come up with \$2000*; 3 = *I could probably not come up with \$2000*; and 4 = *I am certain I could not come up with \$2000*).

*Coping resources* consisted of FC and household income. Broadly following Xiao and colleagues (Xiao & Porto, 2017; Xiao et al., 2020), we measured FC as a summated index of z-scores of FSE, desirable financial behavior, objective and subjective financial knowledge, and subjective financial management ability.<sup>15</sup>

FSE was measured with three items<sup>16</sup>:

TABLE 2 Explanatory factor analysis: financial capability

Variables and items	Factor loadings	Eigenvalues >1	% of variance explained	Cronbach's alpha
Financial self-efficacy		2.13	71.00	0.79
Confidence to achieve financial goals	0.78			
Finances control me (R)	0.86			
Will never have things I want (R)	0.88			
Short-term financial behaviors		1.93	48.16	0.64
Has emergency savings	0.73			
Has money left at end of month	0.79			
Spends less than or equal to income	0.61			
Overdraws check account (R)	0.63			
Long-term financial behaviors		2.38	47.56	0.72
Has retirement plan with employer	0.59			
Has own retirement plan	0.78			
Has a will	0.65			
Has investments in stocks, bonds, etc.	0.73			
Retirement savings calculation	0.68			
Credit card behaviors		3.39	67.572	0.88
Carry over a balance	0.70			
Pay minimum payment only	0.88			
Incur a late fee for late payment	0.84			
Incur over the limit fee	0.81			
Use credit cards for a cash advance	0.88			
Objective financial knowledge		1.98	39.58	0.61
Compound interest	0.60			
Inflation	0.73			
Bond	0.50			
Diversification	0.59			
Mortgage	0.70			

Note: R denotes reverse-scored items.

1. "If you were to set a financial goal for yourself today, how confident are you in your ability to achieve it?" Respondents rated their agreement on a 5-point scale (1 = *not at confident* to 4 = *very confident*).
2. "My finances control my life." Respondents rated their agreement on a 5-point scale (1 = *never* to 5 = *always*).
3. "Because of my money situation, I feel like I will never have the things I want in life." Respondents rated their agreement on a 4-point scale (1 = *does not describe me at all* to 4 = *describes me completely*).



*Short-term financial behavior* was measured with four-items:

1. "Have you set aside emergency or rainy-day funds that would cover your expenses for 3 months, in case of sickness, job loss, economic downturn, or other emergencies?"
2. "Do you overdraw your checking account occasionally?" These two items were coded with 1 for yes, otherwise 0. Item two was reversed.
3. "Over the past year, would you say your spending was less than, more than, or about equal to your income?" Respondents rated their agreement on a three-point scale: (1 = *spending less than income*, 2 = *spending more than income*, 3 = *spending about equal to income*). If the response was 1 or 3, the variable was coded with 1, otherwise 0.
4. "How often does this statement apply to you? I have money left over at the end of the month." Respondents rated their agreement on a five-point scale: (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *always*). If the response was 4 or 5, the variable was coded with 1, otherwise 0.

*Long-term financial behavior* was measured with five-items:

1. "Do you or your spouse/partner have any retirement plans through a current or previous employer, like a pension plan or a 401(k)?"
2. "Do you or your spouse/partner have any other retirement accounts NOT through an employer, like an IRA, Keogh, SEP, or any other type of retirement account that you have set up yourself?"
3. "Not including retirement accounts, do you or your household have any investments in stocks, bonds, mutual funds, or other securities?"
4. "Have you ever tried to figure out how much you need to save for retirement?"
5. "Do you currently have a will?"

*Credit card behavior* was measured with a five yes/no items. All items were reversed to indicate desirable credit card behavior.

1. "In some months, I carried over a balance and was charged interest."
2. "In some months, I paid the minimum payment only."
3. "In some months, I was charged a late fee for late payment."
4. "In some months, I used the cards for a cash advance."
5. "In some months, I was charged an over the limit fee for exceeding my credit line."

*Objective financial knowledge* was measured with a five-item summated based on questions regarding compound interest, inflation, bond prices, mortgages, and portfolio diversification that are widely used as valid and reliable indicators of financial knowledge (Allgood & Walstad, 2016).<sup>17</sup>

*Subjective financial knowledge* was measured in response to the question "On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your overall financial knowledge?"

*Subjective financial management ability* was measured in response to the question "How strongly do you agree or disagree with the following statements? I am good at dealing with day-to-day financial matters, such as checking accounts, credit and debit cards, and tracking expenses." Respondents rated their agreement on a seven-point scale (1 = *strongly disagree*, 7 = *strongly agree*).

*Household income* was originally reported using eight categories ranging from “less than \$15K” to “\$150K and more,” but we reduced these to four categories (1 = less than \$50K, 2 = \$50K–\$100K, 3 = \$100K–\$150K, 4 = \$150K or more).

Prior studies have identified several sociodemographic variables related to FW (e.g., de Bruijn & Antonides, 2020; Hershey et al., 2010; Xiao & Kim, 2020). Consequently, our study included control variables as follows. Health insurance (yes/no), homeownership (yes/no), age (18 and older), gender (male, female), race (White, Black, Hispanic, Asian/others), marital status (married, single, separated, divorced, or widowed), live with someone (yes/no), dependent children (yes/no), employment status (self-employed, full-time worker, part-time worker, unemployed, student, disabled, homemaker, retired), and education (high school or less, some college, college degree, postgraduate degree).

#### 4.4 | Data analysis strategy

Our dependent variable is continuous, and was approximately normally distributed ( $M = 0$ ,  $Mdn = 0.06$ ,  $SD = 2.71$ ), with skewness and kurtosis (skewness =  $-0.24$ , kurtosis =  $-1.07$ ) falling within the acceptable range of  $-2.00$  to  $+2.00$  (Westfall, 2014). We utilized hierarchical ordinary least squares (OLS) regression with heteroscedasticity-robust standard errors and unweighted data in order to estimate the effects of financial stressors and coping resources on FW.

We utilized a hierarchical regression for three reasons. First, hierarchical regression allows for blocks of explanatory variables to be sequentially added to a regression model based on theory (Wampold & Freund, 1987). The TEMW makes sequential predictions in which perceptions of threat are followed by estimations of coping resources with worry only initiated if coping resources are deemed inadequate to meet the demands of the perceived threat. Second, hierarchical regression allowed us to examine the unique variance contributed to FW by each block of explanatory variables. Third, hierarchical regression allowed us to examine whether: (1) SFS attenuated the relationship between OFS and FW, and (2) the coping resources attenuated the relationships between OFS, SFS, and FW.

The blocks of explanatory variables were entered into the regression model in five steps, with the order of entry conceptually grounded in the TEMW. First, demographic control variables were regressed on FW (Model 1, Table 6). Following this, OFS was added to the model at the second step (Model 2, Table 6). SFS was added to the model at the third step (Model 3, Table 6), and coping resources were added to the model at the fourth step (Model 4, Table 6). Finally, the interaction terms to test the moderation hypotheses were simultaneously added to the regression model (Aiken & West, 1991) at the fifth step (Model 5, Table 6). The interaction terms were created by multiplying financial stressors (i.e., OFS and SFS) by the coping resources variables (i.e., FC and household income) and individual factors variables (i.e., gender and age). All independent continuous variables were centered at the mean prior to the regression analyses and the calculation of the interaction terms (Aiken & West, 1991).

Since our regression model included interaction terms, unstandardized ( $B$ ) coefficients were used in order to test the significance of each of the variables (Aiken & West, 1991). The significance for each block of variables was tested by examining the amount of variance explained,  $R^2$ , and change in variance explained,  $\Delta R^2$ . All variance inflation factors were less than 3.00, except for age 65-plus category (3.58). Thus, we concluded that multicollinearity was not an issue.

In addition to the OLS regression described above, we also used logistic regression to examine the effects of our focal and control variables on the likelihood of respondents being in the

low SFS/high FW (vs. low SFS/low FW) and high SFS/low FW (vs. high SFS/high FW) groups. Specifically, we used median splits for SFS ( $<0.06$  vs.  $\geq 0.06$ ) and FW ( $<-0.61$  vs.  $\geq -0.61$ ) to categorize the respondents into four groups: LoSFS/LoFW, LoSFS/HiFW, HiSFS/LoFW, and HiSFS/HiFW (Table 5).

## 5 | RESULTS

### 5.1 | Confirmatory factor analysis and summary statistics

Confirmatory factor analysis, a “method for evaluating whether a prespecified factor model provides a good fit to the data” (Floyd & Widaman, 1995, p. 293) was conducted to test the hypothesis (H1) that OFS, SFS, and FW would have discriminant validity. Discriminant validity was tested using two approaches developed by Bagozzi and colleagues (Bagozzi et al., 1991; Bagozzi & Phillips, 1982). First, we separately constrained the covariance estimates between the three pairings of the variables (i.e., OFS/SFS, OFS/FW, and SFS/FW) to unity and then performed a test of the significance of the difference in chi-square values between each constrained model and the unconstrained model that had no restriction on covariances. The differences between each constrained model and the unconstrained model were all significant:  $\Delta\chi^2(\Delta df=1) = 2135.84$ ,  $p < 0.001$ ,  $\Delta\chi^2(\Delta df=1) = 7275.43$ ,  $p < 0.001$ , and  $\Delta\chi^2(\Delta df=1) = 6150.21$ ,  $p < 0.001$ , after correction for multiple testing was applied (Bonferroni correction,  $p = 0.0166$ ,  $[0.05/3]$ ). Since a significant change in chi-squared values suggests that OFS, SFS, and FW are distinct concepts, we found support for discriminant validity. Thus, H1 was supported. Second, we performed the confidence interval discriminant validity test. This test entailed calculating the confidence interval for the correlation between factors. Discriminant validity is achieved if the confidence interval does not contain unity. This was observed for the 99% confidence intervals for the correlations between factors: OFS versus SFS (0.7923–0.8183), OFS versus FW (0.6092–0.6402), and SFS versus FW (0.7482–0.7706), thus also providing support for H1.

Table 3 presents the means, standard deviations, and zero-order correlations for the study's focal variables. Table 3 shows that as expected: (1) both OFS ( $r = 0.52$ ,  $p < 0.001$ ) and SFS ( $r = 0.64$ ,  $p < 0.001$ ) are significantly positively correlated to FW, (2) coping resources are significantly negatively correlated to FW, ranging from  $-0.05$  to  $-0.54$  except income less than \$50K ( $r = 0.22$ ,  $p < 0.001$ ), and (3) coping resources are significantly negatively correlated to financial stressors ranging from  $-0.02$  to  $-0.74$  except income less than \$50K that is significantly positively correlated to both OFS ( $r = 0.17$ ,  $p < 0.001$ ) and SFS ( $r = 0.43$ ,  $p < 0.001$ ). Furthermore, the correlations among OFS, SFS, and FW are all less than 0.71 which means that the shared variance (i.e.,  $r^2$ ) between each pair of concepts is less than half, suggesting that these concepts should be treated as distinct (MacKenzie et al., 2005) a result that is consistent with H1.

Table 4 presents the summary statistics for the entire sample and separately for the FW quartiles. Overall, 29.3% ( $N = 5755$ ), 21.1% ( $N = 4090$ ), 12.4% ( $N = 2399$ ), and 37.3% ( $N = 7141$ ) respondents reported low, moderate, high, and very high FW, respectively. Just over a sixth (17.1%) of the respondents who reported a score of at least three on the OFS index reported high to very high FW while over a fifth (22.0%) of the respondents who reported very high SFS reported high to very high FW while over eight-tenths (82.2%) of the respondents who reported very high SFS reported high to very high FW. Nearly a fifth (19.5%) of the respondents who

TABLE 3 Means, standard deviations, zero-order correlations: focal variables

Variable	M	SD	1	2	3	4	5	6	7	8
1. Financial worry	0.00	2.71	–							
2. Objective financial stressors	0.00	1.44	0.52***	–						
3. Subjective financial stressors	0.00	2.54	0.64***	0.61***	–					
4. Financial capability	0.00	4.60	–0.54***	–0.51***	–0.74***	–				
5. Less than \$50K	0.42	0.49	0.22***	0.17***	0.43***	–0.44***	–			
6. \$50K–\$100K	0.36	0.48	–0.05***	–0.02**	–0.15***	0.16***	–0.64***	–		
7. \$100K–\$150K	0.14	0.35	–0.12***	–0.11***	–0.22***	0.23***	–0.35***	–0.31***	–	
8. More than \$150K	0.08	0.27	–0.17***	–0.13***	–0.23***	0.23***	–0.25***	–0.22***	–0.12***	–

Note:  $N = 19,385$ ; household income is coded as four dummy variables with less than \$150K as the referent.

\* $p < 0.05$ ;

\*\*\* $p < 0.01$ ; \*\*\*\* $p < 0.001$ .

**TABLE 4** Summary statistics: full sample and financial worry quartiles

		Financial worry quartiles			
		Low <i>N</i> = 5755 (29.31%)	Moderate <i>N</i> = 4090 (21.06%)	High <i>N</i> = 2399 (12.36%)	Very high <i>N</i> = 7141 (37.27%)
	Total <i>N</i> = 19,385	% (Weighted)	% (Weighted)	% (Weighted)	% (Weighted)
<i>Focal variables</i>					
OFS: zero	42.81	20.95	10.93	4.42	6.51
OFS: one	22.18	5.35	5.28	3.37	8.19
OFS: two	14.53	1.75	2.73	2.47	7.58
OFS: at least three	20.48	1.27	2.12	2.11	14.98
<i>SFS quartiles</i>					
Low ( $< -2.19$ )	20.58	15.12	3.68	0.92	0.86
Moderate ( $\geq -2.19 < -0.61$ )	24.37	8.62	8.04	3.41	4.29
High ( $\geq -0.61 < 2.16$ )	28.80	4.00	6.69	5.16	12.96
Very high ( $\geq 2.16$ )	26.25	1.57	2.65	2.87	19.16
<i>FC quartiles</i>					
Low ( $< -3.10$ )	26.07	2.38	4.16	3.49	16.03
Moderate ( $\geq -3.10 < 0.54$ )	25.54	4.04	5.55	4.15	11.80
High ( $\geq -0.54 < 3.64$ )	25.32	7.77	6.57	3.29	7.69
Very high ( $\geq 3.64$ )	23.07	15.12	4.78	1.43	1.74
<i>Household income</i>					
Less than \$50K	43.53	9.19	8.39	5.67	20.28
\$50K–\$100K	35.35	11.01	7.74	4.29	12.30
\$100K–\$150K	13.80	5.40	3.22	1.73	3.45
More than \$150K	7.33	3.70	1.71	0.67	1.24
<i>Control variables</i>					
<i>Health insurance</i>					
Yes	91.10	27.91	19.49	11.22	32.48
No	8.90	1.41	1.57	1.14	4.79
<i>Age</i>					
Age: 18–34	26.05	4.65	5.32	3.75	12.34
Age: 35–50	26.39	5.38	5.86	3.51	12.23
Age: 51–64	26.56	8.91	5.77	3.08	8.81
Age: 65 and older	20.99	10.37	4.71	2.02	3.89
<i>Gender</i>					
Male	50.05	16.79	11.52	5.93	15.80
Female	49.95	12.52	9.54	6.43	21.47
<i>Race/ethnicity</i>					
White	66.70	21.03	14.31	8.23	23.14

(Continues)

TABLE 4 (Continued)

	Total <i>N</i> = 19,385	Financial worry quartiles			
		Low <i>N</i> = 5755 (29.31%)	Moderate <i>N</i> = 4090 (21.06%)	High <i>N</i> = 2399 (12.36%)	Very high <i>N</i> = 7141 (37.27%)
	% (Weighted)	% (Weighted)	% (Weighted)	% (Weighted)	% (Weighted)
Black	10.89	3.05	2.12	1.07	4.64
Hispanic	14.74	3.16	2.86	2.16	6.57
Asian/others	7.66	2.07	1.77	0.90	2.92
<i>Education</i>					
High school or less	27.12	7.56	5.25	3.37	10.94
Some college	28.64	6.96	6.20	3.54	11.93
College degree	31.32	9.77	6.49	4.19	10.87
Postgraduate degree	12.92	5.01	3.12	1.26	3.53
<i>Employment</i>					
Works full-time	42.79	10.47	9.06	5.78	17.48
Works part-time	8.31	1.85	1.82	1.05	3.59
Self-employed	7.22	2.13	1.41	0.79	2.89
Unemployed	3.84	0.62	0.59	2.24	2.16
Retired	23.57	11.62	5.41	1.94	4.31
Student	3.27	0.69	0.64	0.58	1.37
Homemaker	6.34	1.30	1.36	0.84	2.84
Disabled	4.66	0.65	0.78	0.62	2.62
<i>Homeowner</i>					
Yes	63.93	22.38	14.01	7.58	19.96
No	36.07	6.93	7.05	4.78	17.31
<i>Marital status</i>					
Married	53.94	17.95	11.93	6.56	17.49
Single	29.18	6.26	5.91	3.88	13.13
Separated	1.46	0.25	0.28	0.16	0.77
Divorced	11.14	3.23	2.08	1.28	4.55
Widowed/widower	4.29	1.63	0.85	0.49	1.32
<i>Live with others</i>					
Yes	75.04	22.56	16.26	9.54	26.65
No	24.99	6.75	4.80	2.82	10.62
<i>Dependent child(ren)</i>					
Yes	67.27	20.59	13.79	7.94	24.96
No	32.73	8.73	7.27	4.42	12.31

Note: Weighted results; quartiles derived from z-scores of underlying variables; financial worry quartiles: low ( $< -1.88$ ), moderate ( $\geq -1.88 < 0.06$ ), high ( $\geq 0.06 < 2.43$ ), very high ( $\geq 2.43$ ).

Abbreviations: FC, financial capability; OFS, objective financial stressors; SFS, subjective financial stressors.



**TABLE 5** Median split analyses to understand the association between SFS and FW

SFS	High FW ( $\geq 0.06$ )	Low FW ( $< 0.06$ )	Total
High SFS ( $\geq -0.61$ )	7584 (40.14)	2672 (14.91)	10,256 (55.05)
Low SFS ( $< -0.61$ )	1956 (9.49)	7173 (35.46)	9129 (44.95)
Total	9540 (49.63)	9845 (50.37)	19,385 (100)

Note: Values are  $N$  (percent);  $N$  is unweighted; percent is weighted. High/low categorizations are defined by median-splits. Abbreviations: FW, financial worry; SFS, subjective financial stressors.

reported low FC reported high to very high FW while only 3.17% of the respondents who reported very high FC reported high to very high FW. Over a quarter (26.0%) of the respondents who reported household income below \$50K reported high to very high FW while only 5.2% of the respondents who reported household income between \$100K and \$150K reported high to very high FW.

Half (50.1%) of the respondents were male, and most of the respondents were White (66.7%), married (53.9%), lived with others (75.0%), employed (58.3%), homeowners (63.9%), and had dependent children (67.3%). In addition, most (52.4%) of the respondents were aged 18–50 and well-educated, with nearly three-quarters (72.9%) possessing at least some college education.

Table 5 shows the SFS/FW  $2 \times 2$  contingency table for respondents who reported high versus low levels of FW as a function of high versus low SFS. Respondents with high levels of SFS reported high levels of FW, and vice versa ( $\chi^2(df = 1) = 5002.88, p < 0.001$ ). In addition, respondents reporting high SFS have 10.4 times the odds (95% CI: 9.78, 11.13) of reporting high FW than those reporting low SFS.

### 5.1.1 | Regression results

Table 6 provides a summary of the regression results. Model 1 is the baseline model for the study, in which we regress the control variables on FW. Model 1 was significant ( $F = 169.78; p < 0.001$ ), and explained 17.88% of the variance in FW, and also interestingly shows that all of the control variables significantly predicted FW. Models two through to five all include the control variables entered in Model 1, and Models one to five were used to test Hypothesis 6. In addition, Model 5, which was the primary model for the present study, was used to test the rest of the hypotheses.

Model 2 added OFS, was significant ( $F = 361.72; p < 0.001$ ), and explained 32.61% of the variance in FW, indicating a change in  $R^2$  of 0.1473, which was significant ( $p < 0.001$ ). Model 3 added SFS, was significant ( $F = 619.76; p < 0.001$ ), and explained 46.29% of the variance in FW, indicating a change in  $R^2$  of 0.1368, which was significant ( $p < 0.001$ ). Model 4 added coping resources (i.e., household income, FC), was significant ( $F = 558,213; p < 0.001$ ), and explained 47.12% of the variance in FW, indicating a change in  $R^2$  of 0.0083, which was significant ( $p < 0.001$ ). Finally, Model 5 added the interaction terms. The interactions included were the product of financial stressors and household income, FC, age, and gender. Model 5 was significant ( $F = 411.28; p < 0.001$ ), and explained 49.93% of the variance in FW, indicating a change in  $R^2$  of 0.0281, which was significant ( $p < 0.001$ ). Although this increase in explained variance is of modest size, researchers (e.g., McClelland & Judd, 1993), have noted that changes

**TABLE 6** Linear regression results: financial worry ( $N = 19,385$ )

Hypothesized predictors	Model 1			Model 2			Model 3			Model 4			Model 5		
	B	SE		B	SE		B	SE		B	SE		B	SE	
H2A: OFS	-	-		0.83***	0.01		0.34***	0.01		0.31***	0.01		0.25***	0.03	
H2B: SFS	-	-		-	-		0.55***	0.01		0.48***	0.01		0.53***	0.01	
H3A: \$50K-\$100K	-	-		-	-		-	-		0.19***	0.04		0.19***	0.04	
H3A: \$100K-\$150K	-	-		-	-		-	-		0.15**	0.05		0.25***	0.06	
H3A: More than \$150K	-	-		-	-		-	-		-0.20**	0.07		0.25**	0.09	
H3B: FC	-	-		-	-		-	-		-0.08***	0.01		-0.11***	0.01	
H4A: OFS × \$50K-\$100K	-	-		-	-		-	-		-	-		0.06	0.03	
H4A: OFS × \$100K-\$150K	-	-		-	-		-	-		-	-		0.18***	0.04	
H4A: OFS × More than \$150K	-	-		-	-		-	-		-	-		0.09	0.07	
H4B: OFS × FC	-	-		-	-		-	-		-	-		0.01	0.00	
H4C: SFS × \$50K-\$100K	-	-		-	-		-	-		-	-		-0.004	0.02	
H4C: SFS × \$100K-\$150K	-	-		-	-		-	-		-	-		-0.04	0.03	
H4C: SFS × More than \$150K	-	-		-	-		-	-		-	-		0.10*	0.04	
H4D: SFS × FC	-	-		-	-		-	-		-	-		0.04***	0.00	
H5A: OFS × Age 35-50	-	-		-	-		-	-		-	-		-0.07*	0.03	
H5A: OFS × Age 51-65	-	-		-	-		-	-		-	-		-0.09**	0.04	
H5A: OFS × Age 65 and above	-	-		-	-		-	-		-	-		-0.10	0.06	
H5B: OFS × Male	-	-		-	-		-	-		-	-		0.16***	0.03	
H5C: SFS × Age 35-50	-	-		-	-		-	-		-	-		-0.04	0.02	
H5C: SFS × Age 51-65	-	-		-	-		-	-		-	-		0.02	0.02	
H5C: SFS × 65 and above	-	-		-	-		-	-		-	-		0.05*	0.02	
H5D: SFS × Male	-	-		-	-		-	-		-	-		-0.05***	0.02	



TABLE 6 (Continued)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	B	SE	B	SE	B	SE	B	SE	B	SE
Control variables										
Health insurance = 1	−0.44***	0.07	−0.18**	0.06	0.07	0.06	0.13*	0.06	0.06	0.06
Gender (Male = 1)	−0.69***	0.04	−0.55***	0.03	−0.39***	0.03	−0.34***	0.03	−0.33***	0.03
Race: Black	−0.23**	0.07	−0.70***	0.06	−0.63***	0.06	−0.64***	0.06	−0.73***	0.06
Race: Hispanic	−0.02	0.07	−0.02	0.06	−0.03	0.05	−0.05	0.05	−0.08	0.05
Race: Asian/others	−0.13	0.07	0.002	0.07	−0.05	0.06	−0.06	0.06	−0.07	0.06
Age: 35–50	−0.12*	0.05	0.17**	0.05	0.05	0.04	−0.06	0.04	0.20***	0.05
Age: 51–64	−0.88***	0.06	−0.09	0.05	−0.08	0.05	−0.02	0.05	0.16**	0.05
Age: 65 and above	−1.39***	0.08	−0.36***	0.07	−0.32***	0.07	−0.23**	0.07	0.03	0.07
Homeowner = 1	−0.55***	0.04	−0.26***	0.04	0.20***	0.04	0.28***	0.04	0.21***	0.04
Education: some college	0.10*	0.05	−0.14**	0.05	0.01	0.04	0.06	0.04	0.06	0.03
Education: college degree	−0.30***	0.05	−0.29***	0.04	0.03	0.04	0.11**	0.04	0.17**	0.04
Education: postgrad degree	−0.56***	0.06	−0.53***	0.05	−0.02	0.05	0.13*	0.05	0.21***	0.05
Dependent child(ren) = 1	0.28***	0.04	−0.11*	0.04	−0.09**	0.04	−0.09*	0.04	−0.07*	0.03
Marital status: single	0.05	0.06	0.16**	0.05	−0.10*	0.04	−0.12*	0.05	−0.08	0.05
Marital status: separated	0.40*	0.15	0.22	0.11	−0.24*	0.06	−0.30*	0.12	−0.13	0.12
Marital status: divorced	0.15*	0.07	0.18**	0.06	−0.16**	0.06	−0.19**	0.06	−0.18**	0.06
Marital status: widowed	0.03	0.10	0.06	0.09	−0.27**	0.08	−0.30**	0.08	−0.33***	0.08
Live with others = 1	−0.29***	0.05	−0.13*	0.05	−0.12*	0.04	−0.15**	0.04	−0.06	0.04
Employment: unemployed	0.62***	0.10	0.35**	0.10	−0.26**	0.09	−0.31**	0.09	−0.11	0.04
Employment: self-employed	−0.11	0.08	−0.17**	0.07	−0.19**	0.06	−0.18**	0.06	−0.14*	0.06
Employment: part-time	−0.02	0.07	0.002	0.06	−0.22***	0.06	−0.24***	0.06	−0.17**	0.06
Employment: retired	−0.88***	0.06	−0.64***	0.06	−0.64***	0.05	−0.64***	0.05	−0.50***	0.05

(Continues)

TABLE 6 (Continued)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Employment: student	−0.35*	0.11	−0.15	0.10	−0.28**	0.09	−0.29**	0.09	−0.24**	0.09
Employment: disabled	0.80***	0.09	0.42***	0.08	−0.47***	0.08	−0.53***	0.08	−0.31***	0.08
Employment: homemaker	−0.19*	0.08	−0.10	0.07	−0.34***	0.06	−0.39***	0.06	−0.28***	0.06
Intercept	2.03***	0.11	1.18***	0.10	0.57***	0.09	0.31***	0.09	0.41***	0.09
Model <i>F</i> -statistic	169.78***		361.72***		619.76***		558.21***		412.28***	
Adjusted <i>R</i> -squared	0.1788		0.3261		0.4629		0.4712		0.4993	
Adjusted <i>R</i> -squared change	–		0.1473***		0.1368***		0.0083***		0.0281***	

*Note:* Unstandardized regression coefficients are reported; robust standard errors are reported; “income <\$50K” was used as the reference category for income; “white” was used as the reference category for race; “age 18–34” was used as the reference category for age; “high school or less” was used as the reference category for education; “full-time employment” was used as the reference category for employment status; and “married” was used as the reference category for marital status.

Abbreviations: FC, financial capability; OFS, objective financial stressors; SE, standard error; SFS, subjective financial stressors.

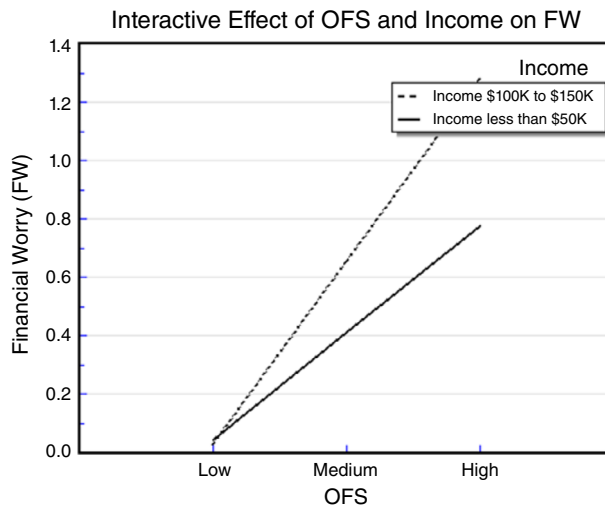
\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

in  $R^2$  due to moderation effects are typically quite small, ranging from 1% to 3%. Taken together, these results provide sufficient evidence in support of Hypothesis 6 that stated that all three blocks of variables (i.e., OFS, SFS, and coping resources) would uniquely explain additional variance in FW after controlling for sociodemographic factors and other blocks of variables.

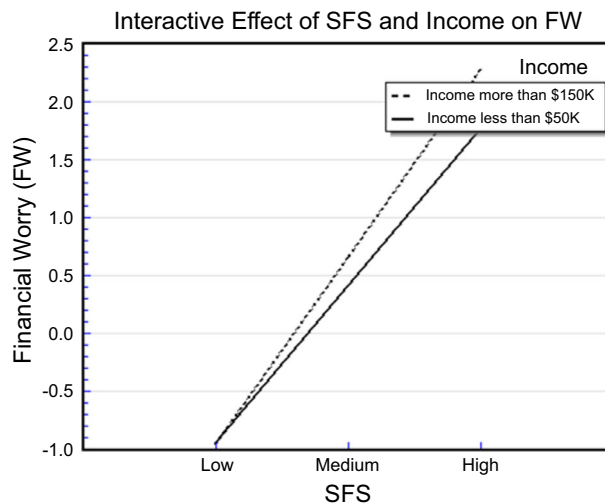
Model 2 indicated that OFS was associated positively with FW after controlling for the sociodemographic variables ( $B = 0.83$ ,  $t = 69.22$ ,  $p < 0.001$ ). The addition of SFS to Model 3 reduced the size of the coefficient of OFS from 0.83 to 0.34 or by 59%, but it retained statistical significance ( $B = 0.34$ ,  $t = 25.49$ ,  $p < 0.001$ ), suggesting that SFS partially mediated the effects of OFS on FW. Model 3 indicated that SFS was associated positively with FW ( $B = 0.55$ ,  $t = 68.82$ ,  $p < 0.001$ ) after controlling for the sociodemographic variables and OFS. The addition of coping resources to Model 4 reduced the size coefficient of OFS by 9%, from 0.34 to 0.31, and the size of the coefficient of SFS by 13%, from 0.55 to 0.48, suggesting a somewhat limited function for coping resources as mediators in the association linking OFS and SFS to FW. Both OFS ( $B = 0.25$ ,  $t = 8.65$ ,  $p < 0.001$ ) and SFS ( $B = 0.53$ ,  $t = 28.44$ ,  $p < 0.001$ ) retained statistical significance on the introduction of the interaction terms in Model 5. Therefore, Hypotheses 2A and 2B were supported.

In the interaction model predicting financial worry (Table 6, Model 5), contrary to expectations, household income was significantly positively related to FW for all income categories: \$50–\$100K ( $B = 0.19$ ,  $t = 5.00$ ,  $p < 0.001$ ), \$100K–\$150K ( $B = 0.25$ ,  $t = 4.40$ ,  $p < 0.001$ ), and more than \$150K ( $B = 0.25$ ,  $t = 2.73$ ,  $p < 0.01$ ). Thus, Hypothesis 3A was not supported. However, we found support for Hypotheses 4A and 4C as reflected in the significant interactions of OFS  $\times$  \$100K–\$150K ( $B = 0.18$ ,  $t = 4.09$ ,  $p < 0.001$ ), and SFS  $\times$  more than \$150K ( $B = 0.10$ ,  $t = 2.29$ ,  $p < 0.05$ ). To understand these significant interactions, we conducted simple slope tests (Aiken & West, 1991) of OFS and SFS on FW in respondents earning the reference household income of less than \$50K against respondents in the higher household income groups. The simple slope for the association between FW and OFS was greater when the household income was \$100K–\$150K ( $B = 0.43$ ,  $SE = 0.02$ ,  $t = 20.60$ ,  $p < 0.001$ ) than when it was less than \$50K ( $B = 0.25$ ,  $SE = 0.03$ ,  $t = 8.65$ ,  $p < 0.001$ ). Figure 3 illustrates this interaction effect. Compared to those earning below \$50K, those earning \$100K–\$150K reported higher levels of FW at higher levels of OFS. Specifically, at low levels of OFS, higher household income has less of an observed impact on respondents' FW whereas at higher levels of OFS, higher household income was associated with higher FW, suggesting an exacerbating effect of household income. The simple slope for the association between FW and SFS was greater when household income was more than \$150K ( $B = 0.64$ ,  $SE = 0.05$ ,  $t = 13.89$ ,  $p < 0.001$ ) than when it was less than \$50K ( $B = 0.53$ ,  $SE = 0.02$ ,  $t = 28.44$ ,  $p < 0.001$ ). Figure 4 illustrates that at lower levels of SFS, compared to making less than \$50K, making more than \$150K has little effect on FW whereas at higher levels of SFS, the impact is bigger, suggesting an exacerbating effect of household income.

In the interaction model predicting FW (Table 6, Model 5), FC was a significant predictor of financial worry ( $B = -0.11$ ,  $t = -19.42$ ,  $p < 0.001$ ). Therefore, Hypothesis 3B was supported. As shown in Model 5 of Table 6, we found no support for Hypothesis 4B as reflected in the nonsignificant interaction OFS  $\times$  FC ( $B = 0.01$ ,  $t = 1.65$ ,  $p = 0.10$ ) but there was support for Hypothesis 4D, as reflected by the significant interaction SFS  $\times$  FC ( $B = 0.04$ ,  $t = 16.69$ ,  $p < 0.001$ ). We tested the simple slopes of SFS on FW in respondents with high, medium, and low FC (1 SD above the mean, at the mean, and 1 SD below the mean). This analysis indicated strong effect of SFS on FW when FC was low ( $B = 0.37$ ,  $SE = 0.02$ ,  $t = 22.06$ ,  $p < 0.001$ ),



**FIGURE 3** Interactive effect of OFS and income on FW. FW, financial worry; OFS, objective financial stressors

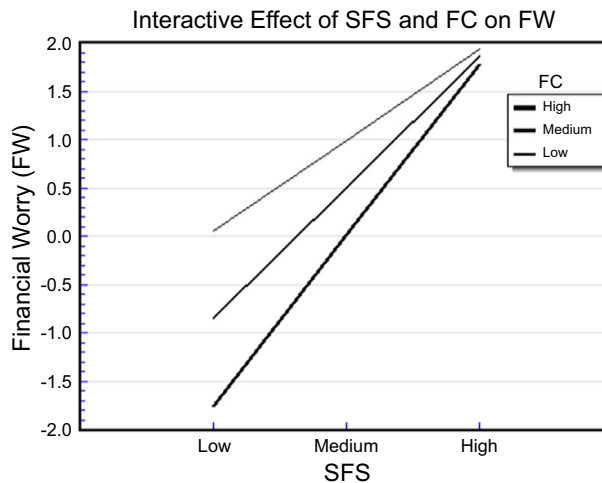


**FIGURE 4** Interactive effect of SFS and income on FW. FW, financial worry; SFS, subjective financial stressors

medium ( $B = 0.53$ ,  $SE = 0.02$ ,  $t = 28.44$ ,  $p < 0.001$ ), and high ( $B = 0.69$ ,  $SE = 0.02$ ,  $t = 28.23$ ,  $p < 0.001$ ). Figure 5 illustrates that whereas at high levels of SFS, the level of FC has little observed effects on FW, at low levels of SFS, high FC is associated with less FW.

In the interaction model predicting FW (Table 6, Model 5), we found strong support for Hypotheses 5A and 5C, as reflected by the significant interactions OFS  $\times$  age 35–50 ( $B = -0.07$ ,  $t = -2.45$ ,  $p < 0.05$ ), OFS  $\times$  age 51–64 ( $B = -0.09$ ,  $t = -2.66$ ,  $p < 0.01$ ), and SFS  $\times$  age 65–plus ( $B = 0.05$ ,  $t = 2.10$ ,  $p < 0.05$ ). The simple slope for the association between FW and OFS was greater when age was 18–34 ( $B = 0.25$ ,  $SE = 0.03$ ,  $t = 8.65$ ,  $p < 0.001$ ) than when age was 35–50





**FIGURE 5** Interactive effect of SFS and FC on FW. FC, financial capability; FW, financial worry; SFS, subjective financial stressors

( $B = 0.18$ ,  $SE = 0.03$ ,  $t = 5.51$ ,  $p < 0.001$ ). Similarly, the simple slope for the association between FW and OFS was greater when age was 18–34 ( $B = 0.25$ ,  $SE = 0.03$ ,  $t = 8.65$ ,  $p < 0.001$ ) than when age was 51–64 ( $B = 0.16$ ,  $SE = 0.04$ ,  $t = 4.47$ ,  $p < 0.001$ ). Figures 6 and 7 illustrate that at low levels of OFS, compared to younger adults, older adults engage in more FW. However, as OFS increases, age has a reduced effect on FW. The simple slope for the association between FW and SFS was greater when age was 65–plus ( $B = 0.58$ ,  $SE = 0.02$ ,  $t = 26.08$ ,  $p < 0.001$ ) than when age was 18–34 ( $B = 0.53$ ,  $SE = 0.02$ ,  $t = 28.44$ ,  $p < 0.001$ ). Figure 8 illustrates that at low levels of SFS, there is little difference in the effect of age on FW. However, as SFS increases, compared to younger adults, older adults engage in less FW, suggesting a buffering effect.

We found support for Hypotheses 5B and 5D with the significant OFS  $\times$  male ( $B = 0.16$ ,  $t = 6.01$ ,  $p < 0.001$ ) and SFS  $\times$  male ( $B = -0.05$ ,  $t = -3.52$ ,  $p < 0.01$ ) interactions. The simple slope for the association between FW and OFS was greater for males ( $B = 0.41$ ,  $SE = 0.03$ ,  $t = 8.65$ ,  $p < 0.001$ ) than for females ( $B = 0.25$ ,  $SE = 0.03$ ,  $t = 13.46$ ,  $p < 0.001$ ). Figure 9 illustrates that the effect of gender on FW reduced as OFS moved from low to high. Specifically, females engaged in more FW than males when OFS was low than when it was high. In contrast, Figure 10 illustrates that at low levels of SFS, there is little difference in the effect of gender on FW. However, as SFS increases, compared to females, males engage in less FW, suggesting a buffering effect. Finally, although not central to our main hypotheses, we found that except health insurance and living arrangements, all control variables were significantly associated with FW.

### 5.1.2 | Examining low SFS/high FW and high SFS/low FW groups

To understand the factors that influence membership of the SFS/FW groups, we conducted chi-square tests,  $t$ -tests, and hierarchical logistic regression. Table 7 shows that with the exception of living arrangements, there were statistically significant differences in all other variables between the LoSFS/HiFW and LoSFS/LoFW groups. Specifically, for our focal variables, the

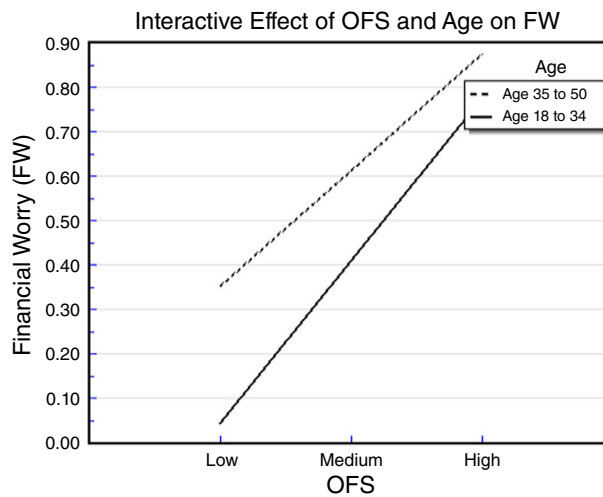


FIGURE 6 Interactive effect of OFS and age on FW. FW, financial worry; OFS, objective financial stressors

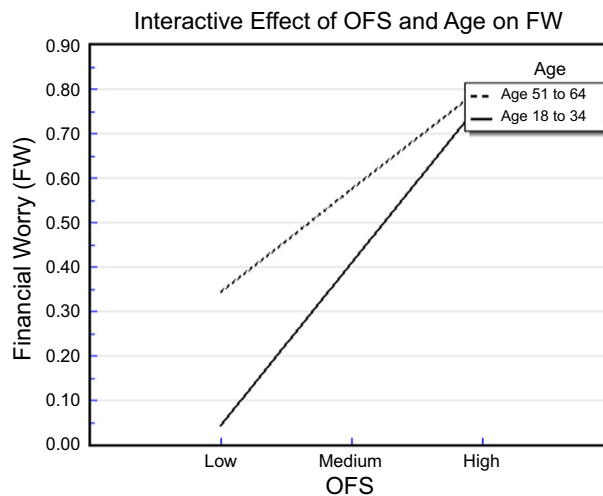
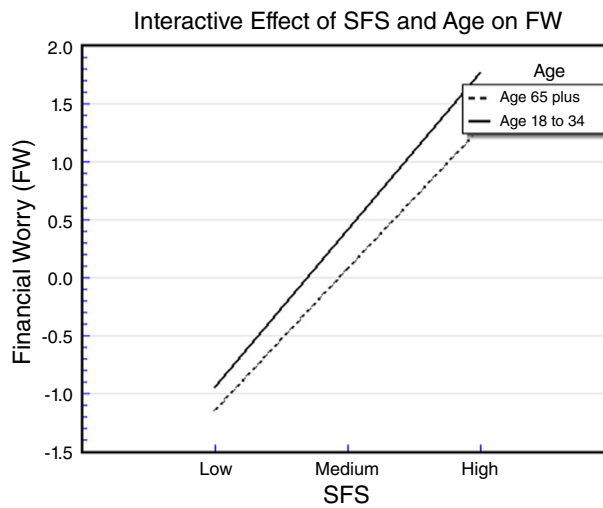


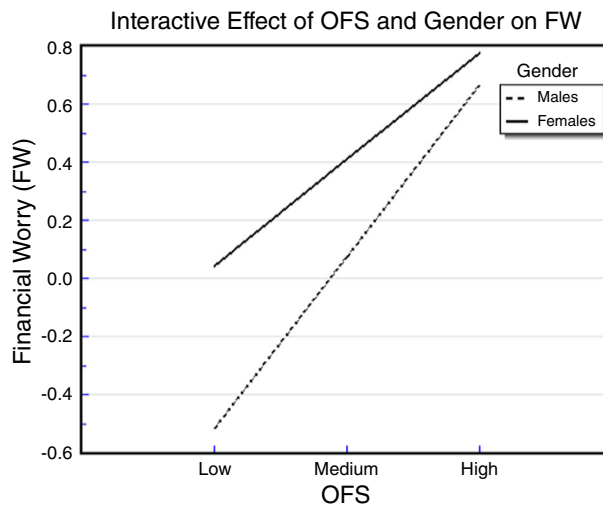
FIGURE 7 Interactive effect of OFS and age on FW. FW, financial worry; OFS, objective financial stressors

*t*-tests for unequal variances showed that OFS scores were significantly higher ( $p < 0.001$ ) while the FC scores were significantly lower ( $p < 0.001$ ) in the LoSFS/HiFW group. Table 7 shows that with the exception of except living arrangements, health insurance, and homeownership, there were statistically significant differences between the HiSFS/LoFW and HiSFS/HiFW groups. Specifically, for our focal variables, the *t*-tests for unequal variances showed that OFS scores were significantly lower ( $p < 0.001$ ) while the FC scores were significantly higher ( $p < 0.001$ ) in the HiSFS/LoFW group.

Table 8 presents the hierarchal logistic regression results of the likelihood of being in the LoSFS/HiFW group versus the reference group, LoSFS/LoFW. Mode 2 that added OFS indicated that OFS was significantly positively associated with the likelihood of being in the LoSFS/HiFW group (odds ratio;  $OR = 1.81$ ,  $p < 0.001$ ). Odds ratios greater than one indicate a positive



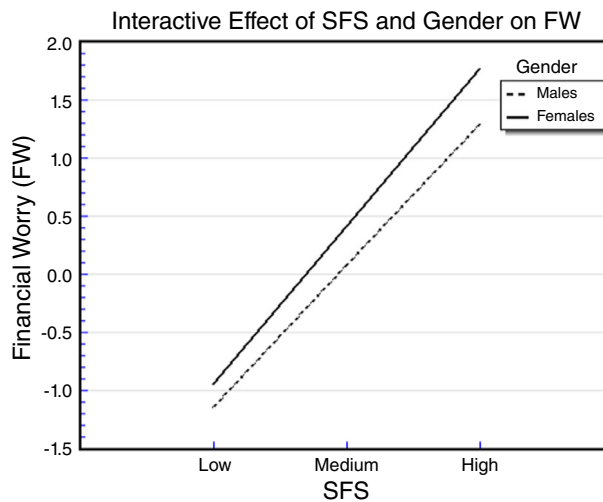
**FIGURE 8** Interactive effect of SFS and age on FW. FW, financial worry; SFS, subjective financial stressors



**FIGURE 9** Interactive effect of OFS and gender on FW. FW, financial worry; OFS, objective financial stressors

association and a greater likelihood of being in the LoSFS/HiFW group while odds ratios less than one indicate a negative association and a reduced likelihood of being in the LoSFS/HiFW group (i. e., a greater likelihood of being in the reference group). OFS remained significant in the subsequent and final model that added interaction terms. Model 3 of Table 8 that added coping resources indicated that FC was significantly negatively associated with the likelihood of being in the LoSFS/HiFW group ( $OR = 0.82, p < 0.001$ ). Model 4 of Table 8 that added the interaction terms indicated that OFS, FC,  $OFS \times FC$ , and  $OFS \times \text{age } 65\text{-plus}$  were significant predictors of the likelihood of being in the LoSFS/HiFW group.

We tested the simple slopes of OFS on the probability of being in the LoSFS/HiFW in respondents with high (1 SD above the mean) and low (1 SD below the mean) FC. This analysis



**FIGURE 10** Interactive effect of SFS and gender on FW. FW, financial worry; SFS, subjective financial stressors

indicated strong effect of OFS on the probability of being in the LoSFS/HiFW group when FC was low ( $B = 0.26$ ,  $SE = 0.08$ ,  $\chi^2(1) = 10.71$ ,  $p < 0.01$ ) and high ( $B = 0.25$ ,  $SE = 0.08$ ,  $\chi^2(1) = 10.12$ ,  $p < 0.01$ ). Figure 11 illustrates that at both low and high levels of OFS, lower levels of FC are associated with higher probability of being in the LoSFS/HiFW group. We tested the simple slopes of OFS on the probability of being in the LoSFS/HiFW in respondents in the reference age group of 18–34 against respondents in the age 65-plus group. The simple slope for the association between the probability of being in the LoSFS/HiFW group and OFS was greater for older adults ( $B = 0.74$ ,  $SE = 0.12$ ,  $\chi^2(1) = 37.81$ ,  $p < 0.001$ ) than for younger adults ( $B = 0.37$ ,  $SE = 0.09$ ,  $\chi^2(1) = 16.75$ ,  $p < 0.001$ ). Figure 12 illustrates this interaction effect. The figure shows that as OFS increases, compared to younger adults, older adults have a higher probability of being in the LoSFS/HiFW group.

Table 9 presents the hierarchical logistic regression results of the likelihood of being in the HiSFS/LoFW group versus the reference group, HiSFS/HiFW. Model 2 that added OFS indicated that OFS was significantly negatively associated with the likelihood of being in the HiSFS/LoFW group ( $OR = 0.63$ ,  $p < 0.001$ ). OFS remained significant in the subsequent and final model that added interaction terms. Model 3 of Table 9 that added coping resources indicated that FC was significantly positively associated with the likelihood of being in the HiSFS/LoFW group. Model 4 of Table 9 that added the interaction terms indicated that OFS, FC, income \$100K–\$150K,  $OFS \times \$50K$ –\$100K,  $OFS \times \$100K$ –\$150K,  $OFS \times$  age 35–50,  $OFS \times$  age 51–64, and  $OFS \times$  male were significant predictors of the likelihood of being in the HiSFS/LoFW group. We probed the nature of these significant interactions using simple slopes for males and females, respondents earning the reference household income of less than \$50K against respondents in the higher household income groups, and respondents in the reference age group of 18–34 against respondents in the higher age groups.

The simple slopes (Figure 13) for the association between the likelihood of belonging to the HiSFS/LoFW group and OFS showed a significant moderating effect of household income on the likelihood of belonging to the HiSFS/LoFW group such that compared to individuals earning less than \$50K ( $B = -0.38$ ,  $SE = 0.04$ ,  $\chi^2(1) = 98.99$ ,  $p < 0.001$ ), individuals earning



TABLE 7 Summary statistics: SFS/FW groups ( $N = 19,385$ )

	Financial stressors/financial worry groups					
	LoSFS/LoFW $N = 7112$	LoSFS/HiFW $N = 2017$	Chi-square/ $t$ -test		HiSFS/LoFW $N = 2606$	HiSFS/HiFW $N = 7650$
	% (Weighted)	% (Weighted)	$p$ -value		% (Weighted)	% (Weighted)
Focal variables						
OFS ( $M, SD$ )	0.32 (0.64)	0.83 (1.01)	<0.0001		1.30 (1.31)	2.20 (1.53)
FC ( $M, SD$ )	3.44 (2.67)	1.47 (2.67)	<0.0001		-0.204 (4.11)	-3.07 (4.00)
Household income						
Less than \$50K	78.53	21.47	0.0002		27.46	72.54
\$50K-\$100K	77.67	22.33			24.08	75.92
\$100K-\$150K	76.40	23.60			26.60	73.40
More than \$150K	83.10	16.90			29.59	70.41
Control variables						
Health insurance						
Yes	78.71	21.29	<0.0001		26.62	73.38
No	67.08	32.92			25.18	74.82
Age	55.22 (15.44)	48.81 (14.37)	<0.0001		45.68 (17.54)	43.17 (15.00)
Gender						
Male	81.24	18.76	<0.0001		30.61	69.39
Female	74.65	25.35			22.94	77.06
Race						
White	78.75	21.25	<0.0001		25.84	74.16
Black	84.12	15.88			32.52	67.48
Hispanic	77.06	27.06			23.91	76.09
Asian/others	80.50	22.94			25.35	74.65

(Continues)

TABLE 7 (Continued)

Financial stressors/financial worry groups						
	LoSFS/LoFW N = 7112	LoSFS/HiFW N = 2017	Chi-square/ <i>t</i> -test <i>p</i> -value	HiSFS/LoFW N = 2606	HiSFS/HiFW N = 7650	Chi-square/ <i>t</i> -test <i>p</i> -value
	% (Weighted)	% (Weighted)		% (Weighted)	% (Weighted)	
<i>Education</i>			0.0002			0.0308
High school or less	79.82	20.18		28.19	71.81	
Some college	78.99	21.01		25.38	74.62	
College degree	75.76	24.94		25.41	74.59	
Postgraduate degree	80.60	19.40		27.18	72.82	
<i>Employment</i>			<0.0001			<0.0001
Works full-time	76.51	23.49		28.42	71.58	
Works part-time	72.35	27.65		22.34	77.66	
Self-employed	73.13	26.87		28.09	71.91	
Unemployed	74.92	25.08		24.93	75.07	
Retired	80.07	19.93		26.03	73.97	
Student	74.82	25.18		23.92	76.08	
Homemaker	58.95	41.05		26.43	73.57	
Disabled	87.95	12.05		38.72	61.28	
<i>Homeowner</i>			<0.0001			0.1386
Yes	79.36	20.64		25.78	74.22	
No	73.88	26.12		27.06	72.94	
<i>Marital status</i>			<0.0001			0.0248
Married	77.87	21.13		25.26	74.74	
Single	73.85	26.15		27.17	72.83	
Separated	85.65	14.35		23.68	76.32	





TABLE 7 (Continued)

	Financial stressors/financial worry groups					
	LoSFS/LoFW N = 7112	LoSFS/HiFW N = 2017	Chi-square/ <i>t</i> -test	HiSFS/LoFW N = 2606	HiSFS/HiFW N = 7650	Chi-square/ <i>t</i> -test
	% (Weighted)	% (Weighted)	<i>p</i> -value	% (Weighted)	% (Weighted)	<i>p</i> -value
Divorced	79.43	20.57	0.9966	27.04	72.96	0.6148
Widowed/widower	85.83	14.17		31.58	68.42	
<i>Living arrangements</i>						
Live with others	78.32	21.68	0.0001	26.56	73.44	0.0011
Live alone	78.32	21.68		26.08	73.92	
<i>Dependent child(ren)</i>						
Yes	75.72	24.28	0.0001	25.4	74.60	0.0011
No	79.45	20.55		28.36	71.64	

Note: Weighted results; *t*-tests were conducted to examine the associations among FC, age and the SFS/FW groups.  
Abbreviations: FC, financial capability; FW, financial worry; OFS, objective financial stressors; SFS, subjective financial stressors.



TABLE 8 Logistic regression results: likelihood of being in the LoSFS/HiFW group ( $N = 9129$ )

	Model 1	Model 2	Model 3	Model 4
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Focal variables				
OFS	-	1.81*** (1.69–1.93)	1.57*** (1.47–1.68)	1.45*** (1.21–1.73)
Income: \$50K–\$100K	-	-	1.07 (0.92–1.25)	1.07 (0.92–1.25)
Income: \$100K–\$150K	-	-	1.08 (0.90–1.31)	1.06 (0.88–1.28)
Income: More than \$150K	-	-	0.81 (0.65–1.01)	0.82 (0.65–1.03)
Financial capability (FC)	-	-	0.82*** (0.80–0.84)	0.81*** (0.80–0.83)
OFS × \$50K–\$100K	-	-	-	1.05 (0.91–1.23)
OFS × \$100K–\$150K	-	-	-	1.18 (0.98–1.43)
OFS × More than \$150K	-	-	-	1.04 (0.83–1.30)
OFS × FC	-	-	-	1.04** (1.02–1.06)
OFS × Age 35–50	-	-	-	0.99 (0.84–1.17)
OFS × Age 51–64	-	-	-	1.11 (0.93–1.32)
OFS × Age 65 and above	-	-	-	1.45** (1.13–1.84)
OFS × Male	-	-	-	1.10 (0.97–1.24)
Control variables				
Health insurance = 1	0.79 (0.60–1.03)	0.88 (0.67–1.16)	1.07 (0.80–1.43)	1.04 (0.78–1.39)
Gender (Male = 1)	0.59*** (0.53–0.66)	0.60*** (0.54–0.67)	0.67*** (0.60–0.75)	0.65*** (0.58–0.73)
Race: Black	0.47*** (0.36–0.61)	0.38*** (0.29–0.51)	0.33*** (0.25–0.43)	0.34*** (0.26–0.45)
Race: Hispanic	1.01 (0.82–1.23)	0.97 (0.79–1.20)	0.90 (0.72–1.11)	0.90 (0.73–1.12)
Race: Asian/others	0.82 (0.66–1.01)	0.85 (0.69–1.06)	0.84 (0.68–1.05)	0.85 (0.68–1.05)
Age: 35–50	1.11 (0.94–1.31)	1.27*** (1.07–1.51)	1.46*** (0.22–1.75)	1.42** (1.17–1.73)
Age: 51–64	0.75** (0.63–0.89)	1.00 (0.83–1.20)	1.34*** (1.11–1.62)	1.28* (1.04–1.56)
Age: 65 and above	0.55*** (0.44–0.69)	0.81 (0.64–1.03)	1.11 (0.87–0.42)	1.11 (0.86–1.43)



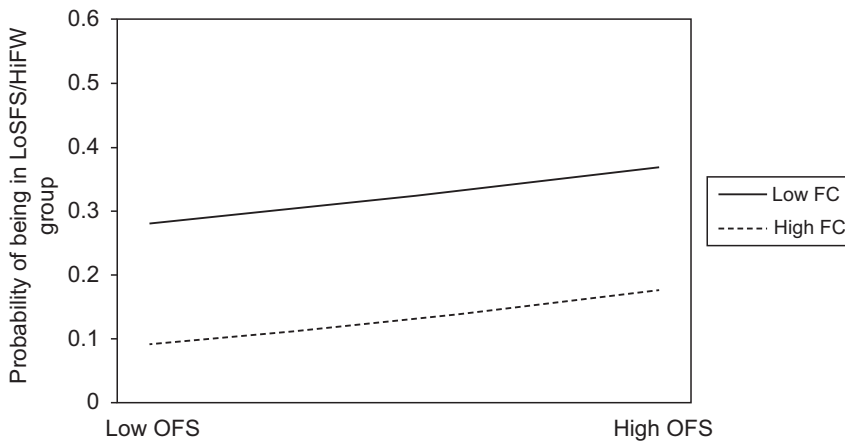
TABLE 8 (Continued)

	Model 1	Model 2	Model 3	Model 4
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Homeowner = 1	0.87 (0.76–0.1.01)	0.99 (0.85–1.15)	1.18* (1.01–1.39)	1.17* (1.01–1.37)
Education: some college	1.00 (0.85–1.18)	0.93 (0.79–1.10)	1.05 (0.88–1.25)	1.05 (0.88–1.25)
Education: college degree	1.05 (0.90–1.21)	1.03 (0.89–1.20)	1.36** (1.16–1.60)	1.35** (1.15–1.58)
Education: postgrad degree	0.86 (0.73–1.02)	0.82* (0.69–0.98)	1.23* (1.02–1.49)	1.23* (1.02–1.549)
Dependent child(ren) = 1	1.09 (0.96–1.25)	0.98 (0.86–1.12)	0.99 (0.86–1.13)	1.00 (0.87–1.14)
Marital status: single	1.01 (0.84–1.23)	1.05 (0.86–1.27)	0.98 (0.80–1.19)	0.98 (0.80–1.19)
Marital status: separated	0.55 (0.25–1.19)	0.50 (0.22–1.13)	0.43* (0.18–0.995)	0.43* (0.19–0.99)
Marital status: divorced	1.05 (0.85–1.31)	1.07 (0.86–1.34)	0.97 (0.77–1.22)	0.96 (0.76–1.20)
Marital status: widowed	0.81 (0.59–1.13)	0.78 (0.56–1.08)	0.71* (0.50–0.99)	0.68* (0.48–0.95)
Live with others = 1	0.95 (0.79–1.13)	0.91 (0.76–1.10)	0.92 (0.76–1.12)	0.92 (0.76–1.12)
Employment: unemployed	1.96** (1.25–3.01)	1.81** (1.13–2.88)	1.39 (0.86–2.25)	1.42 (0.88–2.29)
Employment: self-employed	0.87 (0.70–1.07)	0.90 (0.73–1.11)	0.93 (0.74–1.16)	0.96 (0.77–1.19)
Employment: part-time	0.99 (0.81–1.22)	1.05 (0.85–1.30)	0.96 (0.77–1.20)	0.98 (0.79–1.23)
Employment: retired	0.50*** (0.41–0.59)	0.55*** (0.46–0.65)	0.55*** (0.46–0.66)	0.57*** (0.48–0.69)
Employment: student	0.60** (0.39–0.93)	0.63* (0.40–0.99)	0.65 (0.40–1.04)	0.56* (0.35–0.88)
Employment: disabled	0.72 (0.43–0.1.18)	0.68 (0.40–1.14)	0.52** (0.31–0.88)	0.52** (0.31–0.88)
Employment: homemaker	0.68** (0.53–0.86)	0.74* (0.58–0.94)	0.67** (0.52–0.87)	0.68** (0.53–0.88)
Mean concordant	66.80%	70.80%	75.10%	75.30%
Pseudo R-squared	0.0579	0.0930	0.1315	0.1357
Pseudo R-squared change	–	0.0351***	0.0385***	0.0042***

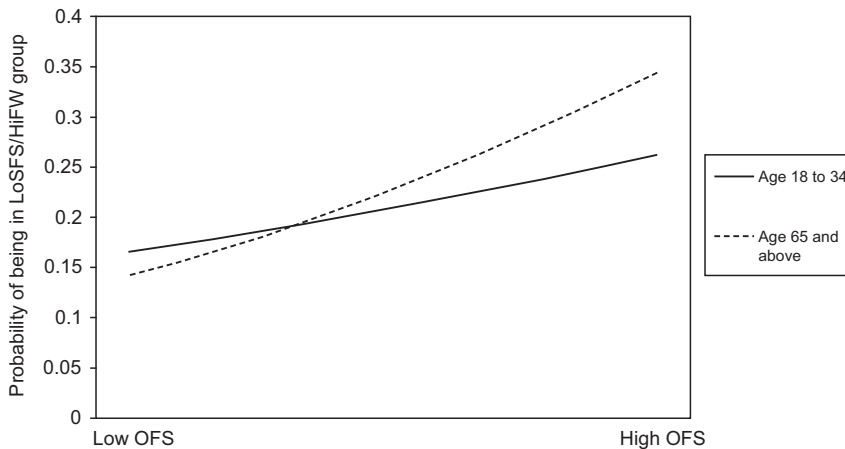
Note: LoSFS/LoFW was the reference group for LoSFS/HIFW; “income <\$50K” was used as the reference category for income; “white” was used as the reference category for race; “age 18–34” was used as the reference for age; “high school or less” was used as the reference category for education; “full-time employment” was used as the reference category for employment status; and “married” was used as the reference category for marital status.

Abbreviations: CI, confidence interval; 95% confidence intervals are in parentheses; OR, odds ratio, except for focal variables in which it is a ratio of odds ratios because of the interaction terms.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .



**FIGURE 11** Interactive effect of OFS and FC on probability of being in LoSFS/HiFW group. FC, financial capability; FW, financial worry; OFS, objective financial stressors; SFS, subjective financial stressors



**FIGURE 12** Interactive effect of OFS and age on probability of being in LoSFS/HiFW group. FW, financial worry; OFS, objective financial stressors; SFS, subjective financial stressors

\$50K–\$100K ( $B = -0.51$ ,  $SE = 0.05$ ,  $\chi^2(1) = 120.58$ ,  $p < 0.001$ ) had reduced likelihood of belonging to the HiSFS/LoFW group when OFS was high than when it was low. This interaction effect suggests a buffering effect of income. The simple slopes (Figure 14) for the association between the likelihood of belonging to the HiSFS/LoFW group and OFS showed a significant moderating effect of household income on the likelihood of belonging to the HiSFS/LoFW group such that compared to individuals earning less than \$50K ( $B = -0.38$ ,  $SE = 0.04$ ,  $\chi^2(1) = 98.99$ ,  $p < 0.001$ ), individuals earning \$100K–\$150K ( $B = -0.72$ ,  $SE = 0.09$ ,  $\chi^2(1) = 66.19$ ,  $p < 0.001$ ) had increased likelihood of belonging to the HiSFS/LoFW group when OFS was low and reduced likelihood of belonging to the HiSFS/LoFW group as OFS moved from low to high.

Figures 15 and 16 show that there was a significant negative relationship between OFS and the probability of being in the HiSFS/LoFW group when the respondent's age was in the



TABLE 9 Logistic regression results: likelihood of being in the HISFS/LoFW group ( $N = 10,256$ )

	Model 1	Model 2	Model 3	Model 4
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Focal variables				
OFS	-	0.63*** (0.61–0.65)	0.65*** (0.63–0.68)	0.68*** (0.63–0.74)
Income: \$50K–\$100K	-	-	0.92 (0.81–1.04)	0.89 (0.78–1.01)
Income: \$100K–\$150K	-	-	0.93 (0.76–1.14)	0.79* (0.62–0.99)
Income: More than \$150K	-	-	1.05 (0.77–1.42)	1.00 (0.69–1.44)
Financial capability (FC)	-	-	1.07*** (1.05–1.08)	1.07*** (1.06–1.09)
OFS × \$50K–\$100K	-	-	-	0.88** (0.81–0.96)
OFS × \$100K–\$150K	-	-	-	0.71** (0.60–0.84)
OFS × More than \$150K	-	-	-	0.91 (0.70–1.17)
OFS × FC	-	-	-	1.00 (0.99–1.01)
OFS × Age 35–50	-	-	-	1.13** (1.04–1.24)
OFS × Age 51–64	-	-	-	1.16** (1.05–1.28)
OFS × Age 65 and above	-	-	-	1.09 (0.95–1.25)
OFS × Male	-	-	-	0.89** (0.82–0.96)
Control variables				
Health insurance = 1	1.09 (0.94–1.26)	1.03 (0.89–1.20)	0.97 (0.84–1.13)	0.99 (0.85–1.15)
Gender (Male = 1)	1.64*** (1.49–1.81)	1.59*** (1.44–1.76)	1.52** (1.38–1.68)	1.46*** (1.31–1.63)
Race: Black	1.45*** (1.26–1.67)	1.91*** (1.64–2.21)	1.92*** (1.65–2.22)	1.98*** (1.71–2.31)
Race: Hispanic	0.98 (0.83–1.15)	0.98 (0.83–1.16)	0.99 (0.84–1.17)	0.99 (0.84–1.17)
Race: Asian/Others	1.10 (0.92–1.32)	1.00 (0.83–1.20)	1.00 (0.83–1.21)	0.99 (0.82–1.19)
Age: 35–50	1.04 (0.92–1.18)	0.90 (0.79–1.03)	0.92 (0.80–1.05)	0.90 (0.79–1.03)
Age: 51–64	1.29** (1.12–1.49)	0.92 (0.79–1.07)	0.89 (0.77–1.04)	0.90 (0.76–1.05)
Age: 65 and above	1.54*** (1.24–1.91)	0.94 (0.75–1.18)	0.88 (0.71–1.11)	0.89 (0.66–1.10)

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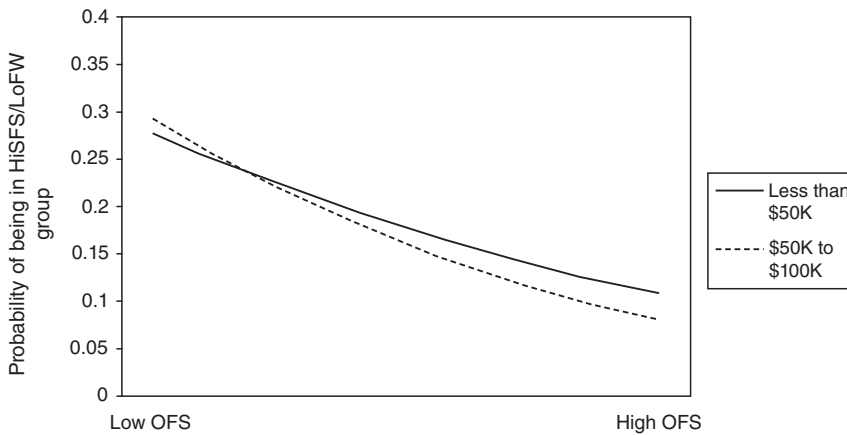
TABLE 9 (Continued)

	Model 1	Model 2	Model 3	Model 4
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Homeowner = 1	0.94 (0.86–1.04)	0.90* (0.81–1.00)	0.81* (0.73–0.90)	0.83* (0.75–0.93)
Education: some college	0.89 (0.79–1.00)	1.05 (0.93–1.19)	1.00 (0.88–1.13)	1.00 (0.88–1.13)
Education: college degree	0.95 (0.84–1.07)	1.03 (0.91–1.17)	0.94 (0.82–1.06)	0.90 (0.79–1.03)
Education: postgrad degree	0.98 (0.83–1.17)	1.13 (0.94–1.35)	0.97 (0.81–1.19)	0.94 (0.77–1.13)
Dependent child(ren) = 1	0.90 (0.81–1.01)	1.13* (1.01–1.27)	1.12 (0.99–1.26)	1.13* (1.01–1.27)
Marital status: single	1.20** (1.05–1.37)	1.07 (0.92–1.23)	1.11 (0.96–1.28)	1.09 (0.95–1.27)
Marital status: separated	0.98 (0.70–1.39)	0.99 (0.70–1.42)	1.10 (0.77–1.58)	1.08 (0.76–1.54)
Marital status: divorced	1.20* (1.02–1.41)	1.13 (0.96–1.34)	1.19 (1.00–1.41)	1.18 (1.00–1.40)
Marital status: widowed	1.10 (0.86–1.40)	1.02 (0.80–1.31)	1.07 (0.83–1.38)	1.09 (0.85–1.40)
Live with others = 1	1.18** (1.05–1.33)	1.10 (1.00–1.24)	1.13 (1.00–1.28)	1.07 (0.94–1.22)
Employment: unemployed	0.98 (0.79–1.22)	0.99 (0.78–1.24)	1.09 (0.87–1.37)	1.08 (0.86–1.35)
Employment: self-employed	1.28** (1.07–1.52)	1.34** (1.11–1.61)	1.34** (1.11–1.61)	1.36** (1.13–1.63)
Employment: part-time	1.31** (1.11–1.54)	1.25** (1.06–1.48)	1.30*** (1.09–1.54)	1.28** (1.08–1.53)
Employment: retired	1.86*** (1.55–2.24)	1.63*** (1.35–1.97)	1.69*** (1.39–2.05)	1.71*** (1.41–2.08)
Employment: student	1.23 (0.96–1.59)	1.07 (0.82–1.40)	1.10 (0.84–1.44)	1.05 (0.80–1.38)
Employment: disabled	1.03 (0.85–1.25)	1.09 (0.89–1.32)	1.23 (1.00–1.50)	1.23* (1.002–1.50)
Employment: homemaker	1.42** (1.18–1.71)	1.30** (1.07–1.57)	1.39** (1.15–1.69)	1.37** (1.12–1.66)
Mean concordant	61.60%	69.90%	70.60%	71.00%
Pseudo R-squared	0.0285	0.0846	0.0919	0.0966
Pseudo R-squared change	–	0.0561***	0.0073***	0.0047***

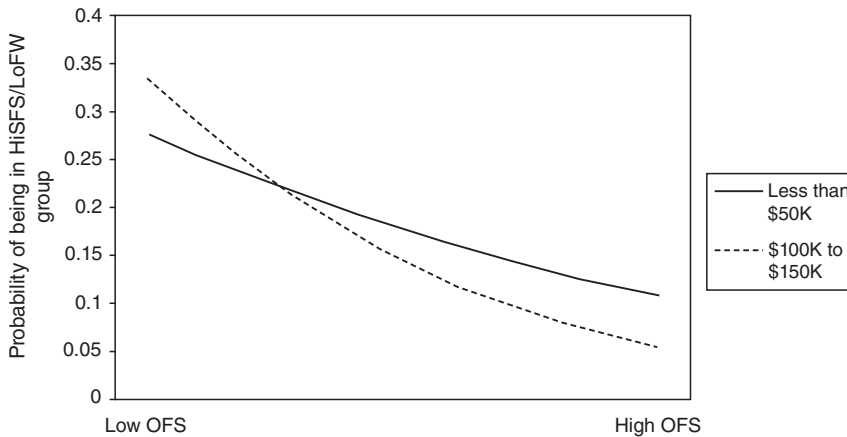
Note: HISFS/HIFW was the reference group for HISFS/LoFW; “income <\$50K” was used as the reference category for income; “white” was used as the reference category for race; “age 18–34” was used as the reference for age; “high school or less” was used as the reference category for education; “full-time employment” was used as the reference category for employment status; and “married” was used as the reference category for marital status.

Abbreviations: CI, confidence interval; 95% confidence intervals are in parentheses; OR, odds ratio, except for focal variables in which it is a ratio of odds ratios because of the interaction terms.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .



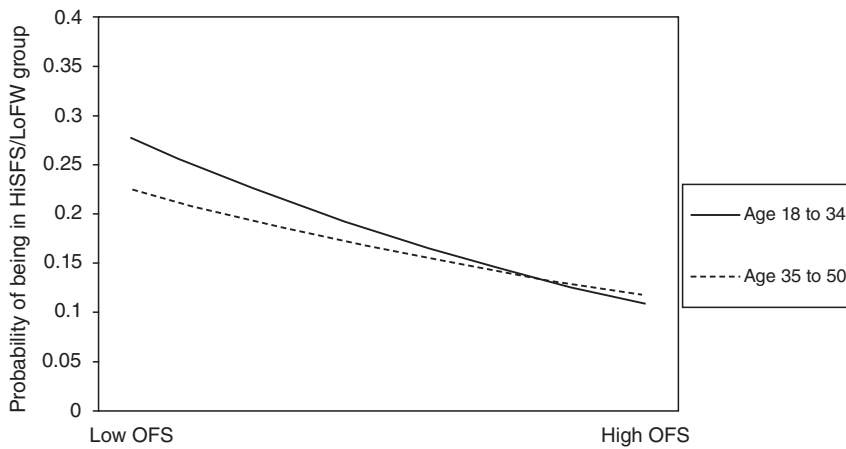
**FIGURE 13** Interactive effect of OFS and income on probability of being in HiSFS/LoFW group. FW, financial worry; OFS, objective financial stressors; SFS, subjective financial stressors



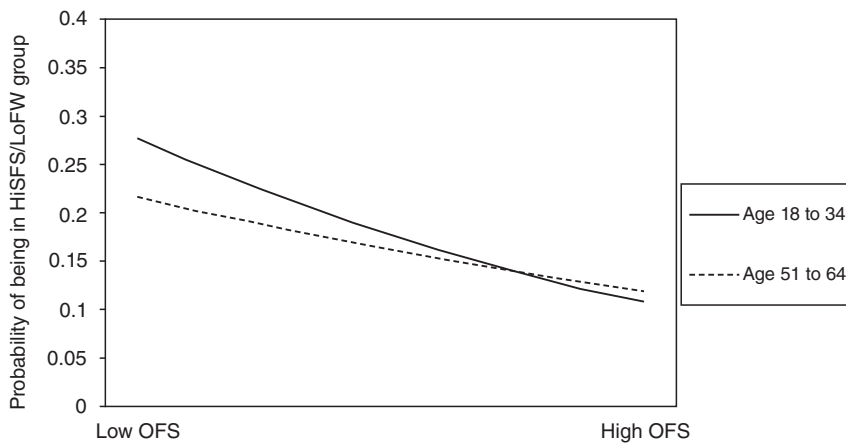
**FIGURE 14** Interactive effect of OFS and income on probability of being in HiSFS/LoFW group. FW, financial worry; OFS, objective financial stressors; SFS, subjective financial stressors

reference category of 18–34 ( $B = -0.38$ ,  $SE = 0.04$ ,  $\chi^2(1) = 98.99$ ,  $p < 0.001$ ) and when the respondent's age was in the higher age groups: 35–50 ( $B = -0.26$ ,  $SE = 0.04$ ,  $\chi^2(1) = 39.64$ ,  $p < 0.001$ ) and 51–64 ( $B = -0.24$ ,  $SE = 0.05$ ,  $\chi^2(1) = 25.75$ ,  $p < 0.001$ ). These interaction effects indicate that compared to younger adults, older adults had reduced likelihood of being in the HiSFS/LoFW group when OFS was low; however, as OFS moved from low to high, age had little effect on the likelihood of being in the HiSFS/LoFW group.

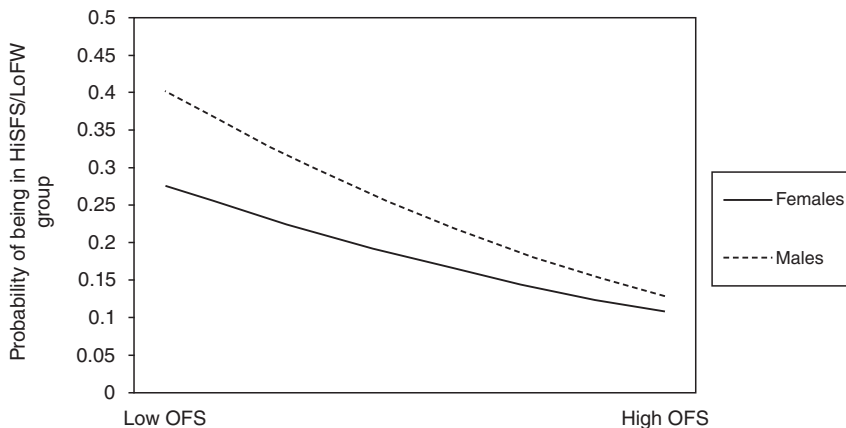
Figure 17 shows that there was a significant negative relationship between OFS and the probability of being in the HiSFS/LoFW group for both males ( $B = -0.50$ ,  $SE = 0.04$ ,  $\chi^2(1) = 144.59$ ,  $p < 0.001$ ) and females ( $B = -0.38$ ,  $SE = 0.04$ ,  $\chi^2(1) = 98.99$ ,  $p < 0.001$ ). This interaction effect indicates that whereas at low levels of OFS, males had a higher probability of being in the HiSFS/LoFW group, at high levels of OFS, gender had less of an observed effect on the probability of being in the HiSFS/LoFW group.



**FIGURE 15** Interactive effect of OFS and age on probability of being in HiSFS/LoFW group. FW, financial worry; OFS, objective financial stressors; SFS, subjective financial stressors



**FIGURE 16** Interactive effect of OFS and age on probability of being in HiSFS/LoFW group. FW, financial worry; OFS, objective financial stressors; SFS, subjective financial stressors



**FIGURE 17** Interactive effect of OFS and gender on probability of being in HiSFS/LoFW group. FW, financial worry; OFS, objective financial stressors; SFS, subjective financial stressors



## 6 | DISCUSSION

Because an essential requirement of theory testing is the establishment of the reliability and validity of a study's constructs (Bacharach, 1989), as a start, this study established discriminant validity among our focal concepts. In line with H1, our results established discriminant validity among OFS, SFS, and FW. Our finding that OFS and SFS are distinct concepts is consistent with past research (e.g., Bridges & Disney, 2010; Frankham et al., 2020) showing that these distinct concepts have differential relationships with mental health outcomes such as worry, anxiety, and depression. Our finding that FW is conceptually distinct from OFS and SFS is important for future FW research including testing of our conceptual model of FW.

According to Matthews and Funke (2006), applying the transactional stress process (Lazarus & Folkman, 1984) to the study of worry may enhance the understanding of the phenomena of worry. To our knowledge, ours is the first study to integrate the transactional stress model and a model of worry to develop a conceptual model that examines the determinants of FW. Our conceptual model suggests that FW is initiated by a cognitive appraisal of coping resources (i.e., household income and FC) as inadequate to meet the demands of the perceived threat (i.e., OFS and SFS). Our conceptual model received strong support from the data and was validated in terms of explanatory power. As such, our findings show that specifying a conceptual model allows for a richer understanding of FW.

Our findings clearly demonstrate the role of both objective and subjective financial stressors, as well as coping resources, in explaining FW. Specifically, our findings indicated that both OFS and SFS were positively associated with FW and that SFS seems to play a mediating role in the link between OFS and FW. Moreover, the associations between both objective and subjective financial stressors and FW were moderated by household income, FC, age, and gender. In addition, household income, FC, age, and gender had significant direct effects on FW. Finally, our findings elucidate the associations among financial stressors, coping resources and FW from a worry theoretical perspective, and also show the efficacy of our conceptual model in predicting FW. These findings are further considered in the following sections.

### 6.1 | Financial stressors

Supporting Hypotheses H2A and H2B literature, both OFS and SFS positively predicted FW. However, SFS was a stronger predictor of FW than OFS since the direct effects of OFS on FW were partially mediated by SFS, as evidenced by the 59% attenuation in the coefficient for OFS after entering SFS in the hierarchical regression model (see Model 3 of Table 6). This suggests that some of the association between OFS and FW can be explained by the association of OFS with SFS. A possible interpretation of these results is that in addition to a direct effect on FW, OFS trigger perceptions of inadequacy related to one's current financial status and these negative perceptions manifest through SFS, which in turn influences FW. Our results suggesting that SFS mediated the effect of OFS on FW are consistent with studies that found that SFS fully mediated (Frankham et al., 2020; Ullah, 1990) or partially mediated (Bridges & Disney, 2010) the effects of OFS on mental health. In addition, this is consistent with the theorizing that the effects of objective stressors on outcomes such as mental health are mediated by cognitive appraisal processes (e.g., Conger et al., 1990; Lazarus & Folkman, 1984). Overall, our finding of a positive association between OFS and SFS (i.e., perceived threats) and FW is consistent with previous worry (e.g., Berenbaum et al., 2018) and FW (e.g., de Bruijn &

Antonides, 2020; Xiao & Kim, 2020) research that has established a link between perceived threat and worry.

## 6.2 | Coping resources

Contrary to H3A, household income positively predicted FW. Although this finding is mostly inconsistent with past research (e.g., Kiso et al., 2019; Lusardi & de Bassa Scheresberg, 2017; Tay et al., 2017), it is partly consistent with Xiao and Kim's (2020) study that reported a positive association for lower incomes (i.e., less than \$35K) and a negative association for higher incomes (i.e., more than \$50K). A possible explanation for this inconsistency is that these studies did not consider the moderating effects of household income (see discussion on moderating effects below). Supporting H3B, FC negatively predicted FW. This finding is consistent with past research showing that FC is a coping resource that individuals can draw upon when dealing with financial stressors (Xiao & Kim, 2020).

## 6.3 | Moderating effects

We examined financial stressors  $\times$  income, financial stressors  $\times$  FC, financial stressors  $\times$  age, and financial stressors  $\times$  gender interactions. Such interaction effects are important to examine because stress models (e.g., Lazarus & Folkman, 1984; Pearlin et al., 1981) theorize that moderators positively or negatively impact the association between stressors and mental health outcomes (e.g., anxiety and worry). The TTSC predicts interactions between coping resources and individual factors, and stressors such that the effects of stressors on mental health outcomes are conditional on the level of coping resources and personal characteristics. As predicted by H4A and H4B, OFS  $\times$  \$100K–\$150K and SFS  $\times$  more than \$150K interactions were significant predictors of FW. These interactions indicated that household income exacerbated the adverse effects of financial stressors on FW. Perhaps people who earn more and experience more financial stressors engage in more FW in response to appraisals of self-blame about their financial situation. Indeed, studies (e.g., Zlomke & Hahn, 2010) have found that self-blame, an emotion-focused coping strategy in which an individual accepts responsibility for a negative event (Lazarus & Folkman, 1984) has a positive association with worry.

In line with H4D, the SFS  $\times$  FC interaction was a significant predictor of FW. Our results indicated that at low SFS, as FC moved from low to high, respondents engaged in less FW. However, as SFS moved from low to high, FC levels had little impact on FW. In other words, high SFS was associated with high FW for all respondents. A possible explanation comes from research on cognitive load, broadly defined as the presence of a psychological burden (e.g., SFS) on one's cognitive system. According to researchers such a burden has negative effects on psychological/attentional factors (e.g., Mani et al., 2013; Meuris & Leana, 2018) and goal directed behavior (Schwabe & Oliver, 2009). Therefore, it is plausible that when SFS is high, the effects of cognitive load interfere with the coping mechanisms of FC. We found no support for H4C that stated that the OFS  $\times$  FC interaction would be a significant predictor of FW. Taken together, our findings on the moderating role of FC suggest a differential impact of FC on the association between financial stressors and FW and highlights the importance of distinguishing between OFS and SFS in the FW process.

As predicted by H5A and H5C, the  $OFS \times age$  and  $SFS \times age$  interactions were significant predictors of FW. Whereas at low OFS, older adults (i.e., age 35–50 and age 51–64) engaged in more FW than younger adults (i.e., 18–34), at high OFS, age had little effect on FW. In other words, high OFS was associated with high FW for all respondents. Interestingly the moderating effects of age on the association between SFS and FW were the converse of those described for OFS. That is, whereas at low SFS, age had little effect on FW, at high SFS, older adults (i.e., age 65–plus) engaged in less FW than younger adults (i.e., 18–34), which suggests a buffering effect of age. Stress researchers provide a possible explanation for this finding. Because older adults have a longer life experience and coping strategies that they consider most effective, compared to younger adults, they appraise negative events as less stressful (Mirowsky & Ross, 1992; Thoits, 1995) and thus engage in less worry. In view of this explanation, the pattern of the moderating effect of age on OFS described above is somewhat puzzling.

In line with H5B and H5D, the  $OFS \times male$  and  $SFS \times male$  interactions were significant predictors of FW. Whereas at low OFS, males engaged in less FW than females, at high OFS, gender had little effect on FW. In other words, high OFS was associated with high FW for both males and females. Interestingly, the pattern of the moderating effects of gender were different for SFS. Whereas at low SFS, gender had little effect on FW, at high SFS, males engaged in less FW than females, which suggests a buffering effect of gender. This finding is explained by the extant literature on gender differences in mental health (e.g., Almeida & Kessler, 1998; Rosenfield & Mouzon, 2013) that suggests that, because of their societal roles, women experience a higher exposure to different stressors than men and consequently have worse mental health outcomes (e.g., depression, worry, and anxiety).

## 6.4 | LoSFS/HiFW and HiSFS/LoFW groups

According to Berenbaum et al. (2018) researchers should “explore how and why perceptions of threat lead to (or fail to lead to) the initiation of worrying” (p. 10). In this study, we took up this suggestion and examined why some individuals experience low SFS but engage in high FW, and conversely why some individual experience high SFS but engage in low FW. In other words, we sought to understand the divergence between SFS and FW, captured by the SFS/FW groups. Our main findings are as follows. First, OFS is an important factor in determining the likelihood of belonging to these groups (i.e., LoSFS/HiFW vs. LoSFS/LoFW) and (HiSFS/LoFW vs. HiSFS/HiFW). Second, FC, household income, gender and age moderated the association between OFS and the likelihood of belonging to these groups. Our findings illuminate the underlying mechanisms of membership of these groups by considering moderation effects.

## 6.5 | Theoretical contributions

Our study makes several theoretical contributions to the existing body of research. First, our conceptual model of FW contributed to the understanding of the phenomena of FW by identifying the roles of threat appraisal and appraisal of coping resources in the initiation of FW. In addition, our study identified that coping resources exert their influence on FW directly and indirectly through moderating effects. Second, our conceptual model contributes to research on

FW by distinguishing between OFS and SFS and simultaneously investigating their influence on FW. Third, our study investigated FC, a concept that is receiving increasing attention from scholars and policymakers but has not been adequately considered in the extant FW literature. Finally, and to the best of our knowledge, ours is the first study to investigate why some individuals experience high SFS but engage in low FW, and vice versa. Overall, our findings contribute to a greater understating of the phenomena of worry.

## 6.6 | Implications for policy and practice

As alluded to in the introduction to our study, FW is a major issue in developed economies—afflicting one out of two adults in the United States alone (Gallup, 2019). Because our conceptual model of FW identified the determinants of FW and the conditional effects of coping resources, our study provides useful guidance to employers, policymakers, and practitioners on factors that potential interventions for reducing FW could target. These interventions are important because individuals experiencing FW tend to focus on stimuli relevant to averting the immediate threat (e.g., financial stressors) which results in the “tunneling effect,” described as the tendency for individuals to neglect information (e.g., about other aspects of their well-being) unrelated to their immediate threat (Mani et al., 2013). Furthermore, FW may result in individuals not acting in ways that promote their overall well-being because they find themselves stuck in a worry loop that is characterized by a series of “What if...” self-statements that serve to increase worry instead of addressing the perceived threat (Borkovec, 1985). For example, “What if I run out of money in retirement? I might not be able to cover my medical expenses, and I will have to forego some medical care. What if I forego some medical care and my health deteriorates? and so forth.”

First, a clear implication from our findings is that reduced exposure to financial stressors may have the further benefit of reducing FW. Policymakers could actively provide individuals with access to government and non-profit programs that offer financial stress counseling. Employers could offer programs that address employee financial well-being, such as debt counseling, and savings options for emergencies through payroll deductions that have been shown to reduce financial stress. Other practitioners, such as financial counselors, could improve their clients' skills in terms of coping with financial stressors. The relationships among OFS, SFS, and FW draw attention to the need for interventions to reduce FW that target OFS and SFS rather than financial stressors in general.

Second, our findings suggest that even if a financial solution is not available by which to cope with financial stressors, improving FC may have the further benefit of reducing FW. FC can be improved through targeted interventions on, for example, both objective and subjective financial knowledge and FSE (Fernandes et al., 2014; Lown, 2011). An example of such interventions is financial coaching. In a randomized controlled trial, Modestino et al. (2019) found that financial coaching increased FSE. Policymakers could partner with nonprofit organizations that offer financial coaching programs to consumers.<sup>18</sup> Financial advisors or counselors could also draw upon interventions from positive psychology (e.g., signature strengths-based training) that have been shown to improve self-efficacy (Seligman et al., 2005). Finally, the moderating effects of FC, age, and gender draw attention to the need for interventions to reduce FW that are targeted at men and women, younger and older adults, and individuals with varying levels of FC.

## 6.7 | Limitations and future research directions

Alongside its various contributions, this study also had several limitations that future research may address. First, because of the cross-sectional nature of the study, the causal direction from financial stressors to FW in our study is uncertain. However, evidence from longitudinal studies suggests that the causal flow is from financial stressors to FW (e.g., Iijima & Tanno, 2013; Owen & Wu, 2007). Second, the causal direction from FC to FW in our study is uncertain. However, evidence from longitudinal studies (e.g., Roick & Ringeisen, 2017) suggests that the causal flow is from self-efficacy, a component of FC, to anxiety, a concept related to worry. In our study, FW is conceptualized as state worry, defined by Matthews and Funke (2006) as an individual's act of worrying following a perceived threat (i.e., financial stressors). Thus, a third limitation of our study is the failure to control for trait worry due to limitations in the survey data. Future studies should aim to control for trait worry. Finally, a few different variables (personality traits, intolerance of uncertainty, worry beliefs, etc.) that have been identified as important predictors of worry (and therefore possible predictors of FW) were not available in the survey data, and future studies should include these variables in order to expand upon our findings.


There are four other interesting possible directions for future research. First, qualitatively exploring individuals' experiences of financial stressors, and examining their beliefs about worry, could help researchers develop a deeper understanding of FW. Second, the present study identified the determinants of FW but did not investigate the outcomes associated with FW. Third, future studies should examine the influence of financial worry on outcomes such as financial well-being and financial behaviors in order to demonstrate the importance of the concept of FW. Finally, although our conceptual model posits that SFS mediates the association between OFS and FW, we did not formally assess mediation in our study. Therefore, future studies should use structural equation modeling to assess the mediating role of SFS in the association between OFS and FW.

In conclusion, although FW has not received serious prior attention from researchers, the present interest (e.g., de Bruijn & Antonides, 2020; DeRigne et al., 2019; Kiso et al., 2019; Weissman et al., 2020) suggests that this is starting to change. In addition to the theoretical contributions of this study's findings, our conceptual model of FW: (a) identifies the determinants of FW; (b) explains the phenomena of FW; (c) highlights the need for considering moderators in the FW process; and (d) provides guidance on factors that possible intervention strategies for reducing FW could target. We hope that our conceptual model and findings instigate further research in the area of FW.

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### ENDNOTES

<sup>1</sup> We consider financial stressors as potential sources of financial stress.

<sup>2</sup> Collins and O'Rourke (2012) define financial coaching as an ongoing process that seeks to change financial habits and improve long-term financial outcomes by setting goals, establishing plans of action, and monitoring progress.

<sup>3</sup> Pathological and nonpathological worry differ in frequency, intensity, and uncontrollability (Borkovec, 1994).

- <sup>4</sup> We however acknowledge that in the popular press a good financial situation is often associated with the absence of financial worry. For example, Dave Ramsey (<https://www.daveramsey.com/debt>), a popular personal finance guru preaches debt-free living as a means to end financial worry.
- <sup>5</sup> Lazarus (1991) viewed worry as inseparable from anxiety when he stated that “it troubles me to see worry separated from the rest of the cognitive-motivational-relational configuration of anxiety” (p. 416).
- <sup>6</sup> Tallis and Eysenck (1994) propose that worry serves two other purposes: (1) a prompt function that helps the individual to maintain awareness of unresolved threats, and (2) a preparation function that helps the individual to anticipate threats and be ready for situations in which high motor activation is required.
- <sup>7</sup> Various researchers (e.g., Smith & Lazarus, 1990) have provided evidence for this.
- <sup>8</sup> Tallis and Eysenck (1994) acknowledge that denial and avoidance (i.e., ignoring the perceived threat) as possible methods by which worry may also be terminated.
- <sup>9</sup> “Threat and challenge are not necessarily mutually exclusive” and “must be considered as separate, although often related, constructs” (Lazarus & Folkman, 1984, p. 33).
- <sup>10</sup> We also compared complete and incomplete data checking for differences across all the variables in this study. No substantive differences were identified. Furthermore, we used multiple imputation instead of listwise deletion. Our results were similar with those found using listwise deletion, and the substantive conclusions were the same.
- <sup>11</sup> Since all variables were measured by self-reporting, we checked for common method bias (Podsakoff & Organ, 1986) using Harman’s single-factor test, which involves a confirmatory factor analysis in which all variables were allowed to load onto one general factor. The general factor accounted for 12.30% of the variance, which did not exceed the commonly accepted threshold of 50%, suggesting that common method bias was not an issue with the dataset, since a single factor did not account for the majority of the variance in our data.
- <sup>12</sup> In factor analysis, this is referred to as “crossloading.”
- <sup>13</sup> Initially, we had four items. However, the item “I am concerned that the money I have or will save will not last” loaded on both the FW and SFS factors with factor loadings of 0.54 and 0.42, respectively. Since the other items for these factors all had factor loadings of at least 0.50, this item was dropped (Costello & Osborne, 2005).
- <sup>14</sup> Since this item loaded onto the OFS factor whose other items had yes/no responses, it was coded with 1 if the response was 5, 6, or 7, otherwise 0.
- <sup>15</sup> The two exceptions are that we included FSE and desirable credit card behavior in our measure of FC.
- <sup>16</sup> Studies have measured financial self-efficacy (e.g., Dietz et al., 2003) with items from Pearlin and Schooler’s (1978) mastery scale. Items 2 and 3 are similar to those in Dietz et al.’s (2003) FSE scale and are consistent with the concept of self-efficacy as presented by Bandura et al. (1997).
- <sup>17</sup> Two sample questions are “Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?” and “If interest rates rise, what will typically happen to bond prices?”
- <sup>18</sup> For example, in the U.S., the Consumer Financial Protection Bureau ran a four-year financial coaching initiative that provided services to economically vulnerable consumers.

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