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Citation for final published version:

Weinstein, Netta and Stone, Dan N. 2018. Need depriving effects of financial insecurity: Implications for well-being and financial behaviors. *Journal of Experimental Psychology: General* 147 (10) , pp. 1503-1520. 10.1037/xge0000436

Publishers page: <http://dx.doi.org/10.1037/xge0000436>

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Accepted for publication at JEP:G: Awaiting DOI

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Need Depriving Effects of Financial Insecurity: Implications for Well-Being and Financial
Behaviors

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Abstract

Evidence suggests that experiencing financial insecurity lowers well-being and increases problematic financial behaviors. The present paper employs a self-determination theory (SDT; Ryan & Deci, 2000a) perspective to understand the mechanisms by which experiencing financial insecurity contributes to these detrimental outcomes. Informed by SDT, we expected that the basic psychological needs for autonomy, competence, and relatedness would drive these effects. Studies were concerned with individuals' general experiences of financial insecurity (using community samples; Studies 1 and 2), and employed manipulations involving self-reflection (Study 3) and hypothetical scenarios (Study 4). Findings demonstrated that financially insecure conditions undermined basic psychological needs and lowered well-being (measured in terms of self-esteem, depression, and anxiety). In addition, lower satisfaction of basic psychological needs linked financial insecurity to a greater likelihood of engaging in financial cheating (Studies 2 and 3) and risky financial decisions (Study 4). Importantly, this pattern of effects remained in evidence across socioeconomically diverse samples and income levels. We discuss implications for future interventions to improve the wellness of individuals in financially insecure circumstances.

Keywords: *self-determination theory (SDT), psychological needs, financial insecurity, well-being, financial behaviors*

Need Depriving Effects of Financial Insecurity: Implications for Well-Being and Financial Behaviors

Individuals' life circumstances and socioeconomic class may create financial insecurity particularly in economic recessions or depressions (e.g., Hacker, Rehm, & Schlesinger, 2013; Wisman, 2013); for many, feelings of financial insecurity are familiar and enduring. Descriptive and qualitative work links economic declines to lower societal well-being. For example, in the stock market crash in the Fall 2008 and Spring 2009, Americans experienced lower life evaluations, higher anxiety, and lower positive affect (Deaton, 2012); Results from Latin America during the economic crises of 2000-2002 produced similar negative effects on well-being (Graham & Sukhtankar, 2004). Earlier economic decline and dislocation in the 1980's in the US (in rural Iowa) appeared to similarly "cost" families' well-being because of the financial insecurity wrought by these conditions (Conger & Elder, 1994).

Research supports these effects, providing evidence that financial insecurity undermines well-being and promotes potentially harmful financial behaviors such as risk-taking and financial cheating (e.g., Ross & Huber, 1985; Vinokur, Price, & Caplan, 1996); but to date, research does not directly address the explanatory mechanisms of these harmful effects. The present paper employs a theory of human motivation and well-being, self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000a), to explore the mechanisms linking financial insecurity to well-being and financial behaviors. Informed by this approach, we argue that the basic psychological needs for autonomy, competence, and relatedness link experiences of financial insecurity to declines in personal well-being and to increases in problematic financial behaviors.

Well-Being Outcomes of Financial Insecurity

Scholarship linking financial experiences to well-being highlights the subjective effects of deleterious financial conditions. For example, individuals who experience job insecurity have lower subjective experiences of their health (Witte, 1999) and exhibit more symptoms of depression (Rocha, Hause Crowell, & McCarter, 2006), as do new widows and divorcees with children, presumably because of increasing financial insecurity (Amato & Patridge, 1987).

Importantly, in direct comparisons, *subjective* experiences of job insecurity relate to poor health more than do *objective* indicators of wealth (De Witte, De Cuyper, Handaja, Sverke, Näswall, & Hellgren, 2010; Hellgren, Sverke, & Isaksson, 1999); for example, despite offering higher income, intermittent work is experienced as equally damaging to well-being as joblessness, presumably because of accompanying insecurity (Camfield, Choudhury, & Devine, 2009; Malenfant, LaRue, & Vézina, 2007). Furthermore, longitudinal cross-lagged analyses support a causal interpretation of job insecurity undermining well-being, but provide no support for the alternative hypothesis: i.e., that those with fewer mental health complaints obtain secure work (Hellgren & Sverke, 2003).

Of direct relevance to the current paper, studies indicate that less financially secure adults have lower well-being (Brown, Taylor, & Price, 2005; Ross & Huber, 1985; Taylor, 2002; Vinokur et al., 1996). Similarly, in college student samples, daily financial stress, i.e., that one is unable to meet daily financial demands, has been linked to anxiety and depression (Lange & Byrd, 1998). Quasi-causal evidence for these links comes from personal finance courses. For example, after completing such courses individuals report improved well-being (O'Neill, Sorhaindo, Xiao, & Garman, 2005). In summary, evidence indicates that financial insecurity harms individuals' well-being; yet, we have little understanding of the

psychological mechanisms underlying the negative effect of financial insecurity on wellness (e.g., Stafford & Marmot, 2003).

Basic Psychological Needs

SDT (Deci & Ryan, 1985; Ryan & Deci, 2000a) provides a framework for understanding how financial insecurity may undermine well-being. SDT posits three psychological needs that are essential for wellness: (1) autonomy, or the experience of making meaningful choices and being volitional in one's actions; (2) relatedness, feeling close and connected to others; and (3) competence, feeling efficacious and able to attain desired outcomes (Deci & Ryan, 2000). These three needs have been shown to be necessary for psychological maintenance and flourishing in much the same way that we need food to maintain and develop bodies (Ryan, 1995).

Supporting this view, a substantial and growing literature suggests that those who experience satisfaction of these three needs have higher well-being (see Ryan & Deci, 2017 for review), including higher self-esteem (Bun, Louiselle, Misukanis, & Mueller, 1988; Gagné, 2003; Milyavskaya, Philippe, & Koestner, 2013; Steele, 1988), fewer symptoms of depression (Ibarra-Rovillard & Kuiper, 2011; Igreja, Zuroff, Koestner, Saltaris, Brouillette, & Lalonde, 2000; Park et al., 2012; Ryan, La Guardia, & Rawsthorne, 2005), and fewer symptoms of anxiety (Black & Deci, 2000; Fischer & Boer, 2011; Uysal, Lin, & Knee, 2009). The impact of fulfilled versus thwarted psychological needs is extensive; it influences people's daily lives (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon, Ryan, & Reis, 1996), generally holds across cultures (Chirkov, Ryan, Kim, & Kaplan, 2003; Chirkov, Ryan, & Willness, 2005; Deci, Ryan, Gagné, Leone, Usunov, & Kornazheva, 2001; Guo et al. 2013; Ryan, Chirkov, Little, Sheldon, Timoshina, & Deci, 1999), and influences well-being for both older and younger individuals (O'Conner & Vallerand, 1994; Phillipe & Vallernad, 2008). Further, while research explores the possibility that other psychological needs might

better account for wellness (e.g., safety), these three psychological needs have proven to be the most consistent and immediate predictors of wellness; hence, the satisfaction of these needs reliably increases well-being while their absence reliably lowers it (see Ryan & Deci, 2017).

Financial Insecurity and Basic Psychological Needs

Given their contributions to psychological functioning, it is important to understand the conditions that foster or undermine basic psychological needs. Although typically researchers have focused on relational supports provided by others (e.g., Niemiec & Ryan, 2009), more distal factors such as economic conditions might also support or undermine psychological need satisfaction (Ryan, R., Di Domenico, Ryan, W. & Deci, 2017; Martin and Hill, 2012).

We expect financial insecurity to influence needs; presumably, this influence may be both on undermining satisfaction of psychological needs (that is, reducing the extent to which individuals feel choiceful, connected to others, or effective in achieving desired ends), and actively frustrating needs (that is, increasing the extent to which individuals feel choiceless, isolated, or ineffective; see Vansteenkiste & Ryan, 2013, for a discussion on the distinction between need satisfaction and frustration). Consider an individual who is experiencing financial insecurity (based on a composite of individuals described in Edin & Shaefer, 2015). The financially distressed may feel higher internal pressure and shame, and less financial volition or “choicefulness”, given financial burdens and limited options; that is, the restricted freedoms that result from feeling financially insecure may undermine the core need for autonomy. Further, he or she may feel lonely and isolated because financial insecurity creates distance from or conflict with others in seemingly different financial situations (e.g., friends who are more financially secure) or with others who share the stressful financial situation (e.g., children, dependents or family members). Hence, perceptions of financial insecurity

may undermine the need for relatedness (i.e., closeness to others). Finally, the need for competence may be undermined because financial burdens reflect a perceived ineptitude, or because they interfere with his or her ability to maintain a desired quality of life for oneself or close others.

Limited evidence supports this view, although some work suggests that financial states might impact need-relevant experiences. For example, possibly reflecting declines in competence need satisfaction due to financial stress, studies show that college students experience a lower sense of mastery, an experience which feeds into competence need satisfaction, as a function of their debt over time (Dwyer, McCloud & Hodson, 2011), and that having debt undermines perceived mastery (Loonin & Plunkett, 2003). Similarly, job stress correlates with insecurity and low self-efficacy, where low self-efficacy is another operationalization of competence need satisfaction, in cross-sectional studies (Bosman, Buitendach, & Laba, 2005; Rigotti, Schyns, & Mohr, 2008). Furthermore, financially insecure individuals, such as adolescents of financially insecure parents (Lim & Loo, 2003), and adults who relocated from East to West Germany after 1989 (Jerusalem & Mittag, 1995), report lower self-efficacy compared to more financially secure counterparts.

In addition, some evidence links perceived financial insecurity to diminished relatedness. For example, perceived financial insecurity is linked to more impaired family dynamics in German adolescents (Walper, Kruse, Noack, & Schwartz, 2005) and American adults (Larson, Wilson, & Beley, 1994), and in rural samples, expected financial difficulty predicts loneliness (Havens, Hall, Sylvestre, & Jivan, 2004). Importantly, longitudinal data show that job insecurity links to greater loneliness across years (Kalil, Ziol-Guest, Hawkey, & Cacioppo, 2010). Further, evidence indicates that insecure life conditions produce loneliness, for example, among adjusting immigrants (Adler, 1977) and among those caring for loved ones with life-changing illnesses (Lewandowski, 1996).

Finally, evidence suggests that perceived financial insecurity reduces autonomy need satisfaction. For example, financial insecurity appears to foster shame (Pan, Chung, Fife, Hsiung, 2007) and perceived pressure (Bradley, 2000). In addition, life affordances such as social class shape perceptions that one has meaningful life choices, which is an important aspect of autonomy need satisfaction (Lapour & Heppner, 2009). In fact, research examining the joint effects of autonomy need satisfaction (in this case, operationalized by a feeling of independence) and income on well-being has shown that autonomy need satisfaction correlates with well-being more strongly than does income. In the first of two key papers, Diener and colleagues (1995) analyzed data from 55 nations and found that, when examining both autonomy and income, only autonomy predicted individuals' subjective well-being. A meta-analysis across 63 societies (by Fischer and Boer 2011) found similar effects on anxiety and general health. In this study, income influence well-being only indirectly, i.e., through autonomy.

While these studies provide a basis for expecting that basic psychological need satisfaction would mediate the effects of financial insecurity and well-being, there are several limitations to existing research. First, as they are not guided by SDT theory, many studies focus on only one of the three psychological needs and often test a proxy for need satisfaction (e.g., Martin & Hill, 2012). Second, studies have largely focused on income or debt; but research on income independent of needs shows that income and debt have mixed direct effects on well-being; in some work, income increases a positive life evaluation, measured on the Cantril (1965) Self-Anchoring Striving Scale, but not emotional well-being (Kahneman & Deaton, 2010). In longitudinal work, underemployment (hours, income, skills, and status) weakly predicts depression but not self-esteem (Friedland & Price, 2003). Furthermore, subjective perceptions of financial distress are often stronger predictors of emotional well-being than are measures of objective household financial status (Bridges & Disney, 2010).

However, no studies of which we are aware directly link the subjective experience of financial insecurity with psychological need satisfaction.

Financial Behaviors

Along with undermining well-being, evidence from nonfinancial domains suggests that the frustration of basic psychological needs increases violations of social norms and unethical action. For example, experimental (Kanat-Maymon, Benjamin, Stavsky, Shoshani, & Roth, 2015) and field work (Anderman, Griesinger, & Westerfield, 1998; Kanat-Maymon et al., 2015; Vansteenkiste, Sierens, Soenens, Luyckx, Lens, 2009) shows that frustrating basic psychological needs increases academic dishonesty. Similarly, in sports, unmet psychological needs have been linked to higher levels of antisocial attitudes and less sportsmanship (Ntoumanis & Standage, 2009).

Lower levels of perceived need satisfaction may also link financial insecurity with harmful financial behaviors, including financial deception and fraud, and excessive risk seeking. For example, Cressey (1953), posited the “fraud triangle” to retrospectively explain why male convicts embezzled others’ money. Cressey posited that three conditions retrospectively explained convicted felons’ embezzlements: “a financial problem which is non-sharable” (p. 577), an opportunity to resolve the financial problem through embezzlement, and a retrospective explanation for their actions, i.e., a rationalization. Accordingly, in relation to the present investigation, Cressey’s convicts appeared to solve their perceived financial insecurity through self-justified theft, deception, and defalcation. Furthermore, in the workplace, management approaches or organizational structures that undermine basic psychological needs, for example because of a focus on short-term financial performance goals (e.g., Johnson et al., 2009) or through “incentivizing” carrot-and-stick approaches – both of which undermine the psychological need for autonomy, may encourage

fraud (See review in Stone, Deci, & Ryan, 2009; also, Dembinski, Lager, Cornford, & Bonvin, 2005; Grandori, 2004).

Those whose core needs are frustrated also engage in riskier behaviors, including spending more on gambling, gambling more frequently, experiencing more negative consequences from gambling behavior (Neighbors & Larimer, 2004), and engaging in riskier sexual behaviors (Abad, 2011). More broadly, lower autonomy need satisfaction has been linked to escalating commitments to failing propositions, suggesting lower aversion loss (i.e., more risk-taking; Schaubroeck & Williams, 1993). Finally, lower need satisfaction is linked to more binge eating behavior which is reflective of dysregulation and ignoring negative outcomes of behavior (Verstuyf, Vansteenkiste, & Soenens, 2012). Consistent with these findings, research more broadly suggests that failures of self-regulation explain relations identified between negative emotionality and risky behavior (Leith & Baumeister, 1996; Magar, Phillips, & Hosie, 2008; Mustanski, 2007). Such research is consistent with SDT, which posits, and finds, that the frustration of basic psychological needs undermines self-regulation (see Deci & Ryan, 2011; Weinstein & Ryan, 2011 for reviews).

Present Research

The current work aims to integrate the literature examining financial insecurity with the motivational theory of SDT to investigate why financial insecurity influences well-being. We employ both cross-sectional studies and experiments, the latter of which are rare in examining the impact of financial insecurity (see intervention studies that encourage positive financial behaviors for an exception; O'Neill et al., 2005). We focus on two outcomes: (1) well-being, which is closely linked to both financial insecurity and psychological needs in the two literatures (e.g., Brown et al., 2005; Ryan & Deci, 2017; Taylor, 2002), and, on an exploratory basis, (2) financial attitudes and behaviors. Herein, we test four hypotheses which build on the existing literature:

Hypothesis 1: Financial insecurity would undermine satisfaction of the basic psychological needs for autonomy, competence, and relatedness.

Hypothesis 2: Psychological need satisfaction would mediate the effects of financial insecurity on well-being.

Hypothesis 3: Psychological need satisfaction would relate to financial cheating and risky decision-making.

Hypothesis 4: Psychological need satisfaction would mediate the effects of financial insecurity on financial cheating and risky decision-making.

Study 1

Study 1 tested hypotheses 1 and 2, which concern the relations of financial insecurity to need satisfaction, and the potential implications of these relations for well-being. To do so, we relied on a large nation-wide sample that maximized variability in demographic factors, such as income, education, age, and gender. The latter three demographics were included as potential covariates. We also tested income as a second predictor and moderator for the effects of financial insecurity. This approach conceptually replicated research which has found autonomy need satisfaction predicts well-being better than income (Diener et al., 1995; Fischer & Boer, 2011). We compared these effects directly to those of financial insecurity, given that research results of the main effects of income on well-being – independent of need satisfaction – are mixed (Bridges & Disney, 2010; Friedland & Price, 2003), while those of financial insecurity seem more robust (e.g., Ross & Huber, 1985; Vinokur et al., 1996).

Method

Participants and Procedure

Participants were 2,079 adults (1040 men) selected by Harris Interactive from their panel of 672,400 individuals residing within the United Kingdom (UK) to broadly represent the population from across the country, with ages ranging from 22 years to 65 years ($M =$

43.21, $SD = 11.49$)¹. All participants were employed, though incomes ranged from less than £10,000 (~\$12,500 US) to over £150,000 (~\$188,000) per year (M income = £14,000 (~\$18,000)/year, $SD = £10,000$). Of participants, 69.8% were employed full time, 18% part-time, and 12.2% self-employed. Participants' education levels ranged from those who had a GCSE or equivalent (similar to a US high school degree or a GED or HSE equivalent; 16.1%) education to those who had attained a Masters/PhD or equivalent (14.5%). The mode reported that they had received a Bachelor's degree or equivalent (33.8%); 35.6% had not received a GCSE or equivalent. This study received ethical approval from the University of Essex Ethics Sub-Committee. Participants completed a measure of financial insecurity, basic psychological needs, and well-being (described below).

Materials

Financial insecurity. Participants were asked "How financially secure do you feel?" with a scale of 1 "*not at all secure*" to 5 "*extremely secure*" ($M = 2.70$, $SD = .92$). Because we focus on financial insecurity, this item was reverse coded to be consistent with measures in additional reported studies.

Need satisfaction. Satisfaction of the needs for autonomy, competence, and relatedness was measured with the nine-item Basic Need Satisfaction scale (La Guardia, Ryan, Couchman, & Deci, 2000). Items were rated using a scale of 1(*not at all true*) to 5(*very true*), and included "I feel free to be who I am" (autonomy; $\alpha = .58$), "I feel capable and effective" (competence; $\alpha = .72$), and "I feel a lot of closeness and intimacy" (relatedness; $\alpha = .71$). Given that the three needs of SDT are conceptually (Ryan & Deci, 2000a) and empirically (r s in this study ranged from .35 to .54, $ps < .001$, higher order $\alpha = .70$) linked, the three needs were averaged to create a composite.

¹ Data from this larger study are reported in Weinstein et al. (2015) and Przybylski et al. (2013). In these two studies, the focus was exposure to natural environments and the "Fear of Missing Out" (FOMO), a psychological phenomenon related to media use.

Well-being was operationalized in the nine-item Emmons Mood Indicator (Diener & Emmons, 1984), including items such as joyful, worried/anxious, and depressed. Items were paired with a five-point Likert-type scale ranging from 1(*not at all*) to 5(*extremely*); internal consistency was $\alpha = .88$.

Results

Correlations. Correlations (Table 1, below the diagonal) explored demographic variables that are tangential to our research questions, but that might relate to financial insecurity – namely, age, gender, and education – and which might confound effects with well-being (László et al., 2010; Molarius et al., 2012; Rosenblatt, Talmud, & Ruvio, 1999; Witte, 1999). Correlations indicated that gender (coded 1 for male, 2 for female; $r = .12$, $p < .001$), and education ($r = -.14$, $p < .001$) were linked with financial security.¹ As such, we controlled for both in further analyses. As expected, financial insecurity correlated with income, $r = -.38$, $p < .001$; because income may predict psychological outcomes, we conducted additional analyses testing their respective contributions to need satisfaction and well-being. We also tested the potentially moderating effects of income on the effects of financial insecurity and well-being, to examine whether financial insecurity is more harmful to those with lower incomes.

Primary Analyses

Need satisfaction. Consistent with Hypothesis 1, financial insecurity linked to lower psychological need satisfaction controlling for age and gender, $b = -.30$, 95% CI = $-.34, -.27$, $t(2075) = -18.71$, $p < .001$, $pr = -.38^2$, $d = -0.82$.

Well-being. A second model regressed well-being onto gender and age at Step 1, financial security at Step 2, and the need satisfaction composite at Step 3. At Step 2, financial

² pr is the standardized partial correlation coefficient representing the size of the effect of the predictor on the outcome. In models with one predictor it is equivalent to the beta weight. In models with multiple predictors, it is equivalent to η^2 (Fritz, Morris, & Richler 2012).

insecurity linked to lower well-being, $b = -.24$, 95% CI = $-.27, -.21$, $t(2075) = -17.07$, $p < .001$, $pr = -.36$, $d = -0.75$. In the third step, need satisfaction linked to higher well-being, $b = .51$, 95% CI = $.48, .54$, $t(2074) = 33.86$, $p < .001$, $pr = .61$, $d = 1.49$. Controlling for need satisfaction, the effect of financial insecurity dropped to $b = -.13$, $t(2074) = -7.32$, $p < .001$, $pr = -.16$, $d = -0.32$.

We conducted indirect effects analyses using the Indirect macro (Preacher & Hayes, 2008) to obtain bias-corrected bootstrapped estimates based on 10,000 bootstrapping samples. The indirect effect was present in this analysis, linking financial insecurity to well-being through need satisfaction, $b = -.132$, $se = .011$, 95% CI $[-.152, -.108]$.

Financial insecurity or income? Given our interest in the effects of finances on psychological outcomes, we explored whether the subjective experience of financial insecurity (which may be linked to one's income and/or mismanagement of income), or actual income, better predict our outcomes. As such, we first regressed outcomes onto gender and education. Second, we regressed outcomes on financial insecurity and income, and finally, we regressed the interaction between financial insecurity and income. In this model, income related to need satisfaction, $b = .04$, 95% CI = $.03, .06$, $t(1725) = 5.01$, $p < .001$, $pr = .12$, though a stronger relation to need satisfaction was identified for financial insecurity, $b = -.27$, 95% CI = $-.30, -.23$, $t(1725) = -14.03$, $p < .001$, $pr = -.32$. In the final step, the two did not interact, $b = .01$, 95% CI = $-.01, .02$, $t(1724) = 0.31$, $p = .76$, $pr = .01$.

Regressing well-being onto these constructs, there was no effect of income in Step 2 despite sufficient statistical power ($= 1.0$ assuming a small effect size; computed using g*power 3.1), $b = .01$, 95% CI = $-.00, .03$, $t(1725) = 1.77$, $p = .08$, $pr = .04$, though financial insecurity linked to lower well-being, $b = -.23$, 95% CI = $-.26, -.20$, $t(1725) = -14.35$, $p < .001$, $pr = -.33$. In a final step, there were no interaction effects, $b = .01$, 95% CI = $-.00, .02$, $t(1724) = 1.56$, $p = .12$, $pr = .04$. Hence, the effect of financial insecurity on need satisfaction

was more than twice that of income ($pr = .32$ vs. $.12$); in addition, the effect of financial insecurity on well-being was about eight times larger than that of income ($pr = .33$ vs. $.04$).

Conclusions

Study 1 tested the two primary study hypotheses with a large, diverse nationwide sample. Results support both hypotheses; financial insecurity was linked to lower need satisfaction (hypothesis one), and lower well-being. Supporting our Hypothesis 2 that need satisfaction would mediate the effects of financial insecurity on well-being, approximately half of the variability shared by financial insecurity and lower well-being was accounted for by lower need satisfaction, and we saw a significant indirect effect in line with this.

Additional analyses revealed that, compared to perceived financial insecurity, income more weakly (though still significantly) related to need satisfaction, though income was uncorrelated with well-being. In addition, the effect of financial insecurity on need satisfaction was more than twice as large as the effect of income on need satisfaction.

Study 2

Study 2 tested all four hypotheses using a cross-sectional design that used purposive sampling to maximize variability in demographic factors, such as income, education, age, and gender, as we had done in Study 1. As in Study 1, our design considered potentially confounding covariates to the link between financial insecurity and well-being, and examined income as a potential predictor and moderator. Study 2 utilized a more comprehensive measure of financial insecurity compared to the one-item measure used in the first study. In addition, it assessed well-being with validated measures of anxiety, depression, and self-esteem – well-being indicators that are relevant to both need satisfaction and financial insecurity (e.g., Lange & Byrd, 1998; Rocha et al., 2006; Ryan & Deci, 2017). Finally, new to this study, we tested willingness to engage in financial cheating as a behavior that might result from the lower need satisfaction experienced in financially insecure conditions.

Method

Participants and Procedure

Participants were 228 MTurk US volunteers (137 women, with ages ranging from 20-65 years, average age $M = 37.8$, $SD = 11.6$). We sought a large sample of approximately $n = 200$ to maximize variation in financial insecurity and allow for exploratory analyses across levels of income. Annual income of participants ranged from less than \$10,000 per year to \$130,000 per year (average income \$45,000 per year). Participants were primarily White (78.9%), with a minority of African American (9.2%), Asian-American (4.8%), and Hispanic/Latino (3.1%) respondents (the remaining 4% identified as another ethnicity). Participants' level of education also varied, ranging from those who had some high school education (1.3%) to those who had attained a PhD or equivalent (1.3%). The mode reported that they had earned a Bachelor's degree or equivalent (34.2%). Participants' stated careers included freelancing jobs (15.8%), homemakers or childcare providers (9.6%), technicians and those working with electronics (8.3%), administrative assistants (7.5%), students (5.3%), as well as varied professions including sales, teachers, students, nurses, and others. Eleven (4.8%) participants were unemployed and three (1%) participants identified themselves as professional 'turkers'. Evidence suggests that MTurk workers provide similar responses to students. In addition, MTurk workers have higher intrinsic enjoyment of computer tasks (Farrell et al., 2017), exert higher effort (Farrell et al., 2017), and exhibit more attention (Hauser and Schwarz 2016) than do student participant pools. Further, the relatively small number of professional 'turkers' in this sample meant a much stronger representation from a broad base of respondents. After reporting demographic information, participants completed measures of financial insecurity, basic psychological needs, well-being, and financial cheating, all measures new to this study, which were presented in a random order. This study received ethical approval from the University of Kentucky Institutional Review Board.

Materials

Financial insecurity. Financial insecurity was measured with the personal financial wellness scale (Prawitz et al., 2006), which is comprised of six items assessing subjective stress experiences such as “what is your level of financial stress these days?”, and “How much stress do you feel about your personal finances?”, as well as lifestyle-focused items “How often do you find yourself just getting by financially and living paycheck to paycheck?”. Items were paired with response options ranging from 1-5, with descriptions to match the nature of the item (e.g., 1 = *very low* to 5 = *very high* and 1 = *never* to 5 = *very frequently*). Scale responses were averaged, with higher scores indicating greater financial insecurity, to create a single composite score consistent with previous research (Prawitz et al., 2006). Further, the six items loaded onto one component in a principal components analysis (with minimum loading > .60) and showed good reliability, $\alpha = .94$.

Need Satisfaction. The 24-item basic psychological need scale has been validated in multiple countries (Chen et al., 2015); it assesses the three basic psychological needs of autonomy (I feel a sense of choice and freedom in the things I undertake), relatedness (I feel close and connected with other people who are important to me), and competence (I feel capable at what I do) need satisfactions. Overall scale reliability was .94, and reliabilities for each subscale were $\alpha = .88$ autonomy, $\alpha = .91$ relatedness, and $\alpha = .95$ competence. Items were assessed on a scale ranging from 1(*not at all*) to 5(*completely true*). Given the conceptual (Ryan & Deci, 2000a) and empirical (r s in this study ranged from .58 to .67; higher order $\alpha = .82$) linkage of the three SDT needs, we averaged to create a composite variable as was done in the previous study.

Well-Being

Anxiety. The State Trait Anxiety Inventory (STAI; Spielberger, 1983; Spielberger, Gorsuch, & Lushene, 1970) assessed general anxiety by asking participants to agree on a 7-

point scale (*strongly disagree* to *strongly agree*) to ten statements describing a variety of tense, nervous, or anxious feelings (present study $\alpha = .97$).

Depression. Depression was measured using the ten-item version of the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), with items including “I felt sad”, “I could not get going”, and “I thought my life had been a failure”. Items were paired with a scale ranging from “*not at all*” to “*very much*”. This measure was designed to assess depressive symptoms in nonclinical populations (Robert & Veronon, 1983). The CES-D evidences good reliability in both previous research (Andresen, Malmgren, Carter, & Patrick, 1994) and present research ($\alpha = .95$).

Self-esteem is an indicator of hedonic well-being (Ryan & Deci, 2001), which is complementary to measurements of mood and life satisfaction (e.g., Diener & Diener, 1995), and has been linked to financial insecurity in past research (Lange & Byrd, 1998). The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) assessed this construct. Participants responded on a 1 to 4 (*strongly disagree* to *strongly agree*) scale to items such as “On the whole, I am satisfied with myself” and “I am able to do things as well as most other people” ($\alpha = .95$).

Well-being composite. A well-being composite was created by reversing depression and anxiety and averaging with self-esteem. The three scales showed good higher order reliability, $\alpha = .86$.

Financial Cheating

Financial cheating was measured with ten items such as “Not pay taxes on money that you earned (e.g., tips)”, “Take money for work that you didn’t do,” and, “Borrow money that you didn’t repay”, which were paired with a 4-point scale ranging from “*would never do this*” to “*definitely would do this*”. Items were similar to those in research on ethics in consumer

behavior (Muncy & Vitell, 1992; Vitell & Muncy, 2005). Reliability for this scale was high, $\alpha = .86$.

Results

Correlations. Correlations (Table 1, above the diagonal) explored demographic variables that are tangential to our hypotheses, but that might relate to financial insecurity – namely, age, gender, and education – and influence its impact on the outcomes of interest (László et al., 2010; Molarius et al., 2012; Rosenblatt, Talmud, & Ruvio, 1999; Witte, 1999). These analyses showed that age and education were linked to financial insecurity (age $r = .14$, $p = .04$, education $r = -.18$, $p = .005$; gender coded 1 = men, 2 = women, $r = .08$, $p = .23$).¹ Consequently, we controlled for age and education in further analyses. As expected, there was a strong link between financial insecurity as income, $r = -.41$, $p < .001$; because income may potentially be just as, or more, important as financial insecurity in predicting psychological outcomes, additional analyses tested the respective contributions of both income and financial insecurity to need satisfaction, well-being, and financial cheating. We also tested the potentially moderating influence of income for the relation between financial insecurity and well-being, to explore the possibility that financial insecurity is more harmful to those with lower income (as we did in Study 1).

Primary Analyses

Need satisfaction. In line with Hypothesis 1 and findings from Study 1, financial insecurity linked to lower overall psychological need satisfaction, $b = -.28$, 95% CI = $-.36, -.20$, $t(223) = -7.04$, $p < .001$, $pr = -.43^3$, $d = -0.95$.

³ Study 2 used a 24-item scale to measure need satisfaction, which balanced items measuring need *satisfaction*, i.e., the experience of having needs met, and *frustration*, i.e., the experience of having needs actively undermined (see theoretical approach in Vansteenkiste & Ryan, 2013). Accordingly, we tested the possibility need frustrations and satisfactions would be differentially related to financial insecurity or to our proposed outcomes. Findings showed financial insecurity related as expected to need frustration ($t = 6.11$, $p < .001$) and satisfaction ($t = -6.23$, $p < .001$), and that in models testing both need frustration and satisfaction simultaneously they independently predicted well-being (need frustration: $t = -5.23$, need satisfaction, $t = 11.92$, $ps < .001$),

Well-being. A second model regressed the well-being composite comprised of self-esteem, anxiety (r), and depression (r) onto age and education at Step 1, financial security at Step 2, and the need satisfaction composite at Step 3. At Step 2, financial insecurity linked to lower well-being, $b = -.44$, 95% CI = $-.53, -.35$, $t(223) = -9.39$, $p < .001$, $pr = -.53$, $d = -1.25$. In the third step, need satisfaction linked to higher well-being, $b = .89$, 95% CI = $.79, .99$, $t(222) = 17.52$, $p < .001$, $pr = .76$, $d = 2.32$. Controlling for need satisfaction, the effect of financial insecurity dropped to $b = -.19$, $t(222) = -5.61$, $p < .001$, $pr = -.35$, $d = -0.74$. The indirect effect (estimated as in Study 1) was present, linking financial insecurity to well-being through need satisfaction, $b = -.276$, $se = .044$, 95% CI $[-.368, -.194]$.

Financial cheating. A similar analytic approach to that used for well-being was used to predict financial cheating. Results showed that financial insecurity linked to more cheating, $b = .07$, 95% CI = $.01, 0.13$, $t(223) = 2.39$, $p = .02$, $pr = .16$, $d = 0.32$. When simultaneously testing financial insecurity and need satisfaction as predictors, higher need satisfaction predicted less financial cheating, $b = -.14$, 95% CI = $-.24, -.05$, $t(222) = -2.95$, $p = .004$, $pr = .19$, $d = -0.40$, and the effect of financial insecurity on cheating became non-significant, $b = .03$, $t(222) = 0.94$, $p = .35$, $pr = .06$, $d = 0.13$, when accounting for basic psychological need satisfaction. An indirect effect of financial insecurity on cheating through need satisfaction was present, $b = .040$, $se = .017$, 95% CI $[.013, .079]$, suggesting that a lack of need satisfaction linked financial insecurity with cheating. Hence, the results suggest higher financial insecurity correlates with less satisfied needs, and, that less satisfied needs correlate with more financial cheating.

Financial insecurity or actual income? As in Study 1, we explored whether the subjective experience of financial insecurity better predicted outcomes than actual income.

though only a marginal effect was found between need satisfaction and cheating ($t = -1.94$, $p = .05$; need frustration: $t = 0.90$, $p = .37$). In conclusion, we did not find consistent evidence of differential patterns for the effects of need frustration and satisfaction.

As such, additional models first regressed outcomes onto gender and education, second, regressed financial insecurity and income on outcomes, and finally, tested the interaction of financial insecurity and income on outcomes. In this model, income did not relate to need satisfaction, $b = .02$, 95% CI = $-.08, .12$, $t(222) = 0.41$, $p = .68$, $pr = .17$, though financial insecurity was still related, $b = -.31$, 95% CI = $-.41, -.21$, $t(222) = -6.33$, $p < .001$, $pr = -.37$. In the final step, the two did not interact, $b = .05$, 95% CI = $-.03, .14$, $t(221) = 1.23$, $p = .22$, $pr = .08$. Hence, consistent with Study 1, partial correlation coefficients indicate that the effect of financial insecurity on need satisfaction was more than twice as large as that of income on need satisfaction.

Similarly, there were no effects of income on either well-being, $b = -.04$, 95% CI = $-.15, .08$, $t(222) = -0.65$, $p = .52$, $pr = -.04$, or financial cheating, $b = -.01$, 95% CI = $-.08, .06$, $t(222) = -0.29$, $p = .78$, $pr = -.04$, though financial insecurity was still related to both, $b = -.50$, 95% CI = $-.61, -.39$, $t(222) = -8.91$, $p < .001$, $pr = -.51$, and $b = .07$, 95% CI = $.01, .14$, $t(222) = 2.09$, $p = .04$, $pr = .14$, respectively. In a final step, there were no interaction effects, $b = .05$, 95% CI = $-.05, .14$, $t(221) = 0.91$, $p = .37$, $pr = .06$, and, $b = -.04$, 95% CI = $-.10, .03$, $t(221) = -1.15$, $p = .25$, $pr = -.08$, respectively. Hence, the effect of financial insecurity on well-being was more than ten times larger than the effect of income on well-being. In addition, the effect of financial insecurity on financial cheating was more than three times large than is the effect of income on financial cheating.

Conclusions

Study 2 findings supported our hypotheses and Study 1 results, showing that financial insecurity linked to lower competence, autonomy, and relatedness need satisfactions. Financial insecurity also linked to lower well-being and a greater likelihood of financial cheating in this study. Importantly, indirect effects linked these effects of financial insecurity to well-being and financial cheating through its impact on psychological needs. While need

satisfaction accounted for substantial variability in well-being, it fully mediated the effect financial insecurity on financial cheating, providing preliminary support for Hypotheses 3 and 4. Later analyses indicated that the subjective experience of financial insecurity was more important in predicting Study 2 outcomes than was income; in addition, the harmful effects of financial insecurity were consistent across levels of income.

Study 3

Findings of Study 1 and 2 were promising, but they were based on cross-sectional data. It may have been that individuals who respond negatively to self-report surveys also report more financial insecurity, less need satisfaction, lower well-being, and more financial cheating. To exclude this possibility, Study 3 manipulated the salience of financial security or insecurity to directly test the effect of financial insecurity on need satisfaction, well-being, and financial cheating.

Method

Participants and Procedure

One-hundred and ninety-three US undergraduate students (primarily, 74%, in business-related majors) completed the study in exchange for course credit, although 29 were excluded from main analyses (25 of these from the financial insecurity condition) because open-ended responses after the manipulation suggested inattention or non-responsiveness to the manipulation (e.g., “I never felt this way”, “IDK”, “n/a”, “none”, “pdf”, “nothing”). We aimed for a sample of comparable size sample to that of Study 2. Of the remaining 164 participants, 115 were men and ages ranged from 18-65 years ($M = 20.86$ years, $SD = 1$ year). Participants reported an annual household (namely, parental) income ranging from less than \$10,000 to more than \$250,000 (average income \$105,000 per year). Participants were primarily white (89.0%), with a minority of African American (5.5%), Asian-American (2.4%), and Hispanic/Latino (1.2%) respondents (the remainder identified as another

ethnicity). After reporting on demographic information, participants were randomly assigned to one of two conditions: a financial security or insecurity condition.

The financial insecurity condition stated: *“Take a few minutes to think back. Please think back to an important time in your life when you felt financially insecure. In other words, please think back to a time when your income or support from others, like your family, was not able to cover your spending. During this time, you thought too much about how you were going to make ends meet, and may have felt that you were spending on ‘credit’, that is, more than you had available to you. Please focus on a time when you felt quite a bit of anxiety about finances. Please spend three minutes writing about this time, in as much detail as you feel comfortable sharing.”*

Those assigned to the financial security condition read: *“Take a few minutes to think back. Please think back to an important time in your life when you felt financially secure. In other words, please think back to a time when your income or support from others, like your family, easily covered your spending. During this time, you didn’t think too much about how you were going to make ends meet, and didn’t feel that you were spending on ‘credit’, that is, more than you had available to you. Please focus on a time when you felt little or no anxiety about finances. Please spend three minutes writing about this time, in as much detail as you feel comfortable sharing.”*

Following the manipulation, participant completed measures of psychological need satisfaction and financial insecurity. They then reported on their well-being and willingness to engage in financial cheating, presented in random order. This study received ethical approval from the University of Kentucky Institutional Review Board.

Materials

Need Satisfaction. As in Study 1, the Basic Psychological Needs Scale (BPNS; La Guardia, Ryan, Couchman, & Deci, 2000) was used to measure autonomy (e.g., “I feel free to

be who I am”; $\alpha = .71$), competence (e.g., “I feel capable and effective”; $\alpha = .68$), and relatedness (e.g., “I feel closeness and intimacy”; $\alpha = .58$), with scale responses ranging from 1(*not at all true*) to 5(*very true*). The full scale across need satisfactions showed acceptable internal reliability, $\alpha = .70$.

Financial insecurity. A single item which served as a manipulation check was embedded into the basic need satisfaction scale described directly above, and used the same 5-point scale. This approach was used to minimize the salience of financial security as a focus of the current research. This item asked participants to report the extent “I feel financially secure” ($M = 3.0$, $SD = 1.30$).

Well-being. We employed shortened versions of the full well-being measures from Study 2 in case extensive surveys might reduce salience of the manipulation, with a composite measure from previous research assessing relations between well-being and need satisfaction (Legate, Ryan, & Weinstein, 2012; Ryan, Legate, & Weinstein, in press; Weinstein et al., in press). Three items of the STAI (Spielberger et al., 1970) measured anxiety (e.g., “I feel under strain”; $\alpha = .89$), three items from the RSES measured self-esteem (Rosenberg, 1965; e.g., “I feel I am a very important and significant person”; $\alpha = .67$), and three items from the CES-D measured depression (Radloff, 1977; e.g., “I feel sad”; $\alpha = .79$). Items were paired with a five-point scale ranging from 1(*strongly disagree*) to 5(*strongly agree*). The three indicators of well-being loaded as a single construct in a principal components analysis ($\alpha = .81$) and were combined for a single indicator of well-being as in Study 2.

Financial cheating. Financial cheating intention used the seven items from Study 2 which were more susceptible to state changes ($\alpha = .81$). Items were paired with a 4-point scale ranging from “*would never do this*” to “*definitely would do this*” as in Study 2.

Results

Correlations

Correlations (Table 2, below the diagonal) again explored links with demographic variables; results indicated that only income linked to financial insecurity, $r = .22, p = .005$. In addition, income differed between conditions, $r = -.16, p = .04$. Accordingly, we controlled for household income in all analyses to better isolate the effects of condition. In this study, age and education did not relate to either financial security or the condition; this divergence from previous findings is reasonable given the smaller variability in these measures as compared to the previous two studies.

Primary Analyses

Manipulation check. As an initial check of the effectiveness of the manipulation, findings from an independent samples t -test showed that condition undermined financial security, $t(160) = 3.15, p = .002$. Further, linear regressions controlled for income at Step 1 and predicted financial security from condition at Step 2. Findings showed income related to higher financial security, $b = .05, 95\% \text{ CI} = .01, .08, t(160) = -2.83, p = .005, pr = .22$. Controlling for this, assignment to the financial insecurity condition predicted lower financial security, $b = -.57, 95\% \text{ CI} = -.98, -.16, t(159) = -2.72, p = .007, pr = -.21, d = -0.43$ (See Table 3 for means and standard deviations by condition).

Need satisfaction. At Step 1, income was unrelated to psychological need satisfaction, $b = .00, t(161) = 0.37, p = .71$. Accounting for this, those in the financial insecurity condition reported lower need satisfaction across the three needs, $b = -.22, 95\% \text{ CI} = -.41, -.03, t(160) = -2.24, p = .03, pr = -.18, d = -0.35$.

Well-being. A second model regressed the well-being composite comprised of self-esteem, anxiety (r), and depression (r) onto income at Step 1, condition at Step 2, and the need satisfaction composite at Step 3. At Step 1, income did not relate to well-being, $b = .002, t(161) = 0.20, p = .84$. At Step 2, those in the financial insecurity condition reported

lower well-being, $b = -.29$, 95% CI = $-.53, -.06$, $t(160) = -2.48$, $p = .01$, $pr = -.19$, $d = -0.39$.

In the third step, need satisfaction was linked to higher well-being, $b = .92$, 95% CI = $.79, 1.04$, $t(159) = 14.65$, $p < .001$, $pr = .76$, $d = 2.32$. Controlling for need satisfaction, the effect of financial insecurity dropped to non-significance, $b = -.09$, $t(159) = -1.17$, $p = .24$, $pr = -.09$, $d = -0.19$. The indirect effect linked condition to well-being through need satisfaction, $b = -.201$, $se = .086$, 95% CI $[-.285, -.035]$.

Cheating intention. A similar approach was used regressing financial cheating intention onto our predictors. At Step 1, income did not relate to financial cheating intention, $b = -.002$, $t(161) = -0.26$, $p = .80$. At Step 2, a trend was present predicting intention toward financial cheating intention from the financial insecurity condition, $b = .20$, 95% CI = $-.02, .42$, $t(160) = 1.78$, $p = .08$, $pr = .14$, $d = 0.28$. In the third step, need satisfaction was linked to less intention to cheat, $b = -.23$, 95% CI = $-.40, -.05$, $t(159) = -2.57$, $p = .01$, $pr = -.20$, $d = -0.41$. Controlling for need satisfaction, the effect of financial insecurity was non-significant, $b = .15$, $t(159) = 1.34$, $p = .18$, $pr = .11$, $d = 0.21$. The indirect effect linked condition to cheating intention through need satisfaction, $b = .050$, $se = .034$, 95% CI $[-.003, .136]$.

Conclusions

Study 3 largely replicated the previous study findings in an experiment. The Study 3 results support a causal model wherein financial insecurity undermined need satisfaction, and in doing so, reduced well-being and increased the likelihood of financial cheating. However, the effect sizes were smaller compared to the previous studies. In this study, participants reflected on a time in their lives when they felt particularly secure or insecure; this manipulation was helpful in eliciting salient and personal experiences, but may have been less compelling for students who had not experienced such circumstances; indeed, a subset, excluded from analyses, could not recall a time when they felt financially insecure.

Study 4

Study 4 tested the effects of financial insecurity on need satisfaction using a different paradigm, a hypothetical scenario akin to those used in the terror management theory literature to elicit vivid and detailed descriptions of possible life events (Cozzolino, Staples, Meyers, & Samboceti, 2004; Florian & Mikulincer, 1997; Greenberg et al., 1990; Rosenblatt, Greenberg, & Lyon, 1989). In the final study, we also tested a different outcome that may be proximal to financial insecurity (e.g., Grable, 2000) and has been shown to result from low psychological need satisfaction (Garrick, 2012; Jolley, Mizerski, & Olaru, 2006), that is, financial risk-taking. Consistent with these literatures, we expected that those assigned to the financial insecurity condition would make riskier financial decisions, an effect that would be mediated by psychological need satisfaction.

Method

Participants and Procedure

Participants were 82 undergraduate and graduate students majoring in Psychology (68 women) in the United Kingdom, with a mean age of 23.6 years ($SD = 7.1$ years). Data were collected for a student project and data collection ceased at the semester's end. Participants ranged in income from under £15,000 (~ \$19,000) per year to more than £45,000 (~ \$56,000) per year (average household income was approximately £24,999 (~ 31,000) per year); we did not measure ethnicity in this study. No students were excluded from analyses.

Participants were randomly assigned to read a financial security or financial insecurity scenario, and were asked to reflect on the scenario for a few minutes. In this case, descriptions outlined each of the two financial situations. In the first, participants imagined themselves unemployed, and in a situation where they must spend money from savings and credit cards to sustain their way of life. In a second condition, participants instead imagined receiving a stable paycheck that enables them to save money and pay off credit card bills (see Appendix for full descriptions).

Following the manipulation, participants reported on their state levels of need satisfaction (α autonomy = .80; α competence = .90; α relatedness = .83; higher order reliability, α = .94) and well-being (α for State Trait Anxiety Inventory (STAI) items = .83; α for Center for Epidemiologic Studies Depression (CES-D) Scale items = .88; α for Rosenberg Self-Esteem Scale (RSES) items = .92; higher order reliability, α = .92) using the scales from Study 3, as well the manipulation check from Study 3 (again, embedded in the need satisfaction scale; $M = 2.88$, $SD = 1.27$). They then completed a financial risk-taking task, new to this study (see below for description), and provided their demographics, namely, age, gender, income. This study received ethical approval from the University of Essex Department of Psychology Ethical Committee.

New Materials

Risky decision task. Participants chose from between riskless or risky alternative for twenty binary gambles, half framed as gains and half framed as losses (cf. Tversky & Kahneman, 1986). Expected values for all gamble alternatives were equal (or for two gambles nearly equal, i.e., within ½ £). For example, in one loss gamble, participants chose between a certain loss of £100 or a 10% chance of losing £1000. Alternatively, in a gain gamble, participants chose between a certain gain of £100 or a 10% chance of gaining £1000. Hence, presented riskless gambles were risk averse, “sure thing” choices while the risky alternatives were risk seeking (see Weinstein & Stone, 2018 for full measure). To quantify this, the number of choices to gamble (coded 2) rather than to accept (coded 1) a smaller but certain portion, was summed for 10 losses and 10 gains, separately, resulting in scores ranging from 10-20 (higher scores reflect more risk). Although gaining after a gamble is moderately satisfying, losing after a gamble is especially painful, and thus gambling when losses are concerned is considered particularly risky (e.g., Levy, 1992).

Results

Preliminary Correlations

Preliminary correlations (Table 2, above the diagonal) indicated that none of the demographic variables (age, gender, or income) related to financial security or differed across conditions, $r_s < .15$, $p_s > .21$; Indeed, the British sample seemed to have lower variability in income than the US sample collected in Study 3.

Primary Analyses

Manipulation check. A simple linear regression regressed state levels of financial security onto condition, and showed those in the insecure condition reported lower state financial security, $b = -1.17$, 95% CI = -1.67, -0.67, $t(80) = -4.68$, $p < .001$, $r = -.46$, supporting that the manipulation had the intended effect (See Table 3 for means and standard deviations split by condition).

Need satisfaction. Those in the financial insecurity condition reported lower psychological need satisfaction, $b = -1.03$, 95% CI = -1.51, -.65, $t(80) = -5.31$, $p < .001$, $pr = -.51$, $d = -1.19$.

Well-being. An additional model regressed well-being onto condition at Step 1 and the need satisfaction composite at Step 2. At Step 1, those in the financial insecurity condition reported lower well-being, $b = -1.29$, 95% CI = -1.68, -.89, $t(80) = -6.55$, $p < .001$, $r = -.59$, $d = -1.47$. In a second step, need satisfaction was linked to higher well-being, $b = .93$, 95% CI = .84, 1.02, $t(79) = 21.23$, $p < .001$, $pr = .92$, $d = 4.78$. Controlling for need satisfaction, the effect of condition dropped to $b = -.32$, $t(79) = -3.65$, $p < .001$, $pr = -.38$, $d = -.82$. An indirect effect estimated as in previous studies was present linking condition to well-being through need satisfaction, $b = -.961$, $se = .176$, 95% CI [-1.316, -.627].

Financial risk-taking. A final model regressed well-being onto condition and gamble choices at Step 1 and the need satisfaction composite at Step 2. At Step 1, those who chose the riskier gain gambles also chose the riskier loss gambles, $b = .29$, 95% CI = .08, .50, $t(79)$

$= 2.77, p = .007, pr = .30$, although there was no direct effect of condition on gamble choices, $b = .49, 95\% \text{ CI} = -.24, 1.22, t(79) = 1.33, p = .19, pr = .15, d = 0.30$. In a second step, need satisfaction (the proposed mediator) was linked to gamble choices, $b = -.66, 95\% \text{ CI} = -1.06, -.27, t(78) = -3.34, p = .001, pr = -.35, d = -0.76$, meaning that those with less satisfied needs, on average, more often chose riskier gambles than those with less unsatisfied needs who more often chose riskless gambles. Following on the main effect of need satisfaction on gamble choices, an indirect effect linked condition to gamble choices through need satisfaction, $b = .653, se = .213, 95\% \text{ CI} = .296, 1.142$ (see Hayes, 2009; MacKinnon et al., 2002; Shrout & Bolger, 2002 for further discussions on indirect effects in the absence of direct relations between independent and dependent variables). Hence, as in previous studies, greater financial insecurity linked to less satisfied needs. In addition, in Study 4, less satisfied needs linked to riskier financial choices.

Conclusions

Study 4 used vivid descriptions of financially secure or insecure circumstances to replicate and expand on findings from the previous three studies. Results showed that those who reflected on financially insecure conditions reported lower need satisfaction, and lower well-being. Although they were not more likely to make risky loss versus risky gain focused decisions, need satisfaction related to such decision-making and indirectly linked it to condition. Findings were largely consistent with those of the previous studies, though more robust than those of Study 3, which may have to do with the different sample (British vs. American) or smaller sample size, but may also be due to a more robust manipulation.

Discussion

Results of four studies supported our expectations that experiences of financial insecurity would undermine psychological need satisfaction, and that this undermining has implications for reduced well-being and for more problematic financial behaviors. Our

findings contribute to the literature in two primary ways: First, they inform research attempting to understand the costs and consequences to living in conditions of financial insecurity. Through combining experiments with cross-sectional designs, they are among the first to explore the mechanisms explaining why financial insecurity may harm well-being or promote financial behaviors such as cheating and risk-taking. Second, this research contributes to the literature on human motivation and psychological needs. Whereas previous work identifies the importance of basic psychological needs, more work is needed to understand how challenging life conditions may impede need satisfaction.

Our findings across four studies supported hypothesis 1, i.e., that financial insecurity would undermine the satisfaction of basic psychological needs for autonomy, relatedness, and competence needs. Together, these findings suggested that individuals who feel daily financial insecurity (Studies 1 and 2), or who reflect on past (Study 3) or possible states (Study 4) of financial insecurity, experienced costs to their feelings of choice and volition, perhaps resulting from the limited options that they perceived under financially insecure conditions. In addition, financially insecure individuals may have felt lonely and isolated by imagining distance or conflict with others, and felt they were unable to manage financial circumstances or to achieve important life goals associated with having some perceived measure of financial freedom. Presumably, these experiences associated with financial insecurity affected their overall experiences of need satisfaction.

The findings inform the motivational literature by suggesting that experiences of one's financial conditions can impact basic psychological needs, building on the literature which examines the impacts of both daily hassles (Lam & Gurland, 2008; Verstuyf, Vansteenkiset, Soenens, Boone, & Mouratidis, 2013) and work conditions (Ryan, Bernstein, & Brown, 2010). Especially relevant to the current work is research examining how people's goals for work, that is, whether they are working because they inherently enjoy and value

their work (intrinsic goal orientation), or whether they work primarily for the pay and achievement they would receive (an extrinsic goal orientation), impacts their perceived energy, feelings of satisfaction and success, and turnover intentions; (Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008). Here the authors found that intrinsic goals fostered these positive outcomes because they promoted the three basic psychological needs at work. These findings complement this paper in showing that one's job-related experiences shape need satisfaction, though in the present studies we focus on financial security as an important antecedent to need satisfaction. Indeed, it might be that those who are oriented toward extrinsic goals experience more financial insecurity even given similar economic conditions (i.e., similar income levels), and partly for this reason their psychological needs are undermined by financial insecurity.

An additional goal of this paper was to understand the implications of financial insecurity for well-being. The findings across four studies supported Hypothesis 2, that individuals who feel financially insecure would suffer costs to their well-being because of the undermining of their basic psychological needs. These findings inform the work on financial insecurity and well-being, which has linked financial insecurity with depression (Lange & Byrd, 1998; Rocha et al., 2006), anxiety (Lange & Byrd, 1998), and psychological distress (De Witte et al., 2010; Hellgren et al., 1999; Hellgren & Sverke, 2003). Here, we attempt to explain why these well-being outcomes occur by employing the widely-used framework of SDT (Deci & Ryan, 1985; Ryan & Deci, 2000a) to outline the psychological difficulties which might, in turn, undermine individuals' well-being under financially insecure conditions. Further studies might examine these questions with longitudinal and daily diary (experience sampling method; ESM) approaches that capture the dynamics of financial insecurity as they occur, naturally, and which also allow for modelling causal and quasi-causal effects (Bolger & Laurenceau, 2013). In fact, well-being outcomes such as depression

or anxiety might emerge for those who are in chronically insecure conditions, or, alternatively, individuals might adapt to uncertain financial conditions and show less ill-being across time; such possibilities remain unexamined in the research designs herein.

These findings are among the first to explore the internal psychological outcomes of feeling financially insecure, building on preliminary research linking financial states to lower mastery (Dwyer et al., 2011; Loonin & Plunkett, 2003), impaired family dynamics (Larson et al., 1994), and pressure (Bradley, 2000). Excepting such initial studies, no research of which we are aware tests need-related outcomes of perceived financial insecurity, yet comprehending such internal experiences is important for understanding the diverse personal outcomes for individuals. For example, while we focused on subjective experiences of psychological well-being in the present study, the satisfaction of competence, autonomy, and relatedness needs has been linked to physical health (Reinboth, Duda, & Ntoumanis, 2004; Sheldon et al., 1996), amotivation and helplessness in the face of frustrations (Weinstein & Ryan, 2011), and aggression (Przybylski, Deci, Rigby, & Ryan, 2014; Weinstein, Hodgins, & Ostvik-White, 2011). Given that the present findings show that financial insecurity robustly impacts these psychological needs, it may be that financial insecurity also leads, perhaps indirectly, to lower physical health, amotivation, helplessness, and aggression. Financial insecurity may also contribute to lower resilience and functioning among those in economically challenging situations. For example, research could contribute by linking financial experiences to subjective assessment of health (Hellgern et al., 1999; Hellgern & Sverke, 2003; Witte, 1999) in employees and to other populations such as older adults and those receiving intensive and costly medical interventions.

The first study tested the simultaneous relations of both income and financial insecurity, along with their potential joint effects, that is, does one's objective financial circumstances attenuate the effect of financial insecurity on psychological needs? Results

showed that accounting for financial insecurity income did not explain sufficient additional variance, and the two predictors did not interact. Hence, subjective experiences, rather than the objective fact (of income), was the most important influence on well-being. This finding is consistent with Van den Broeck et al.'s (2008) research testing extrinsic (e.g., money oriented) and intrinsic (e.g., interest) goals for work. The authors similarly found that individuals' psychological needs were undermined as a function of subjective experiences within the workplace, regardless of their income.

Research has also examined the effects of income and the psychological need for autonomy on well-being. In two large scale cross-national samples, income did not relate consistently to well-being when controlling for autonomy need satisfaction (Diener et al., 1995), or did so only indirectly through autonomy need satisfaction (Fischer & Boer, 2011). These studies suggested that autonomy need satisfaction may link income to well-being, yet the preliminary data tested in Studies 1 and, to an even greater extent in Study 2, further suggest that it is *financial insecurity*, not income, that affects well-being and that is mediated by psychological needs. Indeed, the effects of income on well-being that are identified in past work may be better accounted for by financial insecurity; future research would contribute by both exploring this possibility and attempting to replicate the relations obtained in the current work in varied samples.

Also interesting is that income correlated approximately $r = -.4$ with financial insecurity, a moderate relation which suggests variability in people's experience of the same level of incomes; that is, people in identical economic conditions may experience differing levels of financial insecurity. Above, we speculate that those who hold stronger extrinsic goals may be more likely to report financial insecurity at the same income level, compared to those with stronger intrinsic goals. While social comparison processes likely also partially explain these relations (Clark & Oswald, 1996), it may also be that interpreting income as

threatening to psychological needs would result in a different subjective experience (e.g., different perceived financial insecurity) even under identical economic conditions. This possibility would be fascinating to explore in future research.

Along with testing implications for well-being, our first two studies also related financial insecurity and need satisfaction to financial cheating (testing Hypothesis 3 that need satisfaction would be linked to these behaviors, and Hypothesis 4 that it would indirectly link them to financial insecurity). Indeed, we found that those who were financially insecure either as an individual difference (Study 2) or as a function of assignment to condition (Study 3) reported more willingness to cheat financially. This result mirrors work in SDT showing that those whose needs are undermined are more likely to cheat in academic (Anderman et al., 2015; Kanat-Maymon et al., 2015; Vansteenkiste et al., 2009), work (Dembinski et al., 2005), and sports (Ntoumanis & Standage, 2009) settings. Here, we extend this work to focus on financial misbehavior (e.g., Cressey 1953). The current study findings suggest that such misbehavior might take place in applied settings that create financial insecurity, particularly for those who feel pressure to maintain an income (e.g., see review of such economic conditions in Näswall & Dewitt, 2003); in such cases, failures of work ethics, including theft, may be more likely, which suggests a fruitful opportunity for research.

Evidence suggests that financial distress increases one's focus on financial goals (Dittmar et al. 2014) and, seemingly, elevates the importance of financial needs in a hierarchy of needs (e.g., in a Maslowian (Maslow 1954) hierarchy). In addition, financial distress is a known predictor of theft and embezzlement (Peterson 1947; Cressey 1953). The results reported herein offer a mechanism for understanding these relations. Furthermore, evidence suggests that valuing material possessions and wealth (i.e., materialism) may partly result from parenting styles that include over-protection and rejection (Poraj-Weder, 2014). Given that materialism is associated with more impulsive financial behaviors (Troisi, Christopher,

& Marek, 2006) and financial cheating (Cohn, Fehr, & Maréchal, 2014), it may be the case that materialism's link to these behaviors results from a perception of unsatisfied core psychological needs.

Study 4 tested the indirect effects of financial insecurity on financial risk through psychological need satisfaction. This study was informed by SDT research showing that those who experience lower need satisfaction are more likely to engage in risky gambling (Neighbors & Larimer, 2004), sexual (Abad, 2011), and eating (Verstuyf et al., 2012) behaviors. Herein, we extend these results to focus on financial risk: the results demonstrate that lower need satisfaction may motivate taking larger financial risks. That financial losses and financial stress can motivate additional risk taking where additional losses are at stake suggests consideration should be given to programs that educate consumers about the relationship between financial status and risk taking (Liebowitz 2016; Kapoor et al. 2016).

The finding that lower need satisfaction may relate to risk-taking when greater losses are at stake is tentative, i.e., tested in only one study. However, the result is consistent with the “end-of-the-day” betting effect, in which bets on longshots, i.e., more risks are taken towards the end of the day at horserace tracks, when most gamblers have lost money and frame bets as potentially recovering losses (Ali, 1977; McGlothlin, 1956). The implications of this result for those who experience significant financial stress include the potential for a negative, downward spiral, or snowball effect, wherein financially insecure individuals choose risky financial alternatives that exacerbate (rather than ameliorate) their financial distress, potentially breeding greater financial security. If such a snowball effect exists, this may be best studied in longitudinal designs, which can examine trajectories of both financial insecurities, risk-taking behaviors, and actual financial conditions over time. Such designs would also speak to the rationality of making later riskier choices, given that such decisions could exacerbate future insecurity and lessened well-being because of earlier choices.

Interestingly, observed effects on both cheating and risk-taking may have been due to a desire of financially insecure individuals to reinstate their psychological needs to a baseline level. That is, individuals were more willing to take ‘shortcuts’ to ameliorate psychologically distressing situation – financial insecurity – consistent with seminal work in this area which has suggested that when people’s needs are undermined, they are motivated to engage in more compensatory and maladaptive behaviors to reaffirm needs (Sheldon & Gunz, 2009). Such results, e.g., of cheating on tests by those who are underprepared, are known in academic settings (Anderman et al., 2015; Kanat-Maymon et al., 2015; Vansteenkiste et al., 2009). Extending these results to the financial domain suggests that individuals may risk more financially because of a desire or motive to return to a need satisfying state of financial security. While engaging in cheating or risk-taking are likely not successful strategies for returning to baseline levels of psychological need satisfaction, future studies may test motives directly by asking participants to report their reasons for engaging these behaviors.

Limitations

Our findings are subject to notable limitations. First, while the first two studies tested individuals from a broad range of incomes and education levels, the third and fourth studies used a much less diverse sample of educated and relatively high-income individuals. Accordingly, in these studies factors such as income and education had less robust relations with other constructs than in Study 1, presumably because of insufficient variability in these measures. Alternatively, this may be because ‘household income’, broadly, may not be the best way to quantify the income of students (e.g., for some income reflects independent income, whereas for others it reflects parents’ economic conditions, Hancock, Jorgensen, & Swanson, 2013). Sampling demographically diverse and extreme populations (e.g., Martin & Hill, 2012) is essential given that financial insecurity may be especially problematic for low income individuals, and to a lesser extent, given it may be confounded with other

demographic variables such as age or education. Although in our studies we did not find this to be the case, samples focusing on low-income individuals may be more sensitive to the possible costs these individuals may incur. Relatedly, although our second study sampled from the community, participants in this study were MTurk respondents who may have viewed the study as being work. Admittedly, only 1% of our sample self-identified as being professional survey respondents, whereas the remainder identified working in other, unrelated areas. Yet it is plausible that the sampling context may have impacted on baseline level of financial security, and this should be considered in future work examining financial concerns and other related topics using paid online research platforms.

In addition, our research focused on the general population but we can benefit from additional knowledge of how financial experiences undermine psychological needs in subpopulations that are especially vulnerable to both these experiences and the associated health costs. For example, for those with cancer, the risk of depression and anxiety is threefold in those who have financial stress because of their diagnosis (Sharp, Carsin, & Timons, 2012), and is responsible for lower psychological well-being in American and Japanese elderly individuals (Krause, Jay, & Liang, 1991). In these contexts, financial insecurity may have an even greater undermining effect on basic psychological needs, and interventions that attempt to mitigate these harms or to otherwise bolster basic psychological needs may be helpful in improving the health and well-being of these individuals.

Additionally, except for the gamble choices in Study 4, our findings rely on self-reports, which may be biased by social desirability for some who report less insecurity, more need satisfaction, and higher well-being. Although the two experimental designs reduced the likelihood that such method variance linked financial insecurity and psychological needs, these experiments were vulnerable to demand characteristics in the insecure conditions – participants may have anticipated that they should be reporting lower psychological needs

and well-being. Thus, research which observes additional behavioral outcomes indicative of lower functioning or financially irresponsible behaviors (for example, actual cheating behaviors rather than self-reports) would contribute, as would triangulating self-reports of financial insecurity with reports from close others of participants' expressed financial experiences.

In Conclusion

Despite these limitations, these studies were among the first to examine the outcomes of financial insecurity through the lens of SDT and by doing so inform our understanding of why those who are financially insecure incur “costs” to their well-being and engage in financial behaviors that are harmful to themselves or significant others. Our findings are largely robust across the four studies and advance the study of financial insecurity by using experimental designs – rare to this area – but which provide causal evidence that financial experiences can change people's well-being and behavior or behavioral intentions. In addition, this research provides a launching point for a deeper exploration of how financial insecurity can impact individuals, and we suggest that attention should be given to understanding the mechanisms and outcomes of financially insecure conditions, to understand the full impact on people's lives and experiences.

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Table 1

Study 1 (Below diagonal) and Study 2 (Above Diagonal) Descriptive Statistics and Correlations Between Major Study Variables

	<i>M (SD) Study 1</i>	<i>M (SD) Study 2</i>	1	2	3	4	5	6	7	8
1. Age	43.21 (11.49)	37.76 (11.55)		.16	.07	.00	.14*	.21**	.14*	-.37**
2. Gender	---	---	.00		-.06	.04	.08	.07	-.12	-.17**
3. Education	---	---	-.18**	-.04		.28**	-.18**	-.01	.05	.09
4. Income [%]	£16,000 (10,000)	\$45,000 (31,160)	.01	-.12**	.33**		-.41**	.17*	.17*	-.04
5. Financial insecurity	3.30 (0.92)	3.26 (1.11)	.01	.12*	-.14**	-.38**		-.37*	-.50*	.06
6. Need Satisfaction	3.48 (0.73)	3.86 (0.73)	.12**	.02	.05**	.23**	-.37**		.81**	-.31**
7. Well-Being	3.33 (0.61)	4.58 (0.90)	.11**	-.03	.02	.17**	-.36**	.66**		-.29**
8. Cheating intention [#]	---	1.63 (0.53)								

Notes. ** $p < .01$, * $p < .05$

[%]Income is measured in terms of British pounds (GBP) in Study 1, and U.S. dollars in Study 2.

[#]Cheating intention was measured in Study 2 only.

Table 2

Study 3 (Below diagonal) and Study 4 (Above Diagonal) Descriptive Statistics and Correlations Between Major Study Variables

	<i>M (SD) Study 3</i>	<i>M (SD) Study 4</i>	1	2	3	4	5	6	7	8
1. Age	20.86 (1.00)	23.56 (7.11)		-.13	-.23*	-.02	-.14	-.25*	.22*	.25*
2. Gender	---	---	-.03		.14	-.13	.09	.06	-.08	.05
3. Income [%]	\$105,000(60,000)	£20,000 (5,000)	.01	.01		.02	.03	.04	-.03	-.06
4. Condition	---	---	-.04	-.01	-.16*		-.46**	.51**	.59**	.09
5. Financial insecurity	3.00 (1.30)	2.88 (1.27)	-.04	-.14	.22*	-.24**		.77**	-.82**	-.32**
6. Need satisfaction	3.96 (0.59)	3.16 (1.01)	-.14	-.12	.03	-.18*	.28**		-.84**	-.29**
7. Well-being	4.08 (0.72)	2.89 (1.09)	-.12	-.16*	.02	-.19*	.22**	.77**		.33**
8. Financial behavior [#]	1.72 (0.67)	13.18 (1.70)	.11	-.19*	-.02	.14	-.05	-.22**	-.21**	

Notes. ** $p < .01$, * $p < .05$, # $< .09$

[%]Income is measured in terms of U.S. dollars in Study 3 and British pounds (GBP) in Study 4.

[#]Financial behavior was measured in terms of cheating intention in Study 3 and risky loss-focused financial decision-making (a sum of 10 variables coded 1 for safe, and 2 for risky choices) in Study 4.

Table 3

Mean differences and standard deviations split across condition (secure vs. insecure) for Study 3 and 4 outcomes.

	<i>Study 3</i>				<i>Study 4</i>			
	Secure		Insecure		Secure		Insecure	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>Financial insecurity</i>	3.22	1.29	2.57	1.20	3.50	1.03	2.29	1.23
<i>Autonomy</i>	4.19	0.80	3.95	0.69	3.77	0.60	2.65	1.10
<i>Relatedness</i>	3.99	0.69	3.67	0.78	3.72	0.73	2.65	1.70
<i>Competence</i>	3.92	0.77	3.82	0.76	3.55	0.85	2.64	1.11
<i>Well-Being</i>	4.18	0.72	3.89	0.69	2.24	0.70	3.53	1.05
<i>Financial behavior[#]</i>	1.65	0.62	1.85	0.74	-3.10	1.81	-2.13	1.77

***p* < .01, **p* < .05

[#]Financial behavior was measured in terms of cheating intention in Study 3 and risky loss-focused financial decision-making (a sum of 10 variables coded 1 for safe, and 2 for risky choices) in Study 4.

Appendix A: Debt scenarios for Study 4**Debt Condition**

Take a few minutes to imagine this scenario. Try to fully put yourself in this image and to think though what this would feel like for you...

Three months ago you found out you were made redundant from your job. Since then, you have been unable to find another job and overspending prior to losing your job on dining in restaurants, clothes, and a holiday means you have little in savings. Your redundancy pay is quickly spent on rent and bills and you find you have to claim jobseeker's allowance. This allowance does not pay all your living costs and now you owe £7000 on credit cards, £2000 on store cards, and you are £1000 overdrawn in your bank account. In an attempt to pay these debts you pawn several of the most valuable items you own, borrow money from friends and family, and take out a payday loan with a high interest rate, which allows you to make the minimum payments on your credit cards and store cards. These temporary solutions kept you going for a little while and the following month you are still unemployed and fail to pay rent, several utility bills, credit and store cards, monies borrowed from friends and family, and the payday loan. You regularly receive letters demanding payment and you are threatened with eviction, at this point you know bailiffs will soon be in contact.

Comparison Condition

Take a few minutes to imagine this scenario. Try to fully put yourself in this image and to think though what this would feel like for you.

For the past three months you have been enjoying the stable paycheck you receive from your employer. In that time, you have gotten your total credit limit up to £7000 on credit cards, have £2000 in your newly opened savings account, and you £1000 in your bank account for

daily use. You were also able to repay a payday loan you took out with a high interest rate, monies borrowed from friends and family, and buy back a few valuable items you had pawned to make the minimum payments on your credit cards and store cards. The following month you are not in debt and your stable salary comfortably pays all living costs including rent, utility bills, groceries, and mobile phone bill. At this point you are considering the future and commit to placing some of your monthly salary into a savings account and into a pension scheme.

Authors' Reflection: The Things We Do with and For Money

This project emerged from our shared interest in understanding the sources of human well-being and applying theoretical approaches such as self-determination theory to do so. Here, we sought to understand the nature of findings from a diverse literature linking financial experiences to wellness, and we wondered why financial insecurity motivates potentially self-defeating behaviors such as financial cheating and risk taking. We spent ~ three years unearthing some insights. Our efforts combine Netta's deep knowledge of the influences on and effects of need satisfaction with Dan's obsession with understanding why people do such odd things with and for money. Both authors share, and contemplate pursuing, interests in the further predictions of SDT related to mindfulness, money, and woods, wildlands, and birds. As evidence of their divergent interests and training, the authors once thought they shared an interest in ERPs; however, one author believes that ERPs are event-related brain potentials while the other author believes that ERPs are enterprise resource planning systems. We leave to the reader the exercise – perhaps while engaging a pint at a pub with colleagues – of determining which author believes which acronym is correct.