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# The Price of Financial Precarity: Organizational Costs of Employees' Financial Concerns

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**Abstract.** Personal finances are becoming an increasingly prominent source of distress for a substantial proportion of the population in many developed economies. In this paper, we examine the organizational consequences of this trend by proposing that financial precarity can undermine a person's ability to perform at work. Across two studies, we demonstrate that people who are worried about their financial situation have less cognitive capacity available to them, which subsequently spills over into their work performance. In Study 1, we demonstrate this relationship in a field study with short-haul truck drivers where we combine survey responses with lagged archival data on preventable accidents. We find that a one-standard-deviation increase in financial worry is associated with a 0.4% increase in the probability of a preventable accident because of its detrimental effects on cognitive capacity. In Study 2, we establish the causal ordering among the variables by manipulating financial worry in a laboratory environment using a driving simulation task, confirming the results of Study 1. We discuss the implications of the research findings for organizational theory and workplace practice, arguing that it may be in employers' self-interest to undertake initiatives that reduce employees' financial precarity.

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**Keywords:** employee well-being • employee performance • personal finance • accidents

Financial precarity is a growing concern for many, even in developed economies.<sup>1</sup> In the United States, for example, a report by the American Psychological Association (2015) revealed that money-related concerns are a more prevalent source of distress than those related to health, work, or family. Indeed, nearly two-thirds of the U.S. population report being worried about their financial situation. Data from the Board of Governors of the Federal Reserve System (2016) confirm these findings by showing that most people across the age spectrum do not have \$400 in savings to cover an emergency nor believe they have sufficient savings to retire.

These trends in personal finance have increasingly entered the public discourse in policy debates surrounding economic inequality, minimum wages, and healthcare costs. At the same time, a literature has emerged in organizational science suggesting a role of employing organizations in creating a context for individual financial concerns. As Bidwell et al. (2013) document, organizations have increasingly relied on the use of contingent workers, layoffs, variable pay systems, and variable scheduling, which have coincided with increases in financial precarity. Cobb (2015) further describes how U.S. companies have diminished their offerings of defined benefit plans in favor of defined contribution accounts, effectively shifting the financial risk of retirement onto individual employees. Even

when employees receive such benefits, employers have increasingly limited their contributions while employees' share of costs has increased (Claxton et al. 2015). These changes have obvious short-term financial benefits for the firm and are often marketed as beneficial to employees by enhancing individual choice, but such practices may simultaneously increase employees' financial concerns by introducing economic uncertainty into their lives.

Financial precarity can impose a significant burden on individuals, their families, and entire communities. There is a large body of research showing the detrimental effects of financial insufficiency on a variety of individual and collective outcomes, such as individual physical and psychological health (Belle and Doucet 2003, Galea et al. 2007), family well-being (Benson et al. 2003, Voydanoff 1990), and community cohesion (Small and Newman 2001). At the same time, little work has examined how people's financial concerns affect the organizations that employ them (Meuris and Leana 2015). This omission is notable given the role that firms can play in facilitating—or undermining—financial wellness through their human capital strategies (Davis 2009, Lambert 2008, Pfeffer 1998). Compensation practices, for instance, determine the financial resources employees have at their disposal to meet their needs and the predictability of these

resources, while benefits, ranging from retirement savings matches to health programs, can remove barriers to financial wellness that may otherwise be burdensome (Meuris and Leana 2015, Pfeffer 2010). Thus, employers can play a vital role in influencing employees' financial well-being.

**Mutually** We argue here that individual financial well-being reciprocally influences organizational performance through its effects on employees' ability to do their jobs.

In doing so, we build on prior research that has documented the spillover effect of stressors outside of the work domain on organizational outcomes (e.g., Adler et al. 2006, Frone et al. 1997, Grandey and Cropanzano 1999, Rothbard 2001). Financial concerns, however, have

**Notable** received little attention yet may be particularly salient at work. For most, financial standing is dependent on remuneration for performing a job (Leana and Meuris 2015), as paid employment ensures the attainment and maintenance of material resources and financial stability. When people have financial concerns, they tend to feel economically dependent on their jobs for their survival (Brief et al. 1997), which heightens the salience of these concerns in the workplace because one's finances are inextricably linked to one's work. Indeed, prior research suggests that work attitudes are influenced by the degree of financial dependency people have on their jobs (Brett et al. 1995, Doran et al. 1991). Thus, the ties between employees' financial resources and their jobs can lead financial concerns to be particularly salient at work.

To understand the organizational costs of employees' financial concerns, we draw on emerging research in psychology and economics (e.g., Mani et al. 2013, Mullainathan and Shafir 2013, Shah et al. 2012). We develop and test a model of how employees' financial worry may undermine their ability to perform at work, and thus undermine the value firms derive from their human capital. Moreover, we model the psychological mechanisms that may account for this negative relationship. As such, our research offers several contributions. First, we investigate the organizational costs of employees' personal finances and demonstrate how employees' financial worry can have a reciprocal negative influence on valued organizational outcomes. Organizations contribute to employees' personal financial situations through their wage setting, benefits, and work arrangements, yet these practices are often approached as a competitive process (win-lose) between the employer and its employees (Gittell et al. 2004, Pfeffer 2010). The studies described in this paper suggest that discussion regarding these practices can be approached in a more cooperative fashion. In this regard, our studies provide empirical evidence for employers' interest in the financial well-being of their employees.

More broadly, our research expands the reach of theory regarding the role of money in organizational behavior. Models of employee performance generally assert that employees need motivation, ability, and opportunity to be highly effective in their jobs (Aldag and Brief 1979, Blumberg and Pringle 1982, Vroom 1964). Historically, however, the role of money in performance has been approached primarily from a motivational perspective, as compensation practices can prompt people to join and stay with certain organizations over others (Cappelli 1999, Gerhart and Rynes 2003) or drive them to direct more effort toward their work tasks (Akerlof 1982, Rynes et al. 2005). Financial precarity, similarly, has been suggested to motivate employees to devote more effort to their work as a means of securing their economic status and/or averting further financial decline (Shoss and Probst 2012). In this paper, we depart from this focus on the motivational potential of money by arguing that it can play a prominent role in people's ability to perform at work. We examine the potential impact of employees' personal finances, and their worry about them, on their performance ability, and thus provide evidence of income effects in organizations from a more diversified perspective (Leana and Meuris 2015).

Finally, our research extends the emerging behavioral model of financial scarcity (Bertrand et al. 2004, 2006) in two ways. First, while there is a growing body of evidence on the detrimental effects of financial worry and its consequent diminishment of cognitive capacity, none of this research has been conducted in actual work settings, and thus, we know little about its effect on work performance and, by extension, organizations. As Schilbach et al. (2016, p. 436) summarize, "In contrast to the rich body of evidence on the link between [cognitive] bandwidth and decision-making, evidence on the relationship between bandwidth and productivity is much more limited...[and represents] an area of research ripe for investigation." Similarly, Staw (2010) has argued that we cannot assume that the findings from psychological experiments on cognitive processes will translate into similar effects on actual behavior in work settings. The research described here represents the first attempt to uncover these relationships using consequential work tasks, and thus it provides a theoretical bridge between organization science and applied psychology. While organization science has documented changing work practices that may account for growing financial precarity (e.g., Bidwell et al. 2013, Cobb 2015, Lambert 2008), applied psychologists have documented the costs of financial precarity for individuals (e.g., Mani et al. 2013, Mullainathan and Shafir 2013). We bring these two streams of research together in the present set of studies to show that the price of financial precarity is borne by employers and employees alike.

Second, we argue that financial precarity may decrease cognitive capacity not only directly as a result of distraction (Mullainathan and Shafir 2013) but also indirectly by increasing the frequency of emotional suppression over time. Previous research has shown that financial worry can trigger negative emotions (Haushofer and Fehr 2014, Kushlev et al. 2015) that people are likely to suppress because of their aversive nature (Meuris and Leana 2015). Such emotional regulation, however, necessitates further effort and can reduce a person's available cognitive capacity for other aspects of his or her life (Gross 1998, 2002), including work performance. Indeed, other research has documented the significance of emotional suppression in work contexts such as customer service (e.g., Grandey 2003, Hochschild 1983). Thus, in addition to the attentional consequences of financial precarity argued in prior research, increases in the self-regulation of emotions associated with it may provide a second mechanism through which financial worry undermines cognitive capacity.

We adopt a multimethod approach utilizing field and experimental data to untangle how employee financial worry influences cognitive capacity and subsequent work performance. In Study 1, we use a combination of survey and longitudinal performance data to show that in a large sample of truck drivers, those experiencing financial worry tend to have less cognitive capacity available to them and, consequently, are significantly more likely to have a preventable accident. Our second study, conducted in a laboratory setting, assesses the causal relationships between financial worry, cognitive capacity, and performance in an incentivized driving simulation. Overall, the combination of field and experimental data presents a compelling test of the theoretical arguments put forth in this paper.

## Background and Hypotheses

For over 100 years, organizational scholars have conducted research aimed at understanding the factors that can enhance or undermine employee performance. From Frederick Taylor (1914) to the present, research has focused on a wide range of performance-enhancing (or performance-inhibiting) factors, ranging from stable individual differences (e.g., Barrick et al. 2001) to changing weather conditions (e.g., Lee et al. 2014). Theoretical models have argued that such factors influence performance through three mechanisms: motivation, ability, and opportunity (Aldag and Brief 1979, Blumberg and Pringle 1982, Vroom 1964). Undoubtedly, the factor that has received the most attention among these streams of research has been the role of money in motivating behavior. Indeed, thousands of studies across various social science disciplines have examined the influence of money on performance (for

reviews, see, e.g., Rynes et al. 2005, Shaw and Gupta 2015). The consideration of money on performance, however, has been largely limited to how it can serve as a motivational lever because of the primary focus on compensation and incentives.

By contrast, we propose that money can also play a role in employees' ability to perform at work by contributing to their financial worry. As Mani et al. (2013) and others have argued, financial scarcity—defined as the perception that one does not have sufficient financial resources to meet one's needs—can impose a cognitive "tax" in the form of an unwelcome distraction to other necessities of one's life. Meuris and Leana (2015, p. 147) have noted that financially strapped employees "do not take the metaphorical 'backpack' of scarcity off their shoulders when they come into work; instead, it is carried with them as they complete their work tasks as a competing demand for mental bandwidth." Although the extant empirical research in this domain is limited to studies of the relationship between financial scarcity and cognitive tests, it suggests that employees' financial concerns may also undermine their ability to perform at work by drawing their attention away from work-related to finance-related concerns.

## Financial Resources and Worry

We argue here that when people have fewer financial resources at their disposal, they are apt to worry about their situation because it presents a threat to the well-being of themselves and their dependents. More specifically, people strive to attain and retain valuable resources, and they become worried when they have insufficient resources to meet their needs and obligations (Ennis et al. 2000; Hobfoll 1989, 2001). Kahneman and Deaton (2010), for instance, report a positive relationship between household income and well-being, at least for those with annual incomes in the lower three quintiles of the population. Other scholars (e.g., Kushlev et al. 2015, Ünal-Karagüven 2009) have found a significant negative relationship between income and felt anxiety as well as other negative, but not positive, emotions. Taken together, these studies suggest that, although financial worry is distinct from one's objective financial resources (Ackerman and Paolucci 1983, Leana and Meuris 2015), decreases in the availability of financial resources are often accompanied by an increased propensity to be worried, as economic shocks will tend to be more frequent and/or impactful with limited money at one's disposal.

Although most organizational research has focused on the impact of wages alone in affecting employee performance (see Leana and Meuris 2015), here we consider the total financial resources that employees have at their disposal, including savings, credit availability, and total household income. While income serves as

the primary financial resource that people draw upon to access goods and services, savings also contribute to an individual's financial resources by offering a buffer in case expenses exceed one's total income (Chase et al. 2011). When expenses exceed people's income and savings, they can also rely on consumer debt to meet their needs, serving as the final layer of a person's financial resources. Thus, while wages serve as a component of financial resources by contributing to people's household incomes, financial resources represent a broader construct that captures a person's ability to meet his or her expenses.

**Hypothesis 1.** *Financial resources are negatively related to financial worry.*

### Financial Worry and Cognitive Capacity

Emerging research in psychology and behavioral economics has argued that people concerned with their financial situation tend to ruminate on it, which inadvertently restricts their cognitive processing to focus on stimuli related to their finances (Mani et al. 2013, Mullainathan and Shafir 2013). These arguments draw on resource models of cognition (Baddeley 1992, Baddeley and Hitch 1974, Kahneman 1973, Miller 1956, Norman and Bobrow 1975), which posit that people have a finite capacity to heed and process information. As they become worried about their financial resources, they tend to focus on stimuli relevant to averting the immediate threat (Staw et al. 1981). Increased attention to one's financial situation can be adaptive to managing one's predicament (Shah et al. 2015), but this focus simultaneously leaves fewer cognitive resources available for other necessities because of the limited capacity of the working memory system. This phenomenon is referred to as the "tunneling effect," whereby people tend to neglect information unrelated to their immediate source of concern.

The tunneling effect has received some empirical support in recent years. Mani et al. (2013), for instance, find that farmers performed worse on cognitive tests before the harvest, when their financial resources were depleted, compared with after the harvest, when they were relatively well off. Another of their experiments finds that merely priming perceived financial scarcity decreased performance on cognitive tests, with a larger effect than the loss of one night's sleep. Consistently, we hypothesize that employees who are worried about their financial situation will have less cognitive bandwidth available to them because such worry restricts their information processing and appropriates working memory—defined as "a brain system that provides temporary storage and manipulation of the information necessary for such cognitive tasks as language comprehension, learning, and reasoning" (Baddeley 1992, p. 556). Carvalho et al. (2016) provide some evidence for our hypothesis. Their analyses suggest that changes in the availability of financial resources

(i.e., before versus after a payday) only influence cognitive functioning when people differed in their subjective assessment of their financial situation.

**Hypothesis 2A.** *Financial worry is negatively related to cognitive capacity.*

**Hypothesis 2B.** *Financial resources have an indirect effect on cognitive capacity through financial worry.*

### The Role of Emotional Suppression

While scholars have focused on the tunneling effect as the primary psychological mechanism linking financial worry and cognition, prior research has also shown that financial worry tends to be accompanied by anxiety and other forms of negative affect (e.g., Andrews and Wilding 2004, Haushofer and Fehr 2014, Ünal-Karagüven 2009), which people regulate to avert interference with their lives (Meuris and Leana 2015). Indeed, in anticipation of undesirable consequences from these negative emotions for the achievement of their personal and professional goals (e.g., Andrade and Ariely 2009), people are motivated to suppress them (Gross 2002). As suppression becomes more frequent over time, however, it increasingly taxes an individual's cognitive capacity (Muraven and Baumeister 2000) because emotional regulation typically requires considerable cognitive effort (Richards and Gross 2000).

Given the extant evidence for a positive relationship between financial precarity and negative emotions (Haushofer and Fehr 2014, Kushlev et al. 2015), and emotional suppression and cognitive effort (Goldin et al. 2008, Richards and Gross 2000), we hypothesize that the frequency of emotional suppression provides an additional mechanism through which financial worry can usurp an employee's cognitive capacity, parallel to the tunneling effect described in prior research. That is, in organizational settings, employees are motivated not only to suppress their negative emotions in interpersonal interactions, as demonstrated by prior research in customer service contexts (see Elfenbein 2007 for a review), but to also suppress them as a means of avoiding interference with their personal and professional goals, even in contexts where they are not directly dealing with customers. While the tunneling effect described earlier reflects an attentional process whereby finance-related thoughts appropriate cognitive resources (Mani et al. 2013, Mullainathan and Shafir 2013, Shah et al. 2012), emotional suppression is a self-regulatory process whereby cognitive resources are drained over time as a result of the regulation of emotional experiences and displays (Gross 2002, Muraven and Baumeister 2000). Both mechanisms can simultaneously decrease cognitive capacity, albeit through distinct psychological processes. This dual mechanism perspective is consistent with contemporary approaches to cognitive functioning where

attention, memory, and executive control are independent functions that draw from the same pool of cognitive resources (e.g., Vallat-Azouvi et al. 2012).

**Hypothesis 3.** *Financial worry has an indirect effect on cognitive capacity through the frequency of emotional suppression.*

### Spillover Effect of Financial Worry on Work Performance

If employees' financial worry tends to decrease their cognitive capacity, as we have argued here, it should spill over into their ability to perform their jobs. Financial concerns represent a weight that people carry with them into the workplace (Meuris and Leana 2015). When employees are focusing on their financial concerns and regulating the resultant negative emotions, their job performance can falter because they have less attention and information-processing power to devote to work-related tasks (Smallwood and Schooler 2006). Indeed, decreases in spare cognitive capacity can lead to cursory attention to tasks or concerns that are outside of its scope, including work tasks (Kahneman 1973, Lavie et al. 2004). Thus, we hypothesize that financial worry has an indirect negative effect on job performance through its dampening effect on cognitive capacity.

We propose an indirect rather than a direct negative relationship between financial worry and job performance for two reasons. First, as we have discussed, prior research has established a negative relationship between financial worry and cognitive capacity. We argue here that it is this decrement in cognitive capacity that undermines the ability of employees to perform at work. Second, while financial worry can undermine cognitive capacity and thus performance ability, some authors have argued that financial worry could also potentially enhance work motivation if employees devote more effort toward securing their jobs and avoiding loss (Brockner and Higgins 2001, Higgins 1998, Idson et al. 2000) and/or attaining any performance incentives that may reduce their insufficiency (Shoss and Probst 2012). This potential motivation "bump" may suppress the negative relationship between financial worry and performance resulting from ability decrements because of the differences in effect signs (see

Rucker et al. 2011). For this reason, we do not predict a direct relationship between financial worry and performance. Instead, we hypothesize that financial worry and work performance is an indirect-only relationship (Zhao et al. 2010), whereby financial worry depresses cognitive capacity, which, in turn, results in lower job performance.

**Hypothesis 4A.** *Cognitive capacity is positively related to job performance.*

**Hypothesis 4B.** *Financial worry has a negative indirect effect on work performance through cognitive capacity.*

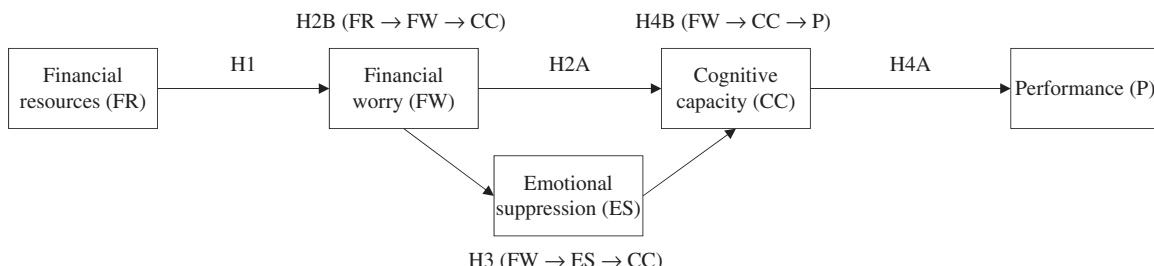
### Overview of Studies

We examine the hypotheses (see Figure 1) in both a natural and a controlled environment. In Study 1, we investigate the effect of financial worry on work performance in a field setting using objective performance data. Study 1 further examines whether emotional suppression offers an indirect mechanism through which financial worry can undermine cognitive capacity and subsequent work performance. We collect survey and lagged archival data on preventable accidents from a large sample of short-haul truck drivers working for a regional transportation company. In Study 2, we focus on the causal relationship between financial worry and performance mediated by decrements in cognitive capacity. Participants were recruited for a laboratory session in which they completed a driving simulation task. We use driving performance as the outcome of interest in both studies because accidents can be quite consequential for employees and employers, incurring significant personal, organizational, and societal costs. In addition, decreased driving performance can be attributed at the individual level of analysis and is a task where performance can be objectively quantified.

### Study 1 Organizational Context

Our first study was conducted with a sample of full-time, short-haul truck drivers employed by a large transportation company. The company operates 21 terminals in nine states, all of which were included in this study. Drivers received wages between \$18.08

**Figure 1.** Conceptual Model



and \$30.02 per hour and paid benefits from their employer. In this regard, they represent a sample of "middle class" employees where we can anticipate variability in financial worry, with some drivers feeling financially strapped and others feeling relative financial stability. Considering the pay and benefits of this employee population, any effect of financial worry on performance should be a conservative estimate of its impact in other organizations where reasonable pay and benefits are not provided.

### Sample and Procedures

Our target sample consisted of all full-time drivers ( $N = 1,649$ ) employed by the company. We elected to study truck drivers because they are responsible for an independent set of tasks where decreases in their available cognitive capacity can pose a significant cost to themselves and to the company. Indeed, as prior research on safety violations among commercial drivers suggests (e.g., Blanco et al. 2006, Lee et al. 2009), any reduction in cognitive capacity can have important consequences for the safety of the driver and others on the road. We opted to operationalize performance as the incidence of preventable accidents because this is a key component of organizational costs and thus of overall company performance. As one executive in our collaborating organization explained, "We are in the safety business first and the transportation business second."

For each driver who consented to participate in our study, we collected responses to a pen-and-paper survey on company time at the beginning of his or her work shift. We also collected archival accident data for an eight-month period following completion of the survey. Since we were restricted to survey administration on specified days at each terminal, we were unable to collect data from those who were absent. Of the total number of drivers employed by the organization, 1,362 drivers (83% of the target population) were present during data collection at their terminals. A small number of drivers who were present declined to participate in our study ( $N = 73$  across the 21 terminals), leading to a survey response rate of 94.6% (78% of the target population) for a total of 1,289 respondents. Participants in this obtained sample were 97% male, had an average age of 47.74 years ( $SD = 9.69$ ), and had an average tenure of 10.11 years ( $SD = 8.33$ ).

To examine whether there were any differences between the obtained and target sample, we compared the means and standard deviations on age and tenure, as well as the percentage of drivers with an accident gathered from archival records. There were no significant differences in age or tenure between the sample and the overall population ( $p > 0.365$ ), and the target sample and the obtained sample had comparable proportions on the outcome of interest (target: 14.2%;

obtained: 14.3%). Because of some missing values in our survey and archival data, we included only cases in which complete data were available. Therefore, sample sizes used in the analyses ( $N = 1,087$ ) are smaller than the obtained sample.<sup>2</sup>

### Measures

**Financial Worry.** We developed a four-item scale capturing the extent to which people are concerned that they do not have sufficient financial resources to meet their needs. These items were, "How often have you been worried about your financial situation?" "How often have you felt satisfied with your financial situation (R)?" "How often have you felt overwhelmed by your financial obligations?" and "How often do you feel that you do not have enough money?" Responses ranged from 1 (never) to 5 (always). We pretested the scale using Amazon's Mechanical Turk ( $N = 300$ ) to assess its convergent and discriminant validity. That is, we examined whether scale scores were correlated with, but distinct from, measures of related constructs and measures: perceived socioeconomic status (SES) using the MacArthur ladder (Goodman et al. 2001), responses to the Minimum Income Question (Ravallion 2012), perceived income adequacy, household income, and highest attained education. The scale showed good internal consistency within the pretest sample (Cronbach's  $\alpha = 0.85$ ). Participants' financial worry was significantly associated with their assessment of income adequacy ( $r = -0.61, p < 0.001$ ), the Minimum Income Question ( $r = 0.56, p < 0.001$ ), and subjective SES ( $r = -0.62, p < 0.001$ ). Moreover, financial worry was negatively correlated with household income ( $r = -0.34, p < 0.001$ ) and educational attainment ( $r = -0.12, p < 0.05$ ). In our current study, as in the pretest, the items in our financial worry measure exhibited high internal consistency (Cronbach's  $\alpha = 0.84$ ).

We further included several measures of financial wellness and financial behavior on the survey, and merged the survey responses with archival data from drivers' 401(k) accounts to examine whether financial worry was correlated with these adjacent measures. Analysis of the retirement savings data indicated that financial worry was negatively related to drivers' total 401(k) balance, controlling for tenure in the company ( $r = -0.18, p < 0.001$ ), and negatively related to the annual amount drivers contribute to their retirement savings ( $r = -0.16, p < 0.001$ ). In addition, financial worry was negatively correlated with paying off the full balance of their credit cards at the end of the month ( $r = -0.28, p < 0.001$ ) and positively related to having paid interest on their credit cards in the past year ( $r = 0.20, p < 0.001$ ). In aggregate, these findings suggest that our measure of financial worry was related to, but distinct from, objective measures of financial wellness, measures of socioeconomic status, and financial behaviors.

**Financial Resources.** We measured the availability of financial resources by asking drivers to report their total household (HH) income from all sources in the past year on a nine-point scale ranging from 1 (\$10,000–\$19,999) to 9 (\$100,000 or more). As Leana and Meuris (2015) note, household income is more appropriate than individual pay in questions related to one's financial resources because spousal earnings and income from other sources (e.g., investments) can significantly affect the resources the employee has at his or her disposal and the psychological processes that emerge. To account for the availability of financial resources beyond household income, we further measured the level of drivers' emergency savings on a seven-point scale ranging from 0 (no emergency savings) to 6 (emergency savings equal to at least six months' worth of expenses). We also measured drivers' confidence in their ability to receive credit or a conventional loan on a five-point scale ranging from 1 (not confident at all) to 5 (very confident). Since each item (HH income, emergency savings, and credit availability) contributes to an employee's financial situation, we created a composite measure representing employees' available financial resources. We calculated the z-score of each item to account for variability in scale length and averaged them to derive a single measure (Meier et al. 2011).<sup>3</sup>

**Frequency of Emotional Suppression.** The frequency of emotional suppression was assessed on the employee survey using the three-item surface acting scale developed by Brotheridge and Lee (2003), capturing the frequency of suppressing one's true feelings. The items were "resist expressing your true feelings," "hide your true feeling about a situation," and "pretend to have emotions that you don't really have," with responses ranging from 1 (never) to 5 (always). This scale had good internal consistency within our sample (Cronbach's  $\alpha = 0.82$ ).

**Cognitive Capacity.** We included the eight-item cognitive problems subscale of the CAT-PD (Simms et al. 2011) as a measure of cognitive capacity. Scale items included "I formulate ideas clearly (R)," "I easily lose my train of thought," and "I frequently get things mixed up in my head," with responses ranging from 1 (very true of me) to 5 (very untrue of me). The cognitive problems scale measures the efficacy of a person's memory, confusion, and cognitive self-regulation, each suggestive of differences in cognitive capacity. We selected this scale because its items capture individual differences in attention, memory, and executive function while also being sufficiently succinct to be completed within our allotted time for data collection. Although the scale tends to be used as a trait indicator, it simultaneously captures context-dependent states reflective of cognitive capacity. Indeed, as research

on self-efficacy (Chen et al. 2001), self-esteem (Pierce et al. 1989), and cognitive failures (Wallace and Chen 2005) has shown, individual difference measures can reflect both trait and state dimensions of psychological constructs and have been used for both purposes. Similarly, the cognitive problems scale should capture context-dependent differences in attention, memory, and executive function, which are components of a person's cognitive capacity. The scale had a Cronbach's  $\alpha$  of 0.71.

**Preventable Accidents.** As the measure of performance, we collected archival data on preventable accidents for each driver over a predetermined eight-month interval following survey data collection. An accident is considered preventable when the driver is determined to be at fault for the accident by the responding law enforcement agency or the company if law enforcement is not involved. We restricted collection of accident data to eight months so that we could avoid summer months (June through August) and thus minimize missing data resulting from drivers' summer vacations. We focus on preventable accidents as our measure of performance because, by definition, such accidents are due to driver error. These are also the costliest form of incident because the company may incur direct and indirect costs for damage to the truck or cargo, any damage incurred by third parties including fatalities, and/or injuries sustained by the driver. In the analyses, we used a dichotomous dependent variable representing whether a driver had a preventable accident in the eight-month interval. In total, 14.2% of the drivers in our study had preventable accidents within the eight-month period.<sup>4</sup>

**Control Variables.** We included a range of control variables in our analyses specifically intended to account for alternative explanations of the findings.<sup>5</sup> First, we included employees' age from archival records as a control given the effect of aging on fluid cognitive ability (Rushton and Ankney 1996) and attention in demanding conditions (Tsang 1998). Second, we controlled for the influence of job tenure. Past research has indicated that increased experience can lead to higher levels of performance because of improved familiarity with the tasks and accuracy of intuition (Dane et al. 2012, Dokko et al. 2009). Since employee age and tenure were right skewed, we used their logarithmic function in our analyses.<sup>6</sup> Third, we controlled for the drivers' level of education as a measure of general cognitive aptitude. Education was measured on a five-point scale ranging from 1 (less than high school) to 5 (graduate degree). Fourth, the number of dependents was included because employees will have to stretch their financial resources further as more people depend on them. We also controlled for both job and life satisfaction in our model, which were measured with one item

each on a six-point scale ranging from 1 (very unsatisfied) to 6 (very satisfied). Controlling for job satisfaction allows us to account for any variance in the probability of safety incidents attributable to a lack of care about one's job or the organization. We further controlled for life satisfaction because it is conceivable that the relationship between drivers' financial resources and cognitive capacity is not primarily due to financial worry but rather results from nonfinancial stressors, such as family conflict, which, in turn, may be cognitively taxing. As a proxy measure of these nonfinancial influences, we included differences in drivers' self-reported life satisfaction.

We additionally controlled for two personality dimensions, conscientiousness and emotional stability, in our model. As Barrick et al. (2001) found in their evaluation of prior meta-analyses, conscientiousness is the most consistent personality-based predictor of differences in performance on the job. Moreover, we included emotional stability to account for individual differences in the experience of anxiety and nervousness (Barrick and Mount 1991), given that the relationship between financial worry and cognitive capacity could be due to individual differences in the propensity to experience negative affect rather than the emotional suppression mechanism our theory proposes. We used Goldberg's (1992) eight-item measures of conscientiousness and emotional stability, assessing dimensions such as "organized" and "efficient" for conscientiousness and "relaxed" and "moody" for emotional stability on a nine-point scale (Cronbach's  $\alpha = 0.84$  for conscientiousness, and  $\alpha = 0.80$  for emotional stability).

Finally, we included driver classification to account for differences in the length and type of routes. The company classifies each driver as either a "city driver" or a "line haul driver." City drivers (coded 1) deliver packages to commercial and residential addresses, while line haul drivers (coded 0) are responsible for the transportation between terminals. We also included an offset variable to account for drivers who left the company within the eight-month interval, since turnover within the interval will reduce the number of days in which they could have had an accident.

### Analytic Approach

Since drivers are nested within terminals, our first step was to assess whether our model should account for variance in mean differences in financial worry or cognitive capacity attributable to terminal membership by calculating the intraclass correlation coefficient (ICC1) for these variables. The ICC was not statistically significant for financial worry ( $F(20, 1,216) = 1.232, p = 0.218$ ) or cognitive capacity ( $F(20, 1,242) = 0.936, p = 0.541$ ), indicating that employees' financial worry and cognitive capacity did not significantly differ by terminal. We further calculated the ICC for

preventable accidents within the eight-month interval of interest, with results showing no significant difference in the rate of preventable accidents among terminals ( $F(20, 1,268) = 1.150, p = 0.291$ ). Nevertheless, company managers were convinced that the terminals did indeed meaningfully differ on these and other factors, so we opted to account for any terminal-level variance in predicting the likelihood of a preventable accident.

We used Mplus 7.4 (Muthén and Muthén 2015) to examine the hypotheses within a single structural equation model using maximum likelihood estimation with robust standard errors. To account for terminal membership, we used a random intercept model, which adjusts for any variance in the logit attributable to terminal for the paths predicting the probability of a preventable accident. The hypotheses concerning indirect effects were examined using the Mplus procedures for mediation described by Muthén and Asparouhov (2015), since bootstrapping is currently not recommended for multilevel mediation models (Hayes 2014). These procedures use the continuous latent variable underlying the binary performance outcome and report a Sobel-type test implemented by Mplus to examine the statistical significance of our hypothesized indirect effects (Hayes 2014).

### Results

**Descriptive Statistics and Correlations.** Table 1 shows the means, standard deviations, and correlations among the variables in the analysis. The mean household income in our sample is between \$60,000 and \$70,000, placing drivers in the middle quintile and above the median income in the United States (U.S. Census Bureau 2016). Thus, our sample is representative of "middle-class" employees in the United States who do not inherently experience economic deprivation as do the working poor (Leana et al. 2012). Drivers in our sample, on average, had only two months' worth of expenses in their savings and were, on average, "somewhat confident" that they could get a loan if they applied for one today. Furthermore, drivers within this organization reported high levels of job and life satisfaction. Correlations show a significant negative relationship between drivers' financial resources and financial worry, providing initial support for Hypothesis 1. The correlations among study variables further show that financial worry was negatively related to cognitive capacity and positively related to having a preventable accident, providing initial support for Hypothesis 2A. Moreover, the frequency of emotional suppression was significantly correlated with financial worry and cognitive capacity, providing initial support for Hypothesis 3.

**Structural Equation Model.** The direct paths of the structural equation model are reported in Table 2. Financial resources were negatively related to financial

**Table 1.** Study 1 Summary Statistics and Correlations

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 <i>Financial worry</i>	2.66	0.64																
2 <i>Age</i>	48.00	9.63	-0.148*															
3 <i>Tenure</i>	10.03	8.27	-0.134**	0.408*														
4 <i>Education</i>	1.47	0.77	-0.033	-0.061*	-0.063*													
5 <i>Household income</i>	6.32	2.00	-0.194**	0.192**	0.282*	0.035												
6 <i>Emergency savings</i>	2.01	2.17	-0.436**	0.204**	0.193*	0.100**	0.214**											
7 <i>Credit confidence</i>	2.63	1.52	-0.485**	0.214*	0.259*	0.044	0.287**	0.504**										
8 <i>Financial resources</i>	0.00	0.75	-0.499**	0.273**	0.328**	0.082*	0.669**	0.769**	0.800**									
9 <i>Dependents</i>	1.33	1.38	0.197**	-0.316**	-0.131**	0.006	-0.045	-0.207**	-0.225**	-0.210**								
10 <i>Job satisfaction</i>	4.49	1.46	-0.094*	-0.103**	-0.041	0.023	0.021	0.012	0.034	0.030	0.014							
11 <i>Life satisfaction</i>	4.42	1.43	-0.240**	-0.019	0.056*	-0.006	0.134*	0.130*	0.170*	0.194**	-0.035	0.465**						
12 <i>Conscientiousness</i>	6.99	1.48	-0.181**	-0.075*	-0.015	0.102**	0.068*	0.111**	0.101*	0.124**	0.006	0.067*	0.119**					
13 <i>Emotional stability</i>	6.52	1.46	-0.229*	-0.008	-0.032	0.056	0.045	0.064*	0.052	0.071*	0.014	0.094**	0.143**	0.452**				
14 <i>City driver</i>	0.72	0.45	0.028	-0.138**	0.045	0.016	-0.156**	-0.057*	-0.032	-0.109**	0.041	-0.045	0.008	0.029	-0.011			
15 <i>Emotional suppression</i>	0.96	0.78	0.314**	-0.128**	-0.105*	0.011	-0.060*	-0.186**	-0.198**	-0.195**	0.088*	-0.092*	-0.167**	-0.193**	-0.272**	0.015		
16 <i>Cognitive capacity</i>	3.01	0.52	-0.219**	0.017	0.024	0.074*	0.041	0.101**	0.108*	0.110**	-0.001	0.066*	0.077*	-0.384**	-0.328**	-0.020	-0.299*	
17 <i>Preventable accident</i>	0.14	0.35	0.062*	-0.022	-0.142**	0.033	-0.064*	-0.056*	-0.079*	-0.088*	-0.001	-0.005	-0.050	-0.008	0.143**	-0.053	-0.094**	

\* $p < 0.05$ ; \*\* $p < 0.001$ .**Table 2.** Study 1 Structural Equation Model Paths

	Financial worry	Cognitive capacity	Preventable accidents <sup>a</sup>
<i>Constant</i>	0.280** (0.013)	2.844** (0.073)	2.377** (0.822)
<i>Age</i>	0.056 (0.166)	0.111 (0.164)	2.508* (1.033)
<i>Tenure</i>	0.012 (0.027)	0.013 (0.021)	-1.096** (0.256)
<i>Education</i>	0.020 (0.102)	0.037* (0.015)	0.097 (0.102)
<i>Dependents</i>	0.051** (0.011)	0.011 (0.011)	-0.069 (0.051)
<i>Life satisfaction</i>	-0.058** (0.018)	-0.018 (0.104)	-0.135** (0.067)
<i>Job satisfaction</i>	-0.005 (0.010)	0.010 (0.011)	0.005 (0.068)
<i>Conscientiousness</i>	-0.010 (0.014)	0.095** (0.013)	-0.089 (0.066)
<i>Emotional stability</i>	-0.075** (0.014)	0.045** (0.010)	0.076 (0.077)
<i>City driver</i>	-0.016 (0.037)	-0.026 (0.022)	1.545** (0.304)
<i>Offset</i>	0.272 (0.176)	0.276 (0.174)	-0.505 (1.396)
<i>Financial resources</i>	-0.387** (0.026)	0.003 (0.026)	-0.193 (0.150)
<i>Financial worry</i>	-0.062* (0.026)	-0.171 (0.150)	
<i>Emotional suppression</i>	<b>-0.131**</b> (0.021)	-0.063 (0.156)	
<i>Cognitive capacity</i>		-0.397* (0.158)	

<sup>a</sup>Random intercept by terminal.\* $p < 0.05$ ; \*\* $p < 0.001$ .

worry ( $B = -0.387$ , SE = 0.026,  $p < 0.001$ ). In turn, financial worry had a significant effect on cognitive capacity ( $B = -0.062$ , SE = 0.026,  $p < 0.05$ ) after accounting for the effect of emotional suppression ( $B = -0.131$ , SE = 0.021,  $p < 0.001$ ), providing support for Hypothesis 2A. Financial worry was positively related to emotional suppression ( $B = 0.374$ , SE = 0.033,  $p < 0.001$ ), and as predicted, emotional suppression partially mediated the relationship between financial worry and cognitive capacity ( $B_{\text{indirect}} = -0.049$ , SE<sub>indirect</sub> = 0.008,  $p < 0.001$ ), supporting Hypothesis 3. We also found support for Hypothesis 2B as financial worry mediated the relationship between financial resources and cognitive capacity ( $B_{\text{indirect}} = 0.043$ , SE<sub>indirect</sub> = 0.009,  $p < 0.001$ ). Cognitive capacity was negatively associated with the likelihood of a preventable accident ( $B = -0.397$ , SE = 0.158, Exp( $B$ ) = 0.673,  $p < 0.05$ ), providing support for Hypothesis 4A. In support of Hypothesis 4B, financial worry had a significant indirect effect on the likelihood of a preventable accident through decrements

in cognitive capacity ( $B_{\text{indirect}} = 0.044$ ,  $SE_{\text{indirect}} = 0.020$ ,  $p < 0.05$ ).

We further estimated the magnitude and cost of the impact of financial worry on the probability of preventable accidents through its influence on drivers' cognitive capacity. Overall, our model suggests that an average driver has a 10.3% probability of a preventable accident.<sup>7</sup> A one-standard-deviation increase in financial worry is associated with a 0.4% increase in the predicted probability of a preventable accident through the demands financial worry places on drivers' cognitive capacity (after accounting for individual differences in the control variables). Based on our effect size, a one-standard-deviation increase in financial worry within the sample would represent eight additional drivers with at least one preventable accident per year. To put this effect into financial terms, the Federal Motor Carrier Safety Administration (2008) estimates that the average costs of such accidents is \$125,070 when no injuries are involved, \$293,922 when at least one nonfatal injury occurs, and \$6,349,486 when a fatality occurs.<sup>8</sup> Data from the Federal Motor Carrier Safety Administration (2016) further show that 79% of accidents involve no injuries, 20% involve at least one non-fatal injury, and 1% include a fatality. If no injuries occur for any of these accidents, a conservative estimate of the annual organizational costs of financial worry would be over \$1 million (eight additional accidents). This amount rises to over \$1.3 million if, as the national data suggest, 20% of these accidents involve an injury, and the cost would increase to over \$7.2 million if there is one fatality among these preventable accidents.

### Additional Analyses

To address potential competing explanations for our results, we conducted three additional analyses with subsets of the sample. First, at two terminals ( $N = 160$ ), we were able to collect more fine-grained data on different sources of worry to check our assumption that financial concerns would be particularly pronounced at work. We asked drivers to indicate on nine-point scales their level of worry about nine different aspects of their lives, including the relationship with their partner, relationships with their family, relationships with friends, financial situation, experiences at work, living conditions, personal health, family health, and childcare or schooling. Surveys were completed at work, on company time, and just before the start of the drivers' shifts. Worry regarding their financial situation had the highest mean score on this scale ( $M = 4.43$ ,  $SD = 2.54$ ) and the strongest correlation with cognitive capacity ( $r = 0.26$ ,  $p < 0.01$ ) compared with the other sources of concern.<sup>9</sup> At a minimum, these findings suggest that financial worry weighs heavily on drivers in our sample when they are at work, more so than other potential sources of concern. 可以被使用在我的additional analysis里

Second, we collected data on hours worked for 970 drivers from their 401(k) account information but did not include it in the primary model to maximize the available sample for analysis. However, we wished to examine whether the findings could be attributed to differences in hours worked. That is, financial worry could motivate employees to work extra hours, which subsequently can fatigue them to the detriment of their cognitive capacity and subsequent driving performance. Inclusion of the log hours worked, however, did not meaningfully change the reported results, and hours worked was not a significant predictor of cognitive capacity ( $B = 0.088$ ,  $SE = 0.131$ ,  $p = 0.502$ ) nor the likelihood of a preventable accident ( $B = -0.967$ ,  $SE = 0.903$ ,  $p = 0.284$ ).

Third, to address potential reverse causality, we collected data on financial resources and financial worry from an employee survey conducted approximately a year and a half after the initial survey data collection. This survey was completed by 1,331 drivers (80.7% of the driver population) of which 867 (67% of study sample) also participated in our initial study. It is possible that cognitive capacity and performance affect financial worry rather than the reverse as we hypothesize here. To explore this possibility, we examined whether cognitive capacity or performance predicted changes in financial resources and worry following collection of the accident data. These analyses indicate that neither cognitive capacity ( $B = -0.044$ ,  $SE = 0.041$ ,  $p = 0.278$ ) nor having a preventable accident ( $B = 0.004$ ,  $SE = 0.053$ ,  $p = 0.936$ ) predicted changes in poststudy financial resources. Moreover, neither cognitive capacity ( $B = 0.062$ ,  $SE = 0.060$ ,  $p = 0.297$ ) nor having a preventable accident ( $B = -0.065$ ,  $SE = 0.081$ ,  $p = 0.422$ ) predicted changes in poststudy financial worry. These results provide some support for the causal ordering we hypothesize, whereby financial worry leads to worse performance rather than the reverse.

### Discussion

In Study 1, we found that financial worry increased the likelihood of a preventable accident indirectly through decrements in cognitive capacity. This effect was significant after accounting for various established predictors of performance, such as tenure, conscientiousness, and job satisfaction, suggesting that the negative effect of financial worry on performance is not just because people with financial problems are less conscientious (as some studies have suggested—e.g., Bernerth et al. 2012) or merely unhappy with their employer or their lives overall.<sup>10</sup> The results support the ability argument we have proposed, as financial worry had a significant indirect effect on performance through cognitive capacity. In addition, we found that as people have more financial resources at their disposal, they are less likely to feel worried about their financial situation. Financial worry, in turn, was associated with

reduced cognitive capacity. The results supported the mediating influence of emotional suppression parallel to the “tunneling” process posited by prior literature (Mullainathan and Shafir 2013). We found that the frequency of emotional suppression partially explained the relationship between financial worry and cognitive capacity after controlling for individual differences in emotional stability, which is suggestive of multiple mediating mechanisms (Preacher and Hayes 2008).

In summary, our findings support the argument that financial worry can have a debilitating influence on employees’ ability to perform their jobs because of its detrimental effect on cognitive capacity. When employees take their financial worries to work (Meuris and Leana 2015), they have less mental bandwidth available for tasks relevant and essential to their jobs. Our study moves beyond prior research on financial scarcity in two important ways. First, we show a link between financial worry and actual job performance using objective data. While others have studied the tax imposed by financial worry on cognitive test performance (e.g., Carvalho et al. 2016, Mani et al. 2013), our results extend these findings to on-the-job performance in real organizations, and thus they are the first to our knowledge to offer evidence of the real costs to employers (as well as employees) of financial precarity in the workforce. Second, our study provides evidence for multiple mechanisms driving the effect of financial worry on cognitive capacity. While prior work has focused on the tunneling effect of scarcity (Mullainathan and Shafir 2013), our findings suggest that the frequency of emotional suppression serves as an additional mechanism through which financial worry can affect cognitive ability.

Although Study 1 provides evidence for a relationship between financial worry, cognitive capacity, and actual on-the-job performance, it has several limitations. First, while the measurement of work performance is objective and occurred after survey data collection, we are unable to show the causal ordering of the relationships. Perhaps drivers who are more accident-prone worry more about losing their jobs, and thus poor performance is causing worry rather than worry causing performance problems as we hypothesize. Our additional analysis, which measured financial resources and worry over a year after the assessment of accident rates, provides evidence to refute such a claim. Still, it does not establish causality. Second, it is possible that the decrements in cognitive capacity are driven by other concerns, such as family worry, fatigue, or depression, which often accompany the availability of financial resources and financial worry. While we controlled for life satisfaction as a proxy for other life stressors and conducted additional analysis that shows that financial worry is the most salient source of concern for drivers in our sample, we were unable

to completely isolate financial worry from other factors that may be associated with one’s financial situation and could result in decreased cognitive capacity and job performance.

Third, we measured cognitive capacity using a self-report scale on which employees are likely to underestimate and underreport the extent to which their cognition is taxed because of inaccurate introspection of cognitive processes (Pronin and Kugler 2007). Given our procedural constraints, we were unable to measure cognitive capacity using direct measurements (e.g., variants of complex span tasks; Engle 2002, Foster et al. 2015). Although this tendency toward underreporting likely provides a more conservative estimate of the proposed relationships, it is nonetheless desirable to test the model with measures less prone to social desirability bias. Finally, our study was conducted with a largely male sample. It is possible that females respond differently to financial worry than males. Despite these potential limitations, Study 1 offers notable evidence for a significant negative relationship between financial worry, cognitive capacity, and subsequent work performance.

## Study 2

To address the limitations in Study 1, we conducted a second study in which we manipulated the experience of financial worry in a laboratory environment. Our focus in Study 2 is on establishing the indirect relationship between financial worry and task performance through decrements in cognitive capacity. The manipulation of financial worry allows us to address several limitations to Study 1. First, the random assignment of participants to experimental conditions offers us the ability to explicitly isolate financial worry as an antecedent to cognitive capacity and job performance and thus address potential competing hypotheses regarding performance decrements. A lab environment also allows us to establish causal linkages for the relationships found in Study 1. It further presents us with the opportunity to use a more complex measure of cognitive capacity, as well as to examine the effects in both males and females.

We concentrated only on the key variables to establish causal ordering: financial resources, financial worry, cognitive capacity, and task performance. We did not examine the indirect effect of emotional suppression in Study 2 because our theoretical model, drawing from research on self-regulation (Muraven and Baumeister 2000), posits that the cognitive drain of suppression results from continued motivation to suppress one’s emotions over extended periods of time rather than suppression within a single lab session. Moreover, while situations where people feel motivated to suppress their emotions can be artificially created within lab environments (e.g., Gabriel and

Diefendorff 2015), we found in pretesting that such situations simultaneously introduce a design confound because the anxiety inherent in these contexts can itself undermine cognitive capacity (e.g., Diamond et al. 1996). Therefore, we opted to focus on addressing the key limitations to Study 1 and establishing the causal relationship between financial worry and work performance mediated by cognitive capacity. As with the prior study, we used driving safety as the performance outcome of interest.

### Sample

We recruited 90 participants through on-campus advertising at a northeastern university and online job board listings. This sample size is consistent with prior research focused on the effects of financial scarcity on cognition (Mani et al. 2013). Potential participants were told that they could earn up to \$20 for completion of the study, with \$10 guaranteed by their attendance and an additional \$10 that could be earned within the one-hour session. We established two criteria for participation. First, to ensure that participants had declarative knowledge of the task (Kanfer and Ackerman 1989) and were familiar with U.S. traffic laws, only those with a valid U.S. driver's license were eligible to participate. Second, to qualify for participation, we required that people be employed for at least 20 hours per week to increase the chances that the financial worry manipulation would be consequential to them. For the same reason, we also recruited adults rather than younger college students who may receive financial support from parents and thus be relatively unconcerned with finances. Two participants were removed from analyses because of technical issues during the session that hindered the complete collection of their data. The remaining sample ( $N = 88$ ) was 51.7% female and had a mean age of 27.9 years ( $SD = 9.92$ ).

### Procedures

Participants signed up online for a one-hour time slot. When they arrived at the lab, they were informed that they would be asked to complete a series of tasks at a computer station during the session with the opportunity to earn additional compensation. Prior to initiating the manipulation, we provided each participant with an introduction to the controls of the driving simulator (e.g., steering wheel, brakes, acceleration). They received a scripted instruction of the simulator from the experimenter and completed a baseline route to become accustomed to the simulator controls, which we used as a premanipulation baseline to control for any naturally occurring differences in aptitude for the driving task.

Next, following the paradigm outlined by Mani et al. (2013), participants were randomly assigned to a low or high emergency expense condition. In the high

expense condition, participants were asked to imagine that their car had a breakdown and that it would cost \$1,500 to repair the problem. Participants were asked to think about how they would navigate this financial decision and how this expense would affect their current life as they proceeded through the subsequent tasks. They were informed that they would be asked to answer these questions after completion of the tasks. In the low expense condition, we used the same procedure, but the cost of the repair was only \$150. Consistent with Mani et al. (2013), an effect of this manipulation is only expected for people low in financial resources because the imagined expense would weigh more heavily on them. This approach follows the moderation of process design approach proposed by Spencer et al. (2005) in which the interaction between an independent variable and its mediator provides an alternative to mediation by measurement as we used in Study 1. That is, in Study 2, we predict that having fewer financial resources enhances the likelihood of being worried about one's finances, in this case because of an imagined emergency expense, which subsequently reduces cognitive capacity.

After the emergency expense manipulation, we measured cognitive capacity by having participants complete shortened versions (approximately 10 minutes) of two standard cognitive tests: an operation span task and a symmetry span task (Foster et al. 2015). Upon completion of these tests, participants completed the driving simulation. Each participant was asked to drive a randomly generated route of approximately six miles using the City Driver simulation software. Participants were instructed that they could earn up to an additional \$10 as part of the task. For each 10-second interval that they arrived past the 10-minute time limit, 25 cents was deducted from their \$10 potential additional payout. In addition, participants had 25 cents deducted for every traffic infraction they incurred during the task. After completion of the driving task, participants were asked to answer the questions posed in the manipulation and complete the demographic and financial questions. At the end of the session, all participants were paid the full \$20 (\$10 for attendance and \$10 experiment payout) and instructed not to tell anyone about the tasks in the session or that they received the full amount after completion of the study.

The \$10 incentive was introduced in the driving task for two reasons. First, a relatively large incentive (doubling their pay for the hour) ensured that participants did not speed through the course to complete the simulation early or, conversely, drive unnaturally slowly to avoid traffic infractions. More importantly, the incentive provided participants with motivation to perform well in the driving task and thus allowed us to examine whether inducing financial worry led people to perform better when people have an incentive to do so.

Overall, the incentive allowed us to test our hypotheses under conditions such as those in real jobs, where motivation and ability can be operating simultaneously, albeit in potential conflict regarding the direction of their effects, increasing the psychological realism of our experiment.

## Measures

**Financial Resources.** We measured financial resources using the same three indicators as in Study 1: reported household income, emergency savings, and credit confidence. As in Study 1, responses were transformed to z-scores and averaged to create a composite indicator, which was entered as a continuous variable in the analyses. Again, we predicted that only the performance of participants with lower financial resources would be adversely affected by the financial worry manipulation.

**Cognitive Capacity.** Complex span tasks are widely used in cognitive psychology as measures of cognitive capacity (Colom et al. 2006). Here, we used shortened versions of the operation and symmetry span tasks following the procedures developed by Foster et al. (2015). In the operation span task, participants were asked to remember a series of numbers in order while completing some basic math equations. When participants started the task, they received a number followed by a math equation that they indicated to be true or false.<sup>11</sup> After answering the math equations, they were asked to recall the numbers in order. Participants completed six trials of the number-equation combinations in randomized order with the shortest trial consisting of two combinations and the longest trial consisting of seven combinations (Foster et al. 2015). In the symmetry span task, participants were asked to remember a series of highlighted squares within a larger square. They saw a highlighted square followed by a figure that they judged to be symmetrical or not symmetrical. As in the operation span task, this repeated for six trials in random order for two to seven iterations. After the number of iterations in a trial was completed, participants were asked to recall the position of the highlighted squares in order. Participants' scores on both span tasks were summed (Foster et al. 2015) with a maximum possible score of 54 so that higher numbers reflect a higher availability of cognitive capacity.

Since we operationalize cognitive capacity differently in Studies 1 and 2, we collected data from 100 participants on Amazon's MTurk to examine whether the instruments used in the two studies converge on the same underlying construct. Participants completed both the psychometric scale used in Study 1 and the cognitive tests used in Study 2, in counterbalanced order. The data indicate a significant positive correlation between the score on the cognitive capacity measure (Study 1) and the score on the cognitive tests

(Study 2) ( $r = 0.39$ ,  $p < 0.001$ ). For comparison, the correlation between the two cognitive tasks used in Study 2—which are explicitly designed to measure the same construct using the same procedures—is only somewhat higher ( $0.47$ ,  $p < 0.001$ ).

**Task Performance.** We assessed task performance by having participants drive a route using the City Driver simulation software and controls. The software allowed us to input the trip length, after which it generated a random route for the participant to drive. For every traffic infraction, the software assigned points based on the severity of the infraction (e.g., driving on the opposite side of the road increased participants' scores more than failing to use a turn signal). Therefore, higher scores indicate worse performance on the driving task. In the analyses, we divided participants' scores by their time to reach their destination because participants who missed or took wrong turns could have a slightly shorter or longer route than other participants depending on the recalculated route assigned by the software. We used points per minute to make the outcome measure comparable across participants.<sup>12</sup> In predicting driving performance, we controlled for participants' performance in the baseline run to account for between-individual differences in driving aptitude and speed of learning on the simulator.

## Results

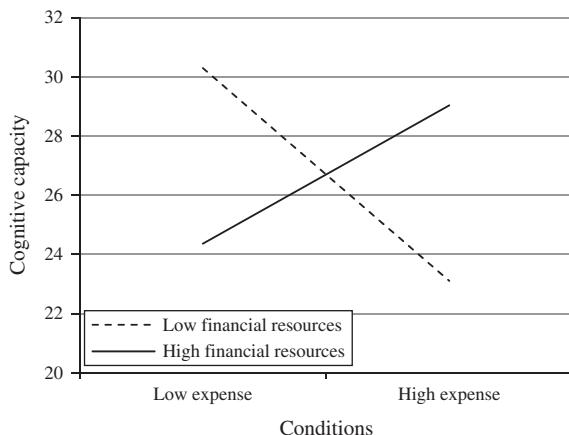
**Descriptive Statistics.** Participants in our sample had, on average, a household income between \$30,000 and \$40,000 ( $M = 2.85$ ;  $SD = 2.56$ ), three months of expenses in emergency savings ( $M = 2.63$ ;  $SD = 1.80$ ), and were "somewhat confident" that they could get a loan ( $M = 2.77$ ;  $SD = 1.39$ ). In the cognitive capacity tasks, participants on average gave correct answers on approximately 27 of the 54 items across both tasks ( $SD = 8.89$ ). In the baseline run on the driving simulator, participants took an average of eight minutes to complete the route and scored 555 points per minute ( $SD = 386.72$ ). On the task performance run, participants took an average of 9.35 minutes and scored 459 points per minute ( $SD = 303.23$ ).

**Manipulation Check.** To assess whether our emergency expense manipulation was effective in eliciting financial worry, we asked participants to indicate the extent to which they were currently worried about nine specific aspects of their lives after reading the scenario and thinking about the related questions. These aspects included not only participants' financial situation but also their family, children, work, and health. As previously described, we examined the effect of the emergency expense manipulation conditional on participants' financial resources, as it is expected that imagining a \$1,500 car payment would be impactful for those lower, but not higher, in financial resources (Mani et al. 2013).

There was a significant main effect for financial resources on worry regarding one's financial situation ( $B = -0.753$ ,  $SE = 0.143$ ,  $p < 0.001$ ), indicating that as participants had more financial resources, they were less likely to be worried about their finances, regardless of condition, consistent with Hypothesis 1. In addition, there was a significant interaction between financial resources and condition ( $B = -0.392$ ,  $SE = 0.143$ ,  $p < 0.01$ ). Participants with fewer financial resources ( $-1 SD$ ) were more worried about their financial situation in the high expense condition than those in the low expense condition ( $B = 0.470$ ,  $SE = 0.159$ ,  $p < 0.01$ ), but there was no significant difference in self-reported financial worry by condition among those with higher financial resources ( $+1 SD$ ) ( $B = -0.160$ ,  $SE = 0.162$ ,  $p = 0.327$ ).<sup>13</sup> Overall, our manipulation was effective in inducing financial worry for those lower in financial resources, but not higher in financial resources. These findings were as expected and consistent with those of Mani et al. (2013).

**Moderated Mediation Model.** As in Study 1, we used Mplus 7.4 to examine the hypothesized direct and indirect effects using maximum likelihood estimation.<sup>14</sup> There was a significant interaction between financial expense condition and financial resources ( $B = 3.840$ ,  $SE = 1.188$ ,  $p < 0.01$ ). Participants who had fewer financial resources ( $-1 SD$ ) had significantly lower levels of cognitive capacity in the high expense condition than in the low expense condition ( $B = -3.595$ ,  $SE = 1.197$ ,  $p < 0.01$ ), while there was no significant difference in cognitive capacity between conditions for people with greater financial resources ( $+1 SD$ ) ( $B = 2.337$ ,  $SE = 1.265$ ,  $p = 0.065$ ), providing support for Hypothesis 2A (see Figure 2). There was also a significant effect of cognitive capacity on driving performance ( $B = -9.843$ ,  $SE = 3.509$ ,  $p < 0.01$ ), providing support for Hypothesis 4A.

**Figure 2.** Study 2 Interaction Between Emergency Expense and Financial Resources on Cognitive Capacity



To test Hypothesis 4B, we examined whether there was an indirect effect of financial expense condition on driving performance through cognitive capacity conditional on financial resources. Following Hayes's (2015) procedure, we calculated 95% confidence intervals (CIs) of the bootstrapped (10,000 iterations) index of moderated mediation, which examines the difference between indirect effects at different values of a moderator. In other words, this procedure investigates whether there is a significant difference between the indirect effect of the manipulation on performance in the driving simulation as a function of participants' financial resources. The index of moderated mediation indicated a significant difference in the indirect effect of the emergency expense manipulation on driving performance through cognitive capacity depending on participants' financial resources (95% CI =  $-98.375, -7.883$ ), as the confidence interval excludes 0. Specifically, there was a significant indirect effect of condition on driving performance when participants had fewer financial resources (95% CI =  $7.970, 94.369$ ) but not when participants had more financial resources (95% CI =  $-77.703, 1.198$ ). These results suggest that, as predicted, the expense manipulation significantly reduced driving performance through decrements in cognitive capacity for those low, but not high, in financial resources, providing support for Hypothesis 4B.

## Discussion

In Study 2, we examined the causal relationship between manipulated financial worry, cognitive capacity, and driving performance. We found a significant effect of the emergency expense manipulation on cognitive capacity among participants low in financial resources, as expected given that an imagined expense should be more impactful for those who have fewer financial resources available to them.<sup>15</sup> As in Study 1, we further found that those primed to experience financial worry performed worse in the driving simulation because of decreases in cognitive capacity. Moreover, as predicted, there was no direct effect of financial precarity on performance, either positively or negatively. Instead, financial worry dampens cognitive capacity, which in turn depresses performance. Thus, we find support for the ability argument put forth in this paper, despite the financial incentive.

While prior experiments show that financial worry can significantly dampen cognitive test scores, Study 2 advances our understanding of these effects in three ways. Importantly, we tie a person's perceptions of financial precarity not just to standard cognitive test scores but also to actual task performance. As Schilbach et al. (2016) note, despite the evidence that financial worry may dampen performance on cognitive tests (e.g., Carvalho et al. 2016, Mani et al. 2013), the relationship between financial worry and job performance cannot be presumed from the findings of

these prior studies (also see Staw 2010). Here, we offer evidence for a debilitating effect of financial worry on actual task performance. Relatedly, the task used in Study 2 is one that is not only part of many adults' day-to-day experience but also required of employees in a variety of occupations, ranging from postal workers to salespeople. Finally, we include an incentive to perform well on the task, which motivation-based arguments would predict to enhance driving performance among participants manipulated to be worried about their finances by increasing their impetus to concentrate on it. Instead, our results suggest that people who are worried about their personal finances perform worse on their assigned tasks even when there is an explicit incentive to do well.

Overall, the results of this experiment further support a negative indirect relationship between financial worry and performance because of its detrimental impact on performance ability. Thus, the findings of Study 2 support those of Study 1 and, additionally, provide evidence of a causal effect of financial worry on a person's ability to perform on the job. Moreover, because of the random assignment to conditions, we can rule out competing hypotheses (e.g., trait anxiety, other sources of worry) that may affect cognitive capacity or task performance.

## General Discussion

In this paper, we examine the mechanisms through which financial precarity can undermine job performance. Across two studies, we find that financial worry decreases cognitive capacity, which subsequently hinders performance. Study 1 demonstrates the association between financial resources, financial worry, cognitive capacity, and subsequent job performance among a sample of commercial truck drivers. Drivers who worry more about their financial situation are more cognitively taxed and, as a result, are more dangerous on the road. Study 2 provides evidence for the causal linkages behind these findings. Participants with fewer financial resources who were manipulated to face a large emergency expense had less cognitive capacity available to them, which reduced their ability to perform in a driving simulation.

Our findings have several implications. First, our findings indicate that when people are worried about money, they tend to perform worse in their jobs, thus imposing costs on both individuals and the organizations that employ them. While historic changes in work practices have had obvious detrimental effects on employees (Bidwell et al. 2013, Cummings and Kreiss 2008, Davis 2009, Lambert 2008), our studies suggest that these detrimental consequences can spill over to employers: as employees are worried about their financial situation, they carry these concerns to work (Meuris and Leana 2015), which may distract

them from their work tasks and thus undermine their performance. Second, from a theoretical standpoint, our studies provide a pathway for a more expansive understanding of the role of money in affecting people's behavior at work. Whereas prior research has focused on its role as a motivational lever (e.g., Akerlof 1982, Rynes et al. 2005, Shaw and Gupta 2015), our findings show that employees' financial situation can significantly affect their *ability* to perform at work. In this regard, our research expands organizational science by examining how financial considerations affect employees from a more diversified perspective (Leana and Meuris 2015).

At the same time, our research advances prior experimental work that has proposed for a relationship between financial worry and cognitive capacity (e.g., Mani et al. 2013, Mullainathan and Shafir 2013). First and foremost, we examine the effect of people's financial worries on their actual work performance in Study 1 and on a task with high ecological validity in Study 2. In this regard, our studies move beyond the use of cognitive ability tests to tasks with real organizational consequences and a substantial impact on people's lives (Schilbach et al. 2016, Staw 2010). In addition, we tie a salient incentive to task performance in Study 2 in which people can double their payoff if they perform well in the task, yet financially stressed participants performed worse. These effects emerged when there was a relatively large incentive to perform well, suggesting the detrimental impact financial worry can have on people's lives even when they are motivated to succeed.

Finally, in Study 1, we offer an additional mechanism that explains the relationship between financial worry and cognitive capacity. That is, financial worry can be cognitively taxing not just because it appropriates attention but also because of the frequent suppression of negative emotions that typically accompanies it (e.g., Haushofer and Fehr 2014). Whereas prior literature has focused on the tunneling effect (e.g., Mullainathan and Shafir 2013), an attentional process whereby finance-related thoughts drain people's cognitive capacity, we find that financial worry can simultaneously reduce cognitive capacity through emotional suppression, a self-regulatory process that usurps cognitive resources over time because of the effort required to engage in such sustained emotional control (Muraven and Baumeister 2000).

## Practical Implications

Our studies demonstrate that financial precarity can have organizational costs by dampening employees' ability to perform at work. For the transportation company in Study 1, such costs amount to a conservative estimate of over \$1 million per year, suggesting that employers may have a vested interest in the financial well-being of their employees. In terms of the

practical implications of our research, the central question is what organizations can do with these findings. Given the wide reach of financial worry—afflicting two out of three adults in the United States alone (American Psychological Association 2015)—the problem is simply too far-ranging to be addressed through short-term measures such as employee selection practices within firms. Various scholars have argued for the importance of providing employees with high-quality jobs (e.g., decent pay and benefits, stable work schedules, job security) for sustained organizational performance (Kalleberg 2011; Pfeffer 1998, 2010; Ton 2014). Other practices may include holistic cost-of-living calculations in pay determinations or readoption of some form of defined benefit retirement plans. In Study 1, however, drivers were reasonably well paid and received good benefits, yet financial precarity still interfered with work performance. This suggests that employers may also wish to implement practices that directly address financial well-being, such as company-sponsored savings programs, mortgage assistance, and similar initiatives. In summary, while we show that financial concerns can have significant spillover costs for organizations in the form of compromised employee performance, we would concurrently argue that employing organizations are well positioned to minimize such costs through programs that enhance employee financial well-being.

### **Limitations and Future Research Directions**

While our findings provide compelling evidence for the negative effect of employees' financial precarity on work performance, there are several limitations to our studies. First, in both studies, we focus on the impact of employees' financial resources and worry on driving. We elected to use driving performance because it is directly consequential for both individuals and organizations and can be attributed to individual employees. However, we would expect that financial precarity can undermine performance on any number of tasks. Future research could examine the influence of financial worry on tasks where there is more interdependency to fully understand the task characteristics that attenuate or strengthen the evidenced effects.

Second, although our studies offer important evidence for a relationship between financial worry and work performance, future research could use exogenous financial shocks to further examine the nature of these effects. More specifically, research could examine the implications of windfalls from tax returns or financial depletion from a large unexpected expense. However, given the importance of subjective appraisals in the relationship between personal finances, cognitive capacity, and performance, our findings, in addition to those reported by Carvalho et al. (2016), suggest that such studies should consider changes in financial

worry rather than solely focusing on the direct effects from exogenous shocks to employees' objective financial situation.

Third, we were only able to examine the influence of emotional suppression in the first study. While Study 1 offers evidence for an additional explanatory mechanism between financial worry and cognitive capacity, future research should causally replicate our finding and investigate the conditions under which the indirect effect of emotional suppression may be more or less pronounced. For example, the extent and frequency with which people suppress the emotional experience of financial worry may be influenced by dispositional (e.g., self-monitoring; Snyder 1974) and situational (e.g., job interdependence) factors that enhance its impact on cognitive capacity and subsequent work performance. Thus, although we provide initial evidence for emotional suppression as an additional mechanism tying financial worry to cognitive capacity and performance, this finding also presents a fruitful area for future inquiry.

Finally, while we found a dampening effect of financial worry on performance through decrements in employees' cognitive capacity, prior research suggests that such worry might also motivate performance (e.g., Higgins 1998, Menges et al. 2017, Shoss and Probst 2012). Given our focus on ability as the mechanism of interest, we did not directly examine the interaction of motivation and ability in this paper. In Study 2, however, participants were strongly incentivized to succeed, yet still we found decrements in performance because of the dampened ability associated with financial precarity. Future research should investigate the interplay between the effect of financial worry on performance motivation and ability, as well as the conditions under which each may be strengthened or attenuated.

### **Conclusion**

In two contexts, we demonstrate the value of considering money in work outcomes beyond its motivational potential. Specifically, we show how financial precarity can impede people's ability to perform at work.

If companies favor work practices that increase financial uncertainty for employees, they are likely to contribute to the endurance of financial precarity among a large portion of the population. By linking people's personal financial situation to their job performance, we illustrate that employers, as well as employees, can incur the costs of employees' financial precarity. In this regard, our findings suggest that companies may have a significant stake in the financial well-being of their workforce and may be well served by instituting practices that reduce employee financial precarity.

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## Endnotes

<sup>1</sup> Financial precarity is defined as worry about one's financial situation. In this paper, we use the terms "financial precarity," "financial worry," and "financial concerns" interchangeably.

<sup>2</sup> Using all available data in the reported model does not change the direction or statistical significance of the results compared with those reported only using cases with complete data.

<sup>3</sup> Including separate measures for household income, emergency savings, and credit confidence provides similar findings to those reported in the Results section.

<sup>4</sup> The distribution of accidents across the eight-month interval reveals that the frequency of accidents appears to be influenced by weather, increasing in the winter months and declining in the spring. There were no other discernable patterns in the distribution of accidents over time.

<sup>5</sup> The reported analyses do not control for individual pay on accident odds for two reasons. First, pay rates are determined by terminal and tenure, which are already accounted for in our analyses. Each terminal is classified within cost-of-living bands. The pay rate within each band is dependent on tenure, as pay rates increase each year after the start of employment up to the third year. After three years with the company, the employee remains at the same pay rate throughout the rest of his or her tenure aside from company-wide annual increases. Second, the addition of pay did not change the reported results.

<sup>6</sup> Findings without any of the log transformations do not significantly differ from those reported in the Results section.

<sup>7</sup> Although 14.3% of our sample had a preventable accident, 10.3% is the probability of a preventable accident for a line haul driver with average values on the continuous variables.

<sup>8</sup> We could not obtain accident cost data more recent than 2008, so these figures underrepresent current actual costs. Inflation rates between 2008 and 2017 were 1.44% per year on average (<http://www.in2013dollars.com/2008-dollars-in-2017?amount=100>, accessed September 18, 2017). Using this rough calculation, current costs would be \$142,205 for accidents without injuries, \$334,189 for accidents with at least one injury, and \$7,219,366 when a fatality occurs.

<sup>9</sup> Worry about relationships and health were also significantly related to cognitive capacity, but these correlations were weaker, ranging from 0.16 to 0.21. The means on these items were also lower, ranging from 2.52 to 3.87.

<sup>10</sup> A model excluding the self-reported control variables (e.g., conscientiousness, life satisfaction) led to a stronger effect of financial worry on performance: a one-standard-deviation increase in financial worry was associated with a 5.2% increase in the odds of a preventable accident.

<sup>11</sup> The software used to conduct the complex span tasks can be obtained from <http://www.cognitivetoools.uk/>.

<sup>12</sup> We were not able to adjust the software to maintain the required distance. Furthermore, the software only allowed us to indicate a distance range rather than an exact distance, leading to natural fluctuations in participants' driving time. Results using performance scores while controlling for time driven rather than dividing scores by time leads to similar findings as those reported in the Results section.

<sup>13</sup> By contrast, there was no significant interaction effect on the other sources of worry ( $p$ 's > 0.155) except one's work ( $p$  = 0.045). Given that our manipulation involved a car breakdown, it is possible that it led some to become worried about retaining their jobs if such a situation were to happen to them.

<sup>14</sup> The use of robust standard errors (RSEs) provides similar findings to those presented in the Results section. However, since bootstrapping procedures for the indirect effects are not available when using RSEs, we report the results using conventional standard errors to remain consistent between the discussion of the direct and indirect effects in the Results section.

<sup>15</sup> Although not statistically significant, there was a difference between participants high and low in financial resources in the control condition as well. One possible explanation for this effect is that the control scenario (\$150 car repair) assured participants with fewer financial resources that they could overcome such a challenge, increasing their perceived efficacy and performance on the cognitive capacity tests (e.g., Stajkovic and Luthans 1998).

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