When Challenges Hinder: An Investigation of When and How Challenge Stressors Impact Employee Outcomes

Christopher C. Rosen  
University of Arkansas

Nikolaos Dimotakis  
Oklahoma State University

Michael S. Cole  
Texas Christian University

Shannon G. Taylor  
University of Central Florida

Lauren S. Simon  
University of Arkansas

Troy A. Smith  
University of Nebraska–Lincoln

Christopher S. Reina  
Virginia Commonwealth University

Over the past two decades, accumulating evidence has indicated that individuals experience challenge and hindrance stressors in qualitatively different ways, with the former being linked to more positive outcomes than the latter. Indeed, challenge stressors are believed to have net positive effects even though they can also lead to a range of strains, eliciting beliefs that managers can enhance performance outcomes by increasing the frequency of challenge stressors experienced in the workplace. The current article questions this conventional wisdom by developing theory that explains how different patterns of challenge stressor exposure influence employee outcomes. Across 2 field studies, our results supported our theory, indicating that when challenge stressors vary across time periods, they have negative indirect effects on employee performance and well-being outcomes. In contrast, when employees experience a stable pattern of challenge stressors across time periods, they have positive indirect effects on employee performance and well-being outcomes. These results, which suggest that the benefits of challenge stressors may not outweigh their costs when challenge stressors fluctuate, have important implications for theory and practice.

Keywords: challenge stressor, stress, temporal context

In recent decades, scholars have developed theories that identify how different workplace stressors may have either positive or negative implications for employees (Boswell, Olson-Buchanan, & LePine, 2004). The most well-established stressor typology geared toward examining these differences is the challenge-hindrance stressor framework (Cavanaugh, Boswell, Roehling, & Boudreau, 2000). This framework specifies that work demands can be separated into two broad categories: challenge stressors (e.g., high workload, job complexity, and work responsibilities), which represent opportunities for achievement and growth, and hindrance stressors (e.g., role ambiguity, daily hassles, lack of job-related resources), which reflect obstacles to task accomplishment and growth. Empirical evidence has generally supported this distinction, demonstrating that although challenge and hindrance stressors both induce strain, challenge stressors also elicit positive emotions and attitudes that offset the negative effects of strain and result in desired employee outcomes (e.g., Rodell & Judge, 2009).

Accumulating research documenting the benefits of challenge stressors has led scholars to recommend that managers increase subordinates’ levels of challenge stressors as a means of motivating and enhancing employee performance and well-being (e.g., Hargrove, Nelson, & Cooper, 2013; LePine, Podsakoff, & LePine, 2005; Lin, Ma, Wang, & Wang, 2015). This research has also had an impact on management education, as evidenced by popular textbooks (e.g., Colquitt, LePine, & Wesson, 2017; Robbins &
Judge, 2015) that have emphasized the benefits of challenge stressors. For example, Levy (2010, p. 295) states “Stress related to being challenged at work has positive outcomes for the manager and organization.” Colquitt et al. (2017, p. 144) noted similar relationships (e.g., “employees who experience high levels of challenge stressors also tend to have higher levels of job performance and organizational commitment”) and mentioned that “these positive effects of challenge stressors have been demonstrated in executives, employees in lower-level jobs, and even students.”

We contend that it may be premature to emphasize the benefits of challenge stressors because prior research has treated challenge stressors as a static phenomenon manifested as either a feature of the workplace (LePine, LePine, & Jackson, 2004) or as discrete incidents independent of one another (Rodell & Judge, 2009). This is problematic because the stressor–strain process does not occur in a temporal void, but rather is embedded in a temporal context with important temporal issues arising at every stage of the stress process: in the pattern of occurrence of stressor conditions/events, in the way those stressor conditions/events impact the focal system, and in the degree to which the focal system can anticipate, prepare for, and react to those conditions/events and their consequences. (McGrath & Bechir, 1990, p. 93)

Yet, research has failed to account for theoretically relevant temporal issues (e.g., stability and/or predictability of challenge stressor occurrence). This is problematic because when research sidesteps issues of temporality, overestimating the robustness and generalizability of findings is a common outcome (Ployhart & Vandenberg, 2010). Moreover, questionable inferences have the potential to prompt misguided intervention efforts, which calls into question recommendations to increase challenge stressors as a means of motivating performance and enhancing employee outcomes. Our primary objective is, therefore, to extend theory and research on challenge stressors by developing and testing a novel theoretical perspective that considers how variations in the ordering of challenge stressor exposures differentially predict employee outcomes.

The current research represents a notable departure from prior studies, as we go beyond a focus on levels of challenge stressors to consider how employees are influenced by stressor patterns. In particular, although the frequency of challenge stressors may remain relatively stable over time for some employees, others may experience fluctuations from one time period to the next (i.e., stressor levels might be similar to what was recently experienced, or they might change from recent levels—either increasing or decreasing). We posit that these fluctuations, which reflect our operationalization of the temporal context, capture meaningful information beyond the current level of challenge stressors and provide insight into when and why challenge stressors may be experienced in a positive (vs. negative) way. We thus answer recent calls (e.g., Shipp & Cole, 2015) to consider the temporal context because of its potential to change the meaning of phenomena, which might serve to challenge conventional wisdom around well-established relationships. In so doing, our investigation of challenge stressor patterns provides an opportunity for theory building that is anticipated to result in a richer understanding of the challenge stressor-strain process (Hollenbeck, 2008). More broadly, the current research stands to build a foundation that scholars could apply to other dynamic phenomena (e.g., organizational citizenship and leader behavior) to which employees have also been shown to react positively and negatively (Bass, Avolio, Jung, & Berson, 2003; Koopman, Lanaj, & Scott, 2016).

We draw from a fundamental aspect of the transactional model of stress (Lazarus & Folkman, 1984) to understand why individuals may have qualitatively different experiences, despite the onset of comparable levels of challenge stressors in their current work environments. Namely, transactional stress theory identifies predictability (i.e., the degree to which the occurrence of a stressor can be anticipated) as a critical input into the process that determines how stressors are experienced. Stressors that can be anticipated permit adaptation (e.g., planning ahead so that one can more effectively manage a threat or take advantage of an opportunity), allowing the individual to be proactive as opposed to reactive (Lazarus, 1991; Parke, Weinhardt, Brodsky, Tangirala, & DeVoe, 2018). Applied to our model, this suggests that when an employee can anticipate the occurrence of challenge stressors, s/he is more likely to transform the potentially disruptive stressors into routine tasks that require normal processing (McGrath & Bechir, 1990). However, if the onset of challenge stressors cannot be anticipated, available evidence suggests that such stressors are more likely to be perceived as an aversive event and, by extension, increase the degree of strain experienced (Katz & Wykes, 1985; Miller, 1981).

By considering how the temporal context influences the stress experience, our research makes theoretical and practical contributions to the work stress literature. In particular, we develop and test theory which suggests that “past is prologue” when it comes to understanding employee reactions to challenge stressors. In so doing, we call into question long-held assumptions about the effects of challenge stressors on employee outcomes, which has the potential to shift consensus (Hollenbeck, 2008) around the benefits of challenge stressors and lead to amendments to theory (e.g., incorporation of boundary conditions that qualify relationships specified by existing theory). Importantly, our research serves to better align challenge stressor research with theory suggesting that stressors represent “dynamic, unfolding processes that imply complex appraisal patterns, rather than static, unitary events” (Jerusalem & Schwarzer, 1992, p. 200), further demonstrating how incorporation of temporal dynamics might change our understanding of stress phenomena and illustrating a potential disconnect between the challenge stressor framework and its underlying transactional stress theory.

Our research is also important from a practical perspective. For example, prior research has touted the benefits of challenge stressors without considering the conditions under which those stressors and their subsequent benefits occur. If certain conditions (e.g., inconsistent patterns of exposure) diminish the benefits of challenge stressors, then managers should weigh those factors when considering increasing an employee’s responsibilities, establishing deadlines, or providing other commonly prescribed opportunities for growth. Thus, the current research has the potential to inform managers seeking to create challenging opportunities for employee growth by identifying more optimal ways of presenting challenges to employees.

We test our theory and temporally focused conceptual models (see Figures 1 and 2) in two studies. In Study 1, we build on Rodell and Judge’s (2009) research, which identified anxiety and atten-
tiveness as mediators of the effects of challenge stressors on performance. Study 1 results provide initial support for our theory, suggesting that it is important to consider the patterns in which challenge stressors occur. In Study 2, we provide a more direct test of our theory by focusing on mediators (i.e., stressor anticipation and appraisals) that are more specific to our pattern-based arguments. Study 2 also provides a more rigorous test of our theory by (a) considering supervisor ratings of performance as the dependent variable and (b) expanding the criterion space to include levels of stress experienced as an additional outcome.

**Theory and Hypotheses**

**Challenge Stressors**

According to the transactional model of stress, a two-stage appraisal process occurs after individuals encounter a demanding (i.e., stressful) event (Lazarus & Folkman, 1984). This process involves determining whether a stressor promotes or thwarts goal attainment and is what drives subsequent emotional and behavioral responses. Consistent with the transactional model of stress, researchers have posited that challenge stressors are strain provoking because, like other job demands, they draw down resources necessary for completing ongoing tasks and coping with other stressors at work (LePine et al., 2005). Thus, challenge stressors are appraised as a threat to goal attainment because they are associated with increased doubt around whether one will have sufficient resources (e.g., time, energy, and attention) to accomplish the tasks at hand and, as a result, elicit strain manifested in the form of negative emotional states. Consistent with this perspective, research has demonstrated that anxiety links challenge stressors to undesirable coping responses (e.g., avoidance and withdrawal behaviors; Rodell & Judge, 2009).

Interestingly, however, a growing body of research also indicates that challenge stressors offset their negative effects via a second path that includes pleasurable feelings and positive emotional states. Challenge stressors represent obstacles that, once overcome, lead to learning and achievement. Thus, people are motivated to take advantage of opportunities presented by challenge stressors because doing so is associated with personal growth (LePine et al., 2005). Therefore, challenge stressors are also appraised as promoting goal attainment and, thus, generate a sense of determination and energy. Supporting this perspective, research has demonstrated that challenge stressors are associated with positive feelings (i.e., attentiveness) that counter their negative effects on performance outcomes (Rodell & Judge, 2009).

It should be noted that prior studies have considered the effects of challenge stressors at both the between and within person levels of analysis (e.g., Boswell et al., 2004; LePine et al., 2005; Rodell & Judge, 2009; Tadić, Bakker, & Oerlemans, 2015; Widmer,
Challenge Stressor Patterns, Attentiveness, and Anxiety

Though prior research has drawn from the transactional model of stress to explain the countervailing effects of challenge stressors on employees, this research has failed to consider a key aspect of this theory—that one’s ability to anticipate the occurrence of a stressor plays an important role in the stress appraisal process (Lazarus & Folkman, 1984). More specifically, when stressors can be anticipated, individuals can prepare for them by stockpiling or conserving resources so that they can be directed toward managing expected demands (Neupert, Ennis, Ramsey, & Gall, 2016; Schwarzer & Knoll, 2003). Moreover, when there is uncertainty around whether or when an event will occur, individuals become increasingly vigilant and deploy attention toward scanning the environment for threats or opportunities (Frija, 1986; Monat, Averill, & Lazarus, 1972). This has the potential to draw down resources that are necessary for managing and responding to other ongoing demands (Rosen, Koopman, Gabriel, & Johnson, 2016). Likewise, prior research has demonstrated that autonomic responses are affected by the predictability of events (Averill, 1973), such that responses are more intense when there is uncertainty around whether an event will occur (Glass & Singer, 1972; Monat et al., 1972). Thus, unpredictability around the occurrence of a stressor serves as an important input into the process that determines how it is appraised and experienced (Katz & Wykes, 1985; Koolhaas et al., 2011).

Indeed, theories of human behavior acknowledge that merely knowing that an aversive event will occur is more beneficial for people than the uncertainty of not knowing (Miller, 1981; Schwarzer & Knoll, 2003); the former is emblematic of a stressor that can be anticipated. Extending these ideas to the work domain, researchers have considered how employees are affected by patterns of exposure to organizational justice that they can or cannot anticipate (Matta, Scott, Colquitt, Koopman, & Passantino, 2017). Matta and colleagues argued that consistency in treatment provides a degree of predictability that allows employees to anticipate how they will be treated during subsequent interactions with supervisors. When employees are treated in a consistently fair (or unfair) way by their supervisor, they can anticipate such treatment and mentally prepare themselves for future interactions. Inconsistent treatment, however, is associated with instability in perceptions of fairness that can tax resources as employees attempt to make sense of their circumstances. Supporting their theorizing, Matta et al. (2017) found that exposure to inconsistently fair treatment resulted in more negative outcomes than exposure to either consistently fair or consistently unfair treatment. These findings align with recent research that suggests employees are more effective at accomplishing work goals when they can anticipate work demands, as anticipation is linked to planning, which allows employees to proactively allocate resources toward managing future work demands (Gollwitzer & Oettingen, 2016; Parke et al., 2018). Together, this emerging body of research lends support to theory suggesting that patterns of stress exposure provide information that employees can use to make sense of their work environment (e.g., Lazarus & Folkman, 1984) and suggests that being able to anticipate demands is a critical component of coping with those demands.

Building on research (e.g., Matta et al., 2017) which suggests that predictability plays a critical role in determining how people experience and respond to stressors, we posit that the positive effects of challenge stressors are diminished when such stressors are experienced inconsistently. More explicitly, when challenge stressors fluctuate over time, they are difficult to anticipate and, therefore, more likely to interfere with or disrupt ongoing work tasks. For instance, when an employee can anticipate that s/he will be working on more complex tasks or have greater job responsibilities, it is easier to plan for those demands by allocating resources (e.g., time and energy) to them (Parke et al., 2018). Thus, when the timing of events is known in advance, individuals have more opportunities to prepare (emotionally and cognitively) and, thus, experience less distress (e.g., anxiety and worry) when they occur (Katz & Wykes, 1985).
When such demands cannot be anticipated, however, they have greater potential to interfere with ongoing goal-directed activities and are, therefore, likely to be appraised less favorably (Lazarus, 1991) and lead to negative emotional states such as anxiety. For instance, if an employee is unable to predict the occurrence of challenge stressors, s/he may not be able to allocate sufficient time and energy to overcome such challenges while also directing attention toward ongoing core work tasks (Parke et al., 2018). An employee confronted with not knowing when s/he will be expected to work fast and hard, for example, may feel especially anxious because s/he may not have the resources needed to perform the present tasks. Likewise, when the onset of challenge stressors cannot be forecasted (e.g., working long hours to meet an unexpected deadline) employees will be more adversely affected, given the sudden onset of such demands, which divert energy and attention from ongoing functioning. Thus, unpredictable challenge stressors have greater potential to interfere with goal attainment and are, therefore, likely to generate more anxiety because they can be appraised as a threat, rather than an opportunity. These assertions are supported by research (e.g., Katz & Wykes, 1985; Weiss, 1970) which has indicated that it is not the objective nature of an aversive event that induces a stress response, but rather the degree to which that event can be predicted.

The transactional model of stress further suggests that individuals who inconsistently experience challenge stressors will be more likely to scan the environment for growth opportunities, with attentional resources becoming increasingly depleted. More explicitly, unpredictability of an event is associated with vigilance, which involves searching for cues that signal whether and when an opportunity (or threat) will occur (Lazarus & Folkman, 1984). The role of vigilance is to aid in one’s anticipatory response, which allows the individual to prepare in some way to take advantage of opportunities or reduce harm associated with threat (Harris, 1981; Lazarus & Folkman, 1984). Thus, individuals who inconsistently experience challenge stressors will be more likely to scan the environment for growth opportunity signals so that they can prepare themselves to take advantage of such opportunities when they occur. However, vigilance taxes attentional resources, which are drawn down as one scans the environment for cues signaling opportunities (Selton et al., 2005; Ocasio, 2011). When an individual is unable to amass or retain resources due to use or distraction, adaptive capacity is reduced, making it difficult to successfully manage multiple competing demands and make progress on goal-directed activities (Rosen et al., 2019). Thus, in addition to being a source of anxiety, unpredictable challenge stressors also serve as distractions that interfere with one’s ability to concentrate and focus on work tasks, reducing feelings of attentiveness (Parke et al., 2018). Overall, based on the theory developed above, we propose a positive relationship between weekly fluctuations in challenge stressors and anxiety and a negative relationship between weekly fluctuations in challenge stressors and attentiveness.

**Hypothesis 1:** From week to week, fluctuations in challenge stressors will be associated with (a) higher anxiety and (b) lower attentiveness.

Regardless of whether they are predictable or not, challenge stressors reflect demands that are associated with negative emotional states (Rodell & Judge, 2009). For example, even if an employee knows about time pressure in advance, such pressure will still present a threat to his or her ability to accomplish work goals (i.e., completing work on time). Concerns about successfully completing work tasks and overcoming challenging aspects of one’s job are likely to activate the loss focused system, which drives individuals to experience negative feelings that are associated with goal frustration (i.e., anxiety: Carver & Scheier, 1998) when challenge stressors are high (as opposed to when they are low), even when exposure to such stressors is predictable (i.e., stable and consistent). As such, we anticipate that high and stable levels of challenge stressors will be positively associated with anxiety.

Accumulating evidence suggests that challenge stressors also generate positive feelings (e.g., feeling alert, attentive, determined) associated with taking advantage of opportunities that promote growth and goal attainment (e.g., Tadić et al., 2015). This also aligns with research suggesting that opportunity cues (i.e., those that signal reward or gain) activate the approach system, which creates positive feelings associated with a state of action-readiness that prepares individuals to take advantage of impending opportunities (Carver & Scheier, 1998). It is through these positive emotional experiences that challenge stressors are theorized to counter their negative, strain-based effects on work outcomes (Rodell & Judge, 2009).

We posit that challenge stressors will generate positive emotional states that offset their anxiety-based effects when they are experienced consistently from one time period to the next. In the previous section, we discussed the difficulties that arise when individuals are unable to forecast and plan due to stressors that are difficult to anticipate. In contrast, when individuals consistently experience challenge stressors, they direct less attention to scanning the environment for opportunity-related cues because they can better anticipate their occurrence (Ocasio, 2011). Being able to anticipate the occurrence of challenge stressors also allows employees to plan for the demands presented by those stressors and, as a result, they can more efficiently direct resources toward overcoming them (Parke et al., 2018). This is consistent with Katz and Wykes’s (1985) preparatory response hypothesis, which asserts that information about the onset of stressful events is beneficial because it allows individuals to initiate a preparatory process that attenuates noxious or distracting aspects of stressors. As such, employees are able to more effectively capitalize on the additional growth opportunities presented by consistently experienced high challenge stressors, leading them to experience these stressors in a more positive way. Therefore, compared with employees who consistently experience low levels of challenge stressors, we anticipate that employees who encounter high and stable levels of challenge stressors from week to week will experience higher levels of attentiveness, a positive emotional state linked to goal striving and feelings of accomplishment.

**Hypothesis 2:** From week to week, high and stable levels of challenge stressors will be associated with (a) higher anxiety and (b) higher attentiveness, compared with low and stable levels of challenge stressors.

**Indirect Effects of Challenge Stressor Patterns**

Theories of work stress and motivation suggest that after experiencing workplace events, emotional states drive subsequent em-
ployee behavior (Bandura, 1991; Lazarus, 1991; Weiss & Cropanzano, 1996). Such behaviors serve as outlets in which individuals channel both positive and negative feelings (Krischer, Penney, & Hunter, 2010; Shockley, Ispas, Rossi, & Levine, 2012). Positive emotional states are energizing, thus providing individuals with resources that can be directed toward goal-oriented behavior (i.e., task performance) and helping others (i.e., organizational citizenship behavior, or OCB), as well as inhibiting impulses to engage in counterproductive work behaviors (i.e., CWB). Supporting this perspective, research has demonstrated that positive emotional states are associated with task performance and OCBs (Ilies, Scott, & Judge, 2006; Yeo, Frederiks, Kiewitz, & Neal, 2014). There is also evidence that individuals experiencing positive emotional states are less likely to engage in CWBs (Avey, Reichard, Luthans, & Mhatre, 2011; Shockley et al., 2012).

Attentiveness is a positive emotional state that is associated with alertness and concentration (Watson & Tellegen, 1985). Individuals who experience higher levels of attentiveness on a week-to-week basis are able to more effectively complete work tasks, due to their heightened levels of concentration. At the same time, attentive individuals are also more likely to recognize when a coworker is in need of help and, given their positive emotional state, are more likely to help others (Isem, 1984; Rodell & Judge, 2009). Likewise, attentive employees are more alert and, thus, more capable of monitoring their behavior to ensure that it conforms to social norms, making them less likely to act on counterproductive impulses (Rosen et al., 2016).

Given the previously specified relationship between week-to-week patterns of challenge stressors and attentiveness, we predict that week-to-week patterns of challenge stressors will also be associated with task performance, OCB, and CWB through their effect on attentiveness. Specifically, because of their negative impact on attentiveness, when challenge stressors fluctuate from week to week, they will demonstrate a negative indirect relationship with task performance and OCB, and a positive indirect relationship with CWB. Interestingly, however, our theory suggests that when challenge stressors are high and stable from week to week, they will be positively associated with attentiveness and these stressors will, therefore, demonstrate a positive indirect relationship with task performance and OCB and a negative indirect relationship with CWB via attentiveness. Therefore, we propose the following:

**Hypothesis 3:** Challenge stressor patterns from week to week will be associated with task performance such that (a) when challenge stressors fluctuate, the degree of change will demonstrate a negative indirect effect on task performance through attentiveness and (b) when challenge stressors are stable, stressor level will demonstrate a positive indirect effect on task performance through attentiveness.

**Hypothesis 4:** Challenge stressor patterns from week to week will be associated with OCB such that (a) when challenge stressors fluctuate, the degree of change will demonstrate a negative indirect effect on OCB through attentiveness and (b) when challenge stressors are stable, stressor level will demonstrate a positive indirect effect on OCB through attentiveness.

**Hypothesis 5:** Challenge stressor patterns from week to week will be associated with CWB such that (a) when challenge stressors fluctuate, the degree of change will demonstrate a positive indirect effect on CWB through attentiveness and (b) when challenge stressors are stable, stressor level will demonstrate a negative indirect effect on CWB through attentiveness.

Compared with positive emotional states, negative emotional states have more deleterious effects on work behavior, given that such states are associated with action tendencies aimed at alleviating negative feelings (Lazarus, 1991; Weiss & Cropanzano, 1996). Employees experiencing negative emotional states may, for example, reduce effort and attention directed toward work as a means of avoiding perceived threats (Spector & Fox, 2002). Alternatively, they might engage in retaliatory behaviors aimed at repairing the damage incurred as a result of experiencing threats to the self (Lazarus, 1991). The relation between negative emotional states and work behaviors is relatively automatic. In particular, CWBs serve as a self-reinforcing outlet that feels good and reduces the extent to which negative emotions are experienced (Krischer et al., 2010). This creates an implicit linkage between negative emotional states and avoidance behaviors that detract from task performance (Johnson, Tolentino, Rodopman, & Cho, 2010). Lending support to this perspective, prior studies indicate that negative emotional states are associated with performance deficiencies, reductions in helping behaviors, and higher levels of CWB (Fox, Spector, & Miles, 2001; Scott & Barnes, 2011; Shockley et al., 2012).

Anxiety is a negative emotional state that is associated with avoidance and escape action tendencies (Lazarus, 1991). Environmental stimuli that make people anxious are aversive. It follows that individuals seek to distance themselves from such stimuli, given that avoidance of aversive stimuli will limit the amount of stress experienced, while also allowing the individual to exert control over a perceived threat (Rodell & Judge, 2009). One way of avoiding stressful work demands is via reducing the effort and energy that is directed toward one’s job, which allows the individual to psychologically disengage and, thus, reduce exposure to the source of one’s anxious feelings. In addition to impacting task performance, we anticipate that this type of disengagement will have a negative impact on OCB, given that helping coworkers requires greater work involvement (i.e., investment of time and energy) from the individual. Because of disengagement and avoidance-related tendencies, anxious employees are also less likely to monitor and regulate behavior to ensure that it conforms to social and professional norms. Consequently, it is reasonable to assume that anxious employees will be more likely to engage in destructive behaviors as a way of restoring balance (e.g., shirking their duties, showing up late, and acting out or being rude to coworkers; Johnson et al., 2010).

The aforementioned relationships between anxiety and performance behaviors, along with the previously specified relationship between challenge stressor patterns (i.e., fluctuating vs. stable levels from week to week) and anxiety, suggest that weekly patterns of challenge stressors will be associated with task performance, OCB, and CWB in part through their effect on anxiety. Because of their hypothesized positive relationship with anxiety, we anticipate that challenge stressor fluctuations will demonstrate...
a negative indirect relationship with task performance and OCB and a positive indirect relationship with CWB via anxiety. Our theory further suggests that when challenge stressor levels are high and stable from week to week, they will demonstrate similar relationships with task performance, OCB, and CWB. However, because of the potential for anticipatory coping, these effects are likely to be less pronounced than those involving high and fluctuating levels of challenge stressors. Therefore, we propose the following:

Hypothesis 6: Challenge stressor patterns from week to week will be associated with task performance, such that (a) when challenge stressors fluctuate, the degree of change will demonstrate a negative indirect effect on task performance through anxiety and (b) when challenge stressors are stable, stressor level will demonstrate a negative indirect effect on task performance through anxiety.

Hypothesis 7: Challenge stressor patterns from week to week will be associated with OCB such that (a) when challenge stressors fluctuate, the degree of change will demonstrate a negative indirect effect on OCB through anxiety and (b) when challenge stressors are stable, stressor level will demonstrate a negative indirect effect on OCB through anxiety.

Hypothesis 8: Challenge stressor patterns from week to week will be associated with CWB such that (a) when challenge stressors fluctuate, the degree of change will demonstrate a positive indirect effect on CWB through anxiety and (b) when challenge stressors are stable, stressor level will demonstrate a positive indirect effect on CWB through anxiety.

Study 1

Method

Sample and procedure. For Study 1, we received IRB approval from Louisiana State University (IRB# 3081; Last in Concepts Workplace Study). The sample for this study comprised 155 employees from an organization that operates a restaurant group in the United States. Respondents were predominantly female (72%) and had a mean age of 22 years, a mean of six years of work experience, and worked an average of 30 hr per week. For eight consecutive weeks, participants completed an online survey assessing the extent to which they experienced challenge stressors, as well as their emotional states and work behavior during the same time frame. We chose to collect weekly data for eight consecutive weeks for several reasons. First, we deemed a typical work week as theoretically justified given its periodic rhythm (Ancona, Okhuysen, & Perlow, 2001), and its nature as a self-contained set of experiences constrained by weekends. Second, asking participants to respond to their work experiences during the previous week is consistent with prior work stress research (Taylor, Bedian, Cole, & Zhang, 2017) and, thus, facilitates comparisons across studies (Shipp & Cole, 2015). Third, we believe an 8-week study span was adequately long for the proposed effects to unfold and yet short enough to circumvent subject attrition (Selig & Preacher, 2009). Finally, the work week is a ubiquitous and typical time frame for most workplaces, which makes it a great starting point for this type of investigation into stressor stability and change.

Employees provided demographic information via a paper-and-pencil survey during an orientation meeting explaining the study. We used an interval-contingent sampling methodology in which participants were asked to complete online surveys within a 48-hr window at the end of each work week. For the measures included in the weekly survey (i.e., stressors, emotional state, and work behavior), instructions reflected a 1-week frame of reference. In total, we obtained 471 observations from 122 separate employee respondents. Given that the potential number of observations was 976 (122 participants × 8 time waves), our overall response rate at the event level was 48%, which is not atypical in this type of research (see Beal, 2015; Ployhart & Vandenberg, 2010). The average number of surveys completed by participants was 3.86.

We excluded participants with only one survey response because it is not possible to include them in the analyses. This left us with a sample of 435 observations derived from 86 individuals. Because our analyses required the simultaneous estimation of effects at current and previous weeks (see below), lagged scores had to be computed and matched to current weeks. This last step resulted in a final sample size of 334 observations derived from 84 individuals.

Measures. Challenge stressors were assessed with Rodell and Judge’s (2009) measure (e.g., “During the past week my job has required me to work very hard”). Participants indicated the extent of agreement with each statement on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). The mean coefficient alpha (across weeks) was .90. We also collected hindrance stressor items (average α = .87) for comprehensiveness and robustness checks1; a sample item is “During the past week I have had to go through a lot of red tape to get my job done.”

We assessed anxiety and attentiveness by asking respondents to indicate the extent to which they experienced each during the past week on a 5-point scale (1 = very slightly/not at all; 5 = extremely/very much). Following Rodell and Judge (2009), we used items from the Positive and Negative Affect Schedule—Expanded Form (PANAS-X; Watson & Clark, 1994) and the Job-Related Affective Well-Being Scale (Van Katwyk, Fox, Spector, & Kelloway, 2000) to measure attentiveness (attentive, alert, determined) and anxiety (nervous, anxious). Mean coefficient alphas (across weeks) were .91 for attentiveness and .83 for anxiety.

Participants provided weekly self-assessments of their task performance. We followed Schoorman and Mayer’s (2008) recommendation to ask respondents for their supervisor’s assessment of their performance rather than their own assessment. This common perspective approach corresponds more closely with supervisors’ appraisals of employee performance than a direct perspective (i.e., the employee’s own view of his or her performance). Task performance was gauged with four items (e.g., “During the past week, my supervisor would say that I . . . adequately completed assigned duties”) from Williams and Anderson (1991), using a 5-point

---

1 The focus of the current research was on challenge stressors. Although we did control for hindrance stressors to account for how individuals experience both types of stressors on a weekly basis, we did not develop and test theory around how the experience of hindrance stressors might also be affected by the temporal context. Prior research has repeatedly demonstrated that hindrance stressors are experienced in a universally negative way by employees.
Likert scale (1 = strongly disagree; 5 = strongly agree; mean α across weeks = .76).

We assessed OCB directed at individuals (i.e., OCBI) and the organization (i.e., OCBO). Each was gauged with four items from Williams and Anderson (1991). Because we did not have differential predictions for each type, we averaged the scores to form an overall measure of OCB (mean α across weeks = .75). Applying Schoorman and Mayer’s (2008) common perspective technique, respondents indicated the extent of agreement with each statement on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). Sample items include “During the past week, my supervisor would say that I . . . helped others who had heavy workloads” (OCBI) and “. . . conserved and protected organizational property” (OCBO).

We used items from Bennett and Robinson’s (2000) measure to assess CWB in the form of production deviance (five items, e.g., “I put little effort into my work”) and personal aggression (four items, e.g., “I lost my temper while at work”). These items were averaged into an overall measure of CWB (mean α across weeks = .88). Respondents indicated how often they engaged in these behaviors during each behavior during the past week (1 = never; 5 = frequently).

Analytical approach. After conducting multilevel confirmatory factor analyses (CFAs) and variance components analysis to establish the appropriateness of our data for multilevel modeling, we tested the hypotheses using a path model, conducted in Mplus. Because our data analysis approach necessitated combining stressor levels across two consecutive weeks, we lagged the challenge stressor measure and utilized it together with the current week’s score to assess their combined effect on current week mediator variables (i.e., attentiveness and anxiety) and behavioral outcomes (i.e., task performance, OCB, and CWB). We discuss details of these analyses below.

Polynomial analyses. Our hypotheses discussed both overall levels as well as weekly patterns (fluctuating or stable) of challenge stressors. To test these hypotheses, we adapted the polynomial regression approach (Edwards, 2002) to model stressor change in a week-to-week fashion within people (see Jansen, Shipp, & Michael, 2016, for an application of polynomial regression to the study of change, and Tepper et al., 2018, for a multi-level application). This allowed us to simultaneously evaluate the effects of different levels of stressors that are stable (from week-to-week), as well as evaluate the effects of a given level of stressors that are experienced in a fluctuating pattern. That is, this approach allows for comparing the effects of high or low levels of challenge stressors that are stable from week to week, as well as the effects of a given level of stressor (whether high or low) that might be experienced consistently (no weekly change) or inconsistently (increase or decrease from week to week).

The polynomial approach adapted to our purposes consists of five terms: current-week and past-week challenge stressors, their interaction, and their squares. For each week, the current level of each mediator was regressed on these variables, as described by the following equation:

\[ M_n = b_0 + b_1C_n + b_2C_{n-1} + b_3C_n^2 + b_4(C_n \times C_{n-1}) + b_5C_{n-1}^2 \]  

(1)

where \( n \) indicates the focal week, \( M \) the mediator, and \( C \) the challenge stressor variable. That is, we predict week \( n \) variables from level and interactions among week \( n \) and week \( n-1 \) stressor variables.

Estimation of effects on anxiety and attentiveness. To understand the effects of fluctuating and stable levels of challenge stressors on attentiveness and anxiety, we used the information from polynomial models (see Eq. 1) predicting anxiety and attentiveness to calculate and test the slope and curvature of the stability and change lines for each variable. Essentially, these two estimates map onto what the polynomial nomenclature labels fit and misfit lines and curvatures, respectively. The change curve (calculated as \( b_1 + b_2 \)) tests Hypothesis 1, by indicating whether week-to-week changes (vs. stability) in challenge stressors are associated with increased or decreased anxiety and attentiveness. The stability slope (calculated as \( b_1 \)) tests whether individuals who consistently experience high (vs. low) challenge stressors across weeks are likely to experience more or less anxiety and attentiveness (Hypothesis 2). We also conducted primary and secondary slope analyses to evaluate whether these effects occur where hypothesized, or whether the response surface was shifted or rotated.

Estimation of indirect effects. To test the indirect effects of fluctuating or stable challenge stressors on work performance outcomes via attentiveness (Hypotheses 3–5) and anxiety (Hypothesis 6–8), we utilized the change curve and stability slope as \( \alpha \) path equivalents. The effect of the mediator on the outcomes (once the effects of challenge stressors are accounted for through the polynomial model variables) represented the \( b \) path of our indirect effect models as usual. These estimates were then used to compute an estimate of the hypothesized overall indirect effect (ab) for each focal outcome (i.e., task performance, OCB, and CWB), and predictor (i.e., stable and fluctuating stressors) set. Confidence intervals were calculated by utilizing parametric estimates (Preacher & Selig, 2012).

This approach has similarities to the block variable approach commonly utilized in polynomial models involving mediation in that it involves linear combinations of variables to concurrently model the effects of the various aspects of fit and misfit on a mediator and outcome variable, which allows for the estimation of indirect effects (Edwards & Cable, 2009). In our case, we needed to adapt this approach to simultaneously but separately model the effects of fluctuating and stable stressors on performance outcomes through our two affective mediators. Our approach is appropriate because it allows us to jointly determine estimates and thereby control for the effect of all independent variables on the dependent variables (see Edwards & Lambert, 2007). Our approach also avoids two issues with block variables. First, block variables by definition have an unstandardized effect of 1.00. This means that standardization is the only way to properly understand these (see Tepper et al., 2018). For the same reason, these variables are difficult to interpret when the sign of the underlying effect they describe is different across mediators (as in our case), requiring the adjustment of coefficient signs manually. Second, in non-OLS regression settings, the calculation of these block variables be-

2 Although not directly hypothesized, the change slope \( (b_1 - b_2) \) determines whether increases (vs. decreases) in challenge stressors are associated with anxiety and attentiveness, whereas the stability curve \( (b_1 + b_2) \) tests whether the magnitude of the effects of stable challenge stressors change as these stressors increase.

3 We thank an anonymous reviewer for this observation.
comes intensive quickly (see Heise, 1972), meaning that a more direct approach can be of help.

Results

Preliminary analyses. We first conducted multilevel CFA to evaluate the factor structure of our measures. The proposed six-factor measurement model (challenge stressors, anxiety, attentiveness, task performance, OCB, and CWB) had good RMSEA (.04) and SRMR\(^4\) (.06) values, although the CFI was somewhat low (.89).\(^5\) In terms of \(\chi^2\), CFI, RMSEA, and AIC, the proposed measurement model fit better than a five-factor model that collapsed the variable and a four-factor model that collapsed the performance variables. Finally, a one-factor model showed overall poor fit to the data (see Table 1). We then assessed the appropriateness of multilevel modeling via variance component analyses. In all cases, a null Level-1 model indicated significant proportions of the variance residing within individuals: 31.1% for challenge stressors, 51.6% for anxiety, 51.8% for attentiveness, 63.9% for task performance, 46.1% for OCB, and 28.8% for CWB.

Table 2 reports descriptive statistics. Current levels of challenge stressors correlated with levels from the previous week, \(r = .57, p < .01\). Challenge stressors were positively associated with current-week anxiety and attentiveness (\(r = .23, p < .01\) and \(r = .21, p < .01\), respectively). Attentiveness was positively associated with task performance, \(r = .34, p < .01\) and OCB, \(r = .36, p < .01\), whereas anxiety was negatively associated with task performance, \(r = -.13, p < .05\) and OCB, \(r = -.12, p < .05\) and positively associated with CWB, \(r = .19, p < .01\).

Hypothesis tests. Hypothesis 1 predicted that individuals will experience lower levels of attentiveness and higher levels of anxiety when their challenge stressors are perceived to fluctuate from week to week. Multilevel modeling results and tests of the response surface along the change and stability lines (see Table 3) suggest negative curvature along the change line for attentiveness (estimate = -.56, \(p < .05\)) and positive curvature along the change line for anxiety (estimate = .66, \(p < .01\)). To interpret these results, we used the coefficient estimates to plot the overall response surfaces as shown in Figure 3 (attentiveness) and Figure 4 (anxiety). Regarding attentiveness, the surface along the change line (dashed) is curved downward (a concave surface), indicating that attentiveness levels are increasing as challenge stressor values become more consistent from week to week, and levels of attentiveness are decreasing as challenge stressor values become more inconsistent (in either direction) from week to week. Figure 4, on the other hand, shows a response surface that is curved upward (a convex surface) along the change line (dashed). This implies that anxiety levels are decreasing as challenge stressor values become more consistent from week-to-week and are increasing as challenge stressor values become more inconsistent (in either direction) from week to week. In sum, individuals experienced lower attentiveness and higher anxiety during a current time period (i.e., week) when their challenge stressor levels fluctuated from the previous week to the current week, compared with periods in which their challenge stressor levels were stable from week to week. Hence, Hypothesis 1 was supported.

In Hypothesis 2, we predicted that when individuals experience high and stable levels of challenge stressors from week to week, they will report higher levels of attentiveness and anxiety than they would during periods in which they experience low and stable levels of challenge stressors. As shown in Table 3 (and represented graphically in Figures 3 and 4), there was a positive slope along the stability line for both attentiveness (estimate = .23, \(p < .01\)) and anxiety (estimate = .20, \(p < .05\)). Thus, when stressors are stable from week to week, higher levels of challenge stressors are associated with higher attentiveness and anxiety as compared with stable but relatively lower levels of challenge stressors. Hypothesis 2 was thus supported.\(^6\)

Hypotheses 3 to 5 referred to the indirect effects of challenge stressor fluctuations and stability on task performance, OCB, and CWB through attentiveness. Results for these hypotheses are presented in Table 3. Fluctuating challenge stressors were negatively associated with attentiveness (estimate = -.56, \(p < .05\)), whereas stable challenge stressors were positively associated with attentiveness (estimate = .23, \(p < .01\)). Attentiveness, in turn, was positively associated with task performance (\(\gamma = .20, p < .01\)) and OCBs (\(\gamma = .18, p < .01\)). However, attentiveness was not associated with CWBs (\(\gamma = -.04, ns\)). The indirect effects of fluctuating stressors through attentiveness were significant for task performance (95% CI [-.2490, -.0275]) and OCBs (95% CI [-.2150, -.0260]). The indirect effects of stable stressors through attentiveness were significant for task performance (95% CI [.0172, .0881]) and OCBs (95% CI [.0147, .0814]). Indirect effects for CWBs included zero for both fluctuating (95% CI [-.0242, .1026]) and stable (95% CI [-.0386, .0010]) stressors. Hypotheses 3 and 4 were thus supported, but Hypothesis 5 was not.

Hypotheses 6 through 8 proposed indirect effects of challenge stressor fluctuations and stability on task performance, OCB, and CWB through anxiety. For the a paths from stressors to anxiety, analyses demonstrated that fluctuating challenge stressors were positively associated with anxiety (estimate = .66, \(p < .01\)), whereas stable challenge stressors were also positively associated with anxiety (estimate = .20, \(p < .05\)). Anxiety was, in turn, associated with task performance (\(\gamma = -.11, p < .05\)), OCBs (\(\gamma = -.11, p < .01\)), and CWB (\(\gamma = .11, p < .01\)). In terms of the indirect effects of fluctuating stressors through anxiety, hypotheses were supported for task performance (95% CI [-.1955, -.0089]), OCBs (95% CI [-.1710, -.1760]), and CWB (95% CI [.0157, .

\(^4\) This CFA was conducted entirely on the within-person level; as such, the SRMR value is for the within component of the model, while the between-person SRMR had a value of 0.00 for all models.

\(^5\) We consider this “low” in the sense of being relatively out of sync with the other relevant fit indices. Although this CFI value is also below the commonly accepted cutoff of .90, we want to join other scholars in cautioning against what West, Taylor, and Wu (2012; p. 219) called the “reification of specific cutoff standards.” Similarly, we join more recent work (Williams, O’Boyle, & Yu, 2020) in urging careful consideration of fit indices across models as opposed to automatically-applied rules of thumb (see also Ragins, Lyness, Williams, & Winkel, 2014).

\(^6\) We also tested the primary and secondary axes of the response surface to ensure that our response surface did indeed support our hypotheses, by having the axes align with the change and stability lines as expected. Secondary axis intercepts (95% CI [-.12.134, 3.814]) and slope (95% CI [-1.991, -.593]) also did not differ from 0 and -1, respectively, indicating that for the attentiveness model the maximum downwards curvature did indeed run along the change line. Likewise, the primary axis intercept (95% CI [-1.355, .531]) for anxiety and slope (95% CI [0.597, 1.524]) for anxiety were not significantly different from 0 and 1, respectively, indicating that, for the anxiety model, maximum upwards curvature also ran across the change line. These results supported our hypotheses.
of the growth opportunities they present and reduce the challenge stressor patterns are easier to anticipate and forecast, which allows employees to plan ahead so that they can take advantage of the growth opportunities they present and reduce the costs of doing so (Parke et al., 2018). We further found support for the assertion that when challenge stressors were stable and high (compared with when they were stable and low) they would be associated with both increased attentiveness and anxiety. Our results provided indirect support for these hypothesized effects, indicating that when challenge stressor patterns are stable from week to week, employees report higher levels of attentiveness, which offset the negative effects of challenge stressors on performance that occur via anxiety under the same circumstances. We did not observe similar countervailing positive effects when challenge stressors fluctuated from week to week. Although our findings were consistent with the transactional model of stress, which suggests that individuals experience positive (negative) emotional states following an appraisal of an opportunity (threat), we did not measure or model key mechanisms specified by this theory. In particular, the transactional model of stress suggests that the ability to anticipate the occurrence of a stressor (i.e., stressor anticipation) determines how a stressor is construed (i.e., how it is appraised), which in turn influences levels of task performance, OCBs, and CWBs, respectively). Hypotheses 6, 7, and 8 were thus supported.7

Discussion

Study 1 results indicate that when challenge stressor levels vary from week to week, employees demonstrate lower levels of attentiveness and higher levels of anxiety. Attentiveness and anxiety in turn mediate the effects of challenge stressor fluctuations on behaviors (i.e., task performance, OCB, and CWB). In contrast, when employees experience a stable pattern of challenge stressors from week to week, they demonstrate higher levels of attentiveness and lower levels of anxiety, which in turn influence levels of task performance, OCB, and CWB.

Despite providing initial evidence for our theory, Study 1 has some important limitations. First, at its core, our theory suggests that being able to anticipate the occurrence of stressors determines how employees experience (i.e., appraise) and respond to them. Unfortunately, we did not consider either stressor anticipation or appraisals in Study 1. Thus, it is reasonable to question the extent to which our findings fully align with the theory that we present. Second, our reliance on data collected from a single source might raise concerns about the inferences that can be drawn from Study 1. Finally, we did not assess level of strain experienced, so it is unclear to what extent stable (vs. fluctuating) challenge stressors have an impact on perceived levels of stress. To address these issues, we conducted a second study in which our empirical examination is better aligned with our theoretical arguments (i.e., we consider mediating mechanisms that are more specific to our theory, which specifies that stressor anticipation and appraisals play a central role in the process that links challenge stressors to outcomes). In addition, we provide a more rigorous test of our hypotheses by using supervisor ratings of performance and we further expand the criterion space by considering how perceived levels of stress experienced vary as a function of the consistency with which challenge stressors occur over time.

Study 2

In Study 1, we theorized that employees experience challenge stressors in a more positive way when the occurrence of such stressors is stable and consistent across time, given that stable challenge stressor patterns are easier to anticipate and forecast, which allows employees to plan ahead so that they can take advantage of the growth opportunities they present and reduce the advantage of the growth opportunities they present and reduce the

Table 1

<table>
<thead>
<tr>
<th>Model</th>
<th>( \chi^2 )</th>
<th>df</th>
<th>CFI</th>
<th>RMSEA</th>
<th>SRMR</th>
<th>AIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Six-factor model: Proposed</td>
<td>761.98</td>
<td>418</td>
<td>0.89</td>
<td>0.04</td>
<td>0.06</td>
<td>17813.18</td>
</tr>
<tr>
<td>Five-factor model: Affective variables combined</td>
<td>924.56</td>
<td>423</td>
<td>0.83</td>
<td>0.05</td>
<td>0.07</td>
<td>18052.83</td>
</tr>
<tr>
<td>Four-factor model: Performance outcomes combined</td>
<td>1606.69</td>
<td>427</td>
<td>0.61</td>
<td>0.08</td>
<td>0.12</td>
<td>19122.42</td>
</tr>
<tr>
<td>One-factor model: All variables combined</td>
<td>2501.76</td>
<td>433</td>
<td>0.32</td>
<td>0.10</td>
<td>0.14</td>
<td>20482.87</td>
</tr>
</tbody>
</table>

Note. \( N = 453 \) observations derived from 115 individuals. CFI = comparative fit index; RMSEA = root mean squared error of approximation; SRMR = standardized root mean squared residual; AIC = Akaike information criterion.

7 As a robustness check, we reran all models using autoregressive and regular HLM models (Raudenbush & Bryk, 2002). That is, we estimated models in which week-by-week observations were assumed not to be interrelated by default (conventional hierarchical linear) and one where these were expected to be related in a first-order fashion. We also ran models controlling for current and lagged values of hindrance stressors and lagged controls. Across all models, results were unchanged and similar to our path model results. The one area of deviation from our results was the path from attentiveness to CWB, which was negative and significant across these models (exemplar \( \gamma = -0.10, p < .05 \), from an autoregressive model including lagged CWB controls). This finding also rendered the indirect effects from stable and fluctuating stressors to CWB through attentiveness significant. However, as our main analytical approach does not confirm this result, we maintained our more conservative report of support for Hypotheses 1–4 and 6–8, and no support for Hypothesis 5.
Indirect effects of stable stressor level

Hypothesis 9: Across time periods, fluctuations in challenge stressors will be associated with lower levels of stressor anticipation.

Hypothesis 10: Across time periods, high and stable levels of challenge stressors will be associated with higher levels of stressor anticipation compared with low and stable levels of challenge stressors.

With regard to the relationship between stressor anticipation and appraisals, our theory suggests that employees will be better prepared to benefit from growth opportunities when they can plan for them in advance, which will enhance the perceived benefits of their efforts.

Table 2
Descriptive Statistics and Within-Individual Correlations Among Study 1 Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hindrance stressors</td>
<td>2.15</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Current challenge stressors</td>
<td>3.14</td>
<td>0.85</td>
<td>.21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Past challenge stressors</td>
<td>3.19</td>
<td>0.84</td>
<td>.18</td>
<td>.57</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Attentiveness</td>
<td>3.90</td>
<td>0.86</td>
<td>−.04</td>
<td>.23</td>
<td>.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Anxiety</td>
<td>1.67</td>
<td>0.85</td>
<td>.27</td>
<td>.21</td>
<td>−.09</td>
<td>−.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Task performance</td>
<td>4.24</td>
<td>0.60</td>
<td>−.17</td>
<td>.09</td>
<td>.34</td>
<td>−.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. OCB</td>
<td>4.04</td>
<td>0.51</td>
<td>.02</td>
<td>.21</td>
<td>.03</td>
<td>.36</td>
<td>−.12</td>
<td>.57</td>
<td></td>
</tr>
<tr>
<td>8. CWB</td>
<td>1.40</td>
<td>0.59</td>
<td>.24</td>
<td>−.01</td>
<td>.01</td>
<td>−.11</td>
<td>.19</td>
<td>−.05</td>
<td>−.07</td>
</tr>
</tbody>
</table>

Note. N = 334 observations derived from 84 individuals. CWB = counterproductive work behavior; OCB = organizational citizenship behavior. * p < .05. ** p < .01.

Table 3
Full Path Model Results Demonstrating Effects of Past and Current Challenge Stressors on Emotional States, and the Effects of Emotional States on Workplace Outcomes (Study 1)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Attentiveness</th>
<th>Anxiety</th>
<th>Task perf.</th>
<th>OCB</th>
<th>CWB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>γ  SE</td>
<td>γ  SE</td>
<td>γ  SE</td>
<td>γ  SE</td>
<td></td>
</tr>
<tr>
<td>Coefficients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>3.84 .09</td>
<td>1.61 .10</td>
<td>4.26 .06</td>
<td>3.95 .05</td>
<td>1.48 .08</td>
</tr>
<tr>
<td>Controls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindrance stress</td>
<td>−.09 .07</td>
<td>.24 .10</td>
<td>−.11 .08</td>
<td>.01 .05</td>
<td>.15 .07</td>
</tr>
<tr>
<td>Study week</td>
<td>−.03 .02</td>
<td>−.05 .02</td>
<td>−.03 .02</td>
<td>.04 .06</td>
<td>−.03 .01</td>
</tr>
<tr>
<td>Lagged dependent variable</td>
<td>−.27 .06</td>
<td>−.09 .08</td>
<td>−.11 .06</td>
<td>−.11 .06</td>
<td>.00 .07</td>
</tr>
<tr>
<td>Challenge stressor variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current challenge stressors</td>
<td>.19 .07</td>
<td>.20 .07</td>
<td>.01 .04</td>
<td>.10 .04</td>
<td>−.05 .04</td>
</tr>
<tr>
<td>Past challenge stressors</td>
<td>.04 .07</td>
<td>.00 .00</td>
<td>.04 .05</td>
<td>−.02 .04</td>
<td>.00 .00</td>
</tr>
<tr>
<td>Current challenge stressors sq.</td>
<td>−.08 .06</td>
<td>.20 .07</td>
<td>−.11 .05</td>
<td>.04 .04</td>
<td>−.07 .04</td>
</tr>
<tr>
<td>Current × Past Challenge Stressors</td>
<td>.30 .11</td>
<td>−.29 .12</td>
<td>.17 .09</td>
<td>.05 .07</td>
<td>.11 .08</td>
</tr>
<tr>
<td>Past challenge stressors sq.</td>
<td>−.16 .07</td>
<td>.18 .08</td>
<td>−.06 .06</td>
<td>.01 .04</td>
<td>−.02 .05</td>
</tr>
<tr>
<td>Mediators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attentiveness</td>
<td>.20 .06</td>
<td>.18 .04</td>
<td>.04 .04</td>
<td>.04 .05</td>
<td>.11 .04</td>
</tr>
<tr>
<td>Anxiety</td>
<td>−.11 .05</td>
<td>−.11 .04</td>
<td>.04 .04</td>
<td>.11 .04</td>
<td>.04 .04</td>
</tr>
<tr>
<td>Response surface characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stability slope</td>
<td>.23 .07</td>
<td>.20 .08</td>
<td>.08 .07</td>
<td>.07 .07</td>
<td>.07 .07</td>
</tr>
<tr>
<td>Change slope</td>
<td>.15 .11</td>
<td>.20 .12</td>
<td>.08 .07</td>
<td>.07 .07</td>
<td>.07 .07</td>
</tr>
<tr>
<td>Stability curvature</td>
<td>.06 .06</td>
<td>.08 .07</td>
<td>.07 .07</td>
<td>.07 .07</td>
<td>.07 .07</td>
</tr>
</tbody>
</table>

LL UL LL UL LL UL

Indirect effects of stable stressor level

Via attentiveness          .0172 .0881 .0147 .0814 .0386 .0010
Via anxiety               −.0610 −.0019 −.0539 −.0046 .0039 .0556

Indirect effects of stressor fluctuation

Via attentiveness          −.2490 −.0275 −.2150 −.0260 −.0242 .1026
Via anxiety               −.1955 −.0089 −.1710 −.0176 .0157 .1765

Note. N = 334 observations derived from 84 individuals. All coefficients unstandardized. CWB = counterproductive work behavior; OCB = organizational citizenship behavior; sq. = squared. LL and UL refer to the lower and upper levels of a 95% confidence interval. Bold text indicates that confidence interval does not include zero.

*p < .05. **p < .01.
these stressors and reduce their aversiveness (Lazarus & Folkman, 1984; Parke et al., 2018). As such, challenge stressors that can be anticipated (i.e., those that occur consistently over time) will be appraised more favorably because employees can prepare to take advantage of them (compared with those that fluctuate). This (a) reduces the extent to which such stressors disrupt ongoing activity and (b) enhances the ability of employees to reap gains associated with the opportunities that challenge stressors present (LePine, Zhang, Crawford, & Rich, 2016).

Thus, challenge stressors that can be anticipated (i.e., those that occur consistently from one time period to the next) are more likely to have a positive relationship with challenge appraisals (i.e., “an individual’s subjective interpretation that demands have a potential for personal gain, growth, development, and well-being”; LePine et al., 2016, p. 1039) and a negative relationship with hindrance appraisals (i.e., “an individual’s subjective interpretation that the demands have a potential to result in loss, constraints, or harm”; LePine et al., 2016, p. 1039). In contrast, challenge stressors that are more difficult to anticipate will be appraised as more demanding because they are difficult to prepare for in advance and, as a result, are more likely to detract resources (e.g., time, energy, and attention) from ongoing work tasks, impeding goal progress. Thus, when employees cannot anticipate the occurrence of challenge stressors, they will be more likely to view them as thwarting growth, gains, or progress (LePine et al., 2016). Therefore, we submit that compared with challenge stressors that can be anticipated (i.e., those that are stable), challenge stressors that cannot be anticipated (i.e., those that occur inconsistently from one time period to the next) will have a negative relationship with challenge appraisals and a positive relationship with hindrance appraisals.

Drawing from stress theory and research (e.g., Drach-Zahavy & Erez, 2002; Tomaka, Blascovich, Kelsey, & Leitten, 1993), we further theorize that stressor anticipation and challenge/hindrance appraisals mediate the effects of stable (vs. fluctuating) patterns of challenge stressors on task performance. We posit that when challenge stressors are experienced consistently (vs. inconsistently), they have a stronger positive indirect effect on task performance due to their influence on stressor anticipation (positive) and subsequent challenge (positive) and hindrance (negative) appraisals. This aligns with research suggesting that challenge appraisals are energizing and cue approach tendencies that ready individuals for action and drive performance behaviors (Webster, 2001).
In contrast, hindrance appraisals signal that a stressor will frustrate goal progress and cue withdrawal and avoidance tendencies that negatively impact performance (Carver & Scheier, 1998; Searle & Auton, 2015). Thus, we expect that when challenge stressors are stable (i.e., experienced consistently across time periods), stressor level will be indirectly associated with task performance via its influence on stressor anticipation (positive) and subsequent (a) challenge appraisals (positive) and (b) hindrance appraisals (negative), whereas when stressors are experienced inconsistently, the degree of stressor change will be indirectly associated with task performance via its influence on anticipation (negative) and subsequent (a) challenge appraisals (negative) and (b) hindrance appraisals (positive).

**Hypothesis 11:** Challenge stressor patterns across time periods will be associated with task performance such that (a) when challenge stressors fluctuate, the degree of change will demonstrate a negative indirect effect on task performance through stressor anticipation and challenge stressor appraisal and (b) when challenge stressors are stable, stressor level will demonstrate a positive indirect effect on task performance through stressor anticipation and challenge appraisals.

In addition to performance, prior research suggests that challenge stressors affect well-being vis-à-vis levels of stress experienced (Boswell et al., 2004; Podsakoff, LePine, & LePine, 2007). Consistent with this research, we posit that challenge appraisals will be associated with lower levels of perceived stress because they signal the potential for gains and goal progress, whereas hindrance appraisals will be linked to higher levels of perceived stress because they signal the presence of a threat in the form of goal frustration or impediment (Webster et al., 2011). Thus, we anticipate that when challenge stressors are stable, their level will be indirectly associated with stress levels via their influence on anticipation (positive) and subsequent (a) challenge appraisals (positive) and (b) hindrance appraisals (negative). Alternatively,
we expect that when challenge stressors fluctuate, the degree of this change will be indirectly associated with stress levels via its influence on anticipation (negative) and subsequent (a) challenge appraisals (negative) and (b) hindrance appraisals (positive).

**Hypothesis 13**: Challenge stressor patterns across time periods will be associated with perceived stress levels such that (a) when challenge stressors fluctuate, the degree of change will demonstrate a positive indirect effect on perceived stress levels through stressor anticipation and challenge stressor appraisal and (b) when challenge stressors are stable, stressor level will demonstrate a negative indirect effect on perceived stress levels through stressor anticipation and challenge appraisals.

**Hypothesis 14**: Challenge stressor patterns across time periods will be associated with perceived stress levels such that (a) when challenge stressors fluctuate, the degree of change will demonstrate a positive indirect effect on perceived stress levels through stressor anticipation and hindrance stressor appraisal and (b) when challenge stressors are stable, stressor level will demonstrate a negative indirect effect on perceived stress levels through stressor anticipation and hindrance appraisals.

**Method**

**Sample and procedure.** For Study 2, we received IRB approval from the University of Nebraska – Lincoln (IRB# 20170917328 EP; Leader-Subordinate Effectiveness in the Workplace). Data for this study were collected from employees (and their supervisors) of a public university in the United States. We collected employee data across three waves. All surveys were administered online. In the first survey, we assessed demographic information and challenge stressors. The second survey (approximately three weeks later) included our measure of stressor anticipation, as well as a measure of challenge stressors that allowed us to assess change in between measurements. Approximately three weeks after that, the third survey assessed challenge and hindrance appraisals, as well as levels of experienced stress. Approximately one week after the third survey, we asked employees’ supervisors to complete a survey rating their employees’ performance. To ensure high response rates, organizational leaders encouraged participation via e-mail. We also incentivized participation through a raffle of gift certificates of varying values (i.e., $5, $10, $20, and $50). Using organizational records, we identified 945 employees nested within 126 supervisors. Of those, 423 employees completed the Time 1 survey, 346 completed the Time 2 survey, and 342 completed the Time 3 survey, for an average response rate of 39% within 102 clusters. Seventy supervisors provide complete data (56%). We excluded participants who worked less than 10 hr per week to ensure that they had sufficient opportunities to experience levels of workload applicable to employed populations. Twenty-two employees failed at least one attention check across the surveys and were thus excluded from further analyses. Finally, 27 employees were excluded for other data quality concerns (e.g., some subjects indicated that the questions in the surveys were not relevant to their work so they uniformly responded “3” or “5” across scales; other employees changed jobs during the survey).

Our final sample (utilizing a FIML approach, see Little & Rubin, 2002) consisted of 325 employees across 102 clusters. Participants were 71% female, an average of 31 years old, and had around seven years’ working experience. On average, they worked 31 hr a week in their current positions.

**Measures.** For all Study 2 measures, respondents were asked to report on experiences “During the past 3 weeks.” Challenge stressors were measured (at Times 1 and 2) using a five-item scale from LePine et al. (2016); participants were asked to use a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) to indicate their agreement with statements such as “My job has required me to work very hard.” Reliabilities were .85 (Time 1) and .88 (Time 2).

Stressor anticipation was measured using an adapted version of the challenge stressor scale above (also composed of five items). Instead of reporting on stressor levels, individuals reported on their capability to anticipate the occurrence of challenge stressors. Specifically, participants were asked to use a 5-point Likert scale (1 = not at all, 5 = extremely) to indicate how well they were able to anticipate in advance when they (e.g.) would have to work really hard.” The reliability of this scale was .94.

**Challenge and hindrance appraisals** were measured using scales from LePine et al. (2016). Participants were asked to use a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) to indicate their agreement to a total of six statements, three for each appraisal type. Sample statements were “I have felt that the demands of my job challenge me to achieve personal goals and accomplishments” (for challenge appraisals) and “I have felt that the demands of my job constrain my achievement of personal goals and development” (for hindrance appraisals). Reliabilities were .90 (challenge) and .91 (hindrance).

**Perceived stress level** was measured using a four-item version of the Bolino and Turnley (2005) measure. Participants were asked to use a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) to indicate their agreement to statements such as “I have felt stressed because of my work.” The reliability of this scale was .95.

**Task performance** was assessed using a four-item version of Williams and Anderson (1991) scale. Supervisors were asked to use a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) to indicate their agreement to statements such as “[This employee] adequately completed assigned duties.” The average reliability of this scale was .91.

**Analytical approach.** We conducted CFAs to establish the appropriateness of our proposed variable structure. We then conducted analyses as before. Our polynomial model was created using the Time 1 and Time 2 challenge stressor variables, which were used to predict stressor anticipation at Time 2. The polynomial variables and stressor anticipation were then used to predict challenge and hindrance appraisals at Time 3, with all of the above variables predicting supervisor-rated performance (at Time 4) and experienced stress (at Time 3).

As before, we calculated the effects of stable and fluctuating challenge stressors on stressor anticipation using the stability slope and change curve. These two estimates represented the a paths for calculating indirect effects. The effect of stressor anticipation on challenge and hindrance stressors comprised our two b paths, whereas the effects of challenge and hindrance stressors on supervisor-rated performance and experienced stress comprised our c paths.
As with Study 1, this approach allowed us to compare the effects of high and low levels of challenge stressors that were stable from Time 1 to Time 2, as well as the effects of stressors experienced consistently (no change from Time 1 to Time 2) versus those that were experienced inconsistently (increase or decrease across time periods). We were also able to calculate separate indirect effects for stable or fluctuating stressors by the product of the appropriate paths, and using a parametric approach to calculate a 95% confidence interval for the same.

**Results**

**Preliminary analyses.** Prior to testing our hypotheses, we conducted a CFA, using the same approach as in Study 1, for the variables measured from the employee perspective. Our hypothesized structure consisted of six factors (challenge stressors at two time points, stressor anticipation, challenge and hindrance appraisals, and stress level). This proposed factor structure fit the data reasonably well (CFI = .93; RMSEA = .05; SRMR = .06). A series of alternative five-factor models did not achieve similarly good fit (see Table 4 for a summary of alternative models).

Table 5 reports means, standard deviations, and correlations among study variables. As in Study 1, Time 1 challenge stressors correlated with Time 2 challenge stressors levels, \( r = .69, p < .01 \). Challenge stressor levels were positively associated with stressor anticipation (\( r = .19, p < .01 \)) and \( r = .28, p < .01 \) for Time 1 and Time 2, respectively). Challenge appraisals were positively associated with task performance, \( r = .13, p < .05 \), whereas hindrance appraisals were negatively associated with task performance, \( r = -.21, p < .01 \). Finally, Time 1 and Time 2 challenge stressors, as well as hindrance appraisals, were associated positively with experienced stress (\( r = .40, r = .43 \), and \( r = .39 \), respectively, \( ps < .01 \)), whereas challenge appraisals were negatively associated with experienced stress, \( r = -.35, p < .01 \).

Before conducting hypotheses tests, we evaluated the basic form of the relationship of Time 1 and 2 challenge stressors to stressor anticipation and appraisals, to investigate the overall relationship between stressor change and these mediating variables. Overall, challenge stressor change was associated with lower levels of anticipation and challenge appraisals (\( \gamma = -.84, p < .01 \)) and \( \gamma = -.92, p < .01 \), respectively) and higher levels of hindrance appraisals (\( \gamma = 1.25, p < .01 \)). Challenge stressors experienced consistently were positively related to stressor anticipation (\( \gamma = .42, p < .01 \)). In summary, the effects were as expected (see Table 6 and Figures 5 and 6).

**Hypothesis tests.** Hypothesis 9 predicted that individuals will be better able to anticipate the occurrence of challenge stressors when challenge stressors are stable across time periods versus when challenge stressor levels fluctuate over time. As shown in Table 6, multilevel modeling results and tests of the response surface along the change and stability lines suggest negative curvature along the change line for stressor anticipation (estimate = -.62, \( p < .05 \)). To interpret these results, we used the coefficient estimates to plot the overall response surfaces as shown in Figure 7. The surface along the change line is curved upward as expected (a convex surface), implying that stressor anticipation perceptions are increasing as challenge stressor values become more consistent over time. In sum, individuals were better able to anticipate their environment when their experienced challenge stressor levels were stable across time periods, compared with periods in which their challenge stressor levels fluctuated. Hence, Hypothesis 9 was supported.

In Hypothesis 10, we predicted that when individuals experience high and stable levels of challenge stressors across time periods, they will report higher levels of stressor anticipation than they would during periods in which they experience low and stable levels of challenge stressors. As shown in Table 7 (and represented graphically in Figure 7), there was a positive slope along the stability line for this effect (estimate = .45, \( p < .01 \)). This means that, when challenge stressors are stable from week to week, higher levels of challenge stressors are associated with increased reports of stressor anticipation compared with stable but relatively lower levels of challenge stressors. Hypothesis 10 was thus supported.\(^8\)

Hypotheses 11 and 13 referred to the indirect effects of challenge stressor fluctuations and stability on supervisor-rated performance and perceived levels of experienced stress (respectively) through stressor anticipation and challenge appraisals. Results are presented in Table 7 (see the Response Surface Characteristics section for \( a \) paths, and the Mediators section for \( b \) and \( c \) paths). As mentioned above, fluctuating challenge stressors were negatively associated with stressor anticipation, while stable challenge stressors were positively associated with the same. Stressor anticipation, in turn, was positively associated with challenge appraisals (\( \gamma = .14, p < .05 \)), which were then associated with lower levels of experienced stress (\( \gamma = -.43, p < .01 \)). Challenge appraisals were not associated with supervisor-rated performance (\( \gamma = .01, ns \)). Accordingly, as shown in Table 8, the indirect effects of challenge stressor fluctuation and stability via stressor anticipation and challenge appraisals included zero for task performance (respectively, 95% CI \([-0.303, 0.179]\) and 95% CI \([-0.098, 0.019]\)).

Thus, Hypothesis 11 was not supported. However, in support of Hypothesis 13, the indirect effects of challenge stressors via stressor anticipation and challenge appraisals on experienced stress did not include zero (95% CI \,[.0028, .1375] and 95% CI \,[-.0610, -.0010] for fluctuating and stable stressors, respectively).

Hypotheses 12 and 14 referred to the indirect effects of challenge stressor fluctuation and stability on supervisor-rated performance and experienced stress (respectively) through stressor anticipation and hindrance appraisals. Results are presented in Table 7. Stressor anticipation was negatively associated with hindrance appraisals (\( \gamma = -.17, p < .05 \)), which were associated with lower levels of performance (\( \gamma = -.21, p < .05 \)) and higher levels of experienced stress (\( \gamma = .29, p < .01 \)). As shown in Table 8, the indirect effects of challenge stressor fluctuation and stability via stressor anticipation and hindrance appraisals did not include zero for supervisor-rated performance or experienced stress (95% CI \,[-.0746, -.0001] and 95% CI \,[.0005, .0865] respectively). Likewise, the indirect effects for the effect of challenge stressor fluctuation via stressor anticipation and challenge appraisals on experienced stress did not include zero (95% CI \,[.0007, .0473] and 95% CI \,[-.0007, -.0001] and 95% CI \,[.0005, .0865] respectively).
CI [−0.555, −0.018] for fluctuating and stable stressors, respectively. Hypotheses 12 and 14 were thus, fully, supported.\(^{10}\)

**Discussion**

Study 2 addressed several of Study 1’s limitations. For example, in Study 2 we examined mediators that were specific to our theory about stressor anticipation and appraisals. Thus, Study 2 went beyond replicating and extending Rodell and Judge (2009) to consider specific mechanisms that explain why and how fluctuating (vs. stable) challenge stressors have different effects on employee outcomes via a process which involves anticipation and appraisal of challenge stressors. We also demonstrated how stable and high stressors are still more aversive than stable and low stressors, a finding in line with the broader literature. Importantly, our Study 2 findings provide additional evidence that the effects of challenge stressors are temporally bounded, indicating that when challenge stressors are experienced in a consistent way from one time period to the next, they exert a more positive influence on employees vis-à-vis lower stress levels and increased performance, whereas challenge stressors which are experienced in an inconsistent way from one time period to the next exert a more negative influence on employees vis-à-vis increased stress levels and reduced performance.

In addition to providing a more direct test of our theory, in Study 2 we were able to link challenge stressor change (i.e., whether challenge stressors are stable or fluctuating over time), stressor anticipation, and challenge/hindrance appraisals to supervisor ratings of job performance. Our results indicated that challenge stressor stability (change) has an indirect, positive (negative) relationship with supervisor ratings of performance via stressor anticipation and hindrance appraisals. These findings complement Study 1’s results by (a) providing evidence that challenge stressors are more likely to be appraised as hindrances when they are more difficult to anticipate and (b) indicating that the effects of challenge stressors on important work outcomes change from positive to negative when they are experienced inconsistently across time periods. Moreover, by demonstrating that these negative effects exist for both self (Study 1) and supervisor (Study 2) ratings of performance, we were able to assuage concerns about biases that might link the dependent variable (i.e., job performance) to employee stress perceptions.

Beyond addressing these limitations, in Study 2 we expanded the criterion space of our model by considering how challenge stressor fluctuations affect perceived levels of stress experienced by respondents via stressor anticipation and challenge/hindrance appraisals. In so doing, we were able to demonstrate that, when

---

**Table 4**

*Confirmatory Factor Analysis (Study 2)*

<table>
<thead>
<tr>
<th>Model</th>
<th>(\chi^2)</th>
<th>df</th>
<th>CFI</th>
<th>RMSEA</th>
<th>SRMR</th>
<th>AIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Six factors: Proposed</td>
<td>536.66</td>
<td>255</td>
<td>0.93</td>
<td>0.05</td>
<td>0.06</td>
<td>17276.97</td>
</tr>
<tr>
<td>Five factors: Appraisal variables combined</td>
<td>860.33</td>
<td>260</td>
<td>0.85</td>
<td>0.07</td>
<td>0.09</td>
<td>17734.81</td>
</tr>
<tr>
<td>Five factors: Hindrance appraisal &amp; stress combined</td>
<td>1009.85</td>
<td>260</td>
<td>0.81</td>
<td>0.08</td>
<td>0.09</td>
<td>17952.18</td>
</tr>
<tr>
<td>Five factors: Challenge stressors/appraisal combined</td>
<td>974.89</td>
<td>260</td>
<td>0.82</td>
<td>0.07</td>
<td>0.12</td>
<td>17882.86</td>
</tr>
<tr>
<td>One factor: All variables combined</td>
<td>2848.09</td>
<td>270</td>
<td>0.36</td>
<td>0.14</td>
<td>0.21</td>
<td>20752.27</td>
</tr>
</tbody>
</table>

*Note. N = 325; CFI = comparative fit index; RMSEA = root mean squared error of approximation; SRMR = standardized root mean squared residual; AIC = Akaike information criterion.*

---

Although not explicitly hypothesized, stressor change also had indirect effects on the DVs via challenge and hindrance appraisals (i.e., through direct paths instead of through stressor anticipation). In addition, we estimated initial indirect effects to appraisal through anticipation. These were all in the expected direction, with stressor change being associated with increased stress (via hindrance and challenge appraisals) and reduced performance (via hindrance appraisals). Stressor stability was positively associated (and change negatively) with challenge appraisal, with the reverse being true of hindrance appraisals. These effects are summarized in Table 8.

**General Discussion**

Across two studies, results supported our theory, indicating that when challenge stressors fluctuate across time periods, they have negative indirect effects on performance and well-being outcomes. In contrast, when employees experience a stable pattern of challenge stressors, challenge stressor level has positive indirect effects on employee outcomes. Importantly, our findings call into question the assumption that challenge stressors always have a net positive impact on individual and organizational outcomes. The results of the current study indicate that when challenge stressors are considered within the temporal context in which they occur, how we interpret their effects changes. That is, our results indicate that the benefits of challenge stressors may outweigh their costs, but only when challenge stressors are stable and, therefore, predictable. Notably, our research suggests that the costs of challenge stressors might outweigh their benefits when they fluctuate from one time period to the next, thus identifying a qualifying condition that should be taken into account by work stress researchers going forward.
Theoretical Contributions
In recent years, work stress scholars have shown a growing appreciation of time and its relevance for individuals and organizations. For example, echoing Zapf, Dormann, and Frese’s (1996) call for truly longitudinal research, Kelloway and Francis (2013) declared that “it is clear that longitudinal methods are increasingly necessary to explore and explain pertinent constructs and relationships” in work stress research (p. 391). Likewise, Ganster and Rosen (2013) called for research that considers how employees respond in different ways to chronic versus acute (e.g., episodic) exposure to workplace stressors.

Despite increased awareness of temporal issues, challenge stressor research continues to neglect the role of time. According to George and Jones (2000), this is a serious issue for the challenge stressor literature given their assertion that research that fails to incorporate time is difficult to defend from a theoretical perspective. The present study addresses this issue by using transactional stress theory to make predictions about how different patterns of challenge stressors have positive indirect effects on task performance and stressor-strain relationships. The majority of existing research takes the perspective that stressors and their subsequent effects accumulate over time (Ganster & Rosen, 2013). Yet, in line with transactional stress theory’s notions of predictability and anticipatory coping, we theorized and found that after accounting for past and current levels of challenge stress, temporal fluctuations among individuals’ challenge stressor experiences affected how these stressors relate to various outcomes (i.e., Study 1 showed that fluctuations among individuals’ challenge stressors impacted the extent to which they felt attentive and anxious which, in turn, influenced task performance, OCB, and CWB levels, whereas Study 2 demonstrated that fluctuations among individuals’ challenge stressors impacted stressor anticipation and appraisals which, in turn, influenced task performance and stress levels).

Together, our results expand on those of Rodell and Judge (2009), who reported countervailing indirect effects of challenge stressors on performance through attentiveness and anxiety alongside positive indirect effects of challenge stressors on CWB through anxiety. Consistent with Rodell and Judge (2009), our results indicated that challenge stressors are beneficial to employees when they are experienced consistently from one time period to the next. In particular, Study 1 results showed that challenge stressors have positive indirect effects on task performance and

Table 5
Descriptive Statistics and Within-Group Correlations Among Study 2 Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Current challenge stressors</td>
<td>3.54</td>
<td>.86</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Past challenge stressors</td>
<td>3.52</td>
<td>.81</td>
<td>.69**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Stressor anticipation</td>
<td>3.17</td>
<td>.97</td>
<td>.28**</td>
<td>.19**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Challenge appraisals</td>
<td>3.76</td>
<td>.90</td>
<td>.08</td>
<td>.09</td>
<td>.22**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Hindrance appraisals</td>
<td>2.22</td>
<td>.98</td>
<td>.11</td>
<td>.25**</td>
<td>-.15**</td>
<td>-.51**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Supervisor-rated performance</td>
<td>4.06</td>
<td>.96</td>
<td>-.10</td>
<td>-.03</td>
<td>.01</td>
<td>.13</td>
<td>-.21**</td>
<td></td>
</tr>
<tr>
<td>7. Experienced stress</td>
<td>2.69</td>
<td>1.19</td>
<td>.43**</td>
<td>.40**</td>
<td>-.03</td>
<td>-.35</td>
<td>.39**</td>
<td>-.09</td>
</tr>
</tbody>
</table>

Note. N = 325.  
*p < .05.  **p < .01.

Table 6
Effects of Past and Current Challenge Stressors on Anticipation and Appraisals (Study 2)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Stressor</th>
<th>Challenge</th>
<th>Hindrance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>anticipation</td>
<td>appraisals</td>
<td>appraisals</td>
</tr>
<tr>
<td>Coefficients</td>
<td>γ</td>
<td>SE</td>
<td>γ</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.17</td>
<td>.07</td>
<td>3.76</td>
</tr>
<tr>
<td>Challenge stressor variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current challenge stressors</td>
<td>−.05</td>
<td>.16</td>
<td>.00</td>
</tr>
<tr>
<td>Past challenge stressors</td>
<td>−.12</td>
<td>.13</td>
<td>−.18</td>
</tr>
<tr>
<td>Current challenge stressors</td>
<td>−.29**</td>
<td>.15</td>
<td>−.32**</td>
</tr>
<tr>
<td>Past challenge stressors squared</td>
<td>−.29**</td>
<td>.09</td>
<td>−.32**</td>
</tr>
<tr>
<td>Response surface characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stability slope</td>
<td>.42**</td>
<td>.14</td>
<td>.25</td>
</tr>
<tr>
<td>Change slope</td>
<td>−.53**</td>
<td>.23</td>
<td>−.24</td>
</tr>
<tr>
<td>Stability curvature</td>
<td>.03</td>
<td>.10</td>
<td>−.08</td>
</tr>
<tr>
<td>Change curvature</td>
<td>−.44**</td>
<td>.30</td>
<td>−.92</td>
</tr>
</tbody>
</table>

Note. N = 325.  
*p < .05.  **p < .01.
OCBs when the challenge stressor pattern was stable across weeks and when levels of challenge stress were relatively high. Study 2 yielded similar results, indicating that when the challenge stressor pattern was stable and when the levels of challenge stress were relatively high, challenge stressors have (a) positive indirect effects on task performance and (b) negative indirect effects on stressor appraisal levels.

With regard to explanatory mechanisms, in Study 1 we simultaneously modeled mediators of challenge stressors (i.e., anxiety and attentiveness) that were considered by Rodell and Judge (2009), while considering how these indirect effects were influenced by the temporal context. This approach allowed us to evaluate the benefits (and costs) of challenge stress vis-à-vis their conditional indirect effects on work behaviors. Taken together, our results indicated that high (compared with low) challenge stressors, when experienced at stable levels from week to week, offer a net benefit (i.e., higher task performance and OCB, lower CWB) through their influence on attentiveness. In contrast, when challenge stressors fluctuate (as opposed to being stable) from week to week, individuals are more anxious and less attentive, which results in more negative behavioral outcomes (i.e., reductions in performance and OCB, increases in CWB).

In Study 2 we measured and modeled a different set of mediators (i.e., stressor anticipation and appraisal), while considering how the indirect effects were influenced by the temporal context. We focused on these mediators because they more directly align with our theory, which suggests that being able to anticipate challenge stressors plays an important role in determining how such stressors influence employee outcomes. As predicted, when experienced at consistent and stable levels across time periods, high (compared with low) challenge stressors offered a net benefit (i.e., higher task performance via stressor anticipation and hindrance appraisals; lower stress levels via stressor anticipation and challenge and hindrance appraisals). However, when challenge stressors fluctuate (compared with when they are stable) across time periods, they offer a net loss (i.e., lower task performance via stressor anticipation and hindrance appraisals, higher stress levels via stressor anticipation and challenge and hindrance appraisals). Thus, the results of our studies indicate that considering the temporal

Figure 5. Effects of current and past challenge stressors on challenge appraisals (Study 2). See the online article for the color version of this figure.
context is critical to understanding the processes by which challenge stressors influence employee outcomes.

This set of findings indicates that challenge stressor levels may not be fully responsible for explanations of the relationship between challenge stressors and employee outcomes. That is, beyond past and present levels of perceived challenge stressors, fluctuations in challenge stressors across subsequent time periods appear to reflect meaningful variation that can impact emotions and appraisals that influence employee outcomes. These findings imply that, even when an individual’s current level of challenge stress is relatively low, s/he may demonstrate lower levels of performance and higher levels of stress when the current challenge stressor level is perceived to be more or less than that experienced in the previous time period, due to the impact of such stressors on attentiveness and anxiety (Study 1) and stressor anticipation and appraisals (Study 2). Hence, our work sheds light on the theoretical importance of challenge stressors’ relative nature and yields insight that enhances our knowledge and understanding of when, how, and why challenge stressors relate to more positive (vs. negative) outcomes.

Our study also advances the broader stress literature by using a novel multilevel polynomial regression approach to help comprehensively understand the effects of stressor patterns. Although repeated measurements have been used to explore challenge-hindrance stressor effects, this research has tended to use longitudinal data to demonstrate a particular process (i.e., variable sequence) as opposed to considering how the temporal context may be used to advance a more nuanced theoretical perspective. Our methodological approach allowed us to explore consequences of challenge stressor (in)consistency, thereby providing the literature with an initial understanding of how individuals’ previous and present levels of experienced challenge stress may better predict outcomes beyond present levels alone. Such a notion is consistent with Shipp and Jansen’s (2011) observation that “a past experience provides the standard against which current experiences are evaluated” (p. 87). Moreover, our findings further support the observation that it is important to consider the temporal context because it can change how constructs and their relationships are conceptualized and provide insight into how theoretically derived propositions (e.g., various forms of eustress such as challenge stressors

Figure 6. Effects of current and past challenge stressors on hindrance appraisals (Study 2). See the online article for the color version of this figure.
are generally beneficial to individuals) should be amended (George & Jones, 2000).

Finally, our results have implications beyond the stress literature. The present study suggests that challenge stressor patterns are theoretically important and capture meaningful variance in employees’ reactions to challenge stressors, a notion consistent with the more general literature of time and temporal issues (e.g., George & Jones, 2000; Shipp & Jansen, 2011). One may begin to speculate on what other literature streams might gain by more carefully exploiting the concepts of event fluctuations and (un)predictability over time. For example, the leadership literature conceptualizes leader-follower interactions as a series of recurring, offset patterns as an explicit part of their future investigations of past experiences, it would behoove scholars to consider onset and indicate that present workplace experiences are bounded within patterns experienced over time. Given our findings, which suggest that present workplace experiences are bounded within past experiences, it would behoove scholars to consider onset and offset patterns as an explicit part of their future investigations of within-person phenomena (Mitchell & James, 2001).

As scholars begin to use increasingly rich longitudinal data to test comprehensive models (inclusive of temporal context), we may find that past practical implications need revisiting if earlier conclusions change after being examined through a temporal lens. It is for this reason that McCormick, Reeves, Downes, Li, and Ilies (2018, p. 24) plead for scholars to “theorize about the importance of fluctuation over time.” One potential barrier, however, is that existing theory may not be temporally sophisticated enough to offer insight into the nature of within-construct change over time, requiring researchers to potentially develop new theory to support more nuanced temporal predictions. The current study, with its emphasis on the temporal context surrounding the experience of challenge stressors over time, stands to provide some of the necessary structure currently lacking in the literature.

**Practical Implications**

In light of recommendations that managers increase employees’ level of challenge stressors (Hargrove et al., 2013; LePine et al., 2005; Lin et al., 2015), our results reveal an important boundary condition that qualifies these previous recommendations. If, as our results suggest, certain conditions (e.g., inconsistency) diminish the benefits of challenge stressors, then those factors should be considered by managers when increasing employees’ responsibilities, establishing deadlines, and providing opportunities for growth. Thus, the current research provides guidance to managers seeking to create challenging opportunities for employee growth by identifying more (vs. less) optimal ways of presenting challenge stressors to employees—namely, providing consistent and predictable opportunities for learning and achievement.

More broadly, our findings suggest that managers should engage in practices that ensure stability and predictability in the work context. This is consistent with justice research, which indicates that employees respond favorably to organizational policies and procedures when applied consistently across people and time (e.g., Colquitt et al., 2013; Matta et al., 2017). Likewise, our findings complement research on expectancy theory, which suggests that employees will be more motivated when they can predict, or anticipate, the linkages between their effort and performance and...
the rewards that high performance will reap. Thus, managers should recognize that employees experience more positive outcomes when they can anticipate work demands and stress experiences from week to week. Importantly, our findings indicate that volatility, even when outcomes are positive (e.g., an unexpected promotion or additional job responsibilities), has the potential to offset the benefits of positive work experiences.

Limitations and Future Directions

The contributions of our research should be considered in light of its limitations. One limitation is that in Study 1 we relied on self-reports for assessing the focal constructs, leaving common method variance (CMV) as a potential concern. However, we adopted procedural remedies (e.g., we examined relationships among time-lagged variables and minimized the scale properties shared by measures) to limit potential effects of CMV (Podsakoff, MacKenzie, & Podsakoff, 2012). In addition, although method bias may have inflated observed linear effects, several of our hypotheses (and overall model tests) were based on a variety of nonlinear and interactive effects. Monte Carlo studies conducted by Evans (1985) indicated that artifactual interactions cannot be created but true interactions can be attenuated (see also Siemsen, Roth, & Oliveira, 2010). Thus, it is unlikely that our results are attributable to CMV.

Second, we did not consider other environmental, social, or personal factors in our tests. Whereas not doing so provides for a parsimonious model, it is conceivable that the relationship between different patterns of challenge stressors and participants’ performance-related behaviors may have been affected by other factors (cf. Bacharach & Bamberger, 2007). These include individual differences, such as resilience (Vanhove, Herian, Perez, Harms, & Lester, 2016), psychological hardiness (Cole & Bruch, 2006), and temporal focus (Shipp, Edwards, & Lambert, 2009), as well as characteristics of one’s job, such as the prevailing workplace climate (Agervold & Mikkelsen, 2004), support and interpersonal resources provided by managers and coworkers (Bakker & Demerouti, 2007), and overall levels of autonomy and control (Fernet, Guay, & Senécal, 2004). Incorporating these or other theoretically relevant factors into our conceptual model represents a fruitful direction for future research.

Figure 7. Effects of current and past challenge stressors on stressor anticipation (Study 2). See the online article for the color version of this figure.
Table 8
Summary of Indirect Effects (Study 2)

<table>
<thead>
<tr>
<th>Effect</th>
<th>Challenge appraisals</th>
<th>Hindrance appraisals</th>
<th>Supervisor-rated performance</th>
<th>Experienced stress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LL</td>
<td>UL</td>
<td>LL</td>
<td>UL</td>
</tr>
<tr>
<td>Indirect effects of stable stressor level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Via anticipation</td>
<td>.0060</td>
<td>.1550</td>
<td>-.1741</td>
<td>-.0146</td>
</tr>
<tr>
<td>Via challenge appraisals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Via hindrance appraisals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Via anticipation and challenge appraisals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Via anticipation and hindrance appraisals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect effects of stressor fluctuation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Via anticipation</td>
<td>-.2731</td>
<td>-.0041</td>
<td>.0991</td>
<td>.3000</td>
</tr>
<tr>
<td>Via challenge appraisals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Via hindrance appraisals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Via anticipation and challenge appraisals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Via anticipation and hindrance appraisals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. N = 325. LL and UL refer to the lower and upper levels of a 95% confidence interval. Bold text indicates that confidence interval does not include zero.

A third limitation was our measurement of challenge stressors across weeks. Prior research has generally considered challenge stress as a static phenomenon (for an exception, see Rodell & Judge, 2009). We felt that there were advantages to considering challenge stressors from week to week. For instance, looking at the phenomenon weekly for eight consecutive weeks (in Study 1) allowed us to take a more representative sample of challenge stressors as experienced over time. Nonetheless, it would behoove future researchers to consider whether the observed effects of challenge stressor patterns are different when those patterns are considered over shorter (i.e., daily) versus longer (i.e., monthly or annually) periods of time. A potential advantage of this approach is that it may allow scholars to differentiate the processes through which employees adapt and change as a result of exposure to chronic versus acute stressors.

Finally, although our Study 1 results are consistent with our theory, which suggests that anxiety and attentiveness are felt (at least in part) in response to challenge stressor exposure, we acknowledge that the measures included in our study may not fully reflect emotional responses to challenge stressor exposure. In particular, our measures of anxiety and attentiveness did not capture responses toward a specific object or event, bringing into question the extent to which these emotional states were experienced as a result of exposure to challenge stressors. That said, our measures were consistent with Rodell and Judge (2009), who also did not consider emotions experienced in response to a specific event, but rather focused on emotions experienced during the same timeframe as challenge stressors. Moreover, the measures we used were intended to capture transient affective states, which can occur over days or weeks—this is consistent with Watson and Clark’s (1994) validation efforts that indicate similar results when emotional states are assessed daily versus weekly. Nonetheless, it is possible that the effects of challenge stressors might be explained by more enduring moods, rather than the emotional states identified in the current and past (e.g., Rodell & Judge, 2009) research. Thus, we encourage future scholars to consider the extent to which reactions to challenge stressors are driven by short and vivid reactions (i.e., emotions) versus more enduring and diffuse affective reactions (i.e., moods).

Conclusion

The present study developed and tested predictions regarding how employees are affected by consistency and fluctuations in challenge stressors. As noted by Sonnentag and colleagues (2014), “the question of how stressors are mapped to time (i.e., how they occur over the course of time) has been largely unexplored” (p. 131). Thus, a primary contribution of the current research is that it demonstrates the unique perspective that can be gained by focusing on temporal aspects of the psychological experience that underlie the exposure to challenge stressors over time. In particular, our findings reveal a situation in which considering the temporal context can influence whether the overall impact of challenge stressors on employees is positive or negative. In keeping with the transactional model of stress, we suggest that future researchers consider work stress as a dynamic process that evolves over time so as to further our understanding of how affective and behavioral reactions to workplace stressors manifest.

References


Bacharach, S., & Bamberger, P. (2007). 9/11 and New York City firefighters’ post hoc unit support and control climates: A context theory of the consequences of involvement in traumatic work-related events. Academy...


Received May 28, 2018
Revision received December 12, 2019
Accepted December 16, 2019

Members of Underrepresented Groups: Reviewers for Journal Manuscripts Wanted

If you are interested in reviewing manuscripts for APA journals, the APA Publications and Communications Board would like to invite your participation. Manuscript reviewers are vital to the publications process. As a reviewer, you would gain valuable experience in publishing. The P&C Board is particularly interested in encouraging members of underrepresented groups to participate more in this process.

If you are interested in reviewing manuscripts, please write APA Journals at Reviewers@apa.org.

Please note the following important points:

- To be selected as a reviewer, you must have published articles in peer-reviewed journals. The experience of publishing provides a reviewer with the basis for preparing a thorough, objective review.

- To be selected, it is critical to be a regular reader of the five to six empirical journals that are most central to the area or journal for which you would like to review. Current knowledge of recently published research provides a reviewer with the knowledge base to evaluate a new submission within the context of existing research.

- To select the appropriate reviewers for each manuscript, the editor needs detailed information. Please include with your letter your vita. In the letter, please identify which APA journal(s) you are interested in, and describe your area of expertise. Be as specific as possible. For example, “social psychology” is not sufficient—you would need to specify “social cognition” or “attitude change” as well.

- Reviewing a manuscript takes time (1–4 hours per manuscript reviewed). If you are selected to review a manuscript, be prepared to invest the necessary time to evaluate the manuscript thoroughly.

APA now has an online video course that provides guidance in reviewing manuscripts. To learn more about the course and to access the video, visit http://www.apa.org/pubs/journals/resources/review-manuscript-ce-video.aspx.