When stressors make you work: Mechanisms linking challenge stressors to performance

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When stressors make you work: Mechanisms linking challenge stressors to performance

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ABSTRACT

Based on previous empirical findings, “challenge stressors” (Cavanaugh, Boswell, Roehling, & Bouderau, 2000; Lepine, Podsakoff, & Lepine, 2005), such as the amount and scope of responsibility, can be loosely considered as “good stressors” that are consistently and positively related to job satisfaction and performance. We introduce the role of appraisal to further examine how challenge stressors are connected to performance. Structural equation modelling analyses using an applied sample of 284 employee–supervisor dyads showed that affective commitment to the organization mediated the relationship between both opportunity and threat appraisal and performance (in-role and extra-role). The mediating role of increased psychosomatic distress was supported only for the relationship between threat appraisal and in-role performance. The findings indicate the importance of taking into account the actual appraisal of “challenge stressors”, as it carries implications for performance, and reveals the key role of affective commitment and induced distress mechanisms in this relationship. In conclusion, “challenge stressors” are not always positively related to performance, but only when they are perceived as opportunities.

INTRODUCTION

The study of work stress examines the process of perceiving, appraising and responding to adverse or challenging job demands at work (Frese & Zapf, 1988). The present study examines the appraisal of job stressors as opportunities or threats, and the response to these stressors in terms of increased or decreased job performance. The idea of examining increased performance is inspired by recent occupational health psychology interest on the positive potential of work stress (e.g. eustress, Nelson & Simmons, 2011). However, reviews suggest that the stressor–performance relationship is not strong and it depends on situational characteristics and individual differences (Jex, 1998; Rosen, Chang, Djurdjevic, & Eatough, 2010).

Jex’s (1998) review of the stressor–performance relationship suggested that it may be mediated by cognitions, emotions and other psychological states. More recently, Rosen et al. (2010) revealed that across different types of stressors, this relationship is small to

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moderate, depending on situational characteristics and individual differences. Moreover, the taxonomy of stressors (role, workload, situational constraints, job control, social characteristics, career-related, job conditions and acute stressors) included in these reviews suggests that there are as many categories of stressors as demands employees face in the job.

Interestingly, Cavanaugh, Boswell, Roehling and Boudreau’s (2000) parsimonious typology of stressors as hindrances (obstacles to personal growth and task accomplishment) and challenges (opportunity for personal development and achievement) has been meta-analysed in relation to job performance (Lepine, Podsakoff, & Lepine, 2005). The findings are straightforward: hindrance stressors were found to be negatively related to performance, directly and indirectly through enhanced strain and decreased motivation. Challenge stressors were related to increased performance, directly and through motivation, but indirectly related to decreased performance through strain (Lepine et al., 2005).

The main limitation that we see in any stressor taxonomy in general, and Cavanaugh et al.’s and Lepine et al.’s in particular, is that taxonomies often fail to take into account the role of subjective individual appraisals. Threat and opportunity appraisals were early theorized by Lazarus and Folkman (1984). We can appraise a threat or loss when demands exceed the resources available, but we can also appraise the situation as a challenge when seen as an opportunity for mastery, gain or personal growth. Lazarus and Folkman postulate that this appraisal depends on the resources available to face the stressor.

In the present study, we propose that certain stressors may be considered by employees as opportunities, threats, or both, depending on the characteristics of the individual and the situation. Given this conceptualization of stressor appraisal, the present study measures individuals’ primary appraisal of stressors as threats and opportunities and examines the mechanisms through which stressor appraisals relate to performance. These are the main research questions of the current study: (a) Is opportunity appraisal a positive predictor of performance? Which mechanisms link opportunity appraisal to performance? and (b) Is threat appraisal a negative predictor of performance? Which mechanisms link threat appraisal to performance?

In order to answer these questions, we examine the opportunity and threat appraisal of the challenge stressors originally put forth by Cavanaugh et al. (2000) and Lepine et al. (2005), and test two mechanisms of the stress appraisal-performance relationship: induced distress and affective commitment, depicted in Figure 1. However, before we explain these mechanisms, the next section will describe in more detail the idea of opportunity and threat appraisal.

The appraisal of threat and opportunity

First of all, in the present study, we will refer to appraisal as opportunity appraisal and threat appraisal in order to clearly distinguish our operationalization from Cavanaugh et al.’s a priori conceptualization of stressors as “challenge/hindrance stressors”. The challenge/hindrance stress line of research initiated by Cavanaugh et al. (2000) is based on certain work demands being theoretically and a priori classified as “challenge stressors” (e.g. time urgency) and others being considered “hindrance stressors” (e.g. red tape) by four judges (three graduate students and one professor) that categorized 16 items as “describing a challenge stressor, a hindrance stressor or neither/both” (p. 67–68). This a priori categorization
is described in their study in which, following the categorization process, they simply asked participants how much stress each of these work-related items was causing them (Cavanaugh et al., 2000), independently from the appraisal process carried out by the participant (i.e. how challenging or hindering these stressors were perceived).

This rigid *a priori* taxonomy has been used in the studies that examine the effects of “hindrance and challenge stressors” (e.g. Boswell, Olson-Buchanan, & LePine, 2004; LePine, LePine, & Jackson, 2004; Lepine et al., 2005; Podsakoff, LePine, & LePine, 2007). In Lepine et al.’s meta-analysis on stressors and performance, challenge stressors were coded as those measures of job/role demands, pressure, time urgency, and workload. Hindrance stressors included measures of constraints, hassles, resource inadequacy, role ambiguity, role and interpersonal conflict, role dissensus, role interference, role strain (items similar to role ambiguity), role clarity (reverse-coded), role overload, supervisor-related stress, and organizational politics. (2005, p. 767)

This coding was based on Brief and George’s (1995) assumption that individuals tend to react to stressors in consistent ways within their work contexts. However, Lepine et al.’s (2005) meta-analysis included studies performed in diverse and unrelated work contexts, suggesting that differences in appraisal among the various samples examined in the meta-analysis could exist.

We agree with Cavanaugh and colleagues when assuming that hindrance stressors are distinct situations that typically represent obstacles and threats to performance (e.g. organizational politics, job insecurity, role ambiguity) and therefore, it would be hard to find their silver lining and appraise them as challenging. These “hindrance stressors” have been found to be directly and indirectly negatively related to performance (Lepine et al., 2005), and as such we can expect that they are consistently appraised as hindrances or threats.

**Figure 1.** Results of the structural equation modelling for the applied sample. The path coefficients are standardized; *N* = 284. In-role and extra-role performance were assessed through supervisors’ ratings. Opportunity and threat appraisal, distress and ACO were measured through employees’ self-reports.
However, we disagree with Cavanaugh’s and colleagues’ assumption that “challenge stressors” (e.g. time pressure, workload or scope of responsibility) are consistently appraised as “demands, that although potentially stressful, have associate potential gains for individuals” (2000, p. 68). For instance, if we do not have the resources to finish a task on time, time pressure may be appraised as a threat that prevents success rather than a challenge. Based on previous empirical research by challenge/hindrance scholars (Cavanaugh et al., 2000; Lepine et al., 2005; Podsakoff et al., 2007), “challenge stressors” can be depicted as eustressors (borrowing the “eustress” concept coined by Selye, 1974), that drive commitment, satisfaction and ultimately performance. However, this parsimonious view of “challenge stressors” as favourable drivers of performance can potentially lead researchers and practitioners to oversight the fact that they are not innocuous (they have been found to be associated with strain as reported by Lepine et al., 2005), and furthermore, that they may not always be perceived as challenging demands that drive engagement and performance.

Actually, the original study developed by Cavanaugh et al. (2000) already presented some evidence in this direction. They found that some items (e.g. “My position presents me with conflicting demands”) did not clearly fall in either of the two categories of hindrance or challenge and discarded them. A recent study developed by Webster, Beehr and Love (2011) also provided some empirical evidence supporting the appraisal idea. They found that employees can simultaneously perceive some work stressors (role ambiguity, workload and responsibility) as both challenges and hindrances and that this primary appraisal partially mediated the relationship between these stressors and work outcomes (emotional exhaustion, physical symptoms, job dissatisfaction and turnover intentions).

In a similar direction, Drach-Zahavy and Erez (2002) found in an experiment with 155 undergraduates performing the Stock Market Prediction Task (predicting stock values of 120 companies using business data), that given the same level of goal difficulty, high performance resulted from appraising the situation as challenging, and poor performance resulted from appraising the same situation as threatening. The threat or opportunity appraisal depended on how the researchers framed the resources available to the participants in terms of the controllability of the situation. Those who were told that resources such as effort, consistency, and focus on the task were key to be successful, appraised the task as an opportunity and this facilitated their task performance. Those who were told that enrolment in a special training programme (that students had not previously enrolled in) was key to be successful, appraised the task as a threat and their performance was hampered.

In sum, empirical evidence suggests the need of taking into account appraisals when examining stressor-outcome relationships. The present study explores two potential mechanisms that link stressors and performance, taking into consideration the quality of the appraisal.

**Stressors and performance: The induced distress mechanism**

Various cognitive, health-related and motivational processes (Rosen et al., 2010) have been used to explain how work stressors are linked to performance. For instance, in the case of very specific sources of pressure such as role stressors, we can explain how they are
negatively related to performance through cognitive processes: role stress implies a lack of accurate information that prevents us from dealing with stressing demands (Tubre & Collins, 2000). However, health-related processes can be applied to all the different types of stressors. Previous empirical findings suggest that stressors are related to psychological or physiological costs. Not only cross-sectional studies, but longitudinal studies have shown strong evidence of lagged effects of stressors on physical strain symptoms, specifically, psychosomatic health complaints (Sonnentag & Frese, 2003). Given that diminished health prevents us from performing at expected levels, we propose an induced distress mechanism that links threat appraisal and performance. When employees appraise threatening demands, the distressing experience can induce psychosomatic ailments that have cognitive, affective and attentional costs that hinder their ability to perform at expected levels. In this case, distress would mediate the negative relationship between threat appraisal and performance.

On the other hand, opportunity appraisal should be negatively related to distress because given the opportunity to grow and develop, opportunity appraisal initiates a mobilization of resources process in individuals. This accumulation of resources (Hobfoll, 2002) not only facilitates the successful management of demands, but it also protects employees from the psychological or physiological costs associated with threat appraisals.

**Stressors and performance: The commitment mechanism**

The relationship between stressors and performance has been also explained through the idea of rewarding experiences. According to Vroom’s (1964) VIE framework (Valence, Instrumentality, Expectancy), the relationship between stressors and performance is based on expectancies: the “effort-to-performance” (McGrath, 1976) and “performance-to-reward” (Beehr & Bhagat, 1985) expectancies become weaker when work stressors are appraised. Similarly, the Effort-Reward Imbalance framework (Siegrist, 1996, 2002) explains how employees suffer from stress if the employer does not reward their coping efforts when facing work demands. In both situations, employees may reduce their efforts (e.g. performance) to balance the low rewards. Actually, in their first meta-analysis, LePine et al. (2005) coded a mixture of variables (expectancy, job/work motivation, effort, persistence, felt challenge and learning motivation) as “motivation” and found that this overall miscellaneous construct partially mediated the relationship between stressors coded as “challenge stressors” and performance. This finding suggests that opportunity appraisal may be related to motivating/rewarding experiences that are positively associated with job performance. Therefore, research on stress and performance would benefit from further exploring the specific mechanisms involved in that motivational process.

We propose that when stressors are appraised as opportunities – which promote performance or personal growth – they become rewarding experiences associated with a stronger commitment to the organization that makes these experiences possible. Commitment is a “force that binds an individual to a course of action” and makes employees persist “in a course of action even in the face of conflicting attitudes and motives” (Meyer & Herscovitch, 2001, p. 301). Meyer and Herscovitch argue that commitment can be distinguished from motivation and attitudinal constructs, because it can explain behaviours relevant to the organization, even when we cannot identify extrinsic motivators or positive attitudes.
Affective commitment to the organization (ACO) (e.g., Bishop & Scott, 2000; Cropanzano, Rupp, & Byrne, 2003) is a psychological state that “refers to the employee’s emotional attachment to, identification with, and involvement in the organization” (Meyer & Allen, 1991, p. 67). Work experiences have been found to be one of the best predictors of ACO (Meyer, Irving, & Allen, 1998). Meyer and colleagues argue that ACO develops when employees’ experiences are positive in terms of satisfying work or opportunities to improve valued skills. Specifically, when employees appraise stressors as opportunities, they see them as experiences that can help them grow, strengthening their commitment. We propose that the demanding but challenging aspects of opportunity appraisal fuel ACO, triggering the mechanism that makes employees persist in their jobs, even in stressful conditions, thus facilitating performance.

Correspondingly, threat appraisal would be related to diminished performance, not only through induced distress, but also through a weakened ACO. Cropanzano et al. (2003) revealed that the experience of emotional exhaustion (the core dimension of the burnout syndrome, a long-term negative stress reaction) signals the employee that working for the organization is not worthwhile in terms of benefits (exhaustion is a cost that overrides the employment benefits), and that employer actions towards the employee are unfair (the employer overworks the employee), thus affecting performance and turnover intentions. They found empirical support in two field studies in which reduced organizational commitment mediated the relationship between emotional exhaustion and effective work behaviours.

Actually, previous meta-analytic research (Podsakoff et al., 2007) has found that the positive relationships between hindrance stressors and turnover and withdrawal indicators were mediated in part by reduced organizational commitment. Following empirical and meta-analytic evidence, we propose that threat appraisal, which impede gains and task accomplishment, is negatively associated with organizational commitment hindering performance.

The present study

To summarize, the present study aims to address two main gaps in the literature: (a) the need to empirically examine the opportunity and threat appraisal of “challenge stressors” as initially classified by Cavanaugh et al. (2000), and (b) the need to find explanatory mechanisms for their negative and positive relationships to performance. The following hypotheses are proposed:

1. **Hypothesis 1**: Distress will at least partially mediate the relationship between threat appraisal and performance: threat appraisal will be positively related to distress and distress will be negatively related to (a) in-role and (b) extra-role performance.
2. **Hypothesis 2**: Distress will at least partially mediate the relationship between opportunity appraisal and performance: opportunity appraisal will be negatively related to distress and distress will be negatively related to (a) in-role and (b) extra-role performance.
3. **Hypothesis 3**: Affective commitment to the organization (ACO) will at least partially mediate the relationship between threat appraisal and performance: threat appraisal will be negatively related to ACO and ACO will be positively related to (a) in-role and (b) extra-role performance.
4. **Hypothesis 4**: ACO will at least partially mediate the relationship between opportunity appraisal and performance: opportunity appraisal will be positively related to ACO and ACO will be positively related to (a) in-role and (b) extra-role performance.
Method

Participants and procedure

Research assistants at one of the authors’ research lab contacted over 500 participants from a diverse sample of organizations using convenience sampling. Employees were contacted first, and if they agreed to participate, the assistant asked the supervisor for participation in the study. The employee survey and the supervisor evaluation form were administered in person by the research assistants. Confidentiality was guaranteed, and identification information was removed once the data were paired. Our final sample comprised 284 employee–supervisor dyads (55.5%) who consented to participate (i.e. both the employee and supervisor agreed to complete the respective surveys) and provided complete data.

The participants’ organizational settings included: sales and marketing (22%), education (16%), healthcare services (13%), consultancy companies (10%), civil protection and police (6%), restaurant industry (6%), among others. Organizational size ranged from less than 10 employees (20%), between 10 and 100 employees (38%), and over 100 employees (42%). The number of dyads per organization ranged between 1 and 32 (mean = 3.0) and supervisors rated on average two subordinates (71% of supervisors rated only one subordinate). Subordinate’s tenure with the supervisor was distributed as follows: 14.4% less than six months; 17.6% between six months and one year; 41.2% between one and five years; 20.1% between 5 and 10 years; 5.3% between 10 and 20 years; 1.4% over 20 years. The majority of subordinates worked in the same organization for more than five years (64%). Average age was 33.4 years and 63% were female. Education was as follows: 12% less than a high school diploma, 34% high school diploma; 54% university degree. Concerning supervisors, the average age was 40.0 years, the majority worked in the same organization for more than five years (65%) and were female (65%). Supervisor’s education was as follows: 6% less than a high school diploma, 21% high school diploma; 73% university degree.

Measures

Opportunity and threat appraisal measures: Overview of measurement development

In order to contribute to previous research on the challenge/hindrance framework, we examined individual appraisals with exactly the same specific stressors that have been previously used to measure “challenge stressors” in a sample of first-year undergraduate students. A sample of 334 undergraduate students enrolled in a first-year introductory Psychology course of a north-eastern university participated in two different online surveys separated by a time lag of a month and a half to test the relationship between appraisal of stressors (i.e. when they were not yet fully immersed in stressful academic situations at the beginning of their first semester in September) and experienced academic distress when students were actually dealing with their academic demands in terms of final exams and assignment deadlines (i.e. by the end of the semester in November). The gender composition of this subsample was 72% female and the average age was 18.62 (SD = 1.49).

We used LePine et al.’s (2004) academic challenge stress items (adapted from Cavannaugh et al., 2000) to generate a two-factor structure based on the type of appraisal (opportunity appraisal or threat appraisal) instead of the theoretical nature of the stressor.
(hindrance or challenge). Whereas the original items were retained, the response scale was modified in order to measure the appraisal quality:

The following items reflect experiences that you can encounter in school. These situations may involve obstacles to your academic accomplishment or personal growth. They may involve opportunities that promote your academic accomplishment or personal growth. Please rate how much obstacle and how much opportunity is involved in each situation. Be sure to answer for both obstacle and opportunity.

We used the word obstacle for threat appraisal because it was a more familiar concept that participants could recognize easily. Participants answered in two scales from 1 (not at all) to 5 (very much).

We run item intercorrelations between threat and opportunity appraisal ratings to the same described challenge stressor. We obtained non-significant coefficients for three items and moderate negative correlations for the time amount \( r = -0.25, p < .01 \) and time pressure \( r = -0.22, p < .01 \) items. These results suggest that participants rated the threat and opportunity appraisal independently. Fully dependent answers (i.e. ratings of either threat or opportunity) would have been indicated by high and negative correlations: low threat ratings when high opportunity was rated and vice versa.

Additionally, we conducted exploratory factor analysis (principal axis factoring extraction with OBLIMIN rotation with Kaiser normalization). A Cattell scree plot and Kaiser’s criterion identified a two-factor solution that explained 50% of the item variance: appraised threat and appraised opportunity. Table 1 shows the exploratory factor structure that shows how the items are grouped by the appraised threat or opportunity.

In addition, we examined the lag correlations between opportunity and threat appraisal and distress. As described above, threat appraisal involves evaluating a situation as a menace or danger because demands are perceived as exceeding resources. Therefore, if threat appraisal initiates the management of situations assuming a high likelihood of failure, it should result on subsequent feelings of emotional academic distress (i.e. a negative affective stress reaction to the experienced stress). On the other hand, opportunity appraisal involves evaluating a situation as an opportunity to grow, mastery or gain. Therefore, if this appraisal triggers the successful management of the situation, it should protect the individual from experiencing emotional distress. Academic distress was measured with items from Lakaev’s (2009) academic stress questionnaire: cognitive

<table>
<thead>
<tr>
<th>Threat ratings</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Difficulty of the work required in your classes</td>
<td>0.75</td>
<td>–</td>
</tr>
<tr>
<td>2. Amount of time spent working on projects or assignments for your classes</td>
<td>0.51</td>
<td>–</td>
</tr>
<tr>
<td>3. Volume of coursework that must be completed in your classes</td>
<td>0.74</td>
<td>–</td>
</tr>
<tr>
<td>4. Time pressures experienced for completing work required in your classes</td>
<td>0.73</td>
<td>–</td>
</tr>
<tr>
<td>5. Amount of projects or assignments in your classes</td>
<td>0.81</td>
<td>–</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunity ratings</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Difficulty of the work required in your classes</td>
<td>–</td>
<td>0.70</td>
</tr>
<tr>
<td>2. Amount of time spent working on projects or assignments for your classes</td>
<td>–</td>
<td>0.70</td>
</tr>
<tr>
<td>3. Volume of coursework that must be completed in your classes</td>
<td>–</td>
<td>0.79</td>
</tr>
<tr>
<td>4. Time pressures experienced for completing work required in your classes</td>
<td>–</td>
<td>0.54</td>
</tr>
<tr>
<td>5. Amount of projects or assignments in your classes</td>
<td>–</td>
<td>0.72</td>
</tr>
</tbody>
</table>

Note: Blanks (−) indicate factor loadings < .15.
distress (four items, $\alpha = .86$, “I felt overwhelmed by the demands of study”) and psychosomatic distress (five items, $\alpha = .71$, “I had difficulty eating”) on a 5-point scale ranging from “none of the time” to “all the time”.

The variables opportunity appraisal and threat appraisal were computed by averaging the items that loaded on the respective factors. The Cronbach alpha coefficients indicate that the opportunity (.72) and threat (.75) appraisal factors were internally consistent. These two variables were correlated with the two academic distress indicators. As expected, threat appraisal at the beginning of the semester was positively correlated to academic distress, both cognitive ($r = .24$, $p < .01$) and psychosomatic ($r = .14$, $p < .05$), measured later in the semester. The correlations between opportunity appraisal and distress were non-significant. In sum, the appraisal measurement strategy showed evidence of reliability and validity.

**Opportunity and threat appraisals: Final measure**

They were assessed with the six challenge stressor items from Cavanaugh et al.’s (2000) measure. Similar to the validation sample, participants were instructed to rate each item in terms of the degree of threat and the degree of opportunity or challenge they perceived. We included a paragraph that described what an obstacle or an opportunity meant in relation to sources of pressure at work. Sample items are: “Time pressures I experience,” and “The amount of responsibility I have.” Responses were measured using the same 5-point scales for opportunity and obstacle appraisal as the student sample.

**Other measures**

Affective commitment to the organization was measured by using the six items developed by Meyer, Allen and Smith (1993), using a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). A sample item is: “I really feel as if this organization’s problems are my own.” Psychosomatic distress was measured with six items that reflected frequency of psychosomatic complaints such as backaches, headaches, sleep problems, exhaustion, stomach problems and anxiety, adapted from Caplan, Cobb, French, Van Harrison and Pinneau (1975). Sample item: “You had trouble sleeping at night.” Performance was measured by having supervisors rating their subordinates’ in-role and extra-role performance using a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Ratings of in-role performance were assessed using nine items by Lynch, Eisenberger and Armely (1999) (sample item: “She/He performs tasks that are expected of him/her,” whereas extra-role performance was measured with 12 items (MacKenzie, Podsakoff, & Fetter, 1993) (sample item: “She/he is always ready to help or to lend a helping hand to those around him/her”).

**Results**

**Preliminary analyses**

Descriptive statistics for the applied sample are given in Table 2. Reliabilities for all scales presented acceptable levels, ranging from .74 (psychosomatic distress) to .87 (in-role and extra-role performance). Zero-order correlations provide preliminary support for the first group of hypotheses about the relations between opportunity appraisal and ACO ($r = .35$, $p < .01$).
Given that we had a small sample size ($N = 284$) in comparison to the number of parameters in the model ($k = 45$), we used a parcelling technique (Little, Cunningham, Shahar, & Widaman, 2002). This technique aims not only to reduce the number of parameters to be estimated but also to decrease measurement error (Bagozzi & Edwards, 1998). It involves combining two or more items into one single indicator to reduce the number of indicators for each construct. For each parcel, one aims at maintaining item-to-construct balance (Little et al., 2002), by combining high and low loading items together. Specifically, we averaged the highest loading item with the lowest loading item, followed progressively by the items with the next highest and lowest loadings, and so on, reducing the number of indicators of distress to three, ACO to three, in-role performance to three and finally, extra-role performance to four indicators. Thus, we reduced the model’s total number of parameters to 25.

To examine the distinctiveness of the six constructs and to test whether our theoretical model is the model that best fits the data, we performed a series of confirmatory factor analysis (CFA). This analysis allows us to compare the fit of the hypothesized six-factor model with five nested models, each of them less differentiated than the original model: a five-factor model that combined the performance measures (in-role and extra-role) into one single factor; a four-factor model that also created a unique factor comprising both opportunity and threat appraisal; a three-factor that added distress to the factor that already included opportunity and threat appraisal, since these are all stress-related concepts; a two-factor model that separated all the variables measured by the employee (opportunity and threat appraisal, distress and ACO) from those measured by the supervisor (in-role and extra-role performance); and finally, a one-factor model that included all six constructs in one factor.

To assess model fit, we used several fit indices (Hu & Bentler, 1998), namely the goodness-of-fit and comparative fit indices (CFI) and root mean square error of approximation (RMSEA). Using chi-square difference tests (Bentler & Bonett, 1980; James, Mulaik, & Brett, 1982), we compared the fit of the original model and the five nested models (Table 3). These tests revealed that the more differentiated model presented the best fit to our data: $\chi^2 (df = 260) = 431.25, p < .01; \text{CFI} = .95; \text{GFI} = .90; \text{RMSEA} = .05$, suggesting that our six dimensions are indeed distinct from one another. Traditionally, GFI values close to .90 indicate that the model fits well the data. It has also been suggested that models with a CFI close to .95 and an RMSEA close to .06 have a good fit (Hu & Bentler, 1999). Taken together, these indices show that our model meets the conventional

### Table 2. Descriptive statistics and intercorrelations of the applied sample.

<table>
<thead>
<tr>
<th></th>
<th>M (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>Threat appraisal</td>
<td>2.86 (0.74)</td>
<td>.81</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opportunity appraisal</td>
<td>3.27 (0.75)</td>
<td>-.04</td>
<td>.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychosomatic distress</td>
<td>2.74 (0.83)</td>
<td>.21</td>
<td>-.03</td>
<td>.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACO</td>
<td>3.70 (0.81)</td>
<td>-.15</td>
<td>.35</td>
<td>-.14</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-role performance</td>
<td>4.07 (0.67)</td>
<td>-.16</td>
<td>.11</td>
<td>-.16</td>
<td>.23</td>
<td>.87</td>
<td></td>
</tr>
<tr>
<td>Extra-role performance</td>
<td>3.73 (0.66)</td>
<td>-.11</td>
<td>.15</td>
<td>-.12</td>
<td>.30</td>
<td>.79</td>
<td>.87</td>
</tr>
</tbody>
</table>

Notes: $N = 284$. ACO = Affective Commitment to the Organization. Cronbach alphas are provided in parentheses on the diagonal. All correlations above .12 are significant ($p < .05$, two-tailed).
cut-off criteria and therefore fits the data well. Factor loadings were all acceptable, ranging between .55 and .80 for opportunity appraisal, between .45 and .79 for threat appraisal, between .66 and .85 for ACO, between .59 and .71 for physical distress, between .80 and .85 for in-role performance, and between .75 and .87 for extra-role performance.

**Mediation analyses**

We tested the study hypotheses with structural equation modelling (SEM) in order to incorporate measurement error and obtain an assessment of overall model fit (Jöreskog, Sörbom, & Du Toit, 2001). The full mediation model showed acceptable fit: $\chi^2 (df = 265) = 438.57, p < .01$, CFI = .94, GFI = 90, RMSEA = .05. We compared the fully mediated model with two partially mediated models: a model where we freed the direct paths from opportunity appraisal to in-role and extra-role performance ($\chi^2 (df = 263) = 438.24, p < .01$, $\chi^2_{\text{diff}}(df = 2) = .33, \text{n.s.}$; CFI = .94, GFI = 90, RMSEA = .05); and a model where we freed the direct paths from threat appraisal to in-role and extra-role performance ($\chi^2 (df = 263) = 434.56, p < .01$, $\chi^2_{\text{diff}}(df = 2) = 4.01, \text{n.s.}$; CFI = .94, GFI = 90, RMSEA = .05). The fit indices were not improved by the added paths, and therefore we retained the fully mediated model.

As shown in Figure 1, threat appraisal was significantly related to distress ($\beta = .26, p < .01$). As expected, distress was negatively related to in-role performance ($\beta = -.14, p < .05$) providing preliminary support for Hypothesis 1a, but it was not related to extra-role performance ($\beta = -.10, p > .05$), failing to support Hypothesis 1b. Opportunity appraisal was not related to distress ($\beta = -.03, p > .05$). Therefore, Hypotheses 2a and 2b were not supported (as the first condition for mediation, that is, a significant relationship between the predictor and mediator variables, was not met).

Opportunity and threat appraisals presented significant relationships with ACO ($\beta = .39, p < .01$ and $\beta = -.17, p < .05$, respectively). In turn, ACO was significantly related to both in-role performance ($\beta = .28, p < .01$) and extra-role performance ($\beta = .35, p < .01$), providing preliminary support for Hypotheses 3 and 4.

To further test the indirect effect of threat appraisal on in-role performance through distress (Hypothesis 1(a)), as well as the indirect effect of threat and opportunity appraisal on both types of performance through ACO (Hypotheses 3 and 4), we conducted Sobel tests. Specifically, we used the z-prime test because of its superior statistical power and lower Type I error rates when compared to other 13 methods to test mediation (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). The indirect effect of threat appraisal on

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<thead>
<tr>
<th>Table 3. Results of CFAs of nested models.</th>
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<tr>
<td>Six-factor model</td>
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<td>Five-factor model</td>
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<td>Four-factor model</td>
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<td>One-factor model</td>
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Notes: $N = 284$. $df =$ degrees of freedom; CFI = comparative fit index; GFI = goodness-of-fit index; RMSEA = root mean square error of approximation.

*p < .05; **p < .01.
in-role performance via distress was significant \( (z' = -1.64, p < .05) \), as predicted in Hypothesis 1(a). The indirect effects of threat appraisal on in-role and extra-role performance via ACO were also significant \( (z' = -2.05, p < .05; z' = -2.16, p < .05, \text{ respectively}) \), in accordance with Hypotheses 3a and 3b. Finally, the indirect effects of opportunity appraisal on in-role and extra-role performance via ACO were significant \( (z' = 3.05, p < .05; z' = 3.48, p < .05, \text{ respectively}) \), thus supporting Hypotheses 4a and 4b.

**Discussion**

This study builds on Lepine et al.’s (2005) meta-analytic work on the stressor–performance relationship by taking into account the individual appraisal of the stressors’ qualities (threat/opportunity) and examining the induced distress and affective commitment mediating mechanisms. Therefore, our research contributes to the literature on stress and performance by showing empirical evidence of (a) the relevance of accounting for the individual appraisal of the stressors; and (b) an affective commitment path based on rewarding positive work experiences from opportunity appraisal to enhanced performance and from threat appraisal to diminished performance.

In order to study the primary appraisal of challenges as threats and opportunities, we first validated the measurement of appraisal using Cavanaugh et al.’s (2000) challenge stress items in a student sample. We found that challenge stress items loaded on two factors that represented the threat ratings and the opportunity ratings, and that only threat ratings at the beginning of the semester were positively related to later academic distress (i.e. when the students were immersed in their academic demands).

Once this measurement approach was validated, we examined the relationship between stress appraisal and performance. We expected that this relationship would be explained by an induced distress mechanism operationalized through distress and an affective commitment mechanism operationalized through ACO. Threat appraisal was positively related to distress and negatively related to ACO. The indirect relationship between threat appraisal and in-role performance through increased psychosomatic distress was significant (H1a), but distress was not significantly related to extra-role performance, thus not supporting H1b. Opportunity appraisal was positively related to ACO but not to distress; therefore, we did not find support for the induced distress mechanism when challenges were perceived as opportunities (H2).

The finding that distress mediated the relationship between threat appraisal and in-role performance, but not extra-role performance, indicates that the induced distress path, which we expected to work through experienced distress, prevents employees from performing the core tasks and responsibilities of their jobs, but it is not related positively nor negatively to OCBs. These results are in contrast with previous research, which found that certain types of stressors such as interpersonal demands and situational constraints may be more related to extra-role behaviour than to task performance (Jex, 1998; Rosen et al., 2010). Jex suggested that a potential explanation may be that when employees experience strain and need to relocate effort and energy, they can diminish their effort on discretionary behaviours more confidently without fear of being penalized (1998). However, our findings indicate the reverse. Perhaps because in this study supervisors rated their employees’ performance, supervisor reports may differ from self-rated performance. If employees are visibly distressed, they may be perceived
by supervisors as less competent in their in-role tasks, shadowing potential changes in their extra-role performance. However, with the available data, we can only speculate. Further research is needed to study the specific effects of appraisal on performance through distress.

On the other hand, the indirect relationship between threat appraisal and both types of performance, through ACO, was significant (H4), and a similar indirect effect was also found for opportunity appraisal (H3). Therefore, the SEM findings suggest that ACO fully mediated the relationships between stress appraisals and both in-role and extra-role performance. These findings support our idea that the appraisal of challenges as opportunities is associated with an affective commitment response to potential growth and development on the job that in turn relates to performance as a way of taking advantage of the challenging opportunities provided by the organization. This mechanism explains how performance can decrease or increase. It decreases in response to threat appraisal that weakens the ACO as a response to negative work experiences or the perception of obstructing working conditions. In line with previous research, lowered in-role and extra-role performance can be considered withdrawal behaviour and have already been related to the experience of negative stressful experiences (Cropanzano et al., 2003; Settoon, Bennett, & Liden, 1996).

The commitment path explains how the opportunity to work in a challenging and positive environment helps to build employee commitment to the organization that facilitates employee’s increased intra-role and extra-role performance. Conversely, even if the demands that employees face are theoretically challenging (e.g. responsibility and time pressure), appraising them in a threatening context that poses obstacles and difficulties damages the experience of commitment to the organization, reflected in diminished commitment and consequently in both in-role and extra-role work outcomes.

**Practical implications, future research and limitations**

There has been a call for researchers to focus on matching job-specific stressors to job-specific measures of performance instead of using an aggregated approach, such as the hindrance-challenge framework, in order to gain a better understanding of the mechanisms through which these relations are explained (Rosen et al., 2010). These authors highlight the problems and limitations associated with categorizing stressors into either hindrance or challenge (Gilboa, Shirom, Fried, & Cooper, 2008). Our paper contributes to this discussion and overrides this limitation by including the measurement of appraisal. From our point of view, the specific-stressors to specific-performance approach provides fragmented empirical evidence that is difficult to translate into practice.

On the other hand, the appraisal approach can be useful for practice in three distinct ways. First, it provides evidence that “challenge stressors”, when perceived as impeding and hindering employees’ jobs, can have negative effects on their health and commitment to the organization and hence affect their performance. Second, the appraisal of “challenge stressors” as opportunities is valued by employees, strengthening their commitment to the organization and consequently facilitating performance. Third, different individuals can appraise the same “challenge stressor” as a threat or an opportunity. Based on these three ideas, managers should be aware of the differential impact that stressors have in
their employees, and reflect on how to manage them and their resources so subordinates appraise them as opportunities instead of threats. Therefore, future research should focus on exploring the antecedents of this appraisal, at the individual (e.g. optimism, self-efficacy, future-oriented coping, social support) and organizational levels (e.g. leadership styles and perceived organizational support).

As any other study, there are some limitations we should acknowledge. First, we should acknowledge the relatively small size of our samples (pre-test and study), particularly the applied sample ($N = 284$). However, our concerns are minimized by two reasons: (a) we found consistent results in the pre-test and applied samples concerning the distinctiveness of the appraisal measures and the direction of their relationship with distress; and (b) we found support for the majority of our hypotheses and insufficient sample sizes tend to affect statistical power by increasing the risk of type-II errors, therefore reducing our ability to detect significant effects and leading researchers to erroneously conclude that there is no effect in the population (Aguinis & Harden, 2009).

A second limitation has to do with the convenience character of the samples. Our goal was precisely to test the generalizability of our appraisal model and examine whether these general principles could be applied across organizational settings (Highhouse & Gillespie, 2009). In order to do so, we not only tested our measures with student and applied samples, but in the latter, we collected data from multiple organizations working in different sectors and with distinct characteristics. On the one hand, the fact that we found support for our hypotheses with such a diverse sample suggests that taking into account the appraisal of stressors is important regardless of the context, therefore strengthening the generalizability of our results. On the other hand, we cannot (and should not) completely discard the role of contextual variables in the appraisal process, and therefore future research should attempt to re-test our model within specific contexts, such as occupations or sectors.

Causality inferences are a concern when using cross-sectional data (Bobko & Stone-Romero, 1998), and therefore reciprocal or alternative causal paths are possible. On the one hand, our model has strong theoretical underpinnings, and the proposed links and mechanisms have been subjected to prior research (e.g. Edwards, Guppy, & Cockerton, 2007, examined the temporal relationship between stressors and performance and found that the best-fitting model included one-way paths from stressors to performance, as measured three months later). On the other hand, we can, for example, also argue that distress can be an antecedent of appraisal, because the experience of psychosomatic ailments can negatively affect our appraisal when faced with demands. This suggests the need for exploring these relationships with longitudinal data in future research to strengthen the causal argument between the variables examined in our study. We also propose the use of experience sampling methodologies that can provide daily data and link antecedents and consequences of threat and opportunity appraisal.

However, although we cannot make causal inferences, we have avoided some of the problems of survey research, such as common method variance, by using two sources of data. Performance data were measured through supervisors, and appraisal, distress and ACO were self-reported by the employees. In this way, we are confident that the size of the relationships between the mediating variables and performance are not inflated by method variance.
Conclusion

This study shows the importance of individuals’ appraisal when examining the impact of “challenge stressors” on work outcomes. Moreover, it provides key evidence on how two mechanisms (commitment and induced distress) explain how stress appraisal affects in-role performance and OCBs. Our research shows how the creative merge of two different research orientations, occupational health psychology and organizational behaviour, can help understand how employees experience work demands and use this experience for effectively managing performance and well-being in organizations.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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