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The stressors-performance relationship in accounting and auditing firms: Is there eustress out there?

La relation stressseurs–performance en cabinets comptables et d’audit : Y a-t-il du bon stress ?

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Abstract

To identify the stressors that improve performance in accounting firms, we used structural equation modeling to analyze 293 questionnaire responses from French certified public accountants (CPAs) and trainee CPAs. The findings clarify the rare studies on the stressors–motivation relationship, and the mechanism by which perceived environmental uncertainty affects performance. We also show that feedback, if perceived as fair, increases performance through motivation and stress reduction. This study thus contributes to the scarce evidence on the link between justice and stress and highlights the unique characteristics of the Big Four accounting firms.

KEYWORDS: PERFORMANCE STRESSOR JUSTICE STRESS MOTIVATION

Résumé

Pour identifier les stressseurs améliorant la performance en cabinets comptables, nous avons utilisé une modélisation par les équations structurelles à partir de 293 réponses d’experts-comptables et d’experts-comptables stagiaires. Les résultats précisent les rares études sur les liens stressseurs–motivation et le mécanisme par lequel l’incertitude environnementale perçue affecte la performance. De plus, un feedback juste accroît la performance via la motivation et la diminution du stress. Nous contribuons donc aux rares recherches consacrées au lien entre stress et justice et suggérons la singularité des grands cabinets d’audit.

MOTS CLÉS : PERFORMANCE STRESSEUR JUSTICE STRESS MOTIVATION

1. Introduction

Accounting firms are well-known for their long-hours culture, and the workload of their employees appears to be intensifying. Press reports recount the deaths of auditors and accountants as a result of exhaustion and stress, while academic studies identify the physiological effects of this occupational pressure (Friedman *et al.*, 1958; GoingConcern, 2011, 2018; Lupu & Empson, 2015; Dumont, 2016). On the other hand, mainstream publications extolling the virtues of “good stress”, or “eustress”, have attempted to legitimize the practices found in today’s firms (Beau, 2017). Paradoxically, although it is common practice to distinguish between good and bad stress, the academic literature rarely focuses on good stress, defined as a level of stress or as a type of stressor.¹ Since the existence of a good level of stress has been refuted (Abramis, 1994), it might be more useful to identify good stressors that are motivating and performance-enhancing (LePine *et al.*, 2005). *This study therefore aims to identify the stressors that improve the performance of auditors and accountants.*

To do this, we used the partial least squares approach to analyze 293 questionnaire responses from French certified public accountants (CPAs) and trainee CPAs. This method estimates a structural model and allows non-parametric hypothesis testing. As in previous studies, the results of this analysis indicate that role ambiguity and role conflict have negative effects on performance, reflected in stress and burnout, but we also find that motivation has a role to play. One stressor omitted in existing studies – perceived environmental uncertainty – can reduce performance via motivation alone. These results contribute to the debate on how to deal with stress in accounting firms (Choo, 1986, 1995; Fogarty *et al.*, 2000). Recommendations for reducing stress levels have been discussed following results suggesting that stressors can include a good stress component (Fogarty *et al.*, 2000). By proposing the mediating role of motivation, the results of the present study also highlight the relevancy of the LePine *et al.* (2005) model. This model can be used to identify a possible good stressor that has a positive effect on performance via motivation: feedback, i.e., information that indicates the degree of success in achieving goals (Ashford & Cummings, 1983). Feedback

1. Historically, stress was first defined as the environment influencing a person, and then as the physiological and psychological responses of a person to the demands, threats, and challenges of his or her environment. Currently, stress refers to the interaction between a person’s physiological and psychological responses on the one hand, and the demands, threats, and challenges of his or her environment on the other (Perrewé and Ganster, 2011). Conditions, i.e., stressors, cause the stress process. This process produces tensions such as anxiety, depression, or burnout (Jex, 1998).

also affects stress and burnout through the notion of fairness. Thus feedback, when perceived to be fair, may contribute more positively to firm performance. This conclusion extends the external validity of the results of a recent case study (Beau, 2018).

To demonstrate the validity of these contributions, we first performed a literature review to identify the constructs linking stressors to accounting firm performance and to formulate various hypotheses (2.). We then conducted our study to test these hypotheses (3.).

2. Theoretical and conceptual foundations

Studies of auditors and accountants often suggest negative relationships between stressors and performance, and explain these relationships via mediators that cannot be used to identify good stressors (2.1.). To identify these good stressors, we mobilize the model developed by LePine *et al.* (2005) (2.2.).

2.1. Relevant literature

We start with some definitions to focus our discussion (Appendix 1). Following the article by Weick (1983), a number of studies have shown negative associations between stressors and the performance of auditors and accountants (Appendix 2). Partially corroborating the role episode model (see Kahn *et al.*, 1964, Rizzo *et al.*, 1970), this literature firstly suggests negative associations between role stressors and performance in firms (2.1.1.), then explains these associations by introducing mediators (2.1.2.).

2.1.1. APPLYING THE ROLE EPISODE MODEL

The role episode model describes a process between a person assigned a role (the focal person) and the person assigning it (the role sender). The transmitted role is a set of activities or behaviors expected by the sender. The received role reflects the focal person's perceptions and understanding of what was sent. The degree of understanding thus influences the focal person's behavior, in particular their performance. In addition, a role may contain several activities and a person may be tasked with various different roles. If these activities or roles conflict with one another or are too numerous, then the focal person's performance will decrease. The role episode model therefore assumes negative links between role stressors² and performance.

2. Role stressors are the feelings experienced by the focal person in a situation where it is difficult, or even impossible, to meet all of the role sender's expectations (Katz & Kahn, 1978).

Early studies often suggested a direct, negative relationship between performance and three role stressors – role ambiguity, role conflict, and role overload. If the role is ambiguous, the focal person will hesitate, make decisions through trial and error, and their efforts will be in vain (Chenhall & Brownell, 1988; Burney & Widener, 2007; Hall, 2008). When faced with role conflict, the focal person will allocate resources according to his or her preferences, since failure to adhere to the principles of unity of command and unity of direction would create a zone of uncertainty (Rizzo *et al.*, 1970). Role overload increases the amount of work performed, but reduces its quality and the focal person's assessment of their own performance (Sales, 1970; Beehr *et al.*, 2000). But these associations are not corroborated in every study. Thus, the early studies only partially support the role episode model.

Moreover, the model does not explain the mechanisms by which these three role stressors may impair performance. To overcome this limitation, some authors introduced mediators into the model. According to Fogarty *et al.* (2000), the first studies may present inconsistent results because they fail to introduce mediators of the negative effects of stressors. In the absence of these mediators, the negative effects of stressors may thus confound their possible positive effects (the good stress), yielding non-significant results.

2.1.2. BEYOND THE ROLE EPISODE MODEL

To explain the link between role stressors and performance, subsequent studies introduced mediators, including burnout³ and stress (Appendix 3). Stressors, when present in particular degrees or combinations, overwhelm the resources of the person dealing with them (Fogarty *et al.*, 2000). This resource exhaustion then reduces performance. Like burnout, the mediators introduced in these subsequent studies therefore explain some of the negative effects of stressors on performance.

But none of the articles included a mediator reflecting the positive effects of the stressors studied. These positive effects may, however, offset the negative effects not explained by the mediators applied (Fogarty *et al.*, 2000; Jones *et al.*, 2010). This offsetting would explain why the residual, direct effects of stressors on performance are rarely significant. Instead of introducing other mediators of the negative effects of stressors on performance, a mediator of

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3. Burnout comprises three dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment. Emotional exhaustion reflects a progressive loss of energy leading to a feeling of psychological fatigue. Depersonalization is an uncaring attitude toward others that can, for example, culminate in the belief that clients deserve the problems they are facing. Reduced personal accomplishment refers to feelings of low self-esteem, low motivation, and the inability to perform satisfactorily.

their positive effects should be introduced to identify good, performance-enhancing stressors. The model developed by LePine *et al.* (2005) therefore has the potential to identify good stressors by introducing motivation as a mediator.

In sum, while early studies were limited to identifying the, generally negative, correlations between role stressors and performance, later studies only explained some of the negative effects of role stressors on performance. We therefore use the model of LePine *et al.* (2005) to overcome this limitation, because it provides a mediator that can be used to identify good stressors.

2.2. Theoretical framework and hypotheses

LePine *et al.* (2005) distinguish two types of stressors. On the one hand, good stressors are challenges or obstacles to be overcome in order to learn or achieve goals (e.g., high workload, time pressure, or a variety of tasks). On the other hand, bad stressors are threats or demands that jeopardize career advancement and goal achievement (e.g., role stressors). Since individuals perceive stressors differently (LePine *et al.*, 2005; Gilboa *et al.*, 2008), we need to find a way of identifying stressors that accountants perceive as good. Motivation (2.2.1.), in contrast to stress and burnout (2.2.2.), can be used to identify a notionally good stressor for accountants – feedback (2.2.3.).

2.2.1. MOTIVATION AS A MEDIATOR

This distinction between good and bad stressors allows us to better explain the relationship between stressors and performance by adding motivation to the transactional model of stress.

On the one hand, according to the transactional model of stress (Lazarus & Folkman, 1984), good stressors trigger positive emotions that stimulate increased effort and motivation. Motivation is based on three cognitions: expectancy, instrumentality, and valence (Vroom, 1995). However, people need to evaluate situations as being good stressors in order to believe in the existence of links between the level of effort and the fulfillment of a demand (expectation) and between the fulfillment of the demand and the results obtained (instrumentality), and only they will value the results obtained if the demand is fulfilled (valence). Thus, only good stressors are positively related to motivation. For example, Rasch and Harrell (1990) suggest a negative correlation between motivation and a combination of role ambiguity and role conflict. These role stressors are considered to be bad stressors (LePine *et al.*, 2005). Perceived environmental uncertainty is also considered a bad stressor (Gilboa *et al.*, 2008), and is expected to be negatively related to motivation. Ferris (1978), in

particular, suggests a negative link between perceived environmental uncertainty and a determinant of motivation. In light of these developments, our first hypothesis is as follows:

Hypothesis 1: Role ambiguity, role conflict, role overload, and perceived environmental uncertainty are negatively correlated with motivation.

On the other hand, motivation is positively associated with performance for two reasons (Galbraith & Cummings, 1967). Firstly, the valence and instrumentality of rewards determine the valence of high performance. Secondly, since the valence of high performance boosts performance, the latter is determined by motivation. Studies corroborate this positive association between motivation and the performance of auditors and accountants (Ferris, 1977, 1978; Jiambalvo, 1979; Anderson & Kida, 1985; Becker, 1997). Bad stressors are thus negatively associated with performance via motivation. Taken together, the developments presented in Section 1.2.1 allow us to formulate Hypothesis 2.

Hypothesis 2: Motivation mediates the residual negative effects of bad stressors on performance, after controlling for stress arousal and burnout.

2.2.2. STRESS AROUSAL AND BURNOUT AS MEDIATORS OF THE NEGATIVE EFFECTS OF STRESSORS

All stressors are negatively associated with tensions, such as stress and burnout (LePine *et al.*, 2005). Admittedly, LePine *et al.* do not present links between stress and burnout, but we can postulate that perception of a stressor arouses stress. This stress arousal is the immediate response to exposure to a stressor (Selye, 1974), whereas burnout results from chronic or intense exposure to one or more stressors (Smith *et al.*, 2007). And burnout is negatively associated with performance since it decreases the energy of those facing stressors (Cohen, 1980; LePine *et al.*, 2005). Stressors therefore decrease performance through stress arousal, which theoretically precedes burnout.

Studies on auditors and accountants have corroborated these supposed indirect effects between role stressors and performance via stress arousal and burnout (for example, Smith *et al.*, 2007, 2017). These indirect effects are therefore not tested in our study. Conversely, existing studies including these two mediators do not investigate perceived environmental uncertainty. The effect of perceived environmental uncertainty on stress is expected to be small, since this uncertainty is in the organization's environment and thus more distant than role stressors (Gilboa *et al.*, 2008). Based on this literature, we therefore propose Hypothesis 3.

Hypothesis 3: Perceived environmental uncertainty is not correlated with stress arousal.

2.2.3. FEEDBACK AS A GOOD STRESSOR

Because they are negatively associated with motivation, perceived environmental uncertainty and role stressors are not good stressors (LePine *et al.*, 2005; Gilboa *et al.*, 2008). Thus, to the best of our knowledge, no good stressors have been identified in studies of accounting firms.

Feedback could be a good stressor for two reasons. First, feedback may be positively associated with motivation, since it provides cues for learning and motivation (Vroom, 1995). By providing cues, feedback indicates the relative importance of different goals in a given situation (Ashford and Cummings, 1983). Specifically, feedback indicates the goals and behaviors most valued by the organization and clarifies the goals with the highest expected payoff. Because this learning can increase the perceived likelihood of achieving a goal and valued payoff through effort, feedback is positively associated with motivation. For example, studies suggest a positive association between performance discussion and motivation, creating improved performance for Big Four auditors, and a positive, indirect association between feedback and motivation (Miller *et al.*, 2006, Drake *et al.*, 2007). These developments and the arguments in 1.2.1 suggest Hypothesis 4.

Hypothesis 4: Feedback is positively correlated with performance via motivation.

Second, if feedback is unfair, it could be positively correlated with stress arousal and burnout, and thus negatively associated with performance. Recent research has, for example, examined individual performance evaluation, a form of feedback, in Big Four accounting firms (Beau, 2017, 2018). According to these studies, if feedback is perceived as unfair, it can cause auditors to feel tense, exhausted, or stressed. More specifically, this feedback places contradictory demands on auditors, requiring them to combine organizational performance and professional performance, i.e., more assignments and increased profitability, while also ensuring the quality of the audits performed. This organizational-professional conflict creates stress in certain conditions. The perception of feedback as unfair may shape its influence on stress. Thus, when feedback is perceived as unfair, it can increase stress. It is therefore not possible to formulate a hypothesis that directly links feedback to stress.

To link them indirectly, a mediator is required. Organizational justice⁴ could be the mediator of the relationship between feedback and stress that we are looking for. There are two reasons for this.

On the one hand, feedback facilitates the perception of justice if it is deemed to be of high quality and if it includes relevant explanations (Shaw *et al.*, 2003, Hartmann & Slapničar, 2009). Under these conditions, feedback enables the open and frequent communication required for procedures to be perceived as fair. For instance, studies corroborate the existence of a positive association between feedback and certain organizational justice dimensions (Hartmann & Slapničar, 2009; Langevin & Mendoza, 2014). This first argument therefore forms the basis for Hypothesis 5.

Hypothesis 5: Feedback is positively correlated with organizational justice.

On the other hand, three theories posit that fairness can reduce stress (Judge & Colquitt, 2004). First, uncertainty management theory suggests a relationship between unfairness and stress. Second, according to equity theory, individuals examine the ratio of their inputs to their outcomes and compare this ratio to that of a “comparison other” in order to assess the fairness of a relationship. Injustice-stress theory specifies this “comparison other”. By comparing their present situation with the receipts of others, with their own situation at a previous point in time, or with internalized norms, an individual can evaluate the fairness of a relationship (Vermunt & Steensma, 2001). If this comparison reveals a discrepancy, the individual will feel stressed (Coprano *et al.*, 2005). Empirically, using a cross-sectional design with all variables being measured at a specific point in time, stress is correlated with all dimensions of organizational justice (Judge & Colquitt, 2004). Herda and Lavelle (2012), Cannon and Herda (2016) report a negative association in accounting firms between the perception of organizational justice and burnout, a consequence of the stress process. This second argument underlies Hypothesis 6.

Hypothesis 6: Organizational justice is negatively correlated with stress arousal.

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4. Organizational justice focuses on perceptions of justice in the workplace. It includes different dimensions: distributive, procedural, and interactional. The latter can be divided into two sub-dimensions: interpersonal and informational (Colquitt, 2001). Ambrose and Schminke (2009), however, have questioned the merits of focusing on one type of justice, suggesting that it could be useful to examine perceptions of global justice. Feedback is a component of accounting firms’ control systems. Because all dimensions of organizational justice are affected by the components of such control systems (Langevin & Mendoza, 2014), we have chosen to focus on global justice in this study.

Appendix 4 summarizes the proposed structural model. Our empirical study tests the hypotheses not tested in previous studies (solid arrows in Appendix 4).

3. Empirical study

To test these hypotheses, we measured the variables of the structural model using a sample of auditors and accountants (3.1.). The results of these tests suggest that variables that are bad stressors in some firms may actually improve performance in others (3.2.).

3.1. Method

We used a cross-sectional design (3.1.1.) and measurement scales (3.1.2.) to test the proposed hypotheses (3.1.3.) and to suggest a possible good stressor for auditors and accountants.

3.1.1. STUDY DESIGN AND SAMPLE

Given the aim of the current study, a cross-sectional design appeared appropriate (de Vaus, 2001; Yin, 2014). We designed this cross-sectional study by following three steps. First, we developed our structural model after reviewing the literature (Appendix 4). Then, following de Vaus (2014), we performed three pilot tests of our questionnaire to clarify the operational definitions, to detect omitted control variables, to shorten the questionnaire, and to evaluate the response rate. The response rate was estimated at about 5% in the third pilot. Finally, using the structural model and this 5% rate, we estimated that the required sample size was 311 respondents, meaning that 6,220 questionnaire invitations needed to be sent (Appendix 5).

Appendix 6 shows the sampling method. We chose to send the questionnaire to French certified public accountants (CPAs) and trainee CPAs (*experts-comptables* and *experts-comptables stagiaires*) because directories exist for these professionals, enabling us to obtain representative samples. To do this, we first randomly selected as many regions as necessary and asked the relevant Regional Councils of the Order of Certified Public Accountants (*Conseils Régionaux de l'Ordre des Experts-Comptables*) for their directories until we reached around 6,220 CPAs and trainee CPAs. We then sent out 6,047 email invitations containing the URL for the questionnaire (Appendix 6, Recruitment). After two email

reminders, we obtained 548 responses, a theoretical response rate of nearly 10% (Appendix 6, Follow-up).

However, not all of these responses were complete, and only 293 responses were ultimately retained for analysis, for three reasons (Appendix 6, Analysis). First, mean value replacement is only recommended when less than 5% of values are missing per item (Hair *et al.*, 2014). Second, although there are alternatives for dealing with missing values, all imputation methods influence the results (de Vaus, 2001) and literature on their suitability in a PLS-SEM context is scarce (Hair *et al.*, 2014). Finally, the removal of partial responses makes sense, since there is no reason to believe that these 293 respondents are any different from those who only partially completed the questionnaire.⁵

Overall, the rate of usable responses to the emails sent was over 5%, which is fairly low. This low response rate is not surprising given the population surveyed and the downward trend in response rates (Van der Stede *et al.*, 2006). Furthermore, the sample and population characteristics differ.⁶ Despite this low response rate and the specific characteristics of the sample, tests suggest the absence of non-response bias for all items of the variables measured.⁷

3.1.2. MEASUREMENT OF VARIABLES

The questionnaire was developed in three stages (Appendix 7). It measures the independent, mediating, and dependent variables (Appendix 1: Operational Definition; Appendix 8).

3.1.2.1. Measurement of independent variables

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5. For example, a chi-square test of independence did not reject the hypothesis that the completeness of responses was independent of the department in which the respondent worked (“Accounting”, “Audit”, “Advisory/Expertise”, “Social/Administration”): $\chi^2(3) = 1.40$; $p = 0.71$.
 6. For example, more than 52% of the respondents were women and more than 49% of the respondents were qualified CPAs. The average respondent was around 39 years old, had worked for 15.72 years in the profession, and for 7.78 years in their current firm. More than 7% of respondents worked in management accounting. Of the respondents working in accounting firms, 15.44% worked in one of the Big Four. The other firms had an average headcount of 116.
 7. Since the sample size was satisfactory, but the response rate was too low to ensure a survey of sufficient quality (Van der Stede *et al.*, 2006), we tested for non-response bias. To do this, the 97 responses obtained before the first reminder were compared (for each item) to the 76 responses obtained after the second reminder (Armstrong & Overton, 1977). For this comparison, we used a Student’s t-test and the Wilcoxon test with the Benjamini and Yekutieli correction (2001). The results of these tests suggest the absence of non-response bias.

The independent variables are role ambiguity, role conflict, role overload, perceived environmental uncertainty, and feedback. We measured *role ambiguity (RA)* and *role conflict (RC)* using the well-known Rizzo *et al.* (1970) scales. However, based on our initial pilot tests, the scale often used to measure *role overload (RO)* did not appear to be reliable. We therefore used the Harris and Bladen (1994) scale, adding three items to the Beehr *et al.* (1976) scale. *Perceived environmental uncertainty (PEU)* was measured using the Duncan (1972) scale. Finally, we measured *feedback from others (F)* with the Hackman and Oldham (1975) scale, adapted by Pezet-Langevin and Rolland (1999).

3.1.2.2. Measurement of mediating variables

The mediators in our study are motivation, stress arousal, burnout, and organizational justice. *Motivation (M)* was measured using two scales reflecting intrinsic and extrinsic motivation (Gagné *et al.*, 2015). However, as the extrinsic motivation scale was unreliable in our study (Cronbach's alpha = 0.53), we only present the results for intrinsic motivation. The *stress arousal (SA)* scale was used for its excellent psychometric properties (Smith *et al.*, 2012). The *emotional exhaustion (EE)* scale proposed by Maslach and Jackson (1981) was used to measure burnout because of its reliability and its excellent convergent and discriminant validities (Sassi & Neveu, 2010). Finally, on theoretical grounds, *organizational justice (J)* was measured using the Ambrose and Schminke (2009) scale.⁴

3.1.2.3. Measurement of the dependent variable

The academic literature has questioned the validity of self-administered questionnaires to measure *performance (P)*, because of personal bias and the problem of common-method variance (Westman & Eden, 1991; Dunk, 1993). However, stereotypes may also bias supervisor-rated performance (Maurer & Taylor, 1994), and a subjective performance measure is nonetheless preferable to an objective one, since our study focuses on individual performance (Van der Stede *et al.*, 2006). For these reasons, we measured performance with the Choo (1986) self-administered scale.

3.1.3. TESTING THE HYPOTHESES

To test Hypotheses 1 to 6, we used the Partial Least Squares (PLS) approach, primarily with the semPLS package in R. The PLS approach was chosen because of the non-normal distribution of the data (Appendix 9). SmartPLS software was used to test for respondent heterogeneity to identify whether feedback was a good stressor for some respondents.

3.2. Results

Our PLS analysis comprised three steps (Hair *et al.*, 2014). First, the measurement model was estimated (3.2.1.). In a second step, the PLS approach was used to estimate the structural model, making it possible to test the hypotheses formulated to identify the good stressors (3.2.2.). Finally, the heterogeneity of the respondents was tested (3.2.3.).

3.2.1. EVALUATING THE MEASUREMENT MODEL

The evaluation of the measurement model indicates the reliability and the convergent and discriminant validities of the scales (Table 1). First, a Cronbach's alpha greater than 0.80 indicates satisfactory reliability. But this coefficient favors scales with a large number of items and generally underestimates reliability. We therefore used the composite reliability indicator, which can be interpreted in the same way as Cronbach's alpha. Reliability was found to be satisfactory because the composite indicator of all scales is greater than 0.80.

(Table 1 here)

Second, the average variance extracted (AVE) value indicates good convergent validity if the construct explains on average at least half of the variance of the items ($AVE \geq 0.5$). The convergent validity of each item was assessed by studying its outer-loading. Items with an outer-loading greater than 0.7 were retained, those with an outer-loading below 0.4 were removed, and other items were deleted if their deletion raised the composite reliability or AVE above the required thresholds. Thus, four items from the role conflict scale and three items from the performance scale were removed to achieve AVE values above 0.5.

Finally, Fornell and Larcker's criterion can be used to evaluate discriminant validity. According to this criterion, the square root of a construct's AVE must exceed the correlation of this construct with any other construct (Table 2). As this criterion is satisfied for all constructs, the discriminant validity of the scales employed is acceptable.

(Table 2 here)

In sum, in the first stage of our PLS analysis, we evaluated the reliability and validity of the scales that would be used to identify the stressors that improve performance in accounting firms. To identify these stressors, the second stage estimates the structural model and tests the related hypotheses.

3.2.2. ESTIMATION OF THE STRUCTURAL MODEL AND RESULTS OF HYPOTHESIS TESTING

We firstly evaluated the properties of the structural model (3.2.2.1.) before testing our hypotheses to distinguish between good and bad stressors (3.2.2.2.) and to ascertain whether perceived environmental uncertainty and feedback from others are indeed stressors (3.2.2.3.).

3.2.2.1. Properties of the structural model

The structural model was estimated in five steps. First, we checked for collinearity among the latent variables. There appears to be no collinearity, because none of the variance inflation factors (VIF) are above five, with the highest being 1.52. Second, we estimated the structural model path coefficients and calculated their statistical significance using 5,000 bootstrap samples. Figure 1 summarizes the results obtained. All of the structural model path coefficients already tested in the literature are significant and of the expected sign (dashed arrows, Figure 1). Third, we evaluated the overall predictive quality of the structural model using the determination coefficient (R^2) of each endogenous variable. Fourth, we calculated the effect size (f^2) for each structural model path coefficient.⁸ Finally, we calculated the overall predictive quality of the structural model with a procedure employing the Geisser-Stone Q^2 indicator for endogenous variables. The Geisser-Stone indicators are all positive and suggest that our model has good overall predictive quality. The structural model used to identify good stressors therefore appears to be reliable.

(Figure 1 here)

3.2.2.2. Good and bad stressors

Only the good stressors are positively associated with motivation. We thus first assumed negative correlations between motivation and four bad stressors: role ambiguity, role conflict, role overload, and perceived environmental uncertainty (Hypothesis 1). Role ambiguity RA (-0.26 ; $t = -4.62$; $p < 0.001$), role conflict RC (-0.19 ; $t = -3.36$; $p < 0.001$), and perceived environmental uncertainty PEU (-0.16 ; $t = -2.56$; $p = 0.006$) were found to be negatively correlated with motivation M. However, role overload RO was not significantly associated with motivation M (-0.03 ; $t = -0.50$; $p = 0.308$). *Hypothesis 1 is therefore supported for all of the bad stressors studied, with the exception of role overload. Accomplishing tasks that would*

8. $f^2 = (R_{with X}^2 - R_{without X}^2) / (1 - R_{with X}^2)$.

be reasonable individually but that are cumulatively difficult, or even impossible, to complete in the allotted time appears to have no effect on CPAs' or trainee CPAs' interest in their work, aside from any external reward ($f^2 < 0.01$). On the other hand, role imprecision ($f^2 = 0.07$), conflicting demands ($f^2 = 0.04$), and perceived uncertainty ($f^2 = 0.03$) have a small negative effect on their interest in performing their work aside from any reward. Moreover, tests of the indirect effects of role ambiguity (-0.10 ; $t = -3.45$; $p < 0.001$), role conflict (-0.07 ; $t = -3.11$; $p = 0.001$), role overload (-0.01 ; $t = -0.49$; $p = 0.311$), and perceived environmental uncertainty (-0.06 ; $t = -2.05$; $p = 0.021$) on performance via intrinsic motivation led to the same conclusion. *Hypothesis 2 is thus supported for all the bad stressors studied, with the exception of role overload.* Role ambiguity, role conflict, role overload, and perceived environmental uncertainty have negative or insignificant indirect effects on performance via motivation. They are therefore not good stressors.

Second, we can presume that there is a positive association between motivation and a possible good stressor: feedback from others (Hypothesis 4). Feedback F was found to be positively associated with motivation M (0.09 ; $t = 1.63$; $p = 0.052$). However, this relationship is only weakly statistically significant. Since the p-value is close to 5%, it is worth examining the practical significance of the effect to see whether there is a statistical power problem (Bonache, 2018). Yet, feedback from others on the effectiveness and quality of their work appears to have a negligible effect on CPAs' and trainee CPAs' motivation to perform their work in the absence of reward ($f^2 = 0.01$). Finally, the test of the indirect effect of feedback on performance via motivation is positive but only weakly statistically significant (0.03 ; $t = 1.47$; $p = 0.070$). *Hypothesis 4 is therefore not supported: feedback has a negligible effect on performance via motivation.*

In sum, role ambiguity, role conflict, role overload, and perceived environmental uncertainty are not good stressors because of their non-positive, indirect effects on performance via motivation. Since feedback has a positive, indirect effect, it may be a good stressor. But its effect on performance via motivation is negligible and it should be verified whether perceived environmental uncertainty and feedback from others are indeed stressors.

3.2.2.3. The role of perceived environmental uncertainty and feedback from others

All stressors are negatively associated with tensions, such as stress arousal, but previous studies including stress arousal as a mediator include neither perceived environmental

uncertainty nor feedback from others. On the one hand, since perceived environmental uncertainty is seen as a more distant bad stressor than other stressors, we assumed that there was no correlation between perceived environmental uncertainty and stress arousal (Hypothesis 3). *Hypothesis 3 is supported, because perceived environmental uncertainty PEU is not significantly correlated with stress arousal SA* (0.04; $t = 0.67$; $p = 0.251$). Perceived environmental uncertainty has a negligible effect on stress ($f^2 < 0.01$) and thus has no indirect effect on emotional exhaustion, or on performance via this mediator. Since it does not arouse stress, perceived environmental uncertainty is not a stressor.

On the other hand, since good feedback favors the perception of justice, we predicted a positive correlation between feedback and organizational justice (Hypothesis 5). Feedback F is indeed positively correlated with organizational justice J (0.26; $t = 4.13$; $p < 0.001$). *Hypothesis 5 is therefore supported.* Feedback from others on the effectiveness and quality of their work has a small effect on the overall perceived fairness of CPAs and trainee CPAs ($f^2 = 0.07$). To consider feedback as a stressor, justice needs to be correlated with stress arousal. Since input-outcome ratios considered as unfair tend to create stress, we assumed a negative correlation between organizational justice and stress arousal (Hypothesis 6). Because of the negative correlation between justice J and stress arousal SA (-0.13 ; $t = -2.12$; $p = 0.018$), *Hypothesis 6 is supported.* Perceived fair treatment by the accounting firm has a weak effect on early symptoms of stress for the CPAs and trainee CPAs studied ($f^2 = 0.02$). Finally, since the indirect effect of feedback on performance via organizational justice, stress arousal, and emotional exhaustion was positive but weakly significant (0.004; $t = 1.32$; $p = 0.093$), feedback does not appear to have a negative effect on performance via these mediators and does not appear to be a stressor across the entire sample studied. This result led us to perform heterogeneity tests to identify whether feedback could be a source of stress for some respondents and thus lower their performance.

3.2.3. HETEROGENEITY TEST RESULTS

To explore whether respondents differ in their perception of feedback, a FIMIX-PLS analysis was used to test for heterogeneity (Hair *et al.*, 2018). Based on the solution of this FIMIX-PLS analysis, we conducted a PLS-POS analysis to assign respondents to one of two segments⁹ (Hair *et al.*, 2018). This segmentation corresponds to working for a Big Four firm

9. The AIC4, BIC, and CAIC information criteria were the weakest for two segments; the AIC3 criterion was the weakest for four segments. The entropy criterion was less than 0.5 for two segments; but above three

(62%) and in audit (64%).¹⁰ Different findings therefore appear to be possible for professionals working in Big Four accounting firms.

Two different findings emerge. First, the estimated structural model path coefficient between feedback and justice is negative for the segment relating to working in audit and in a Big Four firm (-0.562, compared with 0.730 for the other segment).¹¹ In the Big Four firms, feedback appears to be negatively correlated with a perception of being treated fairly by the organization. Because of the negative association between fairness and stress arousal, feedback may have a positive, indirect effect on stress arousal in Big Four firms. Second, for the same segment of the sample, the structural model path coefficient between feedback and motivation is negative (-0.129, versus 0.195 for the other segment).¹¹ In the Big Four firms, feedback from others therefore appears to be negatively associated with intrinsic motivation.

The results of this exploratory analysis suggest contrasting perceptions of feedback. For respondents working in Big Four firms, feedback may be demotivating, a factor of injustice, and therefore a stressor. They may thus perceive feedback as a bad stressor. Conversely, for the other respondents, feedback from others may be motivating and may reduce stress by improving their perception of organizational justice. Feedback thus appears to be perceived as a motivating factor rather than as a good stressor outside the Big Four firms.

segments the number of observations for at least one of the segments was less than 70 – the minimum required given the structural model used in our study.

10. The percentage refers to the sum of the frequencies on the first diagonal of a contingency table divided by the sum of all frequencies in the table. The contingency table cross-references the frequency distribution of the PLS-POS segment affiliation variable with one control variable – in this case working for a Big Four firm and in audit. According to Hair *et al.* (2018), when this percentage exceeds 60%, the overlap is satisfactory. The other control variables cannot be used to create homogeneous segments via MICOM analysis (Hair *et al.*, 2018). We therefore considered that the heterogeneity observed was not caused by the other control variables – number of employees, seniority, experience (the sample was divided into two groups of 146 and 147 respondents using the median values of these three variables), presence of a mentor, being a qualified CPA, gender, working flexible hours, being a partner or director, and being a manager.
11. The difference is significant whether we use a parametric test, a non-parametric test, a permutation test, or a PLS-MGA analysis (Hair *et al.*, 2018).

4. Discussion and conclusion

4.1. Theoretical contributions

In a context where the workload in accounting firms continues to intensify, the aim of this study was to identify the good stressors that improve the performance of auditors and accountants. Early studies showed generally negative associations between stressors and performance (Appendix 2). To explain these associations, subsequent studies introduced mediators of the negative effects of stressors (Appendix 3). However, these studies did not include a mediator of the positive effects of stressors, which meant that the good stressors could not be identified. To identify these good stressors, we employ the model developed by LePine *et al.* (2005), proposing motivation as a mediator. The findings of our study suggest the absence of good stress in role stressors, the presence of a mediating mechanism for the effects of perceived environmental uncertainty, and contrasting perceptions of feedback.

First, role stressors are bad stressors. Prior to our study, the residual, direct effects of role stressors were assumed to be non-significant because the confounding of their possible positive effects with their negative effects could not be explained by the mediators included in these studies (Fogarty *et al.*, 2000; Jones *et al.*, 2010). In these studies, the positive or non-significant residual, direct effects obtained were thus interpreted as the result of the proportion of good stress among role stressors. However, these often non-significant and sometimes positive residual, direct effects could also be caused by a lack of statistical power and sampling errors. We therefore introduced motivation as a mediator in these existing models, and our findings reveal the stressors perceived as good by CPAs and trainee CPAs. We find that only good stressors are positively associated with motivation (LePine *et al.*, 2005). However, our results suggest negative or non-significant associations between role stressors and motivation (Figure 1). Thus, role stressors provide no good stress because they are perceived as bad stressors by the CPAs and trainee CPAs trainees interviewed.

Second, perceived environmental uncertainty is not a stressor. Initially introduced as a distinct antecedent of role stressors (Rebele & Michaels, 1990; Gregson *et al.*, 1994), perceived environmental uncertainty was subsequently presented as a stressor (Viator, 2001; Gilboa *et al.*, 2008). However, studies using stress arousal and burnout as mediators do not explain the negative association between performance and perceived environmental uncertainty in accounting firms. Conversely, our findings suggest that this association is

explained by motivation alone for the CPAs and trainee CPAs studied. Since perceived environmental uncertainty does not predict stress arousal, it should not be considered a stressor.

Finally, feedback is a bad stressor in the Big Four firms. Because feedback is suggested as a motivating factor and, if unfair, as a cause of stress (Ashford & Cummings, 1983; Beau, 2018), we assumed that feedback could be a good stressor for two reasons. First, good stressors are positively associated with motivation. Second, by definition, stressors cause stress. On the contrary, our results suggest that feedback is negatively associated with stress arousal and weakly associated with motivation across the entire study sample. This surprising result was explained by breaking down the sample into segments. For the segment relating to practice outside the Big Four firms, feedback is negatively correlated with stress arousal but positively correlated with motivation. Thus, for this segment, feedback is not a stressor, but a motivating factor. Conversely, for the segment relating to practice in the Big Four firms, feedback is negatively correlated with motivation but positively correlated with stress arousal via justice. Feedback may therefore be perceived as a bad stressor by CPAs and trainee CPAs working in the Big Four firms.

4.2. Generalizability of findings

These contributions show the merits of the model developed by LePine *et al.* (2005) to identify good and bad stressors in accounting firms. Our findings allow us to compare studies of the relationship between stress and performance in accounting firms with studies of this relationship undertaken in other settings.

First, in accounting firms, as in other settings, role stressors are bad stressors. LePine *et al.* (2005) classify role stressors as a bad stressor and our results corroborate this classification in accounting firms. However, contrary to previous studies (Fogarty *et al.*, 2000; Jones *et al.*, 2010), we conclude that role stressors include no good stress components in accounting firms. The results observed in other settings on the links between role stressors and performance nonetheless appear to be generalizable to accounting firms.

Second, our findings suggest excluding perceived environmental uncertainty from stressors, explaining its effect on performance via motivation alone. Firm-based studies suggest a negative association between perceived environmental uncertainty and performance (Rebele & Michaels, 1990; Gregson *et al.*, 1994; Viator, 2001). Our correlation matrix supports this association and also suggests a negative correlation between perceived environmental uncertainty and stress arousal. However, this latter association becomes non-

significant when we control for the effect of other variables (Figure 1). This non-significant relationship supports the interpretation of perceived environmental uncertainty as an antecedent to role stressors or as a distant stressor (Lysonski, 1985; Rebele & Michaels, 1990; Gilboa *et al.*, 2008). This interpretation is shared with other samples, so it appears that considering perceived environmental uncertainty as a demotivating factor rather than as a stressor can be generalized to accounting firms.

Finally, management methods can become bad stressors if they are a source of injustice. For example, when feedback from others takes the form of individual evaluations (Beau, 2018) or of promotion taking into consideration “business” performance (Garnier, 2020), it may be perceived as a bad stressor in Big Four firms. In these firms, feedback appears to arouse stress by reducing the perception of organizational justice, thereby demotivating staff. Outside the Big Four firms, feedback appears to motivate staff and reduce stress by improving organizational justice. In other contexts, organizational justice is related differently to good and bad stressors depending on the type of leadership (Zhang *et al.*, 2014). The type of leadership in the Big Four firms may also moderate our findings. However, to the best of our knowledge, it has not previously been shown that the perception of organizational injustice can transform a management method into a bad stressor.

4.3. Limitations and future research

Our study is not, however, without limitations that call for future research. Like many studies in the accounting, control, and audit field, our article suffers from a lack of external and internal validation (Van der Stede *et al.*, 2006; Larcker & Rusticus, 2010).

First, the descriptive statistics suggest that the sample studied is far from representative of the population of CPAs and trainee CPAs practicing in France. The composition of the sample and the low response rate may limit the study’s external validity. But this is not the case for two reasons. Firstly, we conducted tests that suggest the absence of non-response bias.⁷ Secondly, the purpose of this study was not to generalize our results to the whole population but to test various hypotheses to identify stressors that improve the performance of auditors and accountants. To generalize our findings, we would need to adapt our approach in order to obtain a better response rate, for example, by using face-to-face questionnaires or conducting surveys during training sessions offered by the French Order of Certified Public Accountants (*Ordre des Experts-Comptables*). However, these contexts may bias the responses.

Second, our study has an internal validity problem. For example, the direction of effects may differ from those shown in Figure 1. Our interpretations of the results regarding the

direction of effects are guided by theory. However, based on attribution theory (Staw, 1975), performance may be an antecedent of role stressors (Spector *et al.*, 1988). We also did not control for endogeneity, a problem that is receiving increasing attention in the field. However, the recommended solutions are difficult to implement in questionnaire-based studies, since adding instrumental variables and conducting a longitudinal study would lower the rate of usable responses.

Finally, three future research perspectives could be drawn from our findings. First, our study omitted variables classified as good stressors. Future studies could include workload, task diversity, time pressure, and responsibility (LePine *et al.*, 2005) to identify good stressors for auditors and accountants. Second, management accounting research on the link between budgetary participation and managerial performance could mobilize our model because participation is related to motivation, role ambiguity, justice, and feedback. Third, our article examines previously unstudied correlations in accounting firms, thereby improving our understanding of the relationship between stressors and performance for future meta-analytic structural equation modeling (Bonache, 2019).

4.4. Conclusion

We believe that our study provides an original explanation of phenomena observed in the existing literature. It makes three contributions. First, the residual, direct effects observed between role stressors and performance in previous studies may be explained by their negative, indirect effects via motivation. Including motivation as a mediator helps to explain the mechanism by which perceived environmental uncertainty affects performance. Second, motivation as a mediator can be used to identify bad stressors and potentially stressors that can have a positive, indirect effect on performance depending on the context. Our study thus illustrates the merits of the model developed by LePine *et al.* (2005) to prescribe the use of possible good stressors (responsibility, task diversity, workload, etc.) and to avoid bad stressors (role ambiguity, role conflict, and role overload). Finally, introducing organizational justice to the model developed by LePine *et al.* confirms the importance of fair feedback in accounting firms in order to improve the performance and well-being of CPAs and trainee CPAs. This last finding, based on our cross-sectional study, reinforces the validity of a similar conclusion recently obtained with a different research model (Beau, 2018, Bono & McNamara, 2011).

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Table 1: Evaluation of measurement model

Latent variable	Item	Loading	Composite reliability	AVE	Discriminant validity
<i>Role ambiguity</i> RA	RA1	0.68	0.85	0.50	Yes
	RA2	0.76			
	RA3	0.45			
	RA4	0.72			
	RA5	0.82			
	RA6	0.73			
<i>Role conflict</i> RC	RC1	0.74	0.81	0.52	Yes
	RC3	0.69			
	RC5	0.70			
	RC8	0.74			
<i>Role overload</i> RO	RO1	0.65	0.89	0.58	Yes
	RO2	0.87			
	RO3	0.58			
	RO4	0.86			
	RO5	0.79			
	RO6	0.80			
<i>Perceived environmental uncertainty</i> PEU	PEU1	0.74	0.82	0.53	Yes
	PEU2	0.69			
	PEU3	0.70			
	PEU4	0.74			
<i>Feedback</i> F	F1	0.79	0.92	0.74	Yes
	F2	0.89			
	F3	0.87			
	F4	0.89			
<i>Justice</i> J	J1	0.97	0.97	0.92	Yes
	J2	0.96			
	J3	0.95			
<i>Stress arousal</i> SA	SA1	0.97	0.91	0.72	Yes
	SA2	0.86			
	SA3	0.82			
	SA4	0.85			
<i>Emotional exhaustion</i> EE	EE1	0.81	0.90	0.52	Yes
	EE2	0.78			
	EE3	0.75			
	EE4	0.55			
	EE5	0.68			
	EE6	0.76			
	EE7	0.72			
	EE8	0.55			
	EE9	0.81			
<i>Motivation</i> M	M1	0.87	0.92	0.79	Yes
	M2	0.90			
	M3	0.89			
<i>Performance</i> P	P1	0.63	0.90	0.50	Yes
	P2	0.78			
	P5	0.79			
	P6	0.81			
	P7	0.74			
	P8	0.62			
	P9	0.69			
	P11	0.60			
	P12	0.70			

Notes:

Discriminant validity was evaluated using Fornell and Larcker's criterion (Table 2). Loading = outer-loading. AVE = average variance extracted.

Appendices 8.1 to 8.7 present the items tested in the questionnaire.

Table 2: Descriptive statistics and evaluation of discriminant validity

Construct	Descriptive statistics ⁱ		Discriminant validity: correlations					
	Mean	Standard deviation	RA	RC	RO	PEU	F	J
<i>Role ambiguity RA</i>	3.14	1.09	0.71					
<i>Role conflict RC</i>	3.24	1.25	0.32**	0.72				
<i>Role overload RO</i>	4.43	1.32	0.29**	0.46**	0.76			
<i>Perceived environmental uncertainty PEU</i>	3.29	1.07	0.44**	0.25**	0.27**	0.73		
<i>Feedback from others F</i>	4.75	1.40	-0.24**	-0.04	-0.06	-0.17*	0.86	
<i>Justice J</i>	4.82	1.59	-0.42**	-0.30**	-0.32**	-0.19**	0.26**	0.96
<i>Stress arousal SA</i>	2.43	0.70	0.39**	0.42**	0.49**	0.27**	-0.15°	-0.36*
<i>Emotional exhaustion EE</i>	3.20	1.26	0.45**	0.40**	0.61**	0.30**	-0.15*	-0.42*
<i>Motivation M</i>	5.18	1.03	-0.43**	-0.34**	-0.24**	-0.30**	0.19**	0.44**
<i>Performance P</i>	5.12	0.91	-0.51**	-0.19*	-0.26**	-0.53**	0.36**	0.29**

Notes:

i Descriptive statistics were calculated for each aggregate construct using the mean of their corresponding retained items.

ii Numbers in bold are the square roots of the average variance extracted values of the constructs (Table 1). The other numbers are the correlations between the constructs. °, *, ** denote significance at the 10%, 5%, and 1% levels, respectively, using adjusted p-values to reduce the false discovery rate, in line with Benjamini and Yekutieli (2001).

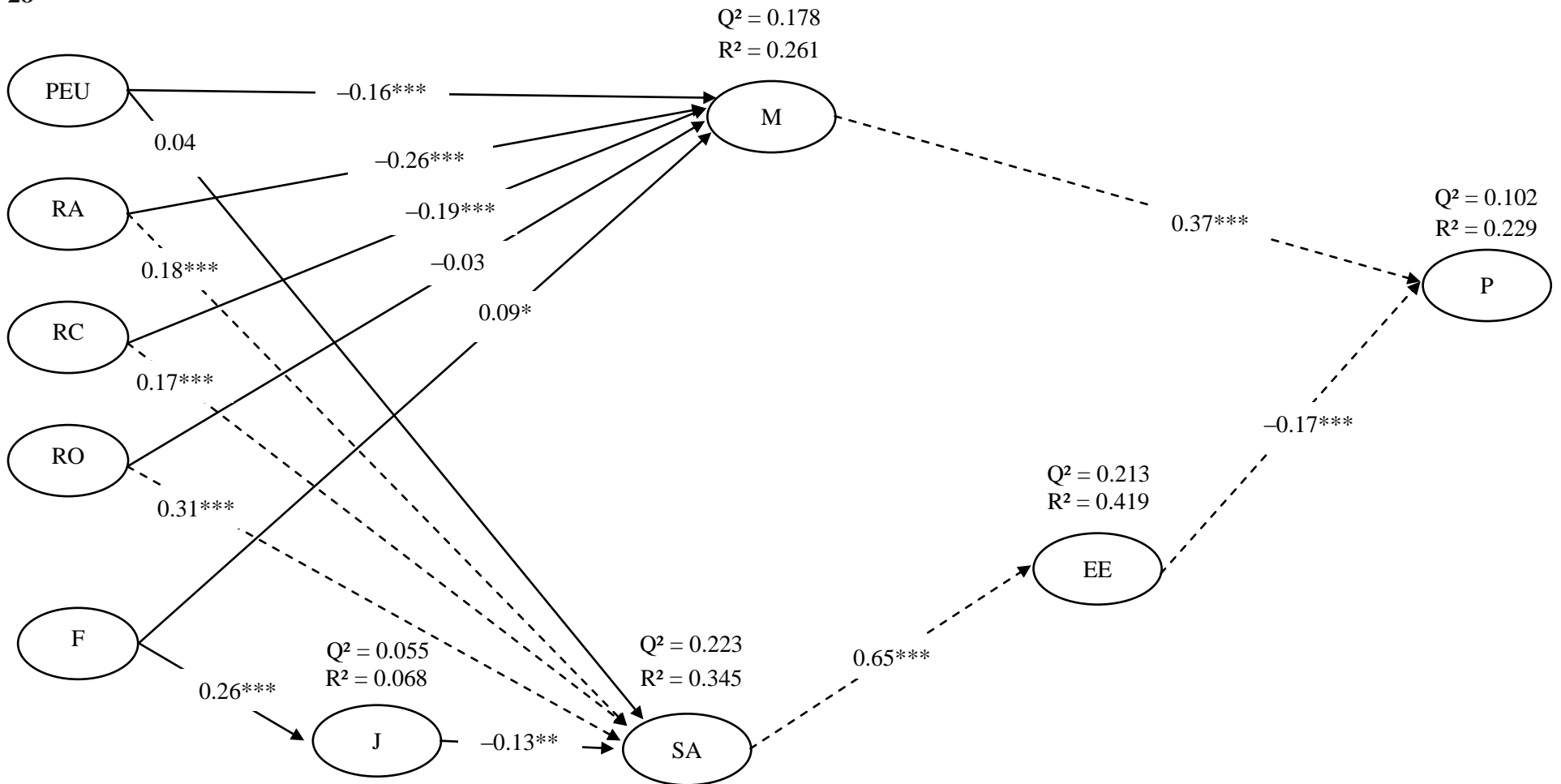


Figure 1: Estimated structural model

Notes:

The dashed arrows indicate relationships in the model that have already been tested and corroborated in previous studies. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Appendix 1 sets out the definitions of the constructs.

Appendices

Appendix 1: Nominal and operational definitions of the variables studied

Construct	Abbreviation	Nominal definition	Operational definition
<i>Independent variables</i>			
Role ambiguity	RA	The degree of imprecision regarding the objectives of a role, the methods to be used to meet these objectives, and the consequences of meeting them (Kahn <i>et al.</i> , 1964).	Rizzo <i>et al.</i> (1970)
Role conflict	RC	The simultaneous occurrence of two types of demands that are difficult, or even impossible, to satisfy concurrently (Kahn <i>et al.</i> , 1964).	Rizzo <i>et al.</i> (1970)
Role overload	RO	A situation where the individual has to accomplish tasks that would be reasonable individually but that are cumulatively difficult, or even impossible, to complete in the allotted time (Schick <i>et al.</i> , 1990).	Harris and Bladen (1994)
Perceived environmental uncertainty	PEU	The inability to assign probabilities with regard to how environmental factors will affect the outcome of a decision, the lack of information regarding the outcomes if this decision were incorrect, and the lack of information regarding the environmental factors associated with a given decision-making situation (Duncan, 1972).	Duncan (1972)
Feedback	F	Information received by role holders about how their behaviors are perceived and evaluated by relevant others (Ashford & Cummings, 1983).	Hackman and Oldham (1975)
<i>Mediators employed</i>			
Organizational justice	J	Perceptions of an organization's fairness, manifested in various ways (Zhang <i>et al.</i> , 2014).	Ambrose and Schminke (2009)
Stress arousal	SA	A relatively predictable arousal of the psycho-physiological (mind-body) system that can, if prolonged, fatigue or damage that system to the point of illness (Girdano <i>et al.</i> , 2013).	Smith <i>et al.</i> (2012)
Emotional exhaustion	EE	Dysfunctional behavioral, emotional, motivational, and physiological responses to certain prolonged stressful situations (Rasclé & Bruchon-Schweitzer, 2006).	Maslach and Jackson (1981)
Motivation	M	Process by which an individual gives direction, intensity, and persistence to his or her actions to achieve a given goal (Robbins <i>et al.</i> , 2009).	Gagné <i>et al.</i> (2015)
<i>Dependent variable</i>			
Performance	P	The degree to which a role holder performs a task satisfactorily (Ferris & Larcker 1983).	Choo (1986)

Appendix 2: Previous studies of the stressor-performance relationship in accounting and auditing firms

Authors (dates)	Stressors included	Stressor measures	Performance measures	Samples
<i>Anderson and Kida (1985)</i>	PEU	Sathe (1974)-12	Holzbach (1978)-6	53 employees from US firms (Virginia)
<i>Greenhaus et al. (1987)</i>	RC, WFC	RHL70-8, Burke <i>et al.</i> (1979)-8	23 supervisor-rated items	366 randomly selected US accountants
<i>Rebele and Michaels (1990)</i>	RA, RC, PEU	RHL70, RHL70, Duncan (1972)-7	15 self-administered items	155 US auditors from international firms
<i>Gregson et al. (1994)</i>	RA, RC, PEU	RHL70-6, RHL70-8, Duncan (1972)-11	One self-administered item on the latest evaluation received	216 randomly selected employees from US firms
<i>Hyatt (1995)</i>	RA, RC	RHL70-6, RHL70-8	Rebele and Michaels (1990)-14 and two self-administered items on the two most recent performance evaluations received	320 US auditors
<i>Fogarty (1996)</i>	RA, RC	RHL70, RHL70	17 self-administered items	462 US auditors from international firms
<i>Fogarty et al. (2000)</i>	RA, RC, RO	RHL70-4, RHL70-4, BWT76-5	Dubinsky and Mattson (1979)-6	188 randomly selected employees from US firms
<i>Fisher (1995, 2001)</i>	RA, RC	RHL70-6, RHL70-8	Choo (1986)-12	119 New Zealand auditors from international firms
<i>Viator (2001)</i>	RA, RC, PEU	RHL70-6, RHL70-6, Duncan (1972)-4	Gregson <i>et al.</i> (1994) and Kalbers and Fogarty (1995)	794 employees from US national and international firms
<i>Murtiasri and Ghozali (2006)</i>	RA, RC, RO	RHL70-5, RHL70-7, BWT76-3	Choo (1986)-3	166 Indonesian auditors
<i>Jones (2007)</i>	RA, RC, RO	RHL70-5, RHL70-3, BWT76-3	Choo (1986)-12	1,026 US auditors from a national firm
<i>Smith et al. (2007)</i>	RA, RC, RO	RHL70-3, RHL70-3, BWT76-5	Dubinsky and Mattson (1979)-6	563 randomly selected employees from US firms
<i>Fanani et al. (2008)</i>	RA, RC	RHL70-6, RHL70-6	Kalbers and Fogarty (1995)-7	49 Indonesian auditors from regional firms
<i>Kalbers and Cenker (2008)</i>	RA	RHL70-6	Fogarty <i>et al.</i> (2000) and Fogarty and Kalbers (2006)-7	172 US auditors from ten regional and national firms
<i>Λαμπράκη (2009)</i>	RA	RHL70-4*	Chong <i>et al.</i> (2004)-1	97 randomly selected employees from Greek firms
<i>Jones et al. (2010)</i>	RA, RC, RO	RHL70-5, RHL70-3, BWT76-3	Choo (1986)-12	1,704 US auditors from a national firm
<i>Everly et al. (2011)</i>	RA, RC, RO	RHL70-3, RHL70-3, BWT76-5	Dubinsky and Mattson (1979)-6	491 randomly selected employees from US firms
<i>Nor (2011)</i>	RA, RC, RO,	RHL70-6, RHL70-8, BWT76-3, Pratt	Choo (1986)-12	274 Malaysian auditors

<i>Mete (2014)</i>	LB WFC, FWC	and Jiambalvo (1981)-19 Netemeyer <i>et al.</i> (1996)-5, Netemeyer <i>et al.</i> (1996)-5	Bakiev (2011)-6	112 employees from Turkish accounting firms
<i>Ajifah et al. (2015)</i>	RC	RHL70-7	Yuresta (2011)	90 employees from Indonesian firms
<i>Novriansa and Sugiyanto (2016)</i>	RA, RC	RHL70-6, RHL70-6	Fogarty <i>et al.</i> (2000)-7	172 Indonesian public auditors
<i>Smith et al. (2017)</i>	RA, RC, RO	RHL70-3, RHL70-3, BWT76-4	Dubinsky and Mattson (1979)-6	486 randomly selected employees from US firms

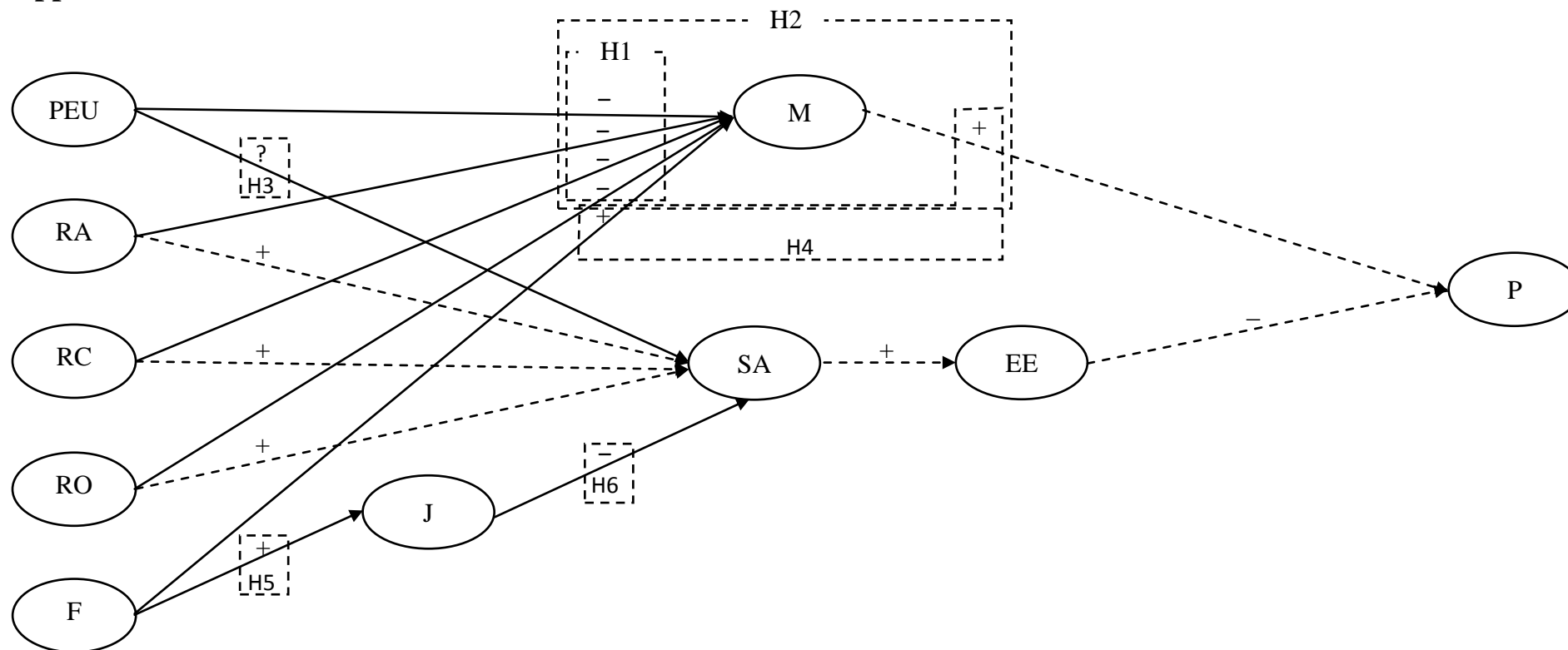
Notes: WFC = work-family conflict; FWC = family-work conflict; LB = leadership behavior. The other stressors are defined in Appendix 1. The stressor measures are listed in the same order as the stressors. Some are abbreviated: RHL70-i = i items from the Rizzo, House, and Lirtzman (1970) scale; BTW76-j = j items from the Beehr, Walsh, and Taber (1976) scale. For each measure, the number following the scale indicates the number of items used from this scale, if reported in the article. * Denotes that other items were used.

Appendix 3: Studies of the stressor-performance relationship including mediators

Authors (date)	Mediators	Signs of indirect effects			Signs of residual effects		
		RA→P	RC→P	RO→P	RA→P	RC→P	RO→P
<i>Fogarty (1996)</i>	JRT	–	–	n.s.	n.s.	–	n.s.
<i>Fogarty et al. (2000)</i>	B	–	–	–	n.s.	n.s.	+
<i>Jones (2007)</i>	B, WB	–	n.s.	–	X	X	X
<i>Smith et al. (2007)</i>	SA, B	n.s.	n.s.	–	n.s.	n.s.	+
<i>Jones et al. (2010)</i>	B, WB	–	n.s.	–	–	n.s.	n.s.
<i>Everly et al. (2011)</i>	SA	n.s.	–	n.s.	–	n.s.	+
<i>Nor (2011)</i>	SA	n.s.	n.s.	n.s.	–	n.s.	n.s.
<i>Smith et al. (2017)</i>	SA, B	–	–	–	n.s.	n.s.	n.s.

Notes: B = Burnout; JRT = job-related tension; WB = well-being. The other constructs are defined in Appendix 1. n.s.: non-significant at the 5% level. –: negative, significant effect. +: positive, significant effect. X: unreported direct effect.

Appendix 4: Structural Model



Notes: Dashed arrows reflect relationships already tested and corroborated in existing studies. Acronyms are defined in Appendix 1. - (+) denotes a hypothesized negative (positive) association based on the existing literature. Hi displays Hypothesis i presented in Section 1.2.

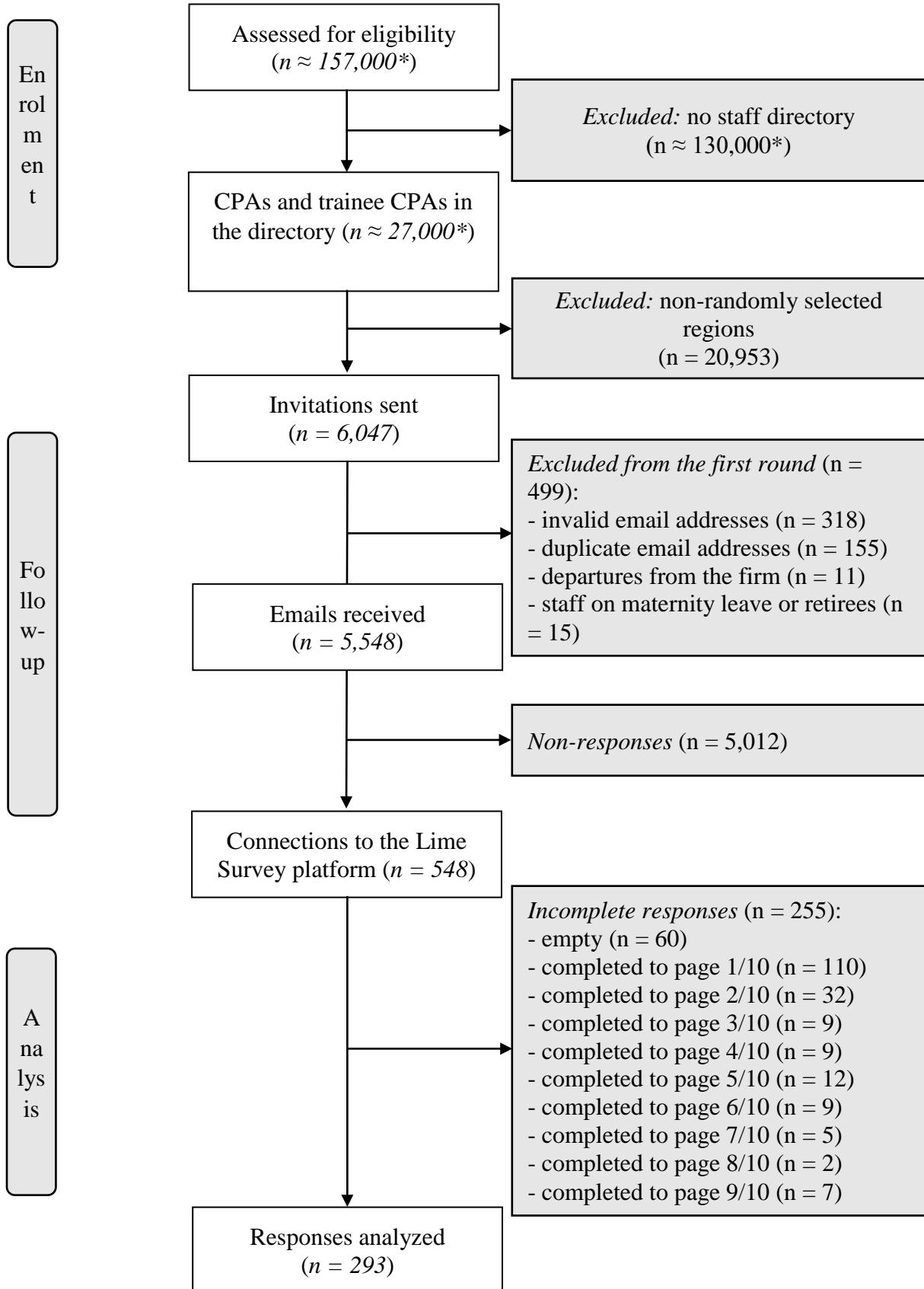
Appendix 5: Determining the minimum number of invitations

We calculated the minimum number of invitations in two steps.

We first performed an a priori power analysis (Cohen, 1988) to determine the minimum sample size required for the specified significance level α , the number of independent variables p , the population size effect f^2 , and the statistical power to be achieved $1 - \beta$. We set the significance level to the conventional type I level of 5% (Cohen, 1988) and specified five independent variables (the maximum number of arrows pointing to a construct, Appendix 4). The type I risk, the number of variables, and the sample size allow us to calculate a critical value F of the Fisher distribution with p and $n - p - 1$ degrees of freedom. The critical value and the degrees of freedom are used to calculate the statistical power $\pi(F, f^2, p, n - p - 1)$ for a given effect size. A small effect size was set using the threshold value from Cohen (1988): $f^2 = 0,02$. To detect this effect size, the sample size n is changed until the statistical power achieved π is as close as possible to the required power level of 80%. A required power level of 80% allows us to obtain the desired balance between type I and type II errors (Cohen, 1988). We performed these calculations using G*Power 3.1.9.2 software because statistical tables are insufficiently precise. This software was used to calculate the minimum sample size: 311.

We then divided this minimum sample size by the response rate from the last two pilot tests of the questionnaire. This calculation assumed that the response rates achieved in these two pilots and in the actual study would be identical. The response rate in the last two pilots was 5%. We therefore divided the minimum sample size by this response rate to determine the required number of invitations: 6,220.

Appendix 6: Flow diagram



Notes: * sources: OMECA, DARES, directory of the Superior Council of the Order of Certified Public Accountants in France (*Conseil Supérieur de l'Ordre des Experts-Comptables*).

Appendix 7: Scale adaptation

We first developed an initial questionnaire and sent it via Google Form to students following a Master's program in Accounting, Control, and Audit in various institutions. In parallel, we sought feedback on this initial questionnaire from two members (a director and a professor) of the Superior Council of the Order of Certified Public Accountants in France (*Conseil Supérieur de l'Ordre des Experts-Comptables*). This helped us to identify missing variables and wording issues, and we were also able to access the email addresses of employees from all firms. We then conducted a systematic literature review to identify any further missing variables. We decided to use cluster sampling by requesting directories from the Regional Councils of the Order of Certified Public Accountants (*Conseils Régionaux de l'Ordre des Experts-Comptables*), and performed reverse translation and pilot testing using the de Vaus (2014) procedure.

Second, the questionnaire and the study design were presented at a research seminar to collect feedback from fellow professors and lecturers in accounting. The CNIL (French Data Protection Authority) correspondent and the ethics committee of our university were informed of the upcoming study. We then met a research engineer specializing in questionnaire administration to determine the local possibilities in terms of questionnaire administration platforms and to learn how to make the questionnaire available online. Finally, a fellow professor translated our complete questionnaire back into English. We used this back translation to discuss translation differences and to improve and agree on the wording. This colleague also suggested that we shorten the questionnaire.

Third, we conducted three pilot tests (de Vaus, 2014). First, we administered the questionnaire to eight accountants and CPAs (first pilot test). They answered the questionnaire on the platform in front of us and gave us their opinion on the questionnaire, its length, the wording of the questions, and other questions that could be asked. We then decided to withdraw the questions on stress management (the scale was too long and unsuitable) and to circulate the results to respondents (preferable to a financial incentive in this case). Respondents also gave their opinion on the ideal timing for sending the questionnaire to avoid a low response rate. Other relevant questions were added at their request: presence of a dependent person at home, flexible work arrangements, use of mobile devices at work and at home, organizational justice, etc.

Fourth, during the second pilot test, we randomly selected CPAs throughout France and sent them a quasi-final draft of the questionnaire. We determined how much of the questionnaire the respondents had completed (page where they stopped). The questionnaire

was shortened and simplified to increase the response rate. Questions on the respondents' status enabled us to add filters to avoid irrelevant questions.

Finally, we ran a third pilot test of the simplified and shortened version of the questionnaire using a random sample of CPAs. This identified a final problem: the questionnaire was difficult to complete using tablets and smartphones. A similar smartphone and tablet version was thus designed with the help of a research engineer specialized in questionnaire administration. The response rate and average completion time were calculated during this final pilot test.

Appendix 8: Measurement scales used

Apart from the scales measuring feedback from others, intrinsic motivation, and stress arousal, the response options range from “1 – strongly disagree” to “7 – strongly agree”. To avoid the problem of common-method variance induced by the self-reporting of all scales, we followed the procedures set out by Podsakoff *et al.* (2003). For example, the confidentiality of responses was protected and this confidentiality was emphasized in the invitation email and in the introduction to the questionnaire in order to reduce social desirability and approval biases. To reduce these biases, the questionnaire reminded respondents before each question that there were no right or wrong answers. We also kept the questions as simple as possible and employed scales that are widely used in the literature. The questionnaire items were inserted into a longer questionnaire including questions not relevant to this study and were randomly rotated using LimeSurvey software.

Appendix 8.1: Measuring role ambiguity (RA), role conflict (RC), and role overload (RO)

Please indicate your level of agreement with the following statements by ticking the most appropriate statement. Over to you...

Item	Label
I am certain about how much authority I have*	RA1
There are clear, planned goals and objectives for my job*	RA2
I know that I have allocated my work time appropriately*	RA3
I know what my responsibilities are*	RA4
I know exactly what is expected of me*	RA5
I receive clear explanations of the work to be done*	RA6
I have to do things in a particular way, but they should be done differently	RC1
I am given assignments without sufficient staff to complete them	RC2
I have to override rules or policies to complete assignments	RC3
I work with two or more groups that operate quite differently	RC4
I get incompatible requests from two or more people	RC5
I do things that one person might accept, but that others might not	RC6
I am given assignments without the proper resources and documentation to complete them	RC7
I work on unnecessary tasks	RC8
I am given enough time to do what is expected of me in my job*	RO1
It often feels like I have too much work for one person	RO2
The performance standards for my job are too high	RO3
I have too much work to do everything properly	RO4
I am asked to do a considerable amount of work	RO5
I never seem to have enough time to get everything done	RO6

Appendix 8.2: Measuring perceived environmental uncertainty (PEU) and feedback from others (F)

Please indicate your level of agreement with the following statements by ticking the most appropriate statement.

Item	Label
I am almost always sure that I know the best ways to deal with problems that arise during assignments*	PEU1
I am almost always sure that I know how to deal with changes in the social, economic, political, or technical environment*	PEU2
It is very often difficult for me to determine whether I have made the right decisions at work	PEU3
I rarely know how to obtain the information I need to make decisions at work	PEU4

Please tick the answer that best expresses your point of view. You may find some of the statements similar, but they will help us to fine-tune your description of your primary role.

Item	Label
The effectiveness of my work can be clearly evaluated by others	F1
In my professional activity, other people (colleagues, superiors, clients, or others) can give me feedback on the effectiveness of my work	F2
In my professional activity, people (internal or external to my company or institution) can tell me whether my work is effective	F3
The information given to me by other people (colleagues, superiors, clients, or others) informs me about the quality and efficiency of my work	F4

Response options range from “-3: Does not describe at all” to “+3: Definitely describes”.

Appendix 8.3: Measuring Intrinsic Motivation (M)

For each of the following statements, please indicate the extent to which they encourage you to make an effort in your current role. We are referring here to the intellectual, physical, and mental effort you put into your work.

Item	Label
Because I enjoy doing my job	M1
Because my job is challenging	M2
Because the work I do is interesting	M3

The response options range from “1: Not at all” to “7: Exactly for this reason”.

Appendix 8.4: Measuring stress arousal (SA)

You will find below a series of questions describing personal situations you may have encountered. Please indicate how often you have experienced each of these situations recently. In the past few weeks, how often have you found yourself...

Item	Label
Anticipating or remembering upsetting things?	SA1
Thinking about things that upset you?	SA2
Concerned or worried?	SA3
Repeating unpleasant thoughts to yourself?	SA4

The response options range from “1: Rarely or never” to “5: Almost always”.

Appendix 8.5: Measuring emotional exhaustion (EE)

Please indicate your level of agreement with the following statements by ticking the most appropriate statement.

Item	Label
I feel emotionally drained by my work	EE1
I feel exhausted at the end of the workday	EE2
I feel worn-out when I get up in the morning and have to face a new day at work	EE3
I find it very draining to work with people all day	EE4
I feel energized by my work*	EE5
I feel frustrated by my work	EE6
I feel that I work "too hard" at my job	EE7
Working directly with people makes me too stressed	EE8
I feel like I'm at the end of my tether	EE9

Appendix 8.6: Measuring organizational justice (J)

Please indicate the extent to which you agree with the following statements.

Item	Label
Overall, I am treated fairly by my firm	J1
Overall, I can rely on my firm to be fair	J2
In general, the treatment I receive in my firm is fair	J3

Appendix 8.7: Measuring performance (P)

Please indicate your level of agreement with the following statements by ticking the most appropriate statement.

Item	Label
I am satisfied with the amount of work I produce	P1
I am satisfied with the quality of my work	P2
I am satisfied with my oral communication skills	P3
I am satisfied with my written communication skills	P4
I am satisfied with my ability to accept responsibility and to take action	P5
I am satisfied with my ability to exercise professional skill and due care	P6
I am satisfied with my ability to follow policies and procedures	P7
I am satisfied with my ability to plan and organize my work	P8
I am satisfied with my ability to adapt to different and new work situations	P9
I am satisfied with my ability to interact with other people in my firm	P10
I am satisfied with my ability to interact with clients outside the firm	P11
I am satisfied with my ability to supervise others	P12

* indicates a reverse item

Appendix 9: Descriptive statistics (n = 293)

Construct	Item	Min	Max	Mean	Median	Standard deviation	Skewness	Kurtosis
RA	RA1	1	7	3.63	4	1.66	0.21	-0.79
	RA2	1	7	3.44	3	1.64	0.42	-0.8
	RA3	1	7	3.51	3	1.47	0.43	-0.54
	RA4	1	7	2.42	2	1.57	1.3	0.92
	RA5	1	7	2.84	2	1.56	0.77	-0.39
	RA6	1	7	2.99	3	1.48	0.8	0.09
RC	RC1	1	7	4.13	4	1.76	-0.18	-1.04
	RC3	1	7	2.98	2	1.74	0.56	-0.91
	RC5	1	7	2.89	2	1.76	0.61	-0.86
	RC8	1	7	2.94	2	1.71	0.65	-0.7
RO	RO1	1	7	4.62	5	1.69	-0.41	-0.82
	RO2	1	7	4.56	5	1.78	-0.33	-1.03
	RO3	1	7	3.38	3	1.66	0.38	-0.79
	RO4	1	7	4.43	5	1.81	-0.26	-1.03
	RO5	1	7	4.69	5	1.72	-0.5	-0.69
	RO6	1	7	4.94	5	1.79	-0.55	-0.84
PEU	PEU1	1	7	3.54	3	1.42	0.41	-0.5
	PEU2	1	7	3.83	4	1.45	0.05	-0.74
	PEU3	1	7	3.12	3	1.54	0.61	-0.56
	PEU4	1	7	2.66	2	1.46	0.97	0.22
FB	FB1	1	7	4.69	5	1.73	-0.47	-0.81
	FB2	1	7	4.83	5	1.57	-0.59	-0.53
	FB3	1	7	4.68	5	1.71	-0.65	-0.65
	FB4	1	7	4.82	5	1.52	-0.62	-0.42
M	M1	1	7	5.13	5	1.20	-0.76	1.28
	M2	1	7	5.04	5	1.20	-0.58	0.66
	M3	1	7	5.38	5	1.08	-0.77	1.43
SA	SA1	1	4	2.47	3	0.81	-0.1	-0.53
	SA2	1	4	2.41	2	0.79	0.01	-0.46
	SA3	1	4	2.74	3	0.84	-0.16	-0.62
	SA4	1	4	2.11	2	0.85	0.22	-0.77
EE	EE1	1	7	3.35	3	1.93	0.33	-1.24
	EE2	1	7	3.62	4	1.87	0.10	-1.24
	EE3	1	7	3.57	4	1.87	0.14	-1.23
	EE4	1	7	2.57	2	1.67	0.98	-0.08
	EE5	1	7	4.24	4	1.59	-0.01	-0.87
	EE6	1	7	2.82	2	1.79	0.73	-0.63
	EE7	1	7	3.77	4	1.86	0.11	-1.16
	EE8	1	7	2.24	2	1.52	1.36	1.11
	EE9	1	7	2.61	2	1.75	0.89	-0.35
J	J1	1	7	4.87	5	1.71	-0.66	-0.59
	J2	1	7	4.76	5	1.63	-0.6	-0.55
	J3	1	7	4.83	5	1.64	-0.59	-0.6
P	P1	1	7	4.28	4	1.55	-0.27	-0.81
	P2	1	7	5.25	5	1.18	-0.84	0.80
	P5	2	7	5.37	6	1.29	-0.76	0.00
	P6	1	7	5.40	6	1.15	-0.78	0.60
	P7	1	7	4.96	5	1.32	-0.57	-0.07
	P8	1	7	4.93	5	1.39	-0.55	-0.31
	P9	2	7	5.46	6	1.18	-0.87	0.50
	P11	2	7	5.54	6	1.20	-0.85	0.27
	P12	1	7	4.91	5	1.36	-0.69	-0.10

Notes: Constructs and items are defined in Appendix 8.