

# Stress at the top: myth or fact? Causal explanations from a fuzzy-set qualitative comparative analysis (fsQCA)

Maria João Guedes<sup>1</sup> · Helena Martins Gonçalves<sup>1</sup> · Vítor da Conceição Gonçalves<sup>1</sup>

Published online: 4 June 2016  
© Springer Science+Business Media Dordrecht 2016

**Abstract** Stress and its associated health issues are a serious concern, because they not only affect employees but also organizations through related costs. The common perception is that being at the top of a hierarchy is associated with higher levels of stress because of the increased responsibilities, challenges, and demands. The present study examines this perception by applying a fuzzy-set qualitative comparative analysis. The study investigates how the top position, authority, number of subordinates, workload, and a sense of control, alone or in combination, lead to stress or its absence. The results show that there are several recipes for stress and that being (or not being) in the top position is neither a sufficient nor a necessary condition for stress (or absence of stress). One of the recipes, however, indicates that being in the top position might be conducive to stress. This finding shows that the position an individual has in the hierarchy does not determine stress. The present study also shows that the absence of a sense of control is almost always a necessary condition for predicting stress and is present in all recipes for the absence of stress. The results can inform managers about the conditions that cause stress and enable managers to think about solutions that can lead to good mental health in their organizations.

**Keywords** Stress · Top management · Fuzzy-set analysis · STAI · Sense of control

---

✉ Maria João Guedes  
mjguedes@iseg.ulisboa.pt

Helena Martins Gonçalves  
helenamg@iseg.ulisboa.pt

Vítor da Conceição Gonçalves  
vcg@iseg.ulisboa.pt

<sup>1</sup> ISEG, Universidade de Lisboa, Rua Miguel Lupi 20, 1249-078 Lisbon, Portugal

## 1 Introduction

Mental wellness is an important concern for organizations, not only for those at the top of the hierarchy, but for the entire workforce as a whole (World Health Organization [WHO] 2000). The World Health Organization (2000) recognizes mental health as a top priority and advocates that the workplace is an essential environment for promoting health literacy. This priority is not surprising as we spend most of our lives working. A work environment that is aware of mental health consequences and that promotes good mental health among employees will always be more productive. Xavier et al. (2013) reported that mental health-related problems are responsible for approximately 26.6 % of the total health problems in Europe and 23 % in developed countries. Understandably, the costs of such health problems are a serious concern to most organizations, whether they incur these costs directly (such as costs for medical appointments or buying medication) or indirectly (such as absenteeism, low productivity, or turnover).

Understanding that stress-related illnesses are just as likely to occur at the top levels of the hierarchy as it is among any other level is relevant. However, the common perception is that being at the top of the corporate ladder of an organization comes with increased responsibilities, challenges, and demands (March and Weiner 2003). At the top of an organization, individuals handle important decisions and manage conflicts, time constraints, and an increased workload (Campbell et al. 2007). Because time and health are limited resources, the assumption is often that top managers experience more stress (Levinson 1981; Lovelace et al. 2007). Although a certain degree of stress provides extra energy that helps performance, permanent and increased levels of stress bring emotional instability (Aburdene 1977), lack of concentration, lapses in judgment, and health problems (Sapolsky 1994).

Despite the common perception, only a small number of studies have examined the relationship between individuals in higher leadership positions and stress. Furthermore, the literature offers competing views. On the one hand, some studies have found that rising through the hierarchy is related to more stress (e.g., Levinson 1981; Cahoon and Rowney 1984; Hambrick et al. 2005). On the other hand, other studies challenge the common perception and show that individuals in higher positions with higher levels of income, education, and socioeconomic status (SES) are associated with better health (Marmot et al. 1984; Lantz et al. 1998; Cohen et al. 2006; Stringhini et al. 2010) and, thus, less stress (e.g., Sherman et al. 2012; Lutchny et al. 2015).

In light of the conflicting views, it is important to unravel whether individuals in higher positions suffer stress and whether other conditions contribute to that relationship. To address this gap in the literature, the present study has two main goals. First, it aims to contribute to the emerging literature that relates stress to top-ranking managers by scrutinizing whether top managers experience more stress than employees at other levels of the hierarchy. Second, the study aims to investigate which recipes (or combinations) lead to stress or no stress. To accomplish these tasks, the study applies a fuzzy-set qualitative comparative analysis (fsQCA) to investigate whether conditions such as the top position, a sense of control, authority, workload, and number of subordinates lead to stress or an absence of stress (Fiss 2007). To the best of our knowledge, the present study is the first to look at these conditions, alone or in combination, as conducive to stress. By investigating what can cause stress and by showing that there are different recipes for stress, our study can help managers engage in actions that promote health, such as reducing the workload or having fewer subordinates to manage. The possibility to take some corrective actions can

be very valuable to organizations and policymakers, because these actions can reduce levels of absenteeism, increase productivity, and as a result, the overall performance of the organization.

This paper proceeds as follows: the first section elaborates on the debate regarding the conditions that might be conducive to stress, presents a literature review, and the study's causal propositions. Next, the paper presents the analytical fsQCA approach followed by the results of the study and a discussion. Finally, the paper offers conclusions, limitations, and suggestions for future research.

## 2 Literature review

This section reviews the following causal conditions of stress: top management, the sense of control, authority, number of subordinates, and workload.

### 2.1 The causal conditions of stress

#### 2.1.1 Top management

Are top managers more stressed? The debate as to whether top managers experience more stress than their subordinates has long attracted the attention of scholars and practitioners. At the upper echelons, managers deal with greater pressure, responsibilities, and demands (March and Weiner 2003) that can cause damage to their mental well-being.

The evidence shows that anxiety can influence an individual's cognition and behavior, which in turn can impair how a top manager determines strategic courses of action (Crum et al. 2013; Mannor et al. 2015). Thus, the importance of understanding the relationship between stress and a top management position is pivotal. Mental health issues are relevant not only in terms of health concerns, but also in terms of economic consequences. According to a European Union report (WHO 2008), about 11 % of the European population had some kind of mental perturbation, and mental issues were responsible for about 26.6 % of the total health problems in Europe (Xavier et al. 2013). The costs that arise from having a workforce where some members have mental health problems have consequences, such as absenteeism, reduced productivity, an increase in error rates, poor relationships with clients, loss of motivation, and poor decision making, all of which are conditions that an organization cannot ignore (WHO 2000). If problems are more prevalent in the top leadership positions of an organization, then poor judgment and decision making can threaten the organization's survival.

Despite the common perception in the academic community that top managers experience more stress, the literature presents contrasting findings that leave the link between the hierarchical position and stress unresolved. On the one hand, some authors claim that higher leadership positions have increased physical demands, such as workload and frequent travel (Campbell et al. 2007). Thus, top managers experience more stress because the resources available to them are often scarce when it comes to managing the increased demands (Levinson 1981; Cahoon and Rowney 1984; Lovelace et al. 2007). In addition, top managers might be worried about being laid off or about losing their source of income or position within society (Adler et al. 2000). On the other hand, recent studies challenge this common perception and find that top managers experience less stress (Sherman et al. 2012; Lutchyn et al. 2015).

### 2.1.2 *The sense of control*

Each individual has a different tolerance for stress that varies according to the nature and circumstances of the stress. Hence, managing the situation is an important aspect when dealing with stress, and it hinges on the individual's sense of control. A sense of control is the belief that one can control and deal with situations (Keeton et al. 2008). Having a high sense of control is related to proactive behavior and positive psychological outcomes, such as lower anxiety levels and feeling healthy (Mirowsky and Ross 1991). Similarly, a low sense of control is associated with negative psychological outcomes, such as stress (e.g., Chorpita and Barlow 1998; Shapiro et al. 1996). In terms of the mental stress at work, Karasek (1979) argued that stress results not only from job demands but also from the employee's decision-making latitude. Thus, employees with a greater sense of control experience less stress because the sense of control represents a psychological advantage and acts as a buffer to stress (Sherman et al. 2012).

### 2.1.3 *Authority*

Authority can be related to position in the hierarchy, control over decisions, and the behavior of subordinates that might lead to stress. In fact, Kraus et al. (2011) predicted that individuals with greater power are disposed to greater control of their environments and are more consistent. Thus, having a greater amount of authority and autonomy to make decisions might be either a source of stress or a great motivator for the top manager as well as for subordinates. Similar to one's sense of control, individuals that have more authority might have more control over their work. For example, they might be able to delegate some tasks, or they might have more decision latitude to manage their agenda. Sherman et al. (2012) found that managers that possess greater authority over subordinates have a greater sense of control, which translates into less stress.

### 2.1.4 *Number of subordinates*

In an organization's top positions, managers are responsible for a large number of subordinates (including those who report directly and indirectly to the leader). Having many subordinates can act either as a source of stress because it confers more responsibility to top managers or as a source of prestige, power, and influence because these subordinates exert authority over other subordinates (McClelland and Burnham 2003; Sherman et al. 2012). Similarly, managers in top positions can also decide to delegate routine management decisions to lower-ranking subordinates, thus alleviating their workload and responsibilities. Sherman et al. (2012) found support for this argument by showing that individuals that are responsible for managing other people experience less stress than those that are not responsible for managing others.

### 2.1.5 *Workload*

The number of hours, pressure, and the intensity and demands of work (Rystedt et al. 2008) can all affect workers' well-being by reducing physical stamina. This translates into negative health outcomes, such as stress (Ganster and Schaubroeck 1991; WHO 2000; Ozkan and Ozdevecioğlu 2013).

In terms of the literature that examines the relationship between demands and stress at the top levels of organizations, the results are still unclear. On the one hand, some studies have argued that top managers are subject to elevated psychosocial demands (Karasek and Theorell 1990); conflicting demands and interests (Maslach et al. 2001); and sometimes even a lack of clarity in their roles, responsibilities, and decision latitudes (Offermann and Hellmann 1996). Top managers also have to deal with physical demands, such as constant meetings, travel, and time constraints (Campbell et al. 2007). As a result, the increasing demands placed on top managers come at the cost of higher levels of stress.

On the other hand, other studies have claimed that managers in top positions have a greater ability to handle stress, have more decision latitude (Skagert et al. 2008), greater job control, and tend to display better mental health (Kawada and Otsuka 2011).

Based on the existing literature, the present study makes the following propositions:

**Proposition 1** *The absence of a sense of control is a necessary condition to predict stress.*

**Proposition 2** *Authority, the number of subordinates, workload, and being top management in different combinations are sufficient to predict stress, but each condition is not.*

### 3 Method

#### 3.1 Data collection

The present study administered a personal survey to managers in different hierarchical positions from diverse organizations. The sample consists of 87 managers (26 top managers and 61 intermediate managers) recruited from the Executives' Courses at a Lisbon University, a research institute, and three private companies (through email invitations). The participants were offered a lunch and free parking in recognition of their participation in the study. They filled out a paper questionnaire in a lecture room (with an average response time of 15 min). The questionnaire was pre-tested on 12 students to ensure that the content and clarity of the items were in line with the purpose of the present study.

About 62 % of the participants are men, with an average age of 41 years (ranging from 21 to 67 years old). Nearly 87 % of the participants have a gross annual income of less than 74,999 Euro and only 5 % have a gross annual income of higher than 105,000 Euros.

The most prevalent industry is that of consultancy, both scientific and financial, which represents more than 39 % of the participants. Overall, 65 % of the participants work in the private sector, 24 % work in the nonprofit sector, and the remaining 11 % work in the public sector. Approximately 47 % of the participants work in organizations with more than or equal to 251 employees, and only 6 % work in organizations with less than or equal to 9 employees.

#### 3.2 Measures

##### 3.2.1 Outcome: stress

We use the State-Trait Anxiety Inventory (STAI) to measure anxiety as a proxy for psychological stress. The STAI consists of the state anxiety scale to evaluate the current level of anxiety, and the trait anxiety scale to evaluate the relatively stable aspect of anxiety. In the present study, we use the Portuguese trait version, which Spielberger (1983)

developed and that McIntyre and McIntyre (1995) translated into Portuguese. This version was later validated by McIntyre et al. (2000) and Fernandes and McIntyre (2002) for the Portuguese population. The scale consists of 20 items that indicate the presence and absence of anxiety on a 4-point scale (from 1 = *almost never*, to 4 = *almost always*). The scores are summarized in Table 1. The results show good reliability with a Cronbach's alpha coefficient of 0.87 (DeVellis 1991).

**Table 1** Scales summary

	Mean	SD	Cronbach's $\alpha$
STAI trait inventory	36.14	8.13	0.87
I feel pleasant	1.58	0.58	
I feel nervous and restless	2.09	0.86	
I feel satisfied with myself	1.62	0.62	
I wish I could be as happy as others seem to be	1.92	0.98	
I feel like a failure	1.08	0.35	
I feel rested	1.62	0.62	
I am "calm, cool and collected"	1.92	0.98	
I feel that difficulties are piling up so that I cannot overcome them	1.08	0.35	
I worry too much over something that really doesn't matter	1.62	0.62	
I am happy	1.92	0.98	
I have disturbing thoughts	2.00	0.76	
I lack self-confidence	1.55	0.76	
I feel secure	2.22	0.95	
I make decisions easily	1.72	0.74	
I feel inadequate	1.20	0.55	
I am content	1.78	0.64	
Some unimportant thoughts run through my mind and bothers me	1.76	0.75	
I take disappointments so keenly that I can't put them out of my mind	1.87	0.93	
I am a steady person	1.63	0.61	
I get in a state of tension or turmoil as I think over my recent concerns and interests	2.28	0.83	
Sense of control	45.10	5.80	0.83
I can get him/her/them to do what I want.	6.01	0.69	
I think I have a great deal of power	5.17	1.45	
If I want to, I get to make the decisions	5.44	0.86	
I can get him/her/them to listen to what I say.	5.68	1.08	
My wishes do not carry much weight.	5.05	1.28	
Even if I voice them, my views have little sway.	5.62	1.13	
My ideas and opinions are often ignored.	5.76	1.08	
Even when I try, I am not able to get my way.	6.44	0.69	
Authority	18.78	5.82	0.85
I can punish or reward subordinates	4.17	2.02	
I can promote or demote subordinates	3.80	2.17	
I am expected to motivate my subordinates	5.37	1.42	
I supervise subordinates and evaluate or correct their work as necessary	5.60	1.17	

### 3.2.2 Conditions

The causal conditions for the study are: top management, sense of control, authority, number of subordinates, and workload.

**3.2.2.1 Top management** If the hierarchical position of the respondent in the organization is in the top management, a value of “1” was assigned. If the position is intermediate, then it is denoted “0”.

**3.2.2.2 The sense of control** To evaluate the role of a sense of control we use the Personal Sense of Power scale that Anderson et al. (2012) developed. The scale comprises eight items (Table 1) ranging from 1 = *disagree strongly* to 7 = *agree strongly*. The scores are summarized in Table 1. The Cronbach’s alpha coefficient is 0.83, which indicates good consistency (DeVellis 1991).

**3.2.2.3 Authority** We follow Sherman et al.’s (2012) authority and autonomy measure that has four items on a 7-point scale that range from 1 = *much less than others in my organization* to 7 = *much more than others in my organization*. The scores are summarized in Table 1. The scores present good internal consistency with a Cronbach’s alpha coefficient of 0.85 (DeVellis 1991).

**3.2.2.4 Number of subordinates** This measure totalled the number of people under direct and indirect management.

**3.2.2.5 Workload** This measure equals the total number of hours worked per week.

## 4 Qualitative comparative analysis

The fsQCA is a configurational comparative method that explores the combination of causal conditions that are necessary and/or sufficient to reach an outcome (Ragin 2000). Under the assumption of “complex causality,” the fsQCA permits the combination of different causal conditions that are conducive to an outcome, different combinations of the causal conditions to reach the outcome, and permits different causal conditions that might have opposite effects depending on the combinations of which they are part (Wagemann and Schneider 2010).

Using the set theory and Boolean algebra, the fsQCA analyzes the degree of various conditions’ presence or absence or the combination of conditions conducive to an outcome. That is, the analysis evaluates cases in terms of their membership in a certain set that is based on the theory and/or knowledge the researcher has on the topic. To conduct a fsQCA, the cases must be scaled into degrees of membership. The membership intervals range from 0 to 1, which indicates the degree from full non-membership (fully out) to full membership (fully in), respectively. A score of 0.5 is the cross-over point (neither in nor out) to create precision (Ragin 2008). Furthermore, three Boolean operations: intersection, set union, and set negation can be used in the fsQCA to create the conditions that should lead to the outcome. Next, the fsQCA identifies the conditions or combinations of conditions that are necessary or sufficient for the outcome. A causal condition is deemed necessary if the outcome cannot be reached without its presence but the condition alone is

not enough to cause the outcome (Ragin 2000, 2008). A condition is sufficient if the outcome always occurs in the presence of the condition, despite other conditions that might also be conducive to the outcome (Ragin 2000, 2008).

In the present study, the causal conditions for the fsQCA analysis are: top management, sense of control, authority, number of subordinates, and workload. The outcome is stress as measured by the managers' anxiety levels.

The fsQCA is appropriate for conducting our analysis because it allows us to pursue simultaneous qualitative and quantitative analyses that captures the differences in both the kind and degree of the outcome under study (Pennings 2005; Ragin 2008). The analysis enables the study of causal complexity, equifinality (a certain outcome can be reached by multiple paths or solutions), multifinality (similar conditions can lead to different outcomes), conjunctural causation (the causal configurations can be jointly necessary and sufficient to lead to the outcome, with each condition perhaps being neither sufficient nor necessary), and asymmetric causality (the presence and the absence of the outcome requires different explanations) (Ragin 2008; Fiss 2011; Basedau and Richter 2014). The fsQCA can be used with either small (<50 cases, e.g., Fiss 2007) or large samples (>50 cases, e.g., Greckhamer et al. 2013; Kraus et al. 2016).

#### 4.1 Calibration

As Woodside (2013) proposed, the present study uses three different anchors to calibrate the data. The anchor points are set to 95 % to specify full membership, 50 % for the cross-over, and 5 % for the full non-membership. Table 2 presents the calibration values and the statistics for each condition and outcome.

#### 4.2 Analysis of necessary and sufficient conditions

Table 3 presents the overview of the necessary conditions for *stress* and  $\sim$ *stress* (where  $\sim$  means "the absence of"). Using the threshold of 0.80 in Ragin (2000) to consider a condition "almost always necessary," the results show that the consistency score for  $\sim$ *sense of control* is 0.81, which is a value above the required threshold. Hence, having no sense of control is "almost always necessary" for *stress*. For  $\sim$ *stress*, the results show that all of the conditions are below 0.80, so these conditions are not necessary.

Table 4 reports the measures of fit for the analysis of sufficiency, showing the intermediate solution and parsimonious solution, as Schneider and Wageman (2010) suggested. However, the present study focuses on the intermediate solution, as it includes simplifying assumptions that enable an interpretation of the results.

**Table 2** Summary data for conditions and outcome

	Mean	SD	Min	Max	Calibration values at		
					95 %	50 %	5 %
<i>Stress</i>	36.14	8.08	20	62	48	36	22.30
<i>Authority</i>	18.78	5.78	4	28	28	19	11.05
<i>Sense of control</i>	45.10	5.77	22	56	53	46	37
<i>Subordinates</i>	268.78	2237.25	1	21,010	125.5	8	2
<i>Workload</i>	46.95	7.90	35	70	60	45	38.20



**Table 3** Overview of necessary conditions

Condition	<i>stress</i>		$\sim$ <i>stress</i>	
	Consistency	Coverage	Consistency	Coverage
<i>top</i>	0.28	0.47	0.34	0.53
$\sim$ <i>top</i>	0.72	0.53	0.66	0.47
<i>authority</i>	0.54	0.58	0.65	0.67
$\sim$ <i>authority</i>	0.69	0.68	0.60	0.55
<i>sense of control</i>	0.50	0.54	0.77	0.79
$\sim$ <i>sense of control</i>	0.81	0.79	0.56	0.51
<i>subordinates</i>	0.59	0.68	0.62	0.68
$\sim$ <i>subordinates</i>	0.72	0.67	0.71	0.62
<i>workload</i>	0.66	0.70	0.54	0.55
$\sim$ <i>workload</i>	0.58	0.57	0.71	0.66

$\sim$  represents the absence of a condition

Table 4 shows that the intermediate solution has a consistency value of 0.766, with a coverage of 0.782. The consistency value is above the minimum that Ragin (2008: p. 118) recommends (0.75) and therefore provides a reliable solution.

The intermediate solution has four configurations that lead to *stress*. The first recipe for stress (with the highest coverage of 0.575 and consistency of 0.804) comprises the absence of *authority*, the absence of *sense of control*, and not being at the *top*. The second recipe (coverage of 0.383 and the highest consistency of 0.899) indicates that a *workload*, the absence of the *sense of control*, and not being at the *top* is conducive to *stress*. The third recipe (coverage of 0.348 and consistency of 0.771) shows that the absence of *authority*, not being at the *top*, and the presence of *subordinates* leads to *stress*. The fourth recipe (coverage of 0.155 and consistency of 0.86) shows that the presence of *authority*, *subordinates*, and being at the *top* but in the absence of *sense of control* causes stress.

**Table 4** Intermediate and parsimonious solutions for stress

Causal configuration	Row coverage	Unique coverage	Consistency
Intermediate solution			
1 $\sim$ <i>authority</i> * $\sim$ <i>sense of control</i> * $\sim$ <i>top</i>	0.575	0.147	0.804
2 <i>workload</i> * $\sim$ <i>sense of control</i> * $\sim$ <i>top</i>	0.383	0.023	0.899
3 $\sim$ <i>authority</i> * <i>subordinates</i> * $\sim$ <i>top</i>	0.348	0.029	0.771
4 <i>authority</i> * <i>subordinates</i> * $\sim$ <i>sense of control</i> * <i>top</i>	0.155	0.155	0.860
Coverage: 0.782; Consistency: 0.766			
Parsimonious solution			
$\sim$ <i>sense of control</i>	0.810	0.433	0.788
<i>subordinates</i> * $\sim$ <i>authority</i>	0.412	0.035	0.786
Coverage: 0.845; Consistency: 0.751			

$\sim$  represents the absence of a condition; \* symbolizes the logical operator AND

**Table 5** Intermediate and parsimonious solutions for the absence of stress

Causal configuration	Row coverage	Unique coverage	Consistency
Intermediate solution			
1' $\sim$ authority * $\sim$ subordinates * sense of control * $\sim$ top	0.344	0.344	0.880
2' authority * $\sim$ subordinates * sense of control * top	0.204	0.061	0.902
3' $\sim$ workload * authority * sense of control * top	0.186	0.044	0.921
Coverage: 0.591; Consistency: 0.883			
Parsimonious solution			
sense of control * $\sim$ subordinates * $\sim$ authority	0.401	0.099	0.891
top * sense of control * $\sim$ work	0.186	0.044	0.921
top * $\sim$ subordinates	0.205	0.004	0.821
sense of control * $\sim$ subordinates * work	0.397	0.012	0.885
Coverage: 0.604; Consistency: 0.857			

$\sim$  represents the absence of a condition; \* symbolizes the logical operator AND

Overall, the absence of *sense of control* and not being at the *top* are present in three of the four recipes. Thus, the position in the hierarchy is neither sufficient nor necessary for *stress*, but in combination with other conditions is conducive to stress.

As Ragin (2008) suggests, the conditions that lead to *stress* might be quite different from those that lead to the absence of *stress*. Hence, we conduct an analysis for the negation of the outcome. Table 5 presents the intermediate and parsimonious solutions for  $\sim$  *stress*. The intermediate solution has an overall consistency of 0.883 and a coverage of 0.591. The solution comprises three recipes. The first recipe (with the highest coverage of 0.344 and consistency of 0.880) shows that not being at the *top*, not having *authority*, no *subordinates*, but having *sense of control* leads to the absence of *stress*. This recipe corresponds to the negation of the fourth recipe conducive to *stress*. Then, the second recipe (with a coverage of 0.204 and consistency of 0.902) shows that being at the *top*, having *authority*, no *subordinates*, and having *sense of control* are conducive to the absence of stress. The third recipe (with a coverage of 0.186 and the highest consistency of 0.921) shows that the absence of *stress* can be reached through the absence of *workload* and the presence of *authority*, *sense of control*, and being at the *top*. The table shows that *sense of control* is present in all configurations for the absence of *stress*. Being at the *top* is part of two recipes but not being at the *top* is part of one recipe. Once more, the position in the hierarchy is neither sufficient nor necessary to  $\sim$  *stress*, but in combination with other conditions can lead to  $\sim$  *stress*.

### 4.3 Robustness checks

The present study analyzes the robustness of the results across socio-demographic and organizational characteristics for each recipe of *stress* and  $\sim$  *stress*. To this end, we test the differences between consistency measures (Ordanini et al. 2013) of: (1) women versus men and (2) younger ( $\leq 35$  years) versus older ( $> 35$  years); (3) low (no University degree) versus high education (with University degree); (4) low (up to 7) versus high (higher than

or equal than 7) SES<sup>1</sup>; (5) married versus other civil status; (6) short ( $\leq 4$  years) versus long tenure ( $> 4$  years); (7) small ( $\leq 249$  employees) versus large ( $> 250$  employees) organizations; and (8) private versus nonprivate (public or nonprofit) sectors. The causal configurations are robust for sociodemographic and organizational characteristics, except for SES (but only in two configurations), as assessed by the lack of significance of the results.

#### 4.4 Manager's profile for *stress* and $\sim$ *stress* recipes

To establish a profile of the managers that are stressed and of those that are not, Tables 6 and 7 present the results for high set memberships ( $> 0.5$ ) in the recipes and in the *stress* and  $\sim$ *stress* outcomes, as presented in Gonçalves et al. (2015).

Table 6 shows the recipes for a high set membership in *stress*. In recipe 1 ( $\sim$ *authority* \*  $\sim$ *sense of control* \*  $\sim$ *top*, where \* symbolizes the logical operator AND), the individuals are mainly from large organizations, in contrast to all of the other recipes. Recipe 2 (*workload* \*  $\sim$ *sense of control* \*  $\sim$ *top*) has the group with the highest percentage of nonmarried individuals. And recipe 3 ( $\sim$ *authority* \* *subordinates* \*  $\sim$ *top*) has the highest percentage of young individuals who have a lower SES and who work in small organizations from the private sector. Recipe 4 (*authority* \* *subordinates* \*  $\sim$ *sense of control* \* *top*) is the only recipe with the top position and includes mainly men with higher SES and longer tenures who are from small and private organizations.

Table 7 contains the recipes with a high set membership in  $\sim$ *stress*. Recipe 1 ( $\sim$ *authority* \*  $\sim$ *subordinates* \* *sense of control* \*  $\sim$ *top*) is the only one with non-top managers who are older men with high SES and who work in large private organizations. When comparing recipe 1 with recipe 4 in *stress* (mirror recipes), there are some aspects that are quite different between the two. First, being a man and working in large organizations is less stressful. Second, being married and having a long tenure causes more stress. Recipe 2 (*authority* \*  $\sim$ *subordinates* \* *sense of control* \* *top*) contains married individuals with long tenures from small firms in the private sector. Recipe 3 ( $\sim$ *workload* \* *authority* \* *sense of control* \* *top*) contains more women among the cases than the other recipes.

## 5 Discussion

The present study explores whether top ranking managers experience more stress than lower ranking managers.

The results show that there are several recipes for *stress* and for the absence of *stress*. Regarding *stress*, the results show that none of the conditions is sufficient for reaching the outcome. However, the absence of a *sense of control* is an “almost always necessary” condition. In fact, the results are in accordance with the literature (e.g., Sherman et al. 2012) that shows that a sense of control is a valuable resource for managers that acts as a buffer from stress. Hence, the findings support proposition 1.

In accordance with proposition 2, none of the conditions is sufficient to reach the outcome. However, the conditions combined in different ways lead to the outcome. Thus, the results disclose four different paths (equifinality) that are conducive to *stress*. First, the

<sup>1</sup> To measure SES, we presented the managers with a picture of three ladders and asked them to choose a rung from the ten available that best represented where they stood in their country, their communities, and their jobs, as in Adler et al. (2000). We averaged the three scales to create the subjective SES index.

**Table 6** Who's stressed?

	Recipe 1 (%)	Recipe 2 (%)	Recipe 3 (%)	Recipe 4 (%)
Socio-demographic				
Sex				
Men	53	55	50	80
Women	47	45	50	20
Age				
<35 years	21	9	33	0
≥35 years	79	91	67	100
Academic				
Until University	5	9	0	0
University	95	91	100	100
SES				
Low	42	55	67	20
High	58	45	33	80
Marital status				
Married	68	45	50	80
Other	32	55	50	20
Organizational				
Tenure				
Short	37	27	50	20
Long	63	73	50	80
Sector				
Private	58	55	50	80
Other	42	45	50	20
Size				
Small	47	55	83	60
Large	53	45	27	40

High set membership (>0.5) in stress and a high set membership (>0.5) in recipes 1–4

results show that being at the *top* of the hierarchy does not lead to *stress*. Second, even when combined with other conditions, both being and not being at the *top* of the hierarchy can lead to *stress*. This finding thus shows that the position in the hierarchy does not relate to *stress* (or no *stress*). However, when combined with other conditions, being at the *top* might lead to *stress*, because this position is present in one of the four recipes for stress.

Managers who are responsible for a large number of subordinates can exert more power and influence. In fact, as Klein (2000) argued, managers look not only to exert authority over subordinates but also to build up those subordinates (i.e., empire building). Thus, having a considerable number of subordinates is a way to exert power and authority. Although having too many subordinates might cause stress because more subordinates require a greater ability to manage and to reconcile different perspectives. With regard to the present study's findings, the latter argument finds some support because having many *subordinates* is part of two recipes for *stress* (recipes 3 and 4), although it is never sufficient, and fewer *subordinates* is also part of two recipes for the absence of *stress* (recipes 1 and 2).

**Table 7** Who's not stressed?

	Recipe 1 (%)	Recipe 2 (%)	Recipe 3 (%)
Socio-demographic			
Sex			
Men	100	80	75
Women	0	20	25
Age			
<35 years	0	20	25
≥35 years	100	80	75
Academic			
Until University	0	0	0
University	100	100	100
SES			
Low	25	20	25
High	75	80	75
Marital status			
Married	50	80	75
Other	50	20	25
Organizational			
Tenure			
Short	50	20	25
Long	50	80	75
Sector			
Private	75	100	100
Other	25	0	0
Size			
Small	25	80	75
Large	75	20	25

High set membership (>0.5) in stress and a high set membership (>0.5) in recipes 1–4

Authority is related to the number of subordinates, because to exert authority a manager needs subordinates. In fact, as Hunter (2008) explained, the company gives authority to a manager. If a manager struggles to get subordinates to acknowledge that authority, then this challenge can lead to stress. The results show that *authority* is neither sufficient for *stress* nor for absence of *stress*. However, when combined with other conditions, a lack of *authority* can lead to *stress* (recipes 1 and 3) but also to the absence of *stress* (recipe 1).

Furthermore, a heavy *workload* is not sufficient to cause *stress*. But when the condition is combined with other conditions (not being at the top and in the absence of a sense of control, as in recipe 2), it can cause stress. Relatedly, the absence of a workload is not related with the absence of stress, but only in combination with other conditions (recipe 3).

If a manager lacks a *sense of control*, then a heavy *workload* can enhance *stress* (Weiss 1968). Accordingly, the literature recognizes that a sense of control in one's job buffers the adverse health effects of job strain (Shimazu et al. 2008; Smith et al. 2008). The results for the absence of *stress* confirm the importance of a *sense of control*. This condition is present in all three recipes for the absence of *stress*. However, one of the recipes is the mirror of a recipe for *stress* (recipe 4 mirrors recipe 1). Comparing these mirror recipes shows that the

pivotal condition that explains the difference between *stress* and the absence of *stress* is the *sense of control*. Indeed, when the condition is present, it leads to the absence of *stress*.

An interesting comparison is between recipe 4 for *stress* and 2 for the absence of *stress*. *Authority* and being on *top* are part of both recipes. Thus, the difference in outcomes between having too many *subordinates* and no *sense of control* and the absence of many subordinates and having a sense of control again shows the pivotal role of a sense of control. It also highlights the less important roles of being at the top and having authority over many subordinates.

Another comparison to highlight is between recipe 3 for *stress* and recipe 2 for no *stress*. Both recipes have the absence of *authority* and not being at the *top*. However, having too many *subordinates* leads to *stress* and having a *sense of control* and not having many *subordinates* leads to the absence of *stress*. Besides the importance of having a *sense of control*, this comparison shows that having too many *subordinates* can be conducive to *stress*.

## 6 Conclusions

Are top executives more stressed? The answer to this question is no. Being in a top position is not sufficient to cause stress. Neither is the absence of being at the top sufficient to not cause stress. However, the absence of a sense of control is “almost always necessary” for stress and having a sense of control is always present for the absence of stress. Possessing a sense of control is very useful and can act as a buffer against stress. Hence, the results help to demystify that being at the top is always more stressful.

Overall, the present study adds to the literature by showing the relevance of the fsQCA for identifying different recipes conducive to a particular outcome. Specifically, the study supports equifinality and asymmetry by highlighting that stress and the absence of stress can be reached through several recipes. Furthermore, the study shows that the recipes that lead to stress are different from those that lead to the absence of stress. The present study’s results highlight the role of top management and a sense of control as predictors of stress and no stress. Furthermore, the fsQCA enables the study of complex causal relations that demonstrate its advantages over the traditional correlation-based analyses (Woodside 2013; Schneider and Eggert 2014). The present study also investigates the robustness of the results across sociodemographic and organizational characteristics under a high membership set. Knowing who is more stressed, and which recipes lead to more stress, can help managers identify and develop strategies that might minimize the costs associated with the stress-related health problems. Anyone can be affected by stress, regardless of age, gender, profession, and social or economic status (Ozkan and Ozdevicioğlu 2013).

Understanding what causes stress can help managers identify corrective actions, such as reducing the workload or having fewer subordinates to manage. Consequently, organizations benefit from promoting health that leads to increased benefits, such as an increase in productivity and decreased costs from absenteeism and medical expenses. At a broader level, policymakers can also learn from the results what guidelines, recommendations, or rules to issue that will promote the workers’ well-being and health, such as limiting the number of work hours. Furthermore, at the country level, the reduction of mental health issues will produce savings through reductions in medical appointments, medications, and absenteeism subsidies that will benefit society as a whole.

## 7 Limitations and future research

Some points need to be noted regarding the present study. First, the participants of the study are mostly men, with a university degree and from the private sector. Hence, these characteristics can affect the study's conclusions. Second, the present study uses determinants of stress that are commonly investigated in the literature. Exploring other determinants and how they can be combined into different recipes to understand stress or its absence would be an interesting extension. Similarly, originating from the study's results, exploring whether certain sociodemographic or organizational characteristics are related to higher levels of stress might be worthwhile.

Finally, we still have no understanding of the implications of stress for health at different levels within the organization or knowledge of the mechanisms that individuals adopt to cope with different stressors. Exploring the role of these coping mechanisms for stress could be a promising avenue for further research.

**Acknowledgments** The authors acknowledge the financial support from Fundação para a Ciência e a Tecnologia, Portugal, through the Advance Research Centre (Project UID/SOC/04521/2013). The authors thank Graça Silva and the referees for helpful comments.

### Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

## References

- Aburdene, P.: Beyond Executive Stress: Board Responsibility for CEO Mental Health. *Directors & Boards Summer*, 27–40 (1977)
- Adler, N.E., Epel, E.S., Castellazzo, G., Ickovics, J.R.: Relationship of subjective and objective social status with psychological and physiological functioning: preliminary data in healthy white women. *Health Psychol.* **19**(6), 586–592 (2000)
- Anderson, C., John, O.P., Keltner, D.: The personal sense of power. *J. Pers.* **80**(2), 313–344 (2012)
- Basedau, M., Richter, T.: Why do some oil exporters experience civil war but others do not? Investigating the conditional effects of oil. *Eur. Polit. Sci. Rev.* **6**(4), 549–574 (2014)
- Cahoon, A.R., Rowney, J.I.: Managerial burnout: a comparison by sex and level of responsibility. *J. Health Human Resour. Adm.* **7**(2), 249–263 (1984)
- Campbell, M., Baltes, J.J., Martin, A., Meddings, K.: *The Stress of Leadership*. Center for Creative Leadership (2007)
- Chorpita, B.F., Barlow, D.H.: The development of anxiety: the role of control in the early environment. *Psychol. Bull.* **124**(1), 3–21 (1998)
- Cohen, S., Schwartz, J.E., Epel, E., Kirschbaum, C., Sidney, S., Seeman, T.: Socioeconomic status, race, and diurnal cortisol decline in the Coronary Artery risk development in young adults (CARDIA) Study. *Psychosom. Med.* **68**(1), 41–50 (2006)
- Crum, A.J., Salovey, P., Achor, S.: Rethinking stress: the role of mindsets in determining the stress response. *J. Pers. Soc. Psychol.* **104**(4), 716–733 (2013)
- DeVellis, R.F.: *Scale Development: Theory and Applications*. Sage Publications, Newbury Park, CA (1991)
- Fernandes, S., McIntyre, T.: Avaliação da eficácia de um programa de intervenção psicológica breve para mulheres com cancro da mama. *Psicologia Teoria Investigação Prática* **7**(2), 353–374 (2002)
- Fiss, P.C.: A set-theoretic approach to organizational configurations. *Acad. Manage. Rev.* **32**(4), 1180–1198 (2007)
- Fiss, P.C.: Building better causal theories: a fuzzy set approach to typologies in organizational research. *Acad. Manage. J.* **54**(2), 393–420 (2011)
- Ganster, D.C., Schaubroeck, J.: Work stress and employee health. *J. Manage.* **17**(2), 235–271 (1991)
- Gonçalves, H.M., Lourenço, T.F., Silva, G.M.: Green buying behaviour and the theory of consumption values: a fuzzy-set approach. *J. Bus. Res.* **69**, 1484–1491 (2015)

- Greckhamer, Y., Misangyi, V.F., Fiss, P.C.: The two QCAs: From a small-N to a large-N set theoretic approach. *Config. Theory Methods Organ. Res.* **38**, 49–75 (2013)
- Hambrick, D.C., Finkelstein, S., Mooney, A.C.: Executive job demands: new insights for explaining strategic decisions and leader behaviors. *Acad. Manage. Rev.* **30**(3), 472–491 (2005)
- Hunter, J.C.: *The Servant: A Simple Story About the True Essence of Leadership*. Crown Business, New York (2008)
- Karasek Jr., R.A.: Job demands, job decision latitude, and mental strain: implications for job redesign. *Admin. Sci. Quart.* **24**, 285–308 (1979)
- Karasek, R., Theorell, T.: *Healthy Work: Stress, Productivity, and the Reconstruction of Working Life*. Basic Books, New York (1990)
- Kawada, T., Otsuka, T.: Relationship between job stress, occupational position and job satisfaction using a brief job stress questionnaire (BJSQ). *Work J. Prev. Assess. Rehab.* **40**(4), 393–399 (2011)
- Keeton, C.P., Perry-Jenkins, M., Sayer, A.G.: Sense of control predicts depressive and anxious symptoms across the transition to parenthood. *J. Fam. Psychol.* **22**(2), 212–221 (2008)
- Klein, J.I.: *Corporate Failure by Design: Why Organizations are Built to Fail*. Greenwood Publishing Group, Westport (2000)
- Kraus, M.W., Chen, S., Keltner, D.: The power to be me: power elevates self-concept consistency and authenticity. *J. Exp. Soc. Psychol.* **47**(5), 974–980 (2011)
- Kraus, S., Richter, C., Brem, A., Chang, M.L., Cheng, C.F.: Strategies for reward-based crowdfunding campaigns. *J. Innovat. Know.* **1**(1), 13–23 (2016)
- Lantz, P.M., House, J.S., Lepkowski, J.M., Williams, D.R., Mero, R.P., Chen, J.: Socioeconomic factors, health behaviors, and mortality: results from a nationally representative prospective study of US adults. *J. Am. Med. Assoc.* **279**(21), 1703–1708 (1998)
- Levinson, H.: When executives burn out. *Harvard Bus. Rev.* **59**(3), 73–81 (1981)
- Lovelace, K.J., Manz, C.C., Alves, J.C.: Work stress and leadership development: the role of self-leadership, shared leadership, physical fitness and flow in managing demands and increasing job control. *Hum. Resour. Manage. R.* **17**(4), 374–387 (2007)
- Lutchyn, Y., Johns, P., Czerwinski, M., Iqbal, S., Mark, G., Sano, A.: Stress is in the eye of the beholder. In: *Lecture Notes on Computer Science (ACII)*, pp. 119–124 (2015)
- Mannor, M.J., Wowak, A.J., Bartkus, V.O., Gomez-Mejia, L.R.: Heavy lies the crown? How job anxiety affects top executive decision making in gain and loss contexts. *Strateg. Mgmt. J.* (2015). doi:[10.1002/smj.2425](https://doi.org/10.1002/smj.2425)
- March, J.G., Weiner, S.S.: Leadership blues. *New Dir. Commun. Coll.* **2003**(123), 5–14 (2003)
- Marmot, M.G., Shipley, M.J., Rose, G.: Inequalities in death-specific explanations of a general pattern? *The Lancet* **323**(8384), 1003–1006 (1984)
- Maslach, C., Schaufeli, W.B., Leiter, M.P.: Job burnout. *Annu. Rev. Psychol.* **52**(1), 397–422 (2001)
- McClelland, D.C., Burnham, D.H.: Power is the great motivator. *Harvard Bus. Rev.* **81**(1), 117–126 (2003)
- McIntyre, T., McIntyre, S.: Questionário de Auto-avaliação—STAI Y1 e Y2. (Spielberger, Gorus, Lushene, Vagg & Jacobs, 1983). Validação em populações de pacientes com dor crônica, cancro da mama, doenças de pele, e consulta externa psicológica (1995)
- McIntyre, S., McIntyre, T., Silvério, J.: Work stress and job satisfaction in Portuguese health professionals. In: Cox, T., Dewe, P., Nielsen, K., Cox, R. (eds.) *European Academy of Occupational Health Psychology Conference Proceedings Series: Occupational Health Psychology Europe*, pp. 105–111. I-WHO Publications, Nottingham (2000)
- Mirowsky, J., Ross, C.E.: Eliminating defense and agreement bias from measures of the sense of control: a  $2 \times 2$  index. *Soc. Psychol. Quart.* **54**(2), 127–145 (1991)
- Offermann, L.R., Hellmann, P.S.: Leadership behavior and subordinate stress: a 360° view. *J. Occup. Health Psychol.* **1**(4), 382 (1996)
- Ordanini, A., Parasuraman, A., Rubera, G.: When the recipe is more important than the ingredients a qualitative comparative analysis (QCA) of service innovation configurations. *J. Serv. Res-US* **17**(2), 134–139 (2013)
- Ozkan, A., Ozdevecioğlu, M.: The effects of occupational stress on burnout and life satisfaction: a study in accountants. *Qual. Quant.* **47**(5), 2785–2798 (2013)
- Pennings, P.: The diversity and causality of welfare state reforms explored with fuzzy-sets. *Qual. Quant.* **39**(3), 317–339 (2005)
- Ragin, C.C.: *Fuzzy-Set Social Science*. University of Chicago Press, Chicago (2000)
- Ragin, C.C.: *Redesigning Social Inquiry: Fuzzy Sets and Beyond*. University of Chicago Press, Chicago (2008)



- Rystedt, L.W., Cropley, M., Devereux, J.J., Michalianou, G.: The relationship between long-term job strain and morning and evening saliva cortisol secretion among white-collar workers. *J. Occup. Health Psych.* **13**(2), 105 (2008)
- Sapolsky, R.M.: *Why Zebras Don't Get Ulcers*. WH Freeman, New York (1994)
- Schneider, M.R., Eggert, A.: Embracing complex causality with the QCA method: an invitation. *J. Bus. Market Manag.* **7**(1), 312–328 (2014)
- Schneider, C.Q., Wagemann, C.: Standards of good practice in qualitative comparative analysis (QCA) and fuzzy-sets. *Comp. Sociol.* **9**, 397–418 (2010)
- Shapiro Jr., D.H., Schwartz, C.E., Astin, J.A.: Controlling ourselves, controlling our world: psychology's role in understanding positive and negative consequences of seeking and gaining control. *Am. Psychol.* **51**(12), 1213–1230 (1996)
- Sherman, G.D., Lee, J.J., Cuddy, A.J., Renshon, J., Oveis, C., Gross, J.J., Lerner, J.S.: Leadership is associated with lower levels of stress. *Proc. Natl. Acad. Sci. U.S.A.* **109**(44), 17903–17907 (2012)
- Shimazu, A., De Jonge, J., Irimajiri, H.: Lagged effects of active coping within the demand-control model: a three-wave panel study among Japanese employees. *Int. J. Behav. Med.* **15**(1), 44–53 (2008)
- Skagert, K., Dellve, L., Eklöf, M., Pousette, A., Ahlborg, G.: Leaders' strategies for dealing with own and their subordinates' stress in public human service organisations. *Appl. Ergon.* **39**(6), 803–811 (2008)
- Smith, P., Frank, J., Bondy, S., Mustard, C.: Do changes in job control predict differences in health status? Results from a longitudinal national survey of Canadians. *Psychosom. Med.* **70**(1), 85–91 (2008)
- Spielberger, C.D.: *Manual for the State-Trait Anxiety Inventory STAI (form Y) ("Self-Evaluation Questionnaire")*. Consulting Psychologists Press, Palo Alto, CA (1983)
- Stringhini, S., Sabia, S., Shipley, M., Brunner, E., Nabi, H., Kivimäki, M., Singh-Manoux, A.: Association of socioeconomic position with health behaviours and mortality. *J. Am. Med. Assoc.* **303**(12), 1159–1166 (2010)
- Wagemann, C., Schneider, C.Q.: Qualitative comparative analysis (QCA) and fuzzy-sets: agenda for a research approach and a data analysis technique. *Comp. Sociol.* **9**(3), 376–396 (2010)
- Weiss, J.M.: Effects of coping responses on stress. *J. Comp. Physiol. Psych.* **65**(2), 251–260 (1968)
- Woodside, A.G.: Moving beyond multiple regression analysis to algorithms: calling for adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory. *J. Bus. Res.* **66**(4), 463–472 (2013)
- World Health Organization: European pact for mental health and well-being. In EU Highlevel conference "Together for mental health and wellbeing". Brussels (2008)
- World Health Organization: *Mental health and work: impact, issues and good practices* (2000)
- Xavier, M., Baptista, H., Mendes, J.M., Magalhães, P., Caldas-de-Almeida, J.M.: Implementing the World Mental Health Survey Initiative in Portugal—rationale, design and fieldwork procedures. *Int. J. Mental Health Syst.* **7**(1), 19 (2013)