Technostress creators, personality traits, and job burnout: A fuzzy-set configurational analysis

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A B S T R A C T

Building on the transactional perspective of stress and the complexity theory, we analyzed the effects of per-sonality traits and technostress creators on job burnout by applying the fuzzy-set configurational approach (*fsQCA*) on a sample of 161 senior managers. Our findings reveal nine substitutable configurations in which different combinations of personality traits may react in different ways to technostress creators and cope dif-ferently with job burnout. Five configurations may lead to *high* job burnout, and four configurations may lead to *low* and *medium* job burnout. The multiple configurations provided can help senior managers to understand that there is not a single optimal path leading to *high* (vs. *low/medium*) job burnout but rather different paths, de-pending on different combinations of personality traits. Indeed, our findings can help senior managers to es-tablish "personalized" preventive actions, depending on different combinations of personality traits in order to prevent *high* levels of stress.

1. Introduction

Information and communication technologies (ICT) are the most frequently used technologies at work and in daily life, and the pervasive connectivity these technologies induce has blurred work home bound aries (Tarafdar, Tu, & Ragu Nathan, 2010). Although the use of ICT has obviously increased the productivity efficiency and effectiveness of organizations, it also generates employee technostress related to an increased work overload, work home conflict, invasion of privacy, and continual relearning and the consequent job related insecurities (Ayyagari, Grover, & Purvis, 2011; Ragu Nathan, Tarafdar, Ragu Nathan, & Tu, 2008; Srivastava, Chandra, & Shirish, 2015; Tarafdar et al., 2010; Tarafdar, Tu, Ragu Nathan, & Ragu Nathan, 2011). Tech nostress has been shown to result in job burnout and decreased em ployee performance (Ayyagari et al., 2011; Srivastava et al., 2015). Job burnout is a psychological syndrome of emotional exhaustion that arises in response to prolonged chronic stressors at work and results in a lack of personal accomplishment (Maslach & Jackson, 1981). Job burnout is related to negative outcomes not only for organizations but also for individuals, manifesting as depression, a sense of failure, fa tigue or a loss of motivation (Bakker, Van Der Zee, Lewig, & Dollard, 2006). Several international organizations, such as the International Labor Organization and the World Health Organization, have concerns about how the stress generated by ICT use affects employees' health (Mahboob & Khan, 2016).

Previous research regarding technostress has shown that personality traits play an important role in coping with stress and its effects on the development of job burnout (Sharma & Gill, 2016; Srivastava et al., 2015). Individuals with different personality traits have been shown to cope with organizational stressors in different manners. For instance, Srivastava et al. (2015) conducted a survey with 152 senior organiza tional managers and found that certain personality traits may in dependently cause managers to have different reactions to technostress creators and to cope differently with job burnout. Their findings showed that the trait of agreeableness may make managers more likely to experience job burnout in high technostress situations, whereas the trait of extraversion makes them less prone to job burnout in such si tuations. Sharma and Gill (2016) conducted a study with 600 managers in the banking sector and found that the traits of extraversion and neuroticism may independently expose managers to exhaustion (strain) in technostress situations, whereas the trait of openness may be less likely to expose them to exhaustion in such situations. Although few previous studies on technostress have examined the interaction effects of personality and situational attributes (technostress creators) on a

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person's behavior (job burnout), they have considered personality traits to operate *independently* rather than *jointly* (see Appendix A). These studies do not consider individual variability in personality traits and do not account for the interdependence between personality traits within a person and in a given situation. Although the personality literature contains some evidence supporting such an interdependence (Grant & Langan Fox, 2006; Vollrath & Torgersen, 2000), no empirical research about technostress has yet investigated the complex interaction between personality traits and technostress situations to explain *why and how individuals experience job burnout.*

The *first* reason for this shortcoming is related to the controversial competitive views of persons and situations. For instance, some studies have adopted a *situationally oriented* approach and suggested that a person's behavior is affected by the characteristics of the situation in which the behavior occurs (Ayyagari et al., 2011; Ragu Nathan et al., 2008; Tarafdar et al., 2010), whereas others have adopted a *dispositionally oriented* approach and suggested that a person's behavior is mostly affected by his or her personality dispositions (Devaraj, Easley, & Crant, 2008; Jahng, Jain, & Ramamurthy, 2002; Junglas, Johnson, & Spitzmüller, 2008). However, a person's behavior in a particular situation does not simply arise from independent personality and situation characteristics; rather, it arises from complex interactions by which personality and situation characteristics shape one another's effects on behavior (Pervin, 1989). This recognition has led some authors to conclude that the traditional distinction between *situational attributions* (attributing behavioral causality to a situation) and *dispositional attributions* (attributing behavioral causality to personality traits) is fundamentally incoherent (Furr, 2009). The transactional perspective of coping and stress rejects such competitive views; it recognizes that personality depends on the situation and that situations are affected by personalities (Lazarus & Folkman, 1987).

The *second* reason is methodologically related to the mismatch between theory and analytic approaches used in business research (Woodside, 2013). The dominant *symmetric* analytic approaches are based on the "*net effects*" tenets, such as the use of structural equation modeling (SEM) or multiple regression analysis (see Appendix A), where each predictor variable is assumed to linearly have its own independent effect on the outcome (Woodside, 2014). However, symmetric approaches cannot account for the mutual causality between predictors to explain variations in the outcome (Ragin, 2006b). This limitation makes symmetric approaches less informative in parsimoniously capturing complexity, mutual causality between predictors, and nonlinearities that characterize a behavior within a complex social system (Woodside, 2013, 2014). To capture complexity, researchers call for moving beyond symmetric approaches to *asymmetric* approaches and suggest that complexity theory (termed configurational theory) is appropriate to understand patterns and combinations of causal conditions (attributes) and how they cause an outcome to occur (Fiss, 2007; Woodside, 2013, 2014). Complexity theory views a behavior as a "constellation" of interconnected relationships between conditions (i.e., personality and situation attributes) that should be *simultaneously* understood as a holistic integrated pattern rather than individual attributes separately (Woodside, 2017). Indeed, by reducing complex interconnected conditions to independent conditions, studies on technostress cannot grasp such complexity and determine the combinations of causal conditions that lead to job burnout in technostress situations.

To address these issues, we adopt a transactional perspective based on the model of stress and coping (Lazarus & Launier, 1978) and a fuzzy set configurational approach derived from complexity theory (*fsQCA*: Ragin, 2000; Woodside, 2014) to determine combinations of causal conditions   resulting from the interaction between personality traits and technostress creators   that lead to *low, medium* and *high* job burnout. The *fsQCA* approach offers a holistic approach to cluster multiple interdependent relationships among conditions into a coherent configuration and to explain an outcome (Ragin, 2000). In the present

research, we apply the *fsQCA* approach to a sample of 161 senior managers.

The present study is novel and makes important contributions to the literature on technostress. *First*, it proposes for the first time a new holistic approach based on *fsQCA* (Ragin, 2008) to analyze the complex interaction between personality traits and technostress situations and to explain how individuals experience job burnout. To date, studies on technostress have considered personality and technostress situations as operating separately or independently rather than interactively. Our study addresses this shortfall and answers the call to study the combined/interactive role of personality traits and stressors in order to better understand occupational stress and strain (Srivastava et al., 2015). *Second*, our study holds considerable promise to overcome the abovementioned mismatch between theory and methods and to enable detailed analyses of combinations of causal conditions that lead to *low, medium* and *high* job burnout in technostress situations. From a practical perspective, our research provides useful insights that may help senior managers understand how technostress should be managed with regard to personality differences in order to prevent job burnout.

In the next section, we present our framework from a transactional perspective, and we propose the fuzzy set approach as the theoretical background of the empirical analysis. Section 3 presents the data source and the methodology. Section 4 presents the results of the fuzzy set approach. Section 5 contains the discussion and the conclusion.

2. Technostress, personality, and job burnout from a transactional perspective

The transactional perspective of stress (Lazarus & Folkman, 1987; Lazarus & Launier, 1978) from organizational psychology is considered as the theoretical foundation of technostress in the IS literature (Tarafdar, Pullins, & Ragu Nathan, 2015). It considers stress as a combination of the demand condition that causes it (technostress creators or stressors) and the individual's response to such stressors (manifested mostly in strain or exhaustion) (Tarafdar al., 2015, p. 105). Building on this perspective, we conceptualize the person situation interaction as a *reciprocal action and transaction* between the person (personality traits) and the situation (technostress creators) that causes job burnout (see Fig. 1).

2.1. Technostress creators and personality traits as determinants of job burnout

Technostress creators are organizational stressors that generate stress within a person and are related to the inadequate use of ICT (Ayyagari et al., 2011; Srivastava et al., 2015; Tarafdar, Tu, Ragu Nathan, & Ragu Nathan, 2007). Ayyagari et al. (2011) identified five technostress creators: *work home conflict* (which describes situations in which ICT use may blur the boundaries between work and home life and create conflicts with home responsibilities), *invasion of privacy* (which describes situations in which ICT use may violate privacy by increasing mentoring, traceability, and surveillance within the workplace), *work overload* (which describes situations in which ICT use may engender an excessive workload), *role ambiguity* (which describes situations in which ICT use may induce poor evaluations of what activity should be prioritized), and *job insecurity* (which describes situations in which people may feel threatened about losing their jobs due to ICT invasion). These stressors have been shown to intensify stress within a person (Ayyagari et al., 2011; Tarafdar et al., 2007, 2015) and to result in job burnout (Srivastava et al., 2015).

Previous research on technostress has shown that personality traits play an important role in coping with stress and its effects on the development of job burnout (Srivastava et al., 2015). Personality traits are relatively stable dispositions, and the literature widely perceives that they include five factors (McCrae & Costa, 1985): *agreeableness, openness to experience, extraversion, neuroticism,* and *conscientiousness.* The
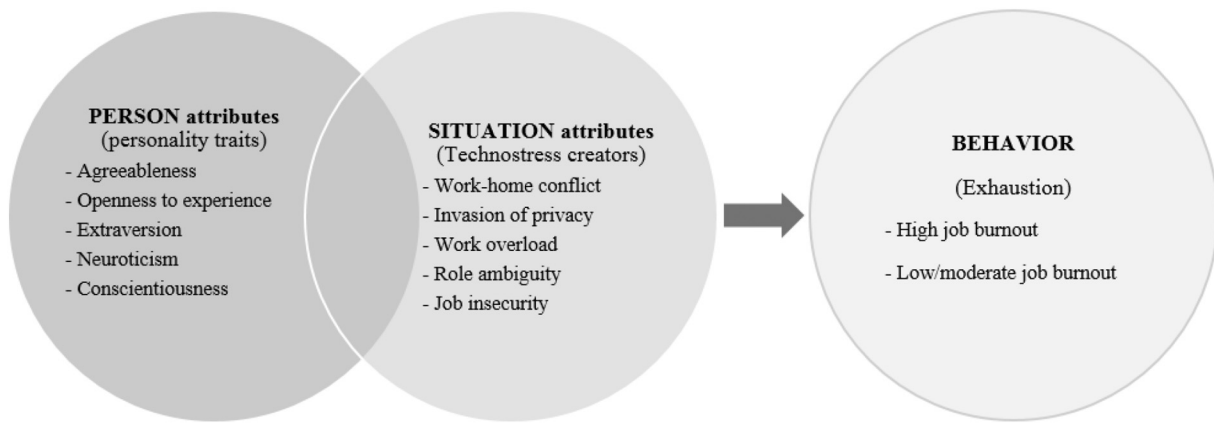
Fig. 1. Research framework: reciprocal action and transaction between personality traits and technostress creators.

first factor, *agreeableness*, describes people who are friendly, helpful and able to inhibit their negative emotions (Graziano, Habashi, Sheese, & Tobin, 2007). Agreeable people are more empathic and altruistic than less agreeable people. The second factor, o*penness to experience*, de scribes people who are flexible, imaginative, and intellectually curious and who prefer variety (Costa & McCrae, 1985). The third factor, *ex traversion*, describes people who are generally outgoing, talkative, and energetic, whereas introverted people are more reserved and solitary (Ashton, Lee, & Paunonen, 2002). The fourth factor, *neuroticism*, de scribes people who tend to be moody and experience feelings of an xiety, worry, fear, anger, frustration, envy, jealousy, guilt, depressed mood, and loneliness (Carver & Connor Smith, 2010). The fifth factor, *conscientiousness*, describes people who are careful, organized, and good planners and exhibit a tendency to show self discipline and aim for achievement (Carver & Connor Smith, 2010). It is important to note that all individuals possess the five personality traits to varying degrees (Grant & Langan Fox, 2006).

2.2. Reciprocal action and transaction between personality traits and technostress creators

Most studies examining the relationship between personality traits and stressors have used the perspective of the *stress effect* approach (Laceulle, Nederhof, Karreman, Ormel, & Aken, 2012). This approach assumes that stressors affect personality change in response to stressful situations and disregards the possibility that personality may also affect responses to stressful situations, whereas the *trait effect* approach as sumes the opposite (Laceulle, van Aken, Ormel, & Nederhof, 2015, p. 2). Some evidence suggests that personality traits may predict responses to stressful situations. For instance, Grant and Langan Fox (2006) found that people who scored low in neuroticism, high in extraversion, and high in conscientiousness experienced low stress, whereas people who scored high in neuroticism and low in conscientiousness experienced high stress. In another study, Lüdtke, Roberts, Trautwein, and Nagy (2011) found that people who scored high in extraversion and high in conscientiousness were less vulnerable to stress.

Taken together, these two approaches suggest that personality traits may not only be affected by stressors but also impact responses to stressful situations. This causal interdependence is called the "*reciprocal action and transaction*" between a person and a situation (Lazarus & Launier, 1978). A model that may account for this reciprocal action and transaction is the *transactional model of stress and coping* (Lazarus & Folkman, 1984). The transactional model suggests that reactions to stress are the result of mutually reinforcing *person environment trans actions* that include two dynamic processes (Lazarus & Folkman, 1984). The first is called the "*primary appraisal*" process, which is similar to trait effects, wherein individuals evaluate whether their personality characteristics (temperaments and personal resources) are congruent

with the demands of the internal and external environment (Lazarus, 1999). For instance, internal environment demands (e.g., the desire to find challenging activities when using ICT) are related to individual desires and should be met by people who are intrinsically motivated (Srivastava et al., 2015). External demands are those that are inherent to contextual environments (e.g., management practices and organi zational demands) and must be met by people working in such en vironments (Srivastava et al., 2015).

The core premise of the primary appraisal process is that stress arises from a misfit between personality characteristics (temperaments and resources) and environment demands (Edwards & Cooper, 1990). People differ in their responses to stressful situations (Lazarus, 1999). Some people possess personality traits that predispose them to higher or lower levels of tolerance to stress (Laceulle et al., 2015). For instance, it has been found that people who scored low in neuroticism, high in extraversion, and high in conscientiousness reacted very differently to stress than people who scored high in neuroticism and low in con scientiousness (Grant & Langan Fox, 2006). Individuals with different combinations of personality traits may react differently to stress (Vollrath & Torgersen, 2000). There is no singular configuration to cope with stressful situations; instead, there are different configurations of personality traits that may lead individuals to cope with stress. Indeed, different individuals may have similar combinations of personality traits to manage stressful situations, whereas similar individuals may have different combinations of personality traits to cope with stress (Grant & Langan Fox, 2006; Vollrath & Torgersen, 2000).

The second dynamic process is called the "*secondary appraisal*", which is similar to stress effects, wherein environments engender ex periences that influence a person to change, react or cope with a stressful situation (Lazarus & Cohen, 1977). The secondary appraisal process is a cognitive assessment of personal resources (e.g., skills, network, time, and energy) that people possess and should activate to cope with stressful situations (Lazarus & Folkman, 1984). The sec ondary appraisal paves the way for coping (Lazarus, 1999). During the secondary appraisal process, if people perceive their personal resources as inadequate to successfully cope with stressors, they may experience increased stress and exhaustion (Lazarus & Folkman, 1984). This stress may lead to personality change (Edwards, Caplan, & Harrison, 1998). For instance, exposure to chronic stress was found to increase frustra tion and anxiety, which are distinctive traits of neurotic people (Laceulle et al., 2012). Indeed, stressful situations may induce person ality change (Laceulle et al., 2012).

Thus, the purpose of the present study is to use a complexity theory based on the *fsQCA* approach in order to elucidate the *reciprocal action and transaction* between personality traits and technostress creators and their relationships with job burnout.

2.3. Personality traits and technostress creators: A complexity theory based on the fsQCA approach

Previous studies on technostress did not consider the coexistence of personality traits within a person and did not account for reciprocal interdependence between personality traits and technostress situations (Srivastava et al., 2015). These studies dominantly used *symmetric* analytic approaches based on the "*net effects*" tenets, such as SEM. Symmetric approaches are very good at predicting an outcome based on the assumption of linearity and non mutual causality between pre dictors, which means that each predictor alone produces the probability of the outcome regardless of other predictors within a model and re gardless of the varied contexts defined by other predictors (Ragin, 2006b). However, symmetric approaches cannot account for the mutual causality between predictors to explain variations in an outcome (Woodside, 2013, 2014). Hence, the use of symmetric approaches makes it difficult to parsimoniously capture complex inter dependencies, mutual causality between predictors, and nonlinearities that characterize a behavior within a complex social system (Woodside, 2013, 2014).

To capture such complexity, complexity theory is relevant, as it allows a behavior (job burnout) to be viewed as clusters of inter connected conditions (personality traits and technostress situations) that should be examined as holistic patterns and combinations rather than independent conditions (Woodside, 2017). Complexity theory as sumes *asymmetric* relationships by accommodating nonlinearity in causation because the causes leading to an outcome (job burnout) may be different than those leading to its absence (Woodside, 2014). Moreover, complexity theory accommodates *equifinality* where different sets of conditions may lead to the same outcome (Ragin, 2008); this tenet typically characterizes a behavior because individuals may have different personality traits yet behave similarly (Chollet, Géraudel, Khedhaouria, & Mothe, 2016).

A notable approach that aptly captures the holistic nature of com plexity theory is the *fsQCA* approach (Ragin, 2000; Woodside, 2014). The approach assumes asymmetric relationships and emanates from understanding combinations of causal conditions and how they, as configurations, may lead certain outcomes to occur (Ragin & Fiss, 2008). Accordingly, it is appropriate to parsimoniously capture com plexity by determining clusters of patterns that result from reciprocal action and transaction between conditions and that lead to an outcome (Woodside, 2017).

3. Data collection and methodology

3.1. Data collection

A web based survey was conducted to collect data from French se nior managers. A link to participate was sent to over 1000 participants. A pilot questionnaire was initially administered to 23 student em ployees on apprenticeship and professionalization contracts as part of their "research initiation" course at a French university. Student em ployees answered the initial questionnaire and provided pertinent comments. Based on their feedback, the questionnaire was restructured and rephrased to improve its clarity and to avoid any ambiguity in comprehension. Once the improved questionnaire was established, student employees were asked to distribute it. To avoid biases, they were asked not to interview people in their companies but rather to distribute the questionnaire in their companies' networks, such as to partners and providers. The questionnaire was a web based survey and was created using the Sphinx® online platform. Respondents who were interested in participating were able to click on a link embedded in an email invitation and were then automatically directed to the web based survey. Some respondents used the link to directly answer the web based survey, whereas others were contacted by the student employees and completed the questionnaire manually. The student employees

then entered the data into the web based survey form. To be able to identify the source of any problem related to data entry, the student employee's name and the respondent's contact information were re corded.

A total of 465 responses were received, of which 161 were from senior managers and 304 were from employees. We selected the 161 managers who occupied senior (or semi executive) management posi tions for two main reasons: *first*, to ensure that respondents who reg ularly use ICT to accomplish their professional activities at work and at home also express job strain, we used the following control question: "working all day at work and at home with ICT is a strain for me" (Ayyagari et al., 2011). Our results show that respondents who occu pied senior management positions intensively used ICT for their pro fessional tasks and were more exposed to job strain than employees, which supports previous studies on technostress (Srivastava et al., 2015). *Second*, it is methodologically reliable to compare our results with those of previous studies (see Srivastava et al., 2015 in Appexndix A) on the basis of comparable same sample sizes and management positions, which prevent bias related to sample heterogeneity and thereby provide comparable results, as recommended by Calder, Phillips, and Tybout (1981).

The senior managers were from large and medium sized French companies working in various economic sectors (industry, commerce and services). Their ages ranged between 24 and 62 years, with an average age of 39 years. The sample group comprised 50.31% men and 49.69% women. Their work experience in their current organization varied from 1 year to more than 25 years (with an average of 10 years of work experience).

3.2. Measurements

The participants indicated their agreement with a set of statements using a seven point Likert type scale that ranged from (1) "strongly disagree" to (7) "strongly agree". All measures displayed a satisfactory level of reliability (Appendix B).

The outcome variable, *job burnout*, was measured as reflective construct using 14 valid items from the Shirom Milamed Burnout Measure (SMBM; Shirom & Melamed, 2006). The SMBM consists of three subscales ($\alpha = 0.96$): physical fatigue (six items, e.g., "I feel tired"; "I feel physically drained"), emotional exhaustion (three items, e.g., "I feel I am unable to be sensitive"; "I feel I'm not capable of in vesting emotionally"), and cognitive weariness (five items, e.g., "I feel I'm not thinking clearly"; "I feel I'm not focused in my thinking").

The independent variables were personality traits and technostress creators. *Personality traits* were measured using a brief scale for the "Big Five" personality dimensions (Gosling, Rentfrow, & Swann, 2003). Three items were used to measure each dimension: *agreeableness* ($\alpha = 0.77$; e.g., "I see myself as sympatric/warm"), *openness to experi ence* ($\alpha = 0.78$; e.g., "I see myself as creative"; "I see myself as imagi native"), *extraversion* ($\alpha = 0.63$; e.g., "I see myself as extraverted"; "I see myself as enthusiastic"), *neuroticism* ($\alpha = 0.65$; e.g., "I see myself as moody"; "I see myself as anxious"), and *conscientiousness* ($\alpha = 0.69$; "I see myself as dependable"; "I see myself as organized").

Technostress creators were measured using valid items from Ayyagari et al. (2011) with five subscales: *work home conflict* (three items; $\alpha = 0.86$; e.g., "using ICTs blurs boundaries between my job and my home life"; "using ICTs for work related responsibilities creates con flicts with my home responsibilities"), *invasion of privacy* (four items; $\alpha = 0.92$; e.g., "I feel uncomfortable that my use of ICTs can be easily monitored"; "I feel that my use of ICTs makes it easier to invade my privacy"), *work overload* (three items; $\alpha = 0.90$; e.g., "I feel busy or rushed due to ICTs"; "I feel pressured due to ICTs"), *role ambiguity* (four items; $\alpha = 0.89$; e.g., "I am unsure whether I have to deal with ICT problems or with my work activities"; "I am unsure what to prioritize: dealing with ICT problems or my work activities"), and *job insecurity* (three items; $\alpha = 0.85$; e.g., "I am worried that new ICTs may pose a

Table 1
Correlations between latent variables and discriminant validity.

Constructs	Constructs										
	1	2	3	4	5	6	7	8	9	10	11
Agreeableness	**0.82**										
Openness to experience	0.33**	**0.90**									
Extraversion	0.33**	0.33**	**0.85**								
Neuroticism	0.13	0.06	0.20*	**0.76**							
Conscientiousness	0.37**	0.14	0.01	0.09	**0.86**						
Work-home conflict	0.17*	0.04	0.05	0.29**	0.16*	**0.88**					
Invasion of privacy	0.11	0.00	0.06	0.17*	0.06	0.39**	**0.90**				
Work overload	0.08	0.10	0.14	0.31**	0.03	0.45**	0.40**	**0.92**			
Role ambiguity	0.07	0.06	0.05	0.24**	0.10	0.35**	0.38**	0.56**	**0.87**		
Job insecurity	0.08	0.09	0.14	0.15	0.09	0.19*	0.34**	0.30**	0.55**	**0.88**	
Job burnout	0.10	0.10	0.02	0.36**	0.07	0.49**	0.31**	0.48**	0.48**	0.31**	**0.82**

Note: 1. Agreeableness; 2. openness to experience; 3. extraversion; 4. neuroticism; 5. conscientiousness; 6. work-home conflict; 7. invasion of privacy; 8. work overload; 9. role ambiguity; 10. job insecurity; 11. job burnout; diagonal elements (in bold) are the square roots of the average variance extracted (AVE). Values in the off-diagonals are the correlations among constructs.
** Correlation significant at 0.01.
* Correlation significant at 0.05.

Table 2
Uncalibrated and calibrated data statistics.

Variables	Statistics									
	Min		5th percentile		50th percentile		95th percentile		Max	
	Un-calib. data	Calib. data	Un-calib. data	Calib. data	Un-calib. data	Calib. data	Un-calib. data	Calib. data	Un-calib. data	Calib. data
Agreeableness	1.67	0.00	4.00	0.05	5.00	0.50	7.00	0.95	7.00	0.95
Openness to experience	1.50	0.00	3.00	0.05	5.00	0.50	7.00	0.95	7.00	0.95
Extraversion	1.00	0.00	1.50	0.05	4.00	0.50	6.50	0.95	7.00	0.97
Neuroticism	1.00	0.00	1.33	0.05	3.52	0.50	5.63	0.95	7.00	1.00
Conscientiousness	2.00	0.00	3.00	0.05	5.00	0.50	7.00	0.95	7.00	0.95
Work-home conflict	1.00	0.00	1.00	0.05	3.67	0.50	7.00	0.95	7.00	0.95
Invasion of privacy	1.00	0.00	1.00	0.05	4.50	0.50	7.00	0.95	7.00	0.95
Work overload	1.00	0.00	1.00	0.05	3.66	0.50	7.00	0.95	7.00	0.95
Role ambiguity	1.00	0.00	1.00	0.05	3.00	0.50	5.50	0.95	7.00	1.00
Job insecurity	1.00	0.00	1.00	0.05	2.33	0.50	6.00	0.95	7.00	0.98
Job burnout	1.00	0.00	1.00	0.05	2.60	0.50	5.52	0.95	7.00	1.00

threat to my job"; "I believe that ICTs make it easier for other people to perform my work activities").

We performed a confirmatory factor analysis to verify the facture structure of the first order constructs. We assessed the measurement scales in terms of convergent validity and discriminant validity. The scales exhibited good convergent validity (see Appendix B) because the factor loadings of the items on their corresponding constructs exceeded the 0.70 threshold (Hair, Black, Babin, & Anderson, 2010). They also exhibited good discriminant validity because the square roots of the average variance extracted (AVE) values were greater than the correlations between the construct and all other constructs in Table 1 (Hair et al., 2010).

To address common method variance (CMV) issues related to self reported measures, we used Harman's (1976) one factor test to isolate the covariance caused by artifacts (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The test revealed an explained variance of 30.90% (less than the threshold level of 50%), which indicated an absence of CMV issues. We also used a common latent method factor (CLF) to capture the common variance among all observed variables in the model, as recommended by Podsakoff et al. (2003). We examined the significance of the structural parameters both with and without the CLF in the model. The results showed that factor loadings with their re spective constructs remained statistically significant in the models both with and without the CLF (mean communalities = 0.72). The difference between the models with and without the CLF is close to zero (less than 0.01), supporting the absence of CMV issues.

Finally, we tested for multicollinearity by calculating the variance inflation factor (VIF) values (O'Brien, 2007). The results show that the VIF values are less than the tolerated threshold of 3 (ranging from 1.23 to 2.05), which indicated that multicollinearity is not an issue.

3.3. Data calibration and analysis

The use of the *fsQCA* approach requires the transformation of data into sets by calibrating the survey scale according to three substantive thresholds (Ragin, 2008): full non membership (0), crossover point (0.5), and full membership (1). Full non membership and full mem bership scores can be understood, respectively, as lower and upper thresholds (Ragin, 2008). The crossover point anchors "the point of maximum ambiguity (*i.e.*, fuzziness) in the assessment of whether a case is more in or out of a set" (Ragin, 2008, p. 30). Conventionally, the most straightforward method to calibrate data is to use the 7 point Likert scale, where the values 1, 4, and 7 will be the anchors for 0, 0.5, and 1 memberships, respectively, and the rest of the values (2, 3, 5, and 6) will follow accordingly (Pappas, Kourouthanassis, Giannakos, & Chrissikopoulos, 2016). However, due to the skewness of our un calibrated data (see Table 2) the full non membership values for agreeableness and openness to experience are quite high (4 and 3 on the Likert scale, respectively) and in order to prevent less meaningful results that may generate one solution with all the conditions identified as necessary, we calibrated data using percentiles (Beynon, Jones, & Pickernell, 2016; Pappas, Giannakos, & Sampson, 2019; Plewa, Ho,

Conduit, & Karpen, 2016). To be more consistent, we calibrated agreeableness and openness to experience in a similar way as the other constructs. Indeed, the full set non membership included individuals whose responses are mainly under the Likert scale values of 4 and 3, respectively, and range between 1.67 and 4 and 1.50 3, respectively.

Indeed, building on the *probability density function* (PDF) and fol lowing the procedure employed by Beynon et al. (2016), we determined the three qualitative anchors for each variable: the lower threshold (5th percentile), upper threshold (95th percentile) and crossover point (50th percentile). The *first*, membership in the set of individuals with *high* job burnout was coded 0 if an individual response was less or equal to the 50th percentile and coded 1 if it was higher. The *second* set measure, membership in the set of individuals with *low and medium* job burnout (i.e., not high job burnout), was coded automatically by the *fsQCA* program as follows:

[*Low/medium burnout* = 1 − *high burnout*]

Based on the qualitative anchors (full non membership, crossover point, and full membership), we transformed the scores into set mea sures using the direct method of calibration described by Ragin (2008). Using the current version of the *fsQCA* software, the calibrated scores were tied to the thresholds of full membership (fuzzy score = 0.95), the crossover point (fuzzy score = 0.50), and full non membership (fuzzy score = 0.05). The rescaled measures that we obtained ranged from 0 to 1 (see Table 2).

After we transformed the data into sets, the process created a data matrix called a "truth table" with 2^k rows, where k is the number of independent variables (2^{10} = 1024 rows in this study). To reduce the number of rows, we set the lowest acceptable consistency for sufficient solutions at (≥ 0.80), as recommended by Ragin (2008, p. 107), and we established a solution frequency threshold at two because the number of cases was large (161 cases).

Following the procedure recommended by Ragin (2008, pp. 160 175), we used the intermediate solution for interpretation, where lo gical remainders were incorporated into the solution based on our theoretical knowledge (Ragin, 2009, p. 111). To determine core and peripheral conditions within the intermediate solution, we used the parsimonious solution (Fiss, 2011; Pappas et al., 2019). In the following section, core and peripheral conditions are depicted with large and small circles, respectively. The presence of conditions is denoted by a black circles ("●") and their absence by a cross circle ("⊗"). Blank spaces indicate "do not care" situations in which the causal conditions may be either present or absent.

4. Results

Table 3 presents the descriptive statistics and correlations for all

Table 4
Configurations leading to *high* job burnout.

	Intermediate solution[a]				
	a1	a2	a3	a4	a5
Agreeableness			•	•	•
Openness to experience	•				•
Extraversion	•		•		•
Neuroticism		•	•		
Conscientiousness				•	
Work-home conflict		●		●	●
Invasion of privacy	⊗		⊗	•	
Work overload		•	•	•	
Role ambiguity	●	●	●	●	●
Job insecurity	•	•	•		
Raw coverage	0.251	0.374	0.222	0.261	0.265
Unique coverage	0.029	0.104	0.011	0.021	0.016
Consistency	0.874	0.905	0.934	0.901	0.926
Overall solution coverage	0.490				
Overall solution consistency	0.858				

Note: black circles ("●") indicate high conditions, cross circles ("⊗") indicate low condition, and blank spaces indicate "do not care". Large circles indicate core conditions, whereas small ones indicate peripheral conditions (Fiss, 2011; Pappas et al., 2019).

[a] The intermediate solution (high job burnout) = (openness AND extraver sion AND not (~) invasion AND role ambiguity AND job insecurity OR neu roticism AND work-home conflict AND work overload AND role ambiguity AND job insecurity OR agreeableness AND extraversion AND neuroticism AND not (~) invasion AND work overload AND job insecurity OR agreeableness AND extraversion AND conscientiousness AND work-home conflict AND work overload AND role ambiguity OR agreeableness AND openness AND extraver sion AND neuroticism AND work-home conflict AND work overload AND role ambiguity).

measures after calibration. Most predictors are significantly correlated at 0.05 and 0.001.

4.1. Results of high job burnout

Before conducting the fuzzy set truth table procedure, we checked for necessary conditions (Ragin, 2009, p. 110). Conventionally, a con dition is necessary if its consistency score exceeds the threshold of 0.90 (Schneider & Wagemann, 2010). Our results show no condition that exceeds the threshold of 0.90. We then conducted the truth table pro cedure to look for sufficient conditions leading to *high* job burnout. The results of the fuzzy set analysis for sufficient conditions are presented in Table 4, which shows that role ambiguity may be a candidate for a possible necessary condition, as it is shared across the five configura tions. The consistency score for role ambiguity assumes a value of 0.76,

Table 3
Correlations after calibration.

	1	2	3	4	5	6	7	8	9	10
Agreeableness										
Openness to experience	0.31**									
Extraversion	0.35**	0.31**								
Neuroticism	0.08	0.01	0.15							
Conscientiousness	0.37**	0.14	0.03	0.12						
Work-home conflict	0.15	0.02	0.05	0.28**	0.11					
Invasion of privacy	0.06	0.04	0.10	0.17*	0.03	0.37**				
Work overload	0.04	0.05	0.12	0.31**	0.02	0.44**	0.37**			
Role ambiguity	0.04	0.03	0.01	0.15	0.05	0.32**	0.31**	0.55**		
Job insecurity	0.08	0.07	0.10	0.05	0.13	0.16*	0.28**	0.27**	0.54**	
Job burnout	0.06	0.05	0.01	0.32**	0.09	0.46**	0.29**	0.46*	0.47**	0.26**

Note: 1. Agreeableness; 2. openness to experience; 3. extraversion; 4. neuroticism; 5. conscientiousness; 6. work-home conflict; 7. invasion of privacy; 8. work overload; 9. role ambiguity; 10. job insecurity; 11. job burnout.

** Correlation significant at 0.01.
* Correlation significant at 0.05.

the highest value among all conditions. Nevertheless, because its consistency score does not exceed the threshold of 0.90, our results emphasize the existence of five combinations of sufficient but not necessary conditions leading to *high* job burnout.

The intermediate solution contains five substitutable configurations (i.e., combinations of conditions) with a satisfactory overall solution consistency of approximately 0.86, which exceeds the recommended threshold of 0.75 (Woodside, 2013). The overall solution coverage is approximately 49%, which is between 20% and 65%, as recommended by Woodside (2013).

Configuration a1 suggests that the presence of both personality traits, openness to experience and extraversion (i.e., high), regardless of agreeableness, neuroticism, and conscientiousness, may lead people to experience *high* job burnout when technostress situations are characterized by the absence of invasion of privacy (i.e., low) and the presence of role ambiguity and job insecurity (i.e., high), regardless of work home conflict and work overload.

Configuration a2 posits that the presence of neuroticism, regardless of other personality traits, may expose people to *high* job burnout when technostress situations are characterized by the presence of work home conflict, work overload, role ambiguity, and job insecurity, regardless of invasion of privacy.

Configuration a3 suggests that the simultaneous presence of agreeableness, extraversion, and neuroticism, regardless of openness to experience and conscientiousness, may lead to people to experience *high* job burnout when technostress situations are characterized by the absence of invasion of privacy, the presence of work overload, role ambiguity, and job insecurity, regardless of work home conflict.

Configuration a4 posits that the presence of agreeableness, extraversion, and conscientiousness, regardless of openness to experience and neuroticism, may expose people to experience *high* job burnout when technostress situations are characterized by work home conflict, invasion of privacy, increased work overload, and role ambiguity, regardless of job insecurity.

Finally, configuration a5 suggests that the conjoint presence of agreeableness, openness to experience, extraversion, and neuroticism, regardless of conscientiousness, may lead people to *high* job burnout when technostress situations are characterized by work home conflict, increased work overload, and role ambiguity, regardless of invasion of privacy and job insecurity.

All configurations are satisfactory subsets of *high* job burnout (consistency exceeds the recommended threshold of 0.75 (Woodside, 2013)), and they cover more than 20% of total membership in the outcome. The unique contribution of causal conditions to *high* job burnout in each configuration is significant because it exceeds zero (Schneider & Wagemann, 2010, p. 255).

The fuzzy set XY plots report in each configuration all individuals who have membership greater than 0.5 in both causal conditions and in the outcome and who are potentially exposed to *high job* burnout: 3 individuals (configuration a1), 18 individuals (configuration a2), 3 individuals (configuration a3), 7 individuals (configuration a4), and 9 individuals (configuration a5).

4.2. Results for low and medium job burnout

We first tested whether any of the causal conditions could be considered necessary for low and medium job burnout (i.e., not high job burnout). The results reveal no condition that exceeds the threshold of 0.90 (Schneider & Wagemann, 2010). We then conducted a fuzzy set analysis for sufficient conditions leading to low and medium job burnout. The results are presented in Table 5.

Table 5 reports five substitutable configurations with satisfactory overall solution consistency and coverage (Woodside, 2013). The two first configurations (b1 and b2) show that the absence of agreeableness (i.e., low) and the simultaneous presence of openness and conscientiousness (i.e., high), regardless of extraversion and neuroticism,

Table 5
Configurations leading to low and medium job burnout.

	Intermediate solution[a]			
	b1	b2	b3	b4
Agreeableness	⊗	⊗		•
Openness to experience	•	•		•
Extraversion			●	●
Neuroticism				
Conscientiousness	•	•	•	
Work-home conflict				
Invasion of privacy				
Work overload				
Role ambiguity	⊗		⊗	⊗
Job insecurity		⊗		•
Raw coverage	0.295	0.292	0.330	0.239
Unique coverage	0.003	0.013	0.046	0.027
Consistency	0.882	0.866	0.868	0.919
Overall solution coverage	0.412			
Overall solution consistency	0.812			

Note: black circles ("●") indicate high conditions, cross circles ("⊗") indicate low condition, and blank spaces indicate "do not care". Large circles indicate core conditions, whereas small ones indicate peripheral conditions (Fiss, 2011; Pappas et al., 2019).

[a] The intermediate solution (low/medium job burnout) = (not (~) agreeableness AND openness AND conscientiousness AND not (~) role ambiguity OR not (~) agreeableness AND openness AND conscientiousness AND not (~) job insecurity OR openness AND extraversion AND conscientiousness AND not (~) role ambiguity OR agreeableness AND openness AND extraversion AND not (~) role ambiguity AND job insecurity).

may lead people to experience *low* and *medium* job burnout when technostress situations are characterized by the absence of role ambiguity (configuration b1) and job insecurity (configuration b2), regardless of the other factors. In configuration b3, the joint presence of openness to experience, extraversion, and conscientiousness, regardless of agreeableness and neuroticism traits, may expose people to *low* and *medium* job burnout when technostress situations are characterized by the absence of role ambiguity, regardless of the other situations. In configuration b4, the joint presence of agreeableness, openness to experience, and extraversion, regardless of neuroticism and conscientiousness, may lead people to experience *low* and *medium* job burnout when technostress situations are characterized by the absence of role ambiguity and the presence of job insecurity, regardless of work home conflict, invasion of privacy, and work overload.

All five configurations have satisfactory raw coverage and consistency (respectively exceeding the thresholds of 20% and 0.75 recommended by Woodside (2013). The unique contribution of causal conditions to *low* and *medium* job burnout in each configuration is significant because it exceeds zero (Schneider & Wagemann, 2010, p. 255).

4.3. Predictive validity, robustness and sensitivity analyses

We tested for predictive validity to check if the model predicts the outcome well for different samples (Pappas et al., 2019; Pappas et al., 2016; Woodside, 2014). To do so, we followed the procedure described by Pappas et al. (2016). First, we split the sample into two subsamples. Second, we ran *fsQCA* for the first sample in order to generate configurations (see Table 6).

Finally, we tested each configuration (i.e., model) against the outcome of the second sample. Table 6 indicates that combinations of complex conditions are consistent indicators (high overall consistency = 0.890). Fig. 2 shows that highly consistent models for the first subsample have high predictive ability for the outcome of the second subsample and vice versa (high consistency = 0.845 and coverage = 0.239).

Finally, we conducted several robustness checks and sensitivity

Table 6
Complex configurations indicating high job burnout for the subsample.

Models from subsample 1	Raw coverage	Unique coverage	Consistency
OPN * EXT * NEU * COF * INV * WLD * AMB * INS	0.276	0.086	0.895
AGR * NEU * CON * COF * INV * WLD * AMB * INS	0.223	0.033	0.894
Overall solution coverage	0.309		
Overall solution consistency	0.890		

Note: AGR: agreeableness; OPN: openness; EXT: extraversion; NEU: neuroticism; CON: conscientiousness; COF: work-home conflict; INV: invasion of privacy; WLD: work overload; AMB: role ambiguity; INS: job insecurity.

analyses. As recommended by Ragin (2006a), we repeated the *fsQCA* procedure with small changes in the data calibration (i.e., using slightly different thresholds for full membership and full non membership) and small changes in the raw consistency value thresholds (i.e., using slightly different raw consistency thresholds in the truth table). We observed slight changes regarding the specific number of solutions, but the interpretation of the results remained substantially unchanged.

5. Discussion

Our *fsQCA* approach shows that interactions between personality traits and stressors result in different and substitutable configurations. Five configurations may lead to *high* job burnout, and four configurations may lead to *low and medium* job burnout.

Regarding *high* job burnout, our findings emphasize the distinctive role of extraversion in engendering such a syndrome. In fact, extraversion is present (i.e., high) in four out of five configurations (a1, a3, a4, and a5), and when extraversion is absent, *high* job burnout may occur only in the presence of neuroticism (configuration a2). Our findings contradict previous studies on technostress (Srivastava et al., 2015), where high extraversion has been found to lead to *low* job burnout within technostress situations. Our results suggest that high extraversion may lead to *high* job burnout with the joint presence of

openness to experience (configuration a1); agreeableness and neuroticism (configuration a3); agreeableness and conscientiousness (configuration a4); and agreeableness, openness to experience, and neuroticism (configuration a5). In each configuration, individuals may experience *high* job burnout when technostress situations are characterized by low invasion of privacy, high role ambiguity, and high job insecurity (configuration a1); low invasion of privacy, high work overload, role ambiguity, and job insecurity (configuration a3); high invasion of privacy, work overload, and role ambiguity (configuration a4); and high work overload and role ambiguity (configuration a5). Nevertheless, in the absence of extraversion (configuration a2), only the presence of neuroticism may cause *high* job burnout (regardless of other personality traits) when technostress situations are characterized by high work home conflict, increased work overload, high role ambiguity and job insecurity. This result supports previous studies in which neuroticism has been found to lead individuals to experience *high* stress due to their anxious temperament (Sharma & Gill, 2016; Srivastava et al., 2015).

Moreover, previous studies on technostress (Hsiao, 2017; Hsiao, Shu, & Huang, 2017; Krishnan, 2017; Srivastava et al., 2015) found that the independent presence of high agreeableness may lead to *high* job burnout in technostress situations. Our findings contradict previous studies and suggest that no independent personality trait is sufficient to
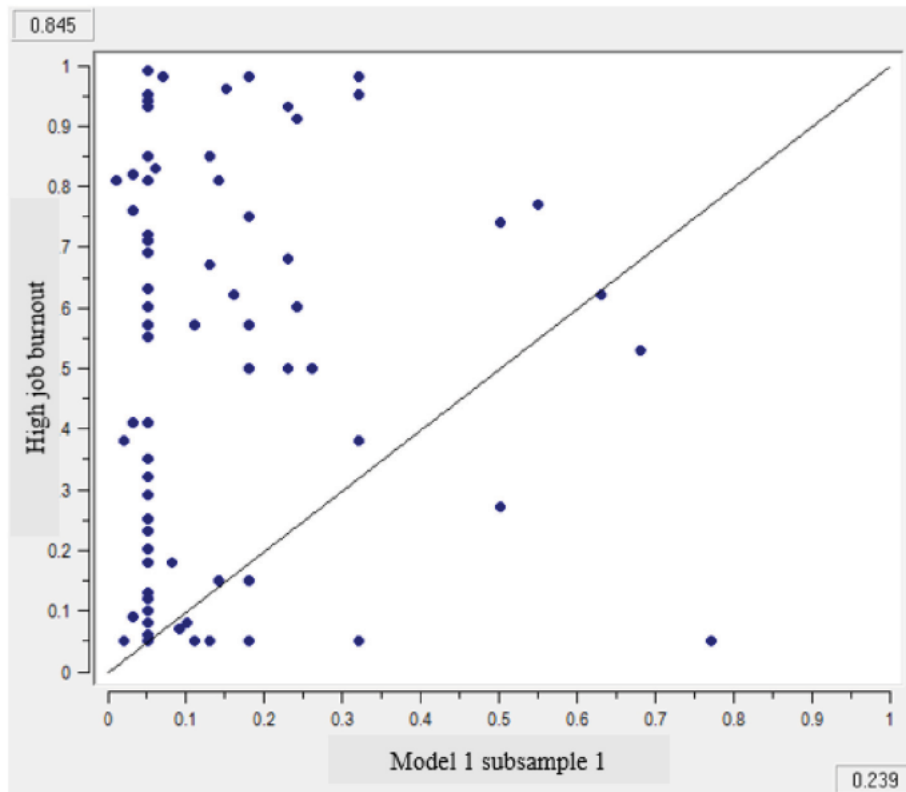

Fig. 2. Test of model 1 for subsample 1 using the outcome for subsample 2.

engender *high* job burnout, but rather that the combination of personal traits may lead to this syndrome in particular technostress situations. Indeed, the combination of high agreeableness with extraversion and neuroticism (configuration a3); extraversion and conscientiousness (configuration a4); and openness to experience, extraversion, and neuroticism (configuration a5) may lead to *high* job burnout when technostress situations are characterized by low invasion of privacy, high work overload, role ambiguity and job insecurity (configuration a3); high work home conflict, invasion of privacy, work overload, and role ambiguity (configuration a4); and high work home conflict, work overload, and role ambiguity (configuration a5). Our findings suggest that each configuration is sufficient but not necessary to lead to *high* job burnout, and people with different combinations of personality traits may react to technostress situations in different manners and experience such a syndrome differently.

Regarding *low* and *medium* job burnout (i.e., not high job burnout), our findings show the distinctive role of openness to experience because it is present (i.e., high) in the four configurations. Indeed, our results suggest that high openness to experience may lead to *low and medium* job burnout in the joint presence of low agreeableness and high conscientiousness (configurations b1 and b2); high extraversion and conscientiousness (configuration b3); and high agreeableness and extraversion (configuration b4) when technostress situations are characterized by low role ambiguity (configurations b1, b3, and b4) and low insecurity (configuration b2). Contrary to previous studies on technostress (Ayyagari et al., 2011; Ragu Nathan et al., 2008; Srivastava et al., 2015), our findings highlight that the causes leading to *high* job burnout may be different than those leading to its absence (i.e., not high job burnout).

Our findings support some personality research (Grant & Langan Fox, 2006; Vollrath & Torgersen, 2000) and suggest that no singular configuration (i.e., combination of personality traits) is sufficient to react to stressful situations (i.e., technostress situations) and engender *low, medium,* and *high* emotional exhaustion (i.e., job burnout); rather, there are different configurations of personality traits that may lead individuals to cope with stressful situations.

5.1. Implications

Our study makes important contributions to the business research literature. It adds to the literature on technostress by providing a holistic view to better understand the causes of job burnout. It shows how personality traits can combine with each other, interact with and react to stressors, and lead individuals to experience *low*, *medium*, and *high* job burnout. Although previous studies on technostress (Hsiao, 2017; Hsiao et al., 2017; Krishnan, 2017; Srivastava et al., 2015) contributed to understanding such interactions, they offered limited insights regarding patterns and combinations of personality traits and stressors and how they, as configurations, cause job burnout. Following the need to address this shortfall in the literature and to better capture complexity, which is the property that typically characterizes a behavior within a complex social system (Grant & Langan Fox, 2006; Laceulle et al., 2015), we propose a new holistic approach based on *fsQCA* (Ragin, 2008) that enables researchers to elucidate such complexity. Our findings emphasize that different combinations of personality traits may cause people to react in different ways to technostress creators and cope differently with job burnout.

Moreover, our study holds considerable promise to overcome the mismatch between theory and analytic approaches in order to enable detailed analyses of combinations of causal conditions that lead to *low, medium,* and *high* job burnout in technostress situations. Previous studies on technostress used mainly net effects approaches based on symmetric and variance based tests (Hsiao, 2017; Hsiao et al., 2017; Krishnan, 2017; Srivastava et al., 2015). These studies may be insufficient to capture the complexity of interactions involved within an individual in real life situations, which are replete with causal

asymmetry, nonlinearities, and discontinuities (Woodside, 2017). Our study builds on complexity theory to address this shortfall and answers the call to move beyond net effects approaches (Woodside, 2013) by suggesting using the *fsQCA* approach to better understand how the combinations of personality traits may react to stressors and lead to job burnout.

Finally, few studies on burnout related to technostress have been conducted with senior managers (Sharma & Gill, 2016; Srivastava et al., 2015), although this syndrome often manifests itself to different degrees in such a population (Levinson, 1981). Indeed, our findings can help senior managers to identify what combinations of personality traits may expose workers to *high* (vs. *low/medium*) job burnout in technostress situations. The multiple configurations provided can help senior managers to understand that there is not a single optimal path leading to *high* (vs. *low/medium*) job burnout but rather different paths, depending on different combinations of personality traits. Indeed, our findings can help senior managers to implement "personalized" preventive actions, depending on different combinations of personality traits, in order to prevent *high* levels of stress (Laurence, Fried, & Slowikc, 2013). Because personality traits are relatively stable during adult life (Costa & McCrae, 1985), senior managers can consider personality trait differences in order to establish "personalized" strategies, which can help workers to cope with stressors. In relation with *high* job burnout, the five configurations (a1 to a5) can help senior managers to target workers depending on their personality traits in order to implement preventive actions that prevent technostress situations in each configuration. For instance, in configuration a1, the traits of openness to experience and extraversion may expose people to *high* job burnout when technostress situations are characterized by *high* role ambiguity and job insecurity and a *low* invasion of privacy. Accordingly, senior managers can target workers who score particularly *high* on openness to experience and extraversion (for instance, using the Big Five Personality Test) and create actions to reduce their perceived *high* levels of role ambiguity and job insecurity (Ayyagari et al., 2011). In addition, reducing role ambiguity can also help workers to cope with *high* job burnout because role ambiguity is found to be a common stressor in the five configurations. To reduce role ambiguity, senior managers, for instance, can train workers with respect to effective time management strategies in order to help them prioritize tasks when using ICT and conduct only the work that matters (Ayyagari et al., 2011). To alleviate concerns related to perceived job insecurity, senior managers can communicate on the importance of human capital and encourage workers who perform their activities well, which may reassure them that their skills cannot be substituted by the use of ICT (Ayyagari et al., 2011; Sharma & Gill, 2016). Similarly, senior managers can implement preventive actions, depending on personality traits in each configuration, in order to reduce high levels of perceived work overload (configurations a2 to a5), work home conflict (configurations a2, a4, and a5), and invasion of privacy due to the use of ICT (configuration a4). For instance, to alleviate concerns related to work overload and work home conflict, senior managers can establish the "right to disconnect" from ICT in order to help workers give greater priority to their core business activities and to be unreachable outside their workstations (Ayyagari et al., 2011; Degryse, 2016). Similarly, senior managers can implement an explicit ICT charter to outline work norms and best practices expected from the use of ICT, which may prevent privacy invasion (Ayyagari et al., 2011; Degryse, 2016).

In relation with *low* levels of job burnout, four configurations (b1 to b4) show that workers with different combinations of personality traits may react to technostress situations in different ways. Beyond the fact that these configurations can help senior managers to implement "personalized" actions that we previously specified, human resource (HR) managers can also exploit these findings to manage workers based on their personality traits. For instance, configuration b4 suggests that individuals who score *high* on agreeableness, openness to experience, and extraversion may cope with technostress situations characterized

by *low* role ambiguity and *high* job insecurity (regardless of the other stressors). Accordingly, HR managers can assign to workers with such personality traits the activities that need frequent use of ICT, as they are less vulnerable to job insecurity, and can particularly establish effective time management strategies in order to prevent perceived role ambiguity. Similarly, the other configurations (b1 to b3) can be useful for HR managers to manage workers by implementing preventive "personalized" actions that help workers to cope with technostress situations and reach *low* levels of job burnout.

5.2. Limitations and future research

Although the present study makes significant contributions, it has some limitations that should be considered in future research. *First*, although the biases related to cross sectional research may be limited in our study because personality traits are relatively stable during adult life (Costa & McCrae, 1985), future research should be replicated by collating different measures spread over time to appraise technostress creators and job burnout.

Second, the reliability of the scale in three personality dimensions is somewhat low. In the present study, we used "the brief scale of the Big Five personality dimensions" that has been used in previous research on technostress (Srivastava et al., 2015) and that was originally established by Costa and McCrae (1985). However, according to Hendriks, Hofstee, and Raad (1999, p. 308), the brief scale "suffers in part from item formulations that can be expected to be too difficult for respondents (…). Apart from being a nuisance to respondents, such item characteristics might add to unreliable variance in the item responses". Indeed, Hendriks et al. (1999) proposed a more reliable scale called "the five factor personality inventory (FFPI)". Future research should use the FFPI in order to increase the reliability of personality trait measures (Hendriks et al., 1999).

Third, organizational factors that reduce stress should be included in future research (Ragu Nathan et al., 2008). Organizational factors such as technical support may help users feel more comfortable with ICT and decrease job burnout. These factors should be added to our model to enrich the configurations and improve the relevance of our results.

Fourth, although the present study aimed to examine the effect of technostress and personality traits on job burnout among senior managers (Srivastava et al., 2015), job burnout may also occur among employees (Sharma & Gill, 2016). Indeed, further comparative studies using the *fsQCA* approach should be performed to better understand similarities and differences between employees and senior managers in terms of the manifestation of job burnout related to technostress.

Finally, in our study, we examined combinations of causal conditions that may lead to job burnout as an output (*high* or *low/medium* levels) but we did not examine cases (who and how many) that may have specific antecedent conditions as inputs (*high* or *low/medium* levels) and that may lead to job burnout (Pappas, 2018). Further studies can be useful to determine specific antecedent conditions that may lead to *high* and *low/medium* job burnout.

Despite these limitations, our *fsQCA* approach holds considerable promise because it closes an important gap in the IS literature. The present study is the first to enable a detailed analysis of the combined/interactive role of personality traits and technostress creators in order to better understand occupational stress and burnout.

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Appendix A. Key research on technostress

Authors	Theory and methodology	Main results
Ayyagari et al. (2011)	- Person-environment fit model. - Online survey of 661 ICT professional users.	Using an SEM approach, the results suggest that work overload and role ambiguity are the two most dominant independent stressors, whereas intrusive technology characteristics are dominant predictors of stressors.
Hsiao (2017)[a]	- Five-factor model. - Online survey of 546 users of mobile social and game.	Using an SEM approach, the results suggest that neuroticism, extraversion, materialism, and external locus of control may independently lead to compulsive social application usage. Agreeableness, materialism, and external locus of control may engender compulsive game application usage. Compulsive usage of social and game applications may increase technostress.
Hsiao et al. (2017)[a]	- Five-factor model. - Online survey of 136 users of mobile social applications.	Using an SEM approach, the results show that neuroticism, agreeableness, and extraversion traits may independently lead to mobile compulsive usage, which in turn may increase technostress.
Krishnan (2017)[a]	- Five-factor model and Hofstede's cultural values framework - Online survey of 332 full-time employees.	Using an MRA approach, the results show that agreeableness and neuroticism traits may independently increase the positive employees' perception of technostress creators (positive stress), whereas openness to experience may increase their negative perception (negative stress). Furthermore, the results show that the relationships of agreeableness, neuroticism and extraversion with technostress creators may be contingent on the extent to which employees are long-term or short-term oriented.
Ragu-Nathan et al. (2008)	- Transaction-based approach. - Survey carried out with 608 ICT end users in five organizations	Using an SEM approach, the results show that technostress creators individually decrease job satisfaction, which results in a decrease in organizational continuance commitment, while technostress inhibitors increase job satisfaction and organizational continuance commitment.
Sharma and Gill (2016)[a]	- Technology acceptance model. - Survey carried out with 600 bank employees at different hierarchal levels.	Using an MRA approach, the results suggest that extraversion and neuroticism traits may independently expose managers to exhaustion (strain) in technostress situations, whereas openness trait may be less likely to expose them to exhaustion in such situations.
Srivastava et al. (2015)[a]	- Transactional model of stress and coping. - Online survey of 152 senior managers.	

Tarafdar et al. (2007)	- Sociotechnical theory and role theory. - Survey of 233 ICT users from two organizations.	Using an SEM approach, the results show that independent personality traits such as agreeableness may expose managers to job burnout in high-technostress situations, while extraversion may be less likely to expose them to job burnout in such situations. Using a SEM approach, the results show that technostress creators influence productivity negatively and role stress positively.	
Tarafdar et al. (2010)	- The end-user computing and technostress literature - Survey of 233 ICT users.	Using an SEM approach, the results show that technostress creators reduce individuals' ICT use satisfaction and ICT productivity and innovation.	
Tarafdar et al. (2015)	- Transaction theory of stress/social cognitive theory - Survey of 237 sales professionals from three business-to-business organizations	Using an SEM approach, the results show that while traditional effort-based mechanisms, such as building technology competence reduce the impact of technostress creators on technology-enabled innovation and performance, more empowering mechanisms, such as developing technology self-efficacy and enhancing IS literacy, as well as and involvement in IS initiatives are required to counter the decrease in overall performance due to technostress creators.	

[a] Refers to research dealing with technostress and personality traits; SEM: structural equation Modeling; MRA: multiple regression analysis.

Appendix B. List of constructs and items

Construct and scale items	Mean	SD	Loading
Agreeableness			
I see myself as warm.	5.39	1.27	0.72
I see myself as sympathetic.	5.67	1.03	0.91
I see myself as kind.	5.64	1.03	0.82
Openness to experience			
I see myself as imaginative.	4.96	1.26	0.92
I see myself as creative.	4.69	1.32	0.89
Extraversion			
I see myself as extraverted.	4.02	1.62	0.80
I see myself as talkative.	4.21	1.64	0.90
Neuroticism			
I see myself as anxious.	3.93	1.57	0.71
I see myself as moody.	2.70	1.53	0.84
I see myself as easily upset.	3.69	1.66	0.71
Conscientiousness			
I see myself as organized.	5.09	1.30	0.95
I see myself as self-disciplined.	5.11	1.34	0.77
Work-home conflict			
Using ICTs blurs boundaries between my job and my home life.	4.00	2.25	0.88
Using ICTs for work-related responsibilities creates conflicts with my home responsibilities.	3.36	2.06	0.89
I do not get everything done at home because I find myself completing job-related work due to ICTs.	3.12	2.03	0.88
Invasion of privacy			
I feel uncomfortable that my use of ICTs can be easily monitored.	4.52	1.92	0.82
I feel my privacy can be compromised because my activities using ICTs can be traced.	4.56	2.05	0.93
I feel my employer could violate my privacy by tracking my activities using ICTs.	3.99	2.08	0.89
I feel that my use of ICTs makes it easier to invade my privacy.	4.29	2.06	0.94
Work overload			
ICTs create many more requests, problems, or complaints in my job than I would otherwise experience.	3.59	1.98	0.85
I feel busy or rushed due to ICTs.	3.65	2.00	0.95
I feel pressured due to ICTs.	3.37	1.94	0.95
Role ambiguity			
I am unsure whether I have to deal with ICT problems or with my work activities.	2.89	1.69	0.87
I am unsure what to prioritize: dealing with ICT problems or my work activities.	2.98	1.74	0.87
I can NOT allocate time properly for my work activities because my time spent on ICT activities varies.	3.10	1.94	0.90
Time spent resolving ICT problems takes time away from fulfilling my work responsibilities.	3.22	1.88	0.84
Job insecurity			
ICTs will advance to an extent where my present job can be performed by a less skilled individual.	2.80	1.98	0.90
I am worried that new ICTs may pose a threat to my job.	2.39	1.64	0.85
I believe that ICTs make it easier for other people to perform my work activities.	3.09	2.00	0.88
Job burnout			
I feel tired.	3.92	1.85	0.76
I have difficulty concentrating.	3.13	1.78	0.84
I feel I'm not thinking clearly.	2.83	1.75	0.85
I feel I am not capable of being sympathetic to coworkers.	2.36	1.57	0.77
I feel fed up.	2.90	1.86	0.83
I feel stressed.	3.21	1.82	0.79
I have difficulty thinking about complex things.	2.83	1.76	0.82
I feel burned out.	3.16	1.96	0.81
I feel I am unable to be sensitive to the needs of coworkers.	2.35	1.53	0.79
I feel I'm not focused in my thinking.	2.72	1.78	0.87
I feel physically drained.	2.93	1.96	0.84
I have no energy to go to work in the morning.	2.52	1.73	0.87
I feel like my "batteries" are "dead".	2.69	1.86	0.83

My thinking process is slow.	2.55	1.63	0.85
I feel I am not capable of investing emotionally in coworkers.	2.42	1.71	0.72

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