The Impact of Personality and Culture on the Job Demands-Control Model of Job Stress

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Abstract. Among the various work stress models, one of the most popular has been the job demands-control (JDC) model developed by Karasek (1979), which postulates that work-related strain is highest under work conditions characterized by high demands and low autonomy. The absence of social support at work further increases negative outcomes. This model, however, does not apply equally to all individuals and to all cultures. This review demonstrates how various individual characteristics, especially some personality dimensions, influence the JDC model and could thus be considered buffering or moderator factors. Moreover, we review how the cultural context impacts this model as suggested by results obtained in European, American, and Asian contexts. Yet there are almost no data from Africa or South America. More crosscultural studies including populations from these continents would be valuable for a better understanding of the impact of the cultural context on the JDC model.

Keywords: JDC model, job stress, personality, crosscultural comparison

Introduction

Job-related stress is a global and increasing concern. According to Milczarek, Schneider, and Gonzalez (2009),

> work-related stress is one of the biggest health and safety challenges that we face in Europe. Stress is the second most frequently reported work-related health problem, affecting 22% of workers from the EU 27 (in 2005), and the number of people suffering from stress-related conditions caused or made worse by work is likely to increase. (p. 7)

At the organizational level, the nature of work has changed profoundly in the last 50 years, where it has essentially shifted from physically demanding work involving manual jobs, toward more psychologically demanding work involving more service-oriented jobs in most Western countries (Kompier, 2002). Moreover, today's work context is commonly characterized by increased work demands, fast-paced work environments, uncertainty, and higher adaptability requirements, all of which contribute to an increase of work stress and negative consequences, such as various psychological and physical strains (DeFrank & Ivencevich, 1998).

Although these work conditions are commonly observed in high-stress jobs, the same work stressors do not necessarily have the same effect on all individuals and in all contexts. Indeed, studies show that perceptions of stress vary according to certain personality traits (Grant & Langan-Fox, 2007). Furthermore, how contextual and culture-driven individual differences influence the stress-strain outcomes is an important matter of investigation in today's increasingly culturally mixed work environments. According to Hofstede (2001), "culture is to a human collectivity what personality is to an individual" (p. 10). For instance, Briner (1996) suggested that cultural influences operate on general beliefs about the nature of stress, and this may also influence its level of perception and prevalence in a given society. Cultural context in fact seems to promote response patterns despite existing individual differences (Triandis, 1994). Moreover, a major change in the modern labor market is a trend toward global integration of business, and in many organizations, geographical boundaries tend to disappear and make way for crossnational teams (Duarte & Rossier, 2008). Given that globalization effects are visible all around the world and represent a large-scale concern, incorporating the role of cultural differences and specificities in the study of professional trajectories represents an important issue. In 2010, it was estimated that 214 million individuals around the world were migrants (International Organization for Migration, 2011). In Switzerland, for example, the percentage of immigrant residents increased by

about 2.2% (38,700 individuals) in 2009 compared to 2008, of a total of 1,802,300 individuals (Swiss Federal Statistical Office, 2011). One major difficulty emerging from this international reality and the associated increase in cultural diversity is directly related to the work setting. Some evidence suggests that culture influences what is perceived as stressful and how an individual reacts to stress (Liu, Spector, & Shi, 2007). Accordingly, we propose a review examining how personality and culture impact this stress-strain relationship. We first summarize the different definitions of stress and describe major results from the work stress literature. Then, our discussion focuses on a review of the literature concerning work stress-strain effects, with particular attention to the potential moderator effects of personality and culture in this relationship.

Job Stress and Its Effects

Job Stress Costs

The costs related to work stress at the individual, organizational, and societal levels are substantial. Throughout Europe, annual health care costs engendered by work stress are estimated to be at least EUR 20 billion (European Commission, 2002). A study conducted in the US demonstrated that healthcare costs at the individual level are higher among those working in high-workload and low-control conditions (Ganster, Fox, & Dwyer, 2001). Furthermore, work strain has also been significantly associated with absenteeism, though this association seems to be indirect and less important than is usually reported (Darr & Johns, 2008). Evidence of a direct causal relationship between stress and illness is rather limited, but enough indirect support from epidemiological literature shows that work-related stress is associated with physiological and emotional responses, which can further lead to various illnesses (Ganster & Schaubroek, 1991). Thus, job strain often leads to poor health by weakening the immune system and by increasing the risk of cardiovascular disease (Truelsen, Nielsen, Boysen, & Gronbaek, 2003). In addition, there is strong evidence that cardiovascular disease is associated with work stress, principally in work conditions characterized by high demands and low control (Carnethon et al., 2009).

Defining Stress and Work Stress

Numerous definitions of stress have been proposed which vary according to the researcher's perspective. For instance, Selye (1956) was one of the first to emphasize the biological effects of stress, which he defined as a nonspecific response of the organism toward threatening stimuli. Furthermore, Lazarus and Folkman (1984, p. 19) defined psychological stress as "a particular relationship between the person and the environment that is appraised as taxing or exceeding his or

her resources and endangering his or her well-being." Some institutions claim their own definition of work-related stress. For instance, the National Institute of Occupational Safety and Health (1999) defined work stress as psychological and physical strains that appear when a mismatch is experienced between the work demands and one's resources. In sum, most researchers seem to generally agree that stress is to be conceptualized as a process (Oliver, Mansell, & Jose, 2010) in which strain is generated from an individual-environment interaction. Accordingly, several models of work stress have been developed such as Lazarus and Folkman's transactional model, the P-E fit model (French, Caplan, & Harrison, 1982), the model of causes and consequences of work-related stress (Kompier & Marcelissen, 1990), and the burnout process introduced by Maslach and Jakson (1981) (for an overview, see Guglielmi & Tatrow, 1998). However, the most frequently used model is certainly the job demand-control model (JDC model), developed by Karasek (1979). To illustrate its importance, we note that Karasek's initial article introducing the JDC model has been cited over 2,000 times since 1979. Indeed, the JDC model has been the dominating research model in the occupational stress literature for the last 30 years and results obtained on its basis are valuable for its direct application in the workplace environment.

The JDC Model of Job Strain

According to the JDC model, the severity of job strain, defined as the adverse physical and psychological outcomes resulting from stress, varies with respect to the decision latitude afforded to workers (as measured by the sum of scores on skill discretion and decision latitude subscales) and the environmental demands put on these workers at work (amount of workload and intellectual effort). In other words, an individual perceives more work stress when decision latitude (also known as "job control" or "autonomy") is low and work demands are high (Karasek, 1979). Later, Johnson and Hall (1988) added social support (from one's coworkers and supervisor) to the model as a third dimension. The premise is that high social support can buffer the effects of high workload and low autonomy, or, inversely, low social support combined with high demands and low decision latitude intensifies stress effects. The JDC model is associated with three possible hypotheses: the strain hypothesis, the iso-strain hypothesis, and the buffer hypothesis. Essentially, the strain hypothesis focuses on the negative additive outcomes resulting from high work demands and low decision latitude (van der Doef & Maes, 1999). The buffer hypothesis, on the other hand, emphasizes the positive moderating effect of decision latitude in the relation between job demands and job strain, stipulating that control buffers the strain effects, even in situations of very high work demands. Regrettably, researchers have found only unclear results and insufficient support for the buffer hypothesis, so that several have questioned its value. Recently, there was support for the iso-strain hypothesis in the JDC model (Hellemans & Karnas, 1999), which spec-

ifies that low social support (or high social isolation) has a negative influence on job strain, regardless of the level of perceived decision latitude. The expanded version of the JDC model, which includes a social support dimension, is now referred to as the job demand-control-support model (JDCS model). Another extended form of the JDC model also recently developed is the job demand-resources model, which postulates that the individual's resources, such as usage of skills, learning opportunities, and social support from colleagues, plays a role in determining positive work outcome, such as task enjoyment and commitment toward the organization (Bakker, Van Veldhoven, & Xanthopoulou, 2010).

Psychological Outcomes of Job Strain

From a psychological perspective, Dunnagan, Peterson, and Haynes (2001, p. 1077) found that "anger, depression, work stress, and job satisfaction are highly related." In addition, evidence shows that high job strain (low control and high demands), as conceptualized in the JDC model, is related to "lower general psychological well-being, lower job satisfaction, more burnout, and more job-related psychological distress" (van der Doef & Maes, 1999, p. 107). For example, Mausner-Dorsch and Eaton (2000) found that the subscale of decision authority was most related to depression in the workplace, rather than the decision latitude dimension. Indeed, the prevalence of depression (depressive syndrome, dysphoria, and particularly major depressive episode) was highest under work conditions characterized by high psychological demands and low decision authority.

Risk and Protective Factors

Overall, the relationship between stress and strain seems to be influenced by several background variables, such as years of work experience, age, sex, and socioeconomic status. Various studies found no moderating effect between age and work stress (e.g., Halpin, Harris, & Halpin, 1985). However, Whitmer, Hurst, and Prins (2009) found that the hardiness or stress-hardy personality is negatively associated with work stress outcomes, and that its strength increases with age along with growing working experience. The concept of hardiness includes three personality traits: control (believing that controlling or influencing events is possible), commitment (capacity to be profoundly engaged in life activities), and challenge (perceiving change as an exciting opportunity to grow as an individual). Individuals with a stress-hardy personality are described as resilient and more capable at coping with stress in general (Kobasa, 1979). Concerning the impact of gender, De Bruin and Taylor (2006) examined the role of gender in Karasek's JDC model and found that the relationship between job control and work stress was stronger for men than for women. Socioeconomic status (SES) has also been shown to have a moderating effect on the stress-strain relationship. A study by Griffin, Fuhrer, Stansfeld, and Marmot (2002) indicated that "risks for depression and anxiety, such as low control at home and work, are not evenly distributed across different social positions" (p. 796). Moreover, low SES and poorer health are also associated with more dangerous and stressful work environments (Eshun & Kelley, 2009). Social inequalities thus have an impact on both population health and job stress (House, 2002).

In a workplace context characterized by constant change and increasing demands, identifying various individual characteristics – in particular personality dimensions – that serve as vulnerability or protective factors in response to work stress is of utmost importance. Furthermore, if job conditions are considered a proximal environment, relevant characteristics of a more distal environment, such as cultural values, might also have an impact on work stress and on the stress-strain relationship.

Work Stress and Personality

There is little, albeit growing, interest in the influence of personality on work stress, strain, and coping strategies (Connor-Smith & Flachsbart, 2007). Indeed, taking personality into account may help us to more accurately predict the best person-environment fit for particularly demanding work positions and to highlight the functional adaptive skills that need to be developed in a modern work context. For instance, Grant and Langan-Fox (2007) concluded from their study that "emotional stability, social confidence, and attention to detail are the key to survival in the high-pressure environment of today's organizations" (p. 31). In addition, Bowling and Eschleman (2010) found that employees who are low in conscientiousness or high in negative affectivity are more prone to have counterproductive work behaviors as a maladaptive coping strategy in response to work stress.

First, we review studies on specific personality traits, such as self-efficacy, locus of control, and sense of coherence. Further, we review studies using multidimensional models of personality, such as the Five Factor Model (Rossier, Meyer de Stadelhofen, & Berthoud, 2004).

Individuals with an internal locus of control tend to make internal attributions in order to explain the results of their actions (Rotter, 1975). These individuals are healthier and show higher levels of well-being in high-control and high-demand work situations, whereas those with an external locus of control in the same conditions experience more strain (Meier, Semmer, Elfering, & Jacobshagen, 2008).

Core self-evaluations, defined as a combination of self-esteem, self-efficacy, locus of control, and emotional stability traits, are considered "resilient" traits in the stress process (Bono & Judge, 2003; Judge, Locke, Durham, & Kluger, 1998). Typically, positive core self-evaluations are related to lower perceived stress, the belief that one can have control over stress, the use of more constructive cop-

ing strategies such as problem-focused coping and, finally, less negative outcomes such as low strain (Kammeyer-Mueller, Judge, & Scott, 2009).

Self-efficacy refers to individuals' beliefs about their ability to succeed on the tasks put to them (Bandura, 1977). Individuals who believe that they have the resources and capacity to cope with the demands they encounter may be said to have positive self-efficacy expectations (Hobfoll & Shirom, 2001). Schaubroeck, Jones, and Xie (2001) argue that only those with high self-efficacy "fit" into Karasek's (1979) demands-control model, while those lacking self-efficacy do not. For example, Schaubroeck and colleagues (2001) found that individuals with high self-efficacy who experience high control show more favorable health, whereas individuals with low self-efficacy who experience high control show a stronger association between high work demands and poor health.

Type A behavior patterns typically include positive facets, such as working longer hours and doing more overtime, as well as negative emotional responses such as anger and irritation (Lee, Ashford, & Jamieson, 1993). For example, Day and Jreige (2002) found that the irritability/impatience and the achievement-striving (AS) components of Type A behaviors influence the perception of stress, such that high irritability/impatience predicts more perceived stress, whereas high AS scores predict lower perceived stress. In addition, people who display Type A behavior and have high AS scores are more resilient in situations with low job control, while low AS scores in combination with low job control predict the highest stress level.

Moreover, in a qualitative study on intergenerational conflict among nurses, results indicated that hardiness (Whitmer et al., 2009), which consists of the three components commitment, control, and challenge, is a trait that develops with age and experience. Thus, hardiness is believed to moderate the response to stress by acting as a protective trait.

Similar to Type A behaviors and hardiness, a sense of coherence is seen as a personality style. According to Antonovsky (1987), sense of coherence is related to "adaptive functioning in stressful encounters" (p. 145). Three components underlie the concept of sense of coherence: comprehensibility, manageability, and meaningfulness of one's life. Flannery and Flannery (1990) found that a high sense of coherence was associated with less general life stress and less strain. Furthermore, hostility, emotional stability, optimism, and self-esteem have also been studied in relation to stress (for a review, see Semmer & Meier, 2009).

In 1989, Cohen and Edwards pointed out that results obtained from different studies on the trait-strain relationship are very controversial. In fact, many researchers had focused on the study of one specific trait at a time, all of which separately failed to paint a clear picture of the general role of personality in the stress-strain relationship. Moreover, consensus as to whether and to what extent specific personality traits have extra value above and beyond the five-factor model (FFM) has yet to be attained. For example, the idea that personality traits are shaped by the environment, as postulat-

ed by Rotter's (1954) social learning theory, or rather are biologically rooted is a controversial discussion addressed by Rossier, Dahourou, and McCrae (2005) in a crosscultural study. They found that the FFM factor structure is similar across culture, thereby supporting the FFM theory, which maintains that traits are biologically rooted. Their results also showed a similar two-factor structure across culture for the locus-of-control construct, suggesting that the latter is a biologically rooted trait despite its being defined as a trait shaped by the environment. To date, the most studied and robust findings on personality in relation to work stress and coping are based on the multidimensional and dynamic FFM of personality (Costa & McCrae, 1992). Dimensions of the FFM are neuroticism (N), conscientiousness (C), extraversion (E), openness (O), and agreeableness (A). Essentially, the N dimension reveals the strongest links and is also the most studied in the stress literature. Specifically, N is linked to more exposure to stress as well as to more physical and emotional reactivity toward stress (Connor-Smith & Flachsbart, 2007). This confirms that high-negative affectivity increases people's perception of job stressors as being worse, which in turn has a negative impact on well-being and health (Oliver et al., 2010). In addition, C is considered a protective factor given its consistently negative association with perceived work stress and its positive link with functional coping strategies (Massoudi, 2009). For example, Grant and Langan-Fox (2007) found among a sample of managers in Australia that N, E, and C represented the three main factors related to strain, where high N was associated with increased strain, and high E and C were associated with reduced strain. Among the few studies on personality and work stress, a small number relied on Karasek's JDC model of work stress. However, a growing number of studies that incorporate personal dispositions were conducted using the job demands-resources model. Evidence was found to support the intervening nature of personal dispositions with the JD-R model (Bakker et al., 2010). More research is needed to study the impact of personality, especially using more multidimensional models, in the stress-strain relationship.

Work Stress and Culture

Hofstede (1981, p. 24) defines culture as "the collective programming of the human mind that distinguishes the members of one human group from those of another. Culture in this sense is a system of collectively held values." Growing attention has been given to the study of culture in organizational psychology, particularly since Hofstede introduced the construct of individualism/collectivism in 1980. Individualists tend to see themselves as their "own person," and they value personal achievement and competition, while collectivists mostly consider themselves members of groups and value family and workgroup goals. According to Triandis (1995), individualists consider themselves independent of the groups to which they belong, and

they consider personal objectives more important than those of their ingroups. Behaviors are driven by their own attitudes rather than the group's normative behaviors. On the other hand, collectivists consider themselves interdependent on their ingroups and value the priorities of the group more highly than their own. A collectivist behaves in accordance with ingroup expectations. For example, the United States and Western Europe are considered individualistic cultures, whereas China, Korea, and Japan are considered collectivistic cultures. Hofstede (2001) defined five cultural dimensions: individualism/collectivism, masculinity/femininity, power distance, uncertainty avoidance, long-term/short-term orientation. Minkov (2007) subsequently developed two other dimensions named indulgence versus restraint and monumentalism versus self-effacement, which are included in Hofstede's 2008 value survey module (Hofstede, Hofstede, Minkov, & Vinken, 2008).

Of the five cultural dimensions introduced by Hofstede in 1980, individualism has drawn the most attention. Furthermore, Hofstede (1981) investigated cultural differences on a national level, based on a one-dimensional construct of individualism (with collectivism at the other end of the continuum). Although variability in cultural values was found among individuals from the same cultural background, Hofstede claimed that greater differences in cultural values can be observed among nations. Other authors have taken a different approach to studying culture differences, namely, by looking at interindividual variability. For example, Realo, Koido, Ceulemans, and Allik (2002) studied individual differences with respect to individualism-collectivism based on an orthogonal construct of the concept. For a historical review of the individualism-collectivism concept, see Realo and Allik's article (2009). Given that it can be conceptualized as a national general characteristic or as an individual difference in personality, culture can be analyzed on two levels: across nations or between individuals. We discuss both of these cultural constructs below.

Moorman and Blakely (1995) found that cultural differences can partially predict organizational citizenship behavior (OCB) in that individuals with collectivistic compared to individualistic values or norms tend to display more OCB behavior. Interindividual variations of individualism and collectivism levels are referred to as "idiocentric" and "allocentric" tendencies, respectively (Triandis et al., 1986), although idiocentric individuals may be found in collectivist cultures and allocentric individuals in individualistic cultures. For example, idiocentric persons in a collectivistic culture tend to break away from the culture, which they feel dominated by. Triandis and colleagues (1986) also found that a large proportion of individuals share a combination of both idiocentric and allocentric values. In addition, low socioeconomic status is consistently related to collectivistic values, regardless of the culture. In addition, Triandis (2001) provided an extended typology of the individualism/collectivism continuum by adding the horizontal and vertical dimensions. He suggested that individualism and collectivism can either be horizontal, characterized by a preference for equality, or vertical, characterized by a preference for hierarchy (Triandis, 2001).

Culture has been identified as having a moderating influence on work stress and strain. Nevertheless, Sawang, Oei, and Goh (2006) argued that country and cultural values cannot be used interchangeably. In their study, the culture paradigm was operationalized using the individualism and collectivism dimensions of culture, while the nation paradigm was based on the country per se. This said, various variables involved in the stress process (such as primary and secondary appraisal, coping styles, and work stress) were assessed and compared with both the cultural and national dimensions. For instance, from a "country" perspective, secondary appraisal was significantly higher for Australians and Sri Lankans than for Singaporeans. From a "cultural" perspective, no significant results were found in relation to secondary appraisal. Thus, these results indicate that the two paradigms (culture and nation) were significantly different, supporting the idea that the notion of values is important in defining culture, and that cultural and country-related values are "different and separate" (p. 216). In addition, national culture is not static, gradually changing over time. Thus, these authors advised that "the Individualism-Collectivism paradigm is not to be used as a continuum scale to differentiate one nation from another" (p. 215). For example, affirming that China is today a strictly collectivistic culture can be inaccurate, especially given the changes brought about by the considerable economic growth and intense industrialization of modern China.

In a study conducted in the United States and India, Lakshmi, Menon, and Spector (1999) found that perceptions of stress and coping strategies differ across the two countries. In the United States, work overload and lack of autonomy were the main sources of stress and supervisor support was the most important source of social support. In India, lack of clarity was the main source of stress, and family support was the most important source of social support. Their study also showed that Indians tend to have an external locus of control, while Americans tend to have a more internal locus of control. These authors argued that this difference may be due to the fact that externality in India is perceived as an acceptable form of resignation according to the laws of karma. On the other hand, in the United States externality is perceived as a sense of powerlessness and an undesirable form of lack of control. In another study, Lu, Kao, Cooper, and Spector (2000) compared the impact of stress on health among managers in Taiwan and the UK. Similar stress-strain relationships were found across the two countries. Yet these authors also found that in Taiwan managerial role (ensuring favorable work conditions) and recognition were the two main sources of stress, whereas in the UK the main sources of stress were relationships, organizational climate, and personal responsibility. According to Lu and colleagues, this may be due to fundamental value differences in the East and the West. For instance, Taiwanese embrace the Confucianism value of "righteousness," including aspiring for superiors' re-

spect and favoring personal relationships, while the Western values of "democracy" tend to focus on equity and personal rights. In addition, the results from this study indicated that the meaning of control at work is different across countries. Primary control (increasing one's well-being through direct control and action) is more common in the UK, while secondary control (increasing one's rewards by accommodating to and accepting the situation) is more common in Taiwan.

In a crosscultural study, an American sample and a matching sample of Hong Kong bank tellers were compared with respect to the JDC model (Schaubroeck, Lam, & Xie, 2000). The results indicated that job self-efficacy in the American and collective efficacy in the Hong Kong sample interacted with job control and job demands. Specifically, the impact of work demands was intensified by perceived control for American tellers with lower job self-efficacy. This relationship was identical for the Hong Kong sample, only that collective self-efficacy substituted individual self-efficacy in the interaction.

Overall, crosscultural results generally support the ideas that the study of stress-strain relationships are generalizable across cultures and seem to be appropriate with an *etic* (culturally universal) approach, while the sources of work stress and available resources differ across cultures and are most suitably studied in an *emic* (culture-specific) approach (Lu et al., 2000). Curiously, little research on culture and work stress has been done in the African context. We believe that investigating the JDC model in the African population is important to better understanding the cultural particularities and the extent to which the model can be generalized to different contexts. Some preliminary results suggest that the stress-strain relationship is similar in South Africa and Switzerland, with a few differences in the magnitude of effects (Massoudi, Györkös, Becker, Rossier, & De Bruin, 2010). However, further analyses need to be conducted on a larger sample.

In the end, it remains unclear whether other cultural differences might be more relevant than individualism-collectivism in explaining cultural differences in work stress. For example, the GLOBE project (Global Leadership and Organizational Behavior Effectiveness; House, Hanges, Javidan, Dorfman, & Gupta, 2004) investigated leadership among 62 nations with a 9-dimension construct of culture (uncertainty avoidance, power distance, societal collectivism, ingroup collectivism, gender egalitarianism, assertiveness, future orientation, performance orientation, and humane orientation), of which only three dimensions do not stem from Hofstede's original culture dimensions. Perhaps future work-stress research would benefit from exploring these nine dimensions in depth.

Conclusion

Although work stress has been studied considerably, studies investigating both individual and cultural factors that may be alleviating or contributing to work-related strains are still needed. As previously discussed, the job demands-control model is an important model of work stress, and examining the roles of personality and culture in this model may extend the model and thereby increase its strength substantially. By adding these two factors and examining their potentially moderating roles in the JDC model, we can cover individual, organizational, and cultural aspects, thus making the JDC model a more "rounded" and promising model for researchers to use.

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