

Alma Mater Studiorum – Università di Bologna

Dipartimento di Scienze dell'Educazione
Dottorato di Ricerca in Psicologia Sociale, dello Sviluppo e
delle Organizzazioni
XXIV Ciclo

**Work and Family: a complex interplay.
An Italian application of the DISC Model
on health care workers**



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Settore scientifico disciplinare: M-PSI/06
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To my family,
to my work,
to me.

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INTRODUCTION

INTRODUCTION

Research on the work–family interface has grown substantially over the past three decades. It is due to changes in family structure (e.g. number of dual-earner, single parent families, and ‘sandwiched-generation’ (Neal and Hammer, 2007) and in work structure as well (e.g. working women, dual earner or career couples (Barnett and Chen, 1997; Hammer, Allen and Grigsby, 1997)).

Given these changes more employees report difficulty juggling family and work responsibilities (Edwards and Rothbard, 2000; Geurts and Demerouti, 2003; Marks, 2006) with an impact on the workers (Cullen and Hammer, 2007; Rantanen, Kinnunen, Feldt, and Pulkkinen, 2008; Rupert, Stevanovic, and Hunley, 2009) and organizations as well (Wyatt, 2007). The necessity of giving consideration to work-family interface in organizational settings is recognized also by *The European Agency for Safety and Health at Work* that considers the lack of work-family balance as an emergent psychosocial risk factor in the 6% of workers of The European Union (2007).

The complexities of the field, the multiplicity of theoretical prospective and the amount of instruments developed to investigate it have generated variation in findings and obstacles in knowledge accumulation and policy development (Kossek and Lambert, 2005).

The present thesis provides empirical evidence to some of the important questions concerning work-family interface (i.e. relationship between emotional job characteristics, w-f interface and emotional exhaustion) by investigating the field with a stress prospective.

Work and family: a complex interplay

In the last thirty years there has been a large amount of research aimed at understanding the work-family links reviewing the idea that work and family are not separate spheres of life (Byron, 2005; Eby, Casper, Lockwood, Bordeaux, and Brinley, 2005) because in some respects they have permeable boundaries (Barnett, 1998) (cfr Fig.1). The work-family interface was defined as a link mechanism from work characteristics (or family's one) to family's (or work) outcomes (Voydanoff, 2002). In this process each aspect is influenced by the other in a negative or positive way (Guerts and Demerouti, 2003, Geurts, Kompier, Roxburgh, and Houtman, 2003). Trying to understand the causes and consequences of work-family interface, researchers proposed a variety of mechanisms that explained the nature of the relationship between work and family roles (Edwards and Rothbard, 2000) (e.g. *work-family accommodation*, Lambert, 1990; *work-family compensation*,

Zedeck, 1992; *work-family enrichment*, Greenhaus and Powell, 2006, etc.).

Even if many link mechanisms are conceptualized, in negative and positive dimensions, the major focus is still on the negative consequences of being involved in work and family domains (Caspar, Eby, Bordeaux, Lockwood, and Lambert, 2007). In fact only recently there has been an interest in positive links and its consequences (Matthews, Barnes-Farrell and Bulger 2010) although the process had been outlined a long time ago first by Sieber and then Marks.

Sieber (1974) argued that role accumulation is beneficial both for individuals and society, while Marks (1977) contended that human energy is not finite in nature but recreates itself within limits, thus giving the possibility to be involved in multiple roles.

More recently there has been an interest in the study of a much broader conceptualization of the work and family interface, particularly the study of work-family balance (Barnett, 1998; Frone, 2003). Frone (2003) suggests that there are two components to work-family balance: work-family conflict and work-family facilitation. In accordance with Frone the present work has taken into account the two specific mechanisms of the work-family field considered essential in the understanding of work-family balance.

The first one is *work-family conflict* defined as “a type of role conflict that arises when joint role pressures from work and family domains are experienced as incompatible in some respect, as a result of which participation in one role” (Greenhaus and Beutell, 1985, p. 77). More recently Greenhaus and Singh (2003) said that work-family conflict occurs when simultaneous pressures from work and family are incompatible in some respect, so that meeting the demands of one role makes it difficult to meet the demands of the other role.

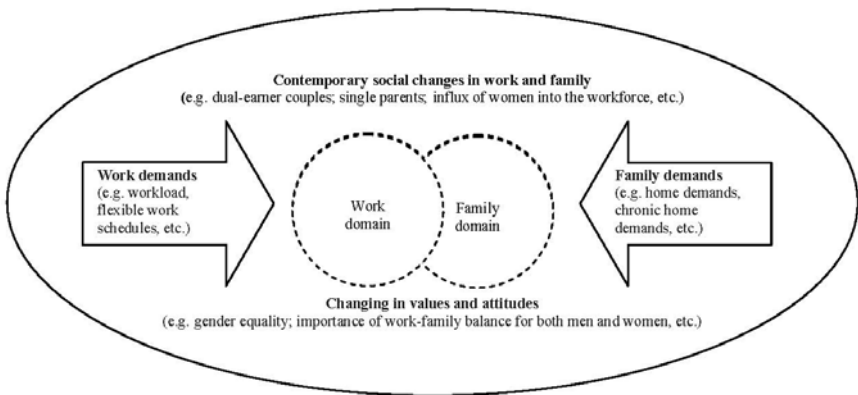


Fig 1. *Overlapping-spheres model* (adapted from Barnett, 1998).

In addition, scholars have also tried to identify directions and dimensions of the conflict. Directionality refers to the direction in which the conflict travels: *work-to-family conflict* refers to work-

related stressors and demands negatively affecting functioning in the family domain, whereas *family-to-work conflict* refers to family-related stressors and demands negatively affecting the work domain (Adams, King, and King, 1996; Frone, Russell, and Cooper 1997). Some evidence shows the relation between the two directions as positive and moderate (Frone, Russell, and Cooper 1992; Netemeyer, Boles and McMurrian, 1996).

Dimensionality of conflict refers to the nature of the source of the conflict that can be filed in both directions. The types of conflict have been defined as following. *Strain-based conflict* exists “when strain produced in one role makes it difficult to fulfill the requirements of another role” (Greenhaus and Beutell, 1985, p.76). While *Time-based conflict* occurs “when time devoted to one role makes it difficult to fulfill requirement in another role” (Greenhaus and Beutell,1985, p.76). *Behavioral conflict* emerges “when behaviour required in one role makes it difficult to fulfill the requirements of another role” (Greenhaus and Beutell,1985, p.76). *Psychological conflict* is defined as “the psychological preoccupation with one role, while performing another role that interferes with one’s ability to become engaged in that last role” (Carlson and Frone, 2003, p.518).

In a recent meta-analytic review, based on 1080 correlations from 178 samples, Michel, Kotrba, Mitchelson, Clark and Baltes (2011) found that work role stressors (job stressors, role conflict,

role ambiguity, role overload, time demands), work role involvement (job involvement, work interest/centrality), work social support (organizational support, supervisor support, coworker support), work characteristics (task variety, job autonomy, family friendly organization), and personality (internal locus of control, negative affect/neuroticism) are antecedents of work-to-family conflict (WFC); while family role stressors (family stressors, role conflict, role ambiguity, role overload, time demands, parental demands, number of children/dependents), family social support (family support, spousal support), family characteristics (family climate), and personality (internal locus of control, negative affect/neuroticism) are antecedents of family-to-work conflict (FWC). Following Geurts and Demerouti (2003) the consequences of conflict can be categorized as: *physical* (poor physical health, somatic or physical symptoms; headache, backache, upset stomach, fatigue dizziness and pain in chest or heart area; sleep deprivation), *psychological* (different aspect of stress, mental health, coping with difficulties in life, enjoyment of daily activities, depression, anger, irritation, and insomnia), *behavioural* (increased consumption of stimulants, heavy alcohol use, irregular physical exercise, medication use), *attitudinal* (different kinds of satisfaction, organizational commitment) or *organizational consequences* (turnover intentions, job performance and absenteeism).

Work-family facilitation is one of the positive links between work and family and refers to “the extent to which participation at work (or home) is made easier by virtue of the experiences, skills, and opportunities gained or developed at home (or work)” (Frone 2003, 145). This means that work and family can also be a source of strength to one another (Frone, 2003). For Grzywacz (2002), facilitation can function as a resource which enables individuals to function more effectively in both domains and enriches their lives.

Facilitation, as conflict, is conceptualized as bidirectional: work can facilitate family life, in this case it is called *work-family facilitation*, and family can facilitate work life, in this case it is called *family-work facilitation* (Frone, 2003; Grzywacz and Marks, 2000). The distinctions between the two directions are empirically based (Grzywacz and Marks, 2000).

In addition, the two directions of facilitation have, as conflict as well, different dimensions, defined as follows (van Steenbergen, Ellemers and Mooijaart, 2007):

- *Energy-based facilitation*: emerges when energy obtained in one role makes it easier to fulfill the requirements of another role.
- *Time-based facilitation*: occurs when the time devoted to one role stimulates or makes it easier to effectively manage and use the time in another role.

- *Behavioral facilitation*: exists when behavior required or learned in one role makes it easier to fulfill the requirements of another role.
- *Psychological facilitation*: occurs when an individual is able to put matters associated with one role into perspective by virtue of another role, which makes it easier to fulfill the requirements of the first role.

As noted by Frone (2003) and Grzywacz (2002) there has been very little research on the second component of work-family balance, as such, little is known about predictors, and outcomes of work-family facilitation. Ours last computerized search (February, 2012), conducted using PsychInfo databases with “work–family facilitation” term, identified 35 articles on peer-reviewed journals.

Many of these studies were aimed by the interest on identifying individual, work and family factors that may have an effect on the level of facilitation between work and family.

As *individual dispositional characteristics* were recognized innovativeness, openness, and conscientiousness (Grzywacz, 2002) or conscientiousness and agreeableness (Wayne, Musicca and Fleeson, 2004). As *family and work-related resources* in determining facilitation were fund materials, assets, or commodities offered by interpersonal activities (Clark , 2000), *work support* (Sanz-Vergel, Demerouti, Moreno-Jiménez, Mayo,

2010; Voydanoff, 2005), *family support* (Aryee Srinivas, and Tan, 2005; Demerouti, Bakker e Bulters, 2004; Voydanoff, 2005) and *work culture in favors of work-family balance* (Clark, 2000; Wayne, Grzywacz, Carlson, and Kacmar, 2007). In work-family field resources are considered the main antecedent of facilitation as are capable of generating the process of enhancement or simplification of the performance in a second domain (Grzywacz and Butler, 2005; Voydanoff, 2004; Wayne et al., 2007).

Influenced by the theoretical works of Sieber (1974) and Marks (1977), researchers have also begun to explore the benefits associated with performing multiple roles and the effect of work-family facilitation on work and family outcomes. In regard it seems that the positive process of the work-family interface has an impact on different aspects of satisfaction as *work satisfaction* (Hill, 2005; Kirchmeyer, 1992; Wayne et al., 2004), *career satisfaction* (Lu, Siu, Spector, and Shi, 2009), *family satisfaction* (Grzywacz, 2002; Kirchmeyer, 1992; Wayne et al., 2004), and *life satisfaction* (Hill; 2005). Indicators of work–family facilitation have also been correlated with enhanced *mental and physical well-being* (Frone, 2003; Grzywacz, 2000; Grzywacz and Bass, 2003), as well as greater *family and organizational effort* (Kirchmeyer, 1992; Wayne, et al., 2004), greater *occupational commitment*, and *productivity* (Grzywacz, 2002) and better *marriages and parent-child interactions* (Grzywacz, 2000).

In accordance with Grzywacz (2002) and Frone (2003), we could conclude that research on work-family balance needs to be expanded to include both positive (facilitation) and negative (conflict) links, as well as examining effects in both directions (work-to-family and family-to-work). In addition, it is evident that even facilitation is under investigated that is an important mechanism in understanding work-family balance (es.: Barnett, 1998; Voydanoff, 2002; Frone, 2003) as it is recognized as a key concept in job stress prevention and in well being promotion (Grzywacz and Bass, 2003; Major, Klein, and Ehrhart, 2002).

The stress perspective on work-family research

Theory and empirical evidence suggests that work-family conflict plays a negative role on physical, psychological, behavioral, attitudinal individual outcomes (Geurts and Demerouti, 2003) while facilitation plays an enhanced role on mental and physical well-being (Frone, 2003; Grzywacz, 2000; Grzywacz and Bass, 2003). Based on these considerations we decided to capture the complete work-family experience, on health care workers, examining dimensions of both conflict and facilitation with a stress prospective.

“The growing body of empirical work-family research has generated the need to develop theories to organize existing evidence and to guide further inquiry. Several investigators have brought theoretical rigor to work-family research by drawing from theories in other areas, such as stress research (Frone, Russell, and Cooper, 1992; Grandey and Cropanzano, 1999; Greenhaus and Parasuraman, 1986; Higgins, Duxbury, and Irving, 1992; Kopelman, Greenhaus, and Connolly, 1983)” (Edwards and Rothbard, 2005 pp.211-212). The benefit of using stress models in work-family understanding, is recognized far-back (Greenhaus, 1989) and generally widespread (e.g. Butler, Grzywacz, and Bass, 2005; Frone, Russel, and Cooper, 1997; Wayne, et al., 2007) as the two fields have over lapped in some constructs.

Among the stress models used as frameworks of work-family research we remember:

1. *Role stress theory* based on the assumption that having to cover multiple roles leads to personal interrole conflict due to conflicting demands on time, lack of energy, or incompatible behavior among roles, it becomes more difficult to perform each role successfully (Greenhaus and Beutell, 1986).
2. *Conservation of Resources (COR) theory* (Hobfoll, 1989, 2001) is based on two important principles:
 - a. “resource loss is disproportionately more salient than resource gain” (Hobfoll, 2001, p. 343);
 - b. “people must invest resources in order to protect against resource loss, recover from losses, and gain resources” (Hobfoll, 2001, p. 349).

Furthermore, people with greater resources are more capable of resource gain and people with limited or fewer resources are more susceptible to resource loss (Hobfoll, 2001; Hobfoll and Lilly, 1993). Grandey and Cropanzano (1999), who were the first researchers to use COR theory to investigate work-family conflict (WFC), proposed that this approach was more exhausting than role theory as it proposes that “interrole conflict leads to stress because resources are lost in the process of juggling both work and

family roles” (p. 352) and as specifies moderating variables (e.g., self-esteem, positive affectivity, internal locus of control) that might affect the relationship between work-family stressors and stress outcomes.

3. *Effort-Recovery (E-R) Model* (Meijman and Mulder, 1998) assumes that job and family demands are not necessarily negative for individuals if they have the opportunity to recover from the effort expended to meet those demands. Studies on this topic have demonstrated that specific recovery experiences affect health and well-being. Recently the model has been applied in work-family studies, showing that the conflict between work and family domains reduces the opportunities to recover (Taris, Beckers, Verhoeven, Geurts, Kompier, and van der Linden, 2006), and increases the need for recovery (Demerouti, Taris, and Bakker, 2007);
4. *Job Demands-Resources (JD-R) Model* (Demerouti, Bakker, Nachreiner, and Schaufeli, 2001) assumed that any kind of job is composed by job demands and job resources. The presence of specific demands (e.g. work overload) and the absence of specific resources (e.g. social support) predicts negative individual outcomes. The same process occurs in work-family link: when job demands require too much effort and time and job resources are insufficient to

fulfil the job requirements, energy and time resources are depleted. As a consequence, negative load effects builds up and hampers ones functioning in the non work domain (e.g. work-family conflict). On the other hand, when job resources are sufficient to deal with high job demands, individuals may be stimulated to learn from and “grow” in their job and energy will be mobilized rather than depleted. This will facilitate one’s functioning in the non work domain (e.g. work-family facilitation) As remembered by Geurts and Demerouti (2003) both processes might also initiate from the non work domain.

Recognized the benefit of using stress models in work-family understanding, the present dissertation investigate the issue using for the first time (in work-family field) the Demand-Induced Strain Compensation (DISC) Model (De Jonge and Dormann, 2003, 2006).

The Demand-Induced Strain Compensation Model

The basic aim of the Demand-Induced Strain Compensation (DISC) Model (De Jonge and Dormann, 2003; 2006), was to unify the principles of some traditional stress models as Demands-Control-Support Model (Karasek, 1979) and Effort-Reward-Imbalance (Siegrist, 1996).

The model, applicable particularly to human service jobs (De Jonge and Dormann, 2003), attributes individual employee's outcomes to two key job characteristics: job demands and job resources. Job demands are work tasks that place short-lasting or persistent requirements upon workers, and that require physical or psychological efforts (Jones and Fletcher, 1996). Examples of job demands are time pressure, dealing with aggressive clients, or lifting heavy objects. Job resources, on the other hand, are instrumental or psychological means at work that can be employed to deal with job demands. Examples of job resources are job autonomy, emotional support from colleagues, or technical equipment (van den Tooren, et al., 2011).

The first innovations introduced by the model is the *multi-dimensionality of constructs* involved in the stress process (De Jonge and Dormann, 2003): job demands, job resources and job-related outcomes are considered in cognitive ('head'), emotional ('heart') and/or physical ('hands') components (Hockey, 2000; De Jonge and Dormann, 2003).

As observed by Van de Ven (2011) the distinction between cognitive, emotional and physical job demands was taken into consideration also in the most recent European Working Conditions Survey (EWCS), carried out in 2010 (Eurofound, 2011). In addition, cognitive, emotional and/or physical job-related outcomes are considered positive (e.g., active learning,

employee learning, employee creative behaviour, emotional stability, and physical strength) and negative (concentration problems, emotional exhaustion, and physical complaints) ways (cf. Van den Tooren, et al., 2011).

The second innovation concerns the *Triple Matching Principle (TMP)* (De Jonge and Dormann, 2003; De Jonge, et al., 2008). Like previous models, the DISC can be considered an “interactive effect model” as it proposes job resources to moderate the relation between job demands and job-related strain (De Jonge and Dormann, 2006), but, innovatively, proposes that stress-buffering effects of job resources occur more often if job demands, job resources and outcomes are based on the same domain (*triple match*) (i.e. cognitive, emotional, or physical) (e.g. workers with high physical job demands are least likely to experience back pain if they have sufficient physical job resources). The stress-buffering effects of job resources occur less often when two out of three job stress constructs belong to the same domain (*double match*), less and less often when demands, resources, and strain all belong to a different domain (*non-match*).

In some respect, the TMP is similar to the matching hypothesis proposed by Cohen and McKay (1984) but in addition, the matching principle, emphasizes the importance of a match between job demands and job strain and between job resources and job strain (Frese, 1999; De Jonge and Dormann, 2003).

Finally the DISC proposes two other principles (De Jonge and Dormann, 2003; 2006):

- The *compensation principle*, accordingly the negative effects of job demands can be best compensated by matching job resources. This principle describes the self-regulating process (e.g. Vancouver, 2000) through which an employee can use job resources to prevent or diminish the possible negative effects of job demands. For instance, employees who are confronted with high emotional job demands (e.g. anger control) are least likely to experience emotional job strain (e.g. emotional exhaustion) if sufficient emotional job resources (e.g. a listening ear from colleagues or supervisors) are available to deal with their emotionally demanding job. If insufficient emotional job resources are available, emotional job strain is more likely to occur (De Jonge and Dormann, 2003).

- The *balance principle*, assumed a balanced mixture of job demands and matching job resources is associated with employee well-being outcomes. For instance, employees who are confronted with high emotional job demands (e.g. anger control) are most likely to experience emotive well-being (e.g. emotional stability) if sufficient emotional job resources (e.g. a listening ear from colleagues or supervisors) are available to deal with their emotionally demanding job. If workers have insufficient

emotional job resources at their disposal, emotive well-being is less likely to occur (De Jonge and Dormann, 2003).

In a recent work van den Tooren and colleagues (2011) offer an overview based on 29 empirical studies of different nature (e.g. publisher papers and paper in press, theses, conference contributions, etc.) regarding matching, compensation and balance principles of the DISC Model.

The testing of the *Matching Principle* showed supportive results in:

- 29.6% of Triple Matches (TM) tested. In these cases the interaction term between similar job demands and resources (e.g. emotional demands x emotional resources) in the prediction of an identical outcome, were significant (Daniels and De Jonge, 2010);
- 22,3% of Double Matches (DM) tested. In these cases the interaction term between similar job demands and resources (e.g. emotional demands x emotional resources) in the prediction of a different outcome, or the direct path of demands (or resources) in prediction of an identical outcome were significant (Daniels and De Jonge, 2010);
- 7,9% (NM) of Non Matched tested. In these cases demands, resources and outcome, are supposed to be qualitatively different (Daniels and De Jonge, 2010).

The results of testing *Compensation Principle* (i.e. job resources buffer the relation between job demands and job strain) were valid in 34.3% on 73 tests of moderating effect of job resources in triple match hypothesis. Finally testing of the *Balance Principle* (i.e. job resources strengthen the relation between job demands and employee well-being) resulted valid in 20.0% on 35 tests of moderating effect of job resources in triple match hypothesis.

The authors of the overview concluded that the matching hypothesis and the triple-match principle were partly supported with respect to the stress-buffering effect of matching job resources (i.e. compensation principle), whereas no support was found for the activation-enhancing effect of matching job resources (i.e. balance principle). However they underline that the results could be biased by the different kinds of studies considered. To plug the gap Van de Ven offers in his PhD dissertation (2011) a brief and chronological overview of 9 studies already published or in press in peer reviewed journals. Furthermore he considered only cross-sectional and longitudinal studies investigating the hypothesized interaction effects in the DISC Model. As shown in Table 1 although most DISC studies show that particular combinations of specific job demands and matching job resources are more likely to be related to cognitive,

emotional, and physical outcomes, the Ven de Ven's overview, revealed mixed results with regard to the core DISC principles.

Table 1. Chronological overview of DISC studies published in peer reviewed journals.

Study	Sample (country)	Design	Demands	Resources	Outcomes	TM	DMc	DMe	NM
De Jonge et al. (2004)	471 and 405 nursing home workers (NED)	Cross-sectional (two studies)	CD ED PD	CR ER PR	CO + EO - PO -	4/6 (67%)	2/12 (17%)	n.a.	n.a.
De Jonge and Dormann (2006)	280 and 267 nursing home workers (NED)	Longitudinal (two-wave; two studies)	CD ED PD	CR ER PR	CO + EO - PO -	2/6 (33%)	2/12 (17%)	4/24 (17%)	0/12 (%)
De Jonge et al. (2006)	826 health care workers (NED)	Cross-sectional	ED (3x)	CR ER	CO +	n.a.	1/6 (17%)	0/6 (0%)	n.a.
De Bruin et al. (2007)	390 workers (NED)	Cross-sectional	CD ED PD	CR ER PR	CO - EO - PO -	0/3 (0%)	0/6 (0%)	n.a.	n.a.
De Jonge et al. (2008)	826 health care workers (NED)	Cross-sectional	ED (3x)	CR ER	CO + (2x) EO -	1/3 (33%)	2/6 (33%)	1/9 (11%)	n.a.
Van den Tooren and De Jonge (2008)	69 nursing home workers (NED)	Cross-sectional	CD ED PD	CR ER PR	CO + EO - PO -	1/3 (33%)	1/6 (17%)	1/12 (8%)	0/6 (0%)
De Jonge and Peeters (2009)	54 health care workers and co-workers (matched) NED	Cross-sectional	CD ED PD	CR ER PR	CO - (2x)	0/2 (0%)	2/4 (50%)	0/8 (0%)	2/4 (50%)
Chrisopoulos et al. (2010)	179 police officers (AUS)	Longitudinal (two-wave)	CD ED PD	CR ER PR	CO - EO - PO -	1/3 (33%)	1/6 (17%)	3/12 (25%)	0/6 (0%)
Van den Tooren et al. (in press)	317 teachers (BEL)	Longitudinal (two-wave)	CD ED PD	CR ER PR	CO - EO - PO -	0/3 (0%)	1/6 (17%)	1/12 (8%)	0/6 (0%)

Note. Table based on Van den Ven (2011); AUS = Australia; BEL = Belgium; NED = Netherlands; CD, ED, and PD = cognitive, emotional, and physical job demands; CR, ER, and PR = cognitive, emotional, and physical job resources; CO, EO, and PO (- or +) = (negative or positive) cognitive, emotive, and physical outcome; TM = triple-matches; DMc, DMe = double-matches of common kind, extended kind; n.a. = not applicable (match was not tested); 1/3 = one out of 3 tested matches was valid.

Contents of the present dissertation

In line with previous considerations and with the aim of improving knowledge in stress and work-family fields the present dissertation investigates the issue of work-family conflict and facilitation in a sanitarian contest, using an innovative stress model (DISC Model (De Jonge and Dormann, 2003, 2006)). In fact, despite its value, and progressive position in stress research, the model has not yet been applied in work-family research.

The general aim has been declined in two empirical studies reported in this dissertation chapters.

Chapter 1 reporting the psychometric properties of the Demand-Induced Strain Compensation Questionnaire.

Although the empirical evidence on the DISC Model has received a fair amount of attention in literature both for the theoretical principles and for the instrument developed to display them (DISQ; De Jonge, Dormann, Van Vegchel, Von Nordheim, Dollard, Cotton and Van den Tooren, 2007) there are no studies based solely on psychometric investigation of the instrument. In addition, no previous studies have ever used the DISC as a model or measurement instrument in an Italian context. Thus the first chapter of the present dissertation was based on psychometric investigation of the DISQ. First of all we investigated the factorial validity of the DISQ by adopting a multiple-group (Italian and Dutch) confirmatory factor analysis approach. Second we checked internal consistencies of the supposed six dimensions. Finally we assessed the validity of the DISQ by studying its correlations with the employee outcomes traditionally used in the model (i. e. active learning, emotional exhaustion and physical health).

Chapter 2 reporting a longitudinal study contribution.

The purpose of the longitudinal study was to examine, using the DISC model, the relationship between emotional job

characteristics, work-family interface and emotional exhaustion among a health care population.

We started testing the the Triple Match Principle of the DISC Model using solely the emotional dimension of the strain-stress process (i.e. emotional demands, emotional resources and emotional exhaustion). Then we investigated the mediator role played by w-f conflict and w-f facilitation in relation to emotional job characteristics and emotional exhaustion. Finally we compared the mediator model across workers involved in chronic illness home demands and workers who are not involved.

Finally, a general conclusion, integrated and discussed the main findings of the studies reported in this dissertation.

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CHAPTER 1

The Demand-Induced Strain Compensation Questionnaire: A Cross-National Study

The Demand-Induced Strain Compensation Questionnaire (DISQ): A Cross-National Study

Abstract

The Demand-Induced Strain Compensation (DISC) Model is a theoretical framework which tries to unify principles that are common to existing job stress models, and thus tries to create a more cohesive theoretical model of job stress. To measure its key concepts (i.e. job demands and job resources), the Demand-Induced Strain Compensation Questionnaire (DISQ), was developed and used in many DISC studies. Despite these numerous studies about the model and its instrument, no studies had focused solely on the psychometric properties of the DISQ. In the present study, we examined the psychometric properties of the Italian and Dutch versions of the DISQ tested on Italian (n = 429) and Dutch (n = 1,637) employees. Results indicated that the six-factor model, consisting of cognitive, emotional and physical demands as well as cognitive, emotional and physical resources, provided a better fit to the data than alternative two-factor models (i.e. demands and resources only). Results were invariant across the Italian and Dutch samples. Internal consistencies of the six dimensions were satisfactory. Additionally, the six dimensions of DISQ were found

to be meaningfully related to employee outcome measures of active learning, emotional exhaustion and physical health. These findings suggest that the DISQ is a valid and reliable instrument to measure the proposed dimensions of job demands and job resources in Italian and Dutch work contexts.

Keywords: Demand-Induced Strain Compensation Model, DISQ, job stress measurement, cross-cultural validation, occupational health.

Introduction

In the last decades the attention for psychosocial risk factors has become increasingly important because of their impact on health and well-being through the phenomenon of work related stress (McDaid, 2008). Psychosocial risk factors refer to psychological, social and even physical damage of a worker due to the organization and management of work or to job characteristics (Cox, Griffiths and Riál-Gonzales, 2000). In line with dominant job stress models, such as the Demand-Control (DC) Model (Karasek, 1979), the Job Demands-Resources (JD-R) Model (Demerouti, Bakker, Nachreiner, and Schaufeli, 2001) and the Effort-Reward Imbalance (ERI) Model (Siegrist, 1996) the Demand-Induced Strain Compensation (DISC) Model (De Jonge and Dormann, 2003; 2006) tries to unify their principles, and thus creates a more cohesive theoretical model of job stress. Consequently, the DISC Model attributes employee learning and stress-reactions or strain to two key job characteristics: job demands and job resources. Job demands are work tasks that place short-lasting or persistent requirements upon workers, and that require physical or psychological efforts (Jones and Fletcher, 1996). Examples of job demands are time pressure, dealing with aggressive clients, or lifting heavy objects. Job resources, on the other hand, are instrumental or psychological means at work that can be employed to deal with job demands. Examples of job

resources are job autonomy (i.e. the opportunity to determine the order and method of one's work activities), emotional support from colleagues, or technical equipment (Van den Tooren, De Jonge, and Dormann, 2011).

Like previous models, the DISC Model can be considered an “interactive effect model” as it proposes job resources to moderate the relation between job demands and job-related strain (De Jonge and Dormann, 2006). Whereas there is little debate on direct effects of job demands and job resources on employee health, evidence for such a moderating role of job resources is mixed (cf. Van der Doef and Maes, 1999; Viswesvaran, Sanchez, and Fisher, 1999; Van Vegchel, De Jonge, Bosma, and Schaufeli, 2005; Van den Tooren, et al. 2011). As recently suggested by Van den Tooren and colleagues (2011), a reason why many studies failed to find moderating effects is due to conceptual and measurement reasons. In fact, researchers usually tend to treat job demands and job resources as global, uni-dimensional constructs, obscuring the differential impact of specific components (Viswesvaran et al., 1999). Treating job demands and job resources as multi-dimensional constructs is important because it gives the opportunity to test the interactive role of different types of job resources related to different types of job demands (Cohen and Wills, 1985; Cutrona and Russel, 1990; Frese, 1999).

The DISC Model elaborates on other job stress models by introducing two innovative principles, namely *multi-dimensionality of constructs* and the *matching principle* (De Jonge and Dormann, 2003; De Jonge, Dormann, and Van den Tooren, 2008). As regards the first principle, multi-dimensionality of constructs, the DISC Model distinguishes three specific types of job demands, job resources, and job strain. Specifically, the model proposes that demands, resources, and strain are either cognitive ('head'), emotional ('heart'), or physical ('hands') in nature (Hockey, 2000; De Jonge and Dormann, 2003). As far as the matching principle is concerned, the DISC Model proposes that stress-buffering effects of job resources occur more often if specific types of resources are matched to specific types of job demands. There exists an optimal complementary fit between specific types of job demands and job resources if the type of job resources belongs to the same domain as the type of job demands workers need to deal with. For instance, it is proposed that workers who are faced with high physical job demands (e.g. moving heavy objects) are least likely to experience back pain if they have sufficient physical job resources (e.g. a trolley) to deal with their physically demanding job. Similarly, it is proposed that cognitive job resources (e.g. information from handbooks) are most likely to mitigate the effect of high cognitive job demands (e.g. solving complex problems) on mental fatigue, whereas

emotional job resources (e.g. a listening ear from colleagues) are most likely to mitigate the effect of high emotional job demands (e.g. being angry with a rude customer) on emotional exhaustion. To a certain extent, the matching principle is similar to the earlier matching hypothesis as proposed by Cohen and McKay (1984). However, contrary to the 1984 matching hypothesis, the matching principle also emphasizes the importance of a match between job demands and job strain and between job resources and job strain (Frese, 1999; De Jonge and Dormann, 2003). The core proposition of the matching principle is that the likelihood of finding stress-buffering effects of job resources increases as the level of match between demands, resources, and strain increases. In other words, stress-buffering effects of job resources are most likely to occur when all job stress constructs (i.e. job demands, job resources, and job strain) belong to the same domain (triple match), less likely to occur when two out of three job stress constructs belong to the same domain (double match), and least likely to occur when demands, resources, and strain all belong to a different domain (non-match).

To measure the different dimensions of job demands and job resources, De Jonge and colleagues (2004) developed the *Demand-Induced Strain Compensation Questionnaire* (DISQ). The DISQ instrument consists of 31 items reflecting six dimensions: (a) cognitive, emotional, and physical job demands,

and (b) cognitive, emotional, and physical job resources. Empirical studies showed psychometrically sound versions of the DISQ in different languages (i.e. Van de Ven, Vlerick, and De Jonge, 2008; De Jonge, Spoor, Sonnentag, Dormann, and Van den Tooren, 2012).

Since different types of job demands and job resources could be detected as crucial determinants of job-related outcomes, the DISQ instrument has always been used in relation to cognitive, emotional and/or physical job-related outcomes which can be either positive (e.g., active learning, employee creative behavior, emotional stability, and physical strength) or negative (concentration problems, emotional exhaustion, and physical complaints) (cf. Van den Tooren, De Jonge and Dormann, 2011). For instance, longitudinal studies of Chrisopoulos, Dollard, Winefiel and Dormann (2010) and De Jonge and Dormann (2006) investigated the issue of match between job stressors and job resources in the prediction of job-related strain.

The present study

The main purpose of the present study is to assess the validity and reliability of the Italian and Dutch versions of the DISQ instrument. In line with the DISC Model and its key assumptions, we conducted the following four steps:

First, we investigated the factorial validity of both Italian and Dutch versions of the DISQ instrument using a multiple group (Italian and Dutch) confirmatory factor analytical approach. In particular, we expected that a six-factor solution model that take into account the quality (job demands and job resources) as well as the dimensions (cognitive, emotional and physical) of these job characteristics would better fit the data, rather than a two-factor solution model (job demands and job resources only) (Hypothesis 1).

Second, we examined the measurement equivalence supposing that the factor structure of the DISQ would be invariant across the Italian and Dutch samples (Hypothesis 2).

Third, we examined the internal consistency of the proposed six dimensions of DISQ using Cronbach's alpha in both samples.

Finally, we tested convergent validity by examining specific patterns of associations between job characteristics measured with the DISQ and three job-related outcomes (i.e., active learning behaviour, emotional exhaustion, and physical health problems). Specifically, we expected significant associations between

different types of job demands and job resources, and job-related outcomes in such a way that:

- active learning behaviour would converge in terms of a positive relation with both cognitive demands and cognitive resources (Hypothesis 3a);
- emotional exhaustion would converge in terms of a positive relation with emotional demands and in terms of negative relation with emotional resources (Hypothesis 3b);
- physical health problems would converge in terms of a positive relation with physical demands and in terms of negative relation with physical resources (Hypothesis 3c).

Methodology

Participants

This paper is based on two databases consisting of employees working in different organizations in Italy and the Netherlands, respectively.

The *Italian* data were collected in the context of training about job stress and psychosocial risk conducted in Local Health Care Service of a region of North Italy. As part of the training, healthcare workers were requested to fill in a structured, anonymous questionnaire investigating a number of psychosocial aspects of work. Originally, the sample was composed of 436

participants, but 7 of them did not fully complete the questionnaire, so we excluded them from further data analyses. Deletion of cases focusing on the DISQ instrument made data available on 429 healthcare workers. Of these people, 88.7% were females and 11.3% were males. Their mean age was 46.97 years ($SD = 8.23$).

The *Dutch* data were collected in six different studies with all kinds of workers, predominantly healthcare workers, teaching staff, teaching-supportive staff, and retail trade workers. The original sample was comprised of 1,672 participants. Thirty-five of them did not fully complete the questionnaire, so the final sample is composed by 1,637 workers. Half of them were females (50.5%), and 49.5% were males. Their mean age was 40.96 years ($SD = 11.10$).

Instruments

Job characteristics were measured by the DISQ instrument, version 2.0 (De Jonge, Dormann, Van Vegchel, Von Nordheim, Dollard, Cotton and Van den Tooren, 2007), which consists of 31 items reflecting both job demands and job resources of successively cognitive, emotional, and physical kind. The cognitive, emotional, and physical demands scales were measured with five, six, and five items, respectively (e.g. “employee X will have to make complex decisions at work”; “employee X will have

to deal with people who have unrealistic expectations”; “employee X will have to perform a lot of physically strenuous tasks to carry out his/her job”). The cognitive, emotional, and physical resources scales were measured with five items, each (e.g. “employee X will have the opportunity to take a mental break when tasks require a lot of concentration”; “employee X will be able to stop emotionally-laden interactions with others for a while whenever he/she wants to”; “employee X will be able to plan his/her work so that physical tasks require no more physical exertion than he/she can manage”). All sub-scales were scored on a 5-point frequency scale, ranging from 1 (never or very rarely) to 5 (very often or always). Higher scores indicate higher levels of the investigated dimensions. It is important to note that the DISQ is formed to measure objective job characteristics as reflect a so called *focusing institution* prospective (Frese and Zap, 1988). For both the Italian and the Dutch version, a translation/back-translation procedure out of English was used as recommended by Brislin, Lonner, and Thorndike (1973).

Active learning behaviour refers to the degree to which employees indicate that their job motivates them to learn new behaviour patterns and skills, or that they are keen to solve problems at their job (Karasek, 1998; Taris and Kompier, 2005). This scale consists of four items (e.g. “At work, I view problems

as puzzles that can be solved.”) scored on a 4-point frequency scale ranging from 1 ((almost) never) to 4 ((nearly) always).

Emotional exhaustion. The burnout component ‘emotional exhaustion’ was assessed with five items with the Italian (Borgogni, Galati, Petitta, and Centro Formazione Schweitzer, 2005) and Dutch version (Schaufeli and Van Dierendonck, 2000) of the Maslach Burnout Inventory (Maslach and Jackson, 1986). An example item is “I feel emotionally drained from my work”. All items were scored on a 7-point frequency scale, ranging from 0 (never) to 6 (always).

Physical health problems. Three items were used to assess physical health problems, for instance “During the past six months, did you have trouble with your low back?”. The items were derived from a well-validated questionnaire developed by Hildebrandt and Douwes (1991). All items were scored on a 3-point scale ranging from 1 (no) to 3 (yes).

Strategy of analysis

Descriptive analyses, internal consistency and convergent validity of the scales were calculated using different statistical tools available in SPSS 17.0. For instance, we calculated Cronbach’s alphas for internal consistency and Pearson correlations for convergent validity. To test the factorial structure of DISQ 2.0, a Multiple Group Confirmatory Factor Analysis (MGCFA) was conducted, using maximum likelihood estimation

as implemented in AMOS 5.0 (Arbuckle and Wothke, 1999). Specifically, two nested models were compared in both Italian and Dutch databases: (1) a two-factor solution model (Model 1 and Model 3), which considers job demands and job resources as two latent and correlated factors; and (2) a six-factor solution (Model 2 and Model 4) which consider six latent and correlated factors because job demands and job resources could each be characterized as cognitive, emotional and physical. The partial disaggregation method was used in order to reduce the number of parameters to be estimated with respect to sample size and to decrease the level of random error (Bagozzi and Heatherton, 1994). In fact, as reported by Dabholkar, Thorpe, and Rentz (1996), even if the traditional structural equations approach provides the most detailed level of analysis for construct testing, "...in practice it can be unwieldy because of likely high levels of random error in typical items and many parameters that must to be estimated." (Bagozzi and Heatherton, 1994, pp. 42-43). Operationally, partial disaggregation was accomplished by randomly aggregating items related to a given construct; particularly two parcels for each latent variable were used. Random combination is based on the assumption that any combination of a construct's variable indicators should yield the same model fit (Dabholkar et al., 1996).

Further, to test measurement invariance, we conducted several MGCFAs using four steps and comparing four nested models (Byrne, 2001; Vandenberg and Lance, 2000):

1. to test configural invariance that would imply that the same set of items would be associated with the same construct (Cheung and Rensvold, 2002), we ran a multi-group analysis with free parameters (Model 5);

2. to test metric invariance which ensures that the construct would be manifested in the same way across samples, we ran a multi-group analysis with fixed factor loadings (Model 6);

3. to test the structural invariance, we ran a multi-group analysis with fixed factor loadings and covariances (Model 7);

4. finally, to ensure that latent variables are reliable across the two countries, we tested the invariance of errors' variances by means of fixing invariance of factor loadings, covariance, and error measurement (Model 8).

In order to value the fit of the factor models to the data and to compare different models, we used the traditional χ^2 fit measure. Because χ^2 is quite sensitive to sample size, the additional use of relative goodness-of-fit measures is strongly recommended (Bentler, 1990). For that very reason, we calculated the Goodness-of-Fit Index (GFI, Jöreskog and Sörbom, 1988), the Comparative

Fit Index (CFI, Bentler, 1990), the Tucker-Lewis Index (TLI, Tucker and Lewis, 1973) and the Root-Mean-Squared-Error-of-Approximation (RMSEA, Steiger, 1990). As a general rule of thumb, model fit can be considered acceptable (with number of observations superior to 250 and number of observed variables included between 12 and 30) when CFI, and TLI are all above .92 (Anderson, Hair, Black, and Babin, 2010) and the RMSEA is equal to or less than .08 (Bentler, 1992; Jöreskog and Sörbom, 1993).

Since the models estimated are nested, we tested significant differences of model fit through the Likelihood Ratio Test ($\Delta\chi^2$, Bentler and Bonett, 1980). As the $\Delta\chi^2$ is also sensitive to sample size (Kelloway, 1995) we also used the Δ CFI (values equal to or less than .01 indicating that the hypothesis of invariance should not be rejected, Cheung and Rensvold, 2002) and the Δ TLI (values equal to or less than .02 indicating that the hypothesis of invariance is sustainable (Vandenberg and Lance, 2000)).

Identical goodness-of-fit indices used to assess model fit in the single-group CFA analyses were also employed in the multi-group tests.

Results

Descriptive analyses

We computed means, standard deviations, and internal consistencies for the assumed six dimensions of the DISQ and for the three outcome measures in both the Italian and Dutch databases (Table 1).

Table 1. Variables used in the analysis. Means (M), standard deviations (SD)

	<i>Range</i>	Italian sample	Dutch sample
		<i>M (SD)</i>	<i>M (SD)</i>
Cognitive Demands	1-5	3.88 (0.64)	3.67 (0.63)
Emotional Demands	1-5	3.38 (0.72)	2.69 (0.70)
Physical demands	1-5	2.15 (0.88)	2.17 (1.04)
Cognitive Resources	1-5	3.35 (0.55)	3.52 (0.64)
Emotional Resources	1-5	3.11 (0.74)	3.59 (0.72)
Physical Resources	1-5	3.14 (1.02)	3.54 (0.88)
Active learning behaviour	1-4	3.71 (.70)	2.59 (0.66)
Emotional exhaustion	0-6	3.23 (1.42)	1.75 (1.15)
Physical health problems	1-3	2.08 (.69)	1.65 (0.61)

Confirmatory Factor Analysis

Table 2 shown the fit indices for all models considering Italian and Dutch databases. In both groups, partial disaggregation models that consider only job demands and job resources in DISQ (Model 1 and Model 3) fitted the data poorly - in fact there aren't any acceptable fit indices. However, in the six-factor models (Model 2 and Model 4), all fit indices were reasonable, despite the

significant χ^2 s (132.57 and 449.03 respectively). Findings clearly indicated that the six-factor model fit the data considerably better compared to the two-factor model for both Italian and Dutch groups. Specifically, the fit of Model 2 was superior to the fit of Model 1, as indicated by the statistically significant difference values ($\Delta\chi^2$ significant at $p < .05$; $\Delta\text{CFI} = .41$; $\Delta\text{TLI} = .55$). In addition, the fit of Model 4 was superior to that the fit of Model 3: $\Delta\chi^2$ significant at $p < .05$, $\Delta\text{CFI} = .34$, and $\Delta\text{TLI} = .40$.

Analyzing the AMOS output (see Figure 1) we found the following relations. Cognitive demands were strongly and positively related to emotional demands but not significantly related to physical demands. On the other hand cognitive demands were strongly and positively related to cognitive resources but not significantly related to emotional and physical resources. Emotional demands were strongly and positively related to physical demands. Therefore were related with all three aspects of resources in positive way to cognitive aspect and in negative way to emotional and physical aspects. Finally physical demands were negatively related with two of the three aspects of resources (i.e. cognitive and physical).

In regard to job resources findings shown strong and positive relations among cognitive, emotional and physical dimensions.

Table 2. Goodness of fit statistics for tests CFA on the DISQ 2.0

		N	χ^2	df	Model fit indices			
					GFI	CFI	TLI	RMSEA
Model 1 (2-factor, I)	Parcel disaggregation model	429	741.06*	53	.78	.61	.51	.17
Model 2 (6-factor, I)	Parcel disaggregation model	429	132.57*	39	.95	.95	.91	.08
Model 3 (2-factor, NL)	Parcel disaggregation model	1637	3563.54*	53	.76	.58	.47	.20
Model 4 (6-factor, NL)	Parcel disaggregation model	1637	449.03*	39	.96	.95	.92	.08

Note: I Italian sample, NL Dutch sample; N = number of participants; χ^2 = chi-square; df = degrees of freedom; GFI = goodness of fit index; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation.

* $p < .01$

These findings were offering support for Hypothesis 1 with regard to the multidimensional factorial structure of job demands and job resources.

Measurement Invariance Analysis

To test the factorial invariance (Hypothesis 2), we first conducted several MGCFA's which compared the following different models:

Model 5 tested the configural invariance by simultaneously evaluating the fit of Model 2 and Model 4. All practical fit indices (CFI = .93; TLI = .92; RMSEA = .06) indicated a good fit, providing evidence that the six-factor solution of the DISQ 2.0 is invariant across Italian and Dutch groups. A graphical representation of Model 5 was given in Figure 1.

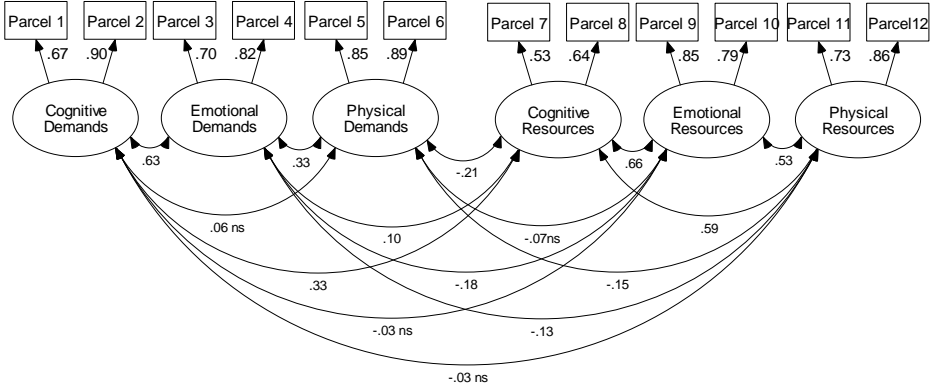
Second, Model 6 comes up with fit indices that are related to metric invariance (i.e., equal factor loadings). The model achieved a good fit (CFI = .93; TLI = .92; RMSEA = .06), although the χ^2 (764.38) is significant. The practical fit indices, $\Delta\chi^2$ ($\Delta\chi^2(3) = 7.56$, $p = ns$) and a null Δ CFI and Δ TLI indicated that Model 6 was well-supported by the data. This implies the equivalence of the strength of the item-factor relationships across databases (Cheung and Rensvold, 2002).

Third, the hypothesis of measurement error invariance (Model 7) was tested. This test can be considered the least important one (Bentler, 1995). Although the χ^2 (788.66) and the $\Delta\chi^2$ ($\Delta\chi^2(5) = 24.28$, $p = .000$) were significant, the other, practical, fit indices (CFI = .93; TLI = .92; RMSEA = .05) as well as a minor change in Δ CFI and Δ TFI indicated that the amount of measurement error of the scale items of the DISQ 2.0 was the same across groups.

Finally, the hypothesis of scalar invariance, a prerequisite for meaningful comparison of group latent means, was tested (Model 8; Cheung and Rensvold, 2002). Though the χ^2 (877.79) and the $\Delta\chi^2$ ($\Delta\chi^2(6) = 89.13$, $p = .000$) were both significant, the CFI (CFI = .93), the TLI (TLI = .92), the RMSEA (RMSEA = .05) and a null Δ CFI and Δ TFI showed acceptable values. This indicates that scalar invariance was tenable. For more details all the fit indices were shown in Table 3.

Overall, all results described above, supported Hypothesis 2.

Figure 1. Standardized solution of the six-factor model of the Italian and Dutch version (Model 5) of the DISQ 2.0 (N= 2066).



Note: factor loadings are significant at $p < .001$.

Table 3. Multi-group analyses: Goodness of fit statistics for tests of factorial validity of the DISQ 2.0 (N = 2,066)

	χ^2	$\Delta\chi^2$	df	Δdf	Model fit indices				
					CFI	Δ CFI	TLI	Δ TLI	RMSEA
Model 5 (configural invariance)	756.82*	-	103	-	.93	-	.92	-	.06
Model 6 (metric invariance)	764.38*	7.56	106	3	.93	.00	.92	.00	.06
Model 7 (structural invariance)	788.66*	24.28**	111	5	.93	.00	.92	.00	.05
Model 8 (invariance of error's variance)	877.79*	89.13**	117	6	.93	.00	.92	.00	.05

Note: GFI = goodness of fit index; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation. Delta Changes refers to present model compared with previous model.

** $p < .001$. * $p < .01$.

Internal consistency

The Table 3 shown the internal consistencies of DISQ's six dimension. In both groups, Cronbach's alphas for five out of six subscales of the DISQ show sufficiently high reliability in both groups as their scores satisfied the criterion of .70 (Nunnally and Bernstein, 1994). Exception are cognitive resources which show a modest value for the Dutch group ($\alpha = .66$) and a lower value for the Italian group ($\alpha = .55$). As far as the outcome measures are concerned, all, but one, showed sufficient reliability. In fact physical health problems scored somewhat lower in the Ducht database ($\alpha = .65$).

Table 3. Internal consistencies (Cronbach's α) of six DISQ's dimensions

	<i>N. of Items</i>	Italian sample	Dutch sample
		α	α
Cognitive Demands	5	.77	.78
Emotional Demands	6	.78	.83
Physical demands	5	.82	.92
Cognitive Resources	5	.55	.66
Emotional Resources	5	.76	.81
Physical Resources	5	.86	.82
Active learning behaviour	4	.76	.86
Emotional exhaustion	5	.89	.88
Physical health problems	3	.77	.65

Convergent validity

Table 4 reports the zero-order Pearson correlations of DISQ for both Italian and Dutch databases.

As expected and in line with previous studies (e.g. De Jonge and Dormann, 2006; Van de Tooren and De Jonge, 2008; Van de Ven, Vlerick, and De Jonge, 2008), active learning behaviour was significantly and positively related to cognitive demands and cognitive resources in both groups (H3a). The respective correlations were also stronger than for the other demands (in both groups) and for the other resources in the Dutch group only. Furthermore, emotional exhaustion was significantly and positively related to emotional demands, and negatively to emotional resources in both groups (H3b). Rather similarly, these correlations were also stronger than for the other demands and resources in both groups. Finally, physical health problems were significantly and positively related to physical demands, and negatively to physical resources in both groups (H3c). Again, the respective correlations were also stronger than for the other demands and resources in both groups. Therefore, Hypothesis 3 was almost completely supported for all three outcome measures, as emotional resources were stronger in case of active learning.

Table 4. Zero-order Pearson correlations of DISQ 2.0 for Italian (Below the Diagonal, N= 429) and for Dutch (Above the Diagonal, N= 1,637) databases.

	1	2	3	4	5	6	7	8	9
1. Cognitive demands	1	.56**	.02	.15**	-.06*	-.02	.34**	.20**	.02
2. Emotional demands	.48**	1	.26**	-.01	-.17**	-.11**	.14**	.26**	.10**
3. Physical demands	.12*	.28**	1	-.16**	-.05*	-.16**	-.10***	.07*	.15**
4. Cognitive resources	.15**	-.01	.02	1	.43**	.48**	.22**	-.15**	-.06*
5. Emotional resources	.03	-.19**	-.01	.53**	1	.43**	.18**	-.24**	-.10**
6. Physical resources	-.05	-.19**	-.15**	.35**	.39**	1	.10**	-.15**	-.11**
7. Active learning behaviour	.32**	.19**	.06	.26**	.34**	-.03	1	-.06*	-.08**
8. Emotional exhaustion	.17**	.31**	.16**	-.11*	-.26**	-.19**	-.05	1	.27**
9. Physical health problems	.12*	.19**	.32**	-.03	-.09	-.19**	.06	.27**	1

Note: *** $p < .001$, ** $p < .01$, * $p < .05$.

Discussion

The present study examined the psychometric properties of the Italian and Dutch version of the DISQ instrument and compared its validity across the respective databases. The DISQ, originally developed in English, was created to measure three different kinds of job demands and three different kinds of job resources which both consist of cognitive, emotional, and physical nature. These six types of job demands and job resources are key job characteristics in the Demand-Induced Strain Compensation (DISC) Model, which is a more cohesive theoretical model of job stress.

First, confirmative factor analysis indicated that the six-factor model (i.e., cognitive demands, emotional demands, physical

demands, cognitive resources, emotional resources, and physical resources) can be considered the best factor solution in both the Italian and Dutch group. These findings suggest further evidence about the assumed multi-dimensionality of job demands and job resources.

With respect to measurement invariance, the results of multiple-group CFA analyses showed that the constructs were conceptualized in the same way across groups, implying configural invariance of the instrument (Cheung and Rensvold, 2002). Similarly, we found agreement with regard to the way the construct was manifested across countries (Cheung and Rensvold, 2002). The importance of this result is due to the fact that metric invariance is a prerequisite for meaningful cross-group comparison (Bollen, 1989). Finally, also the hypothesis of structural invariance across groups was supported as well as the hypothesis of invariance of error's variance.

The second step was investigating the internal consistencies of the assumed six dimensions of the DISQ. In line with Van de Tooren and colleagues (2011), we found that both the Italian and Dutch version of the DISQ instrument showed satisfactory internal consistencies for all job demands and job resources, cognitive resources exclusive (Nunnally and Bernstein, 1994). The not satisfactory internal consistency of cognitive resources could be

due by the fact that the variable is done by different concepts (e.g. social support, autonomy).

The last step was to verify the convergent validity of the DISQ instrument. Consistent with prior literature (e.g., De Jonge and Dormann, 2006; Van den Tooren and De Jonge, 2008; Van de Ven, et al., 2008), and in line with our third hypothesis, cognitive job demands and resources were found to be positively related to active learning behaviour. Similarly, emotional job demands and resources were found to be related to emotional exhaustion in the expected direction. Finally physical job demands and resources were found to be successively positively and negatively associated with physical health problems (for a review, see Van den Tooren et al., 2011). Is important to stress the order of discussed associations as in line with the Model (De Jonge and Dormann, 2003, 2006) as Triple Match Principle: the correlation between job demands, job resources and job related outcomes were all of the same domain (e.g. emotional job demands, emotional job resources and emotional exhaustion).

Summarizing, the psychometric characteristics of the six DISQ sub-scales appear to be satisfactory for the two countries. All psychometric statistics attest high correspondence between the DISC Model assumptions and the empirical data in both groups. These findings prove also that the Italian and Dutch versions of DISQ 2.0 are valid and reliable, and show numerous similarities in

psychometric properties. So, the DISQ instrument can be adequately used to provide an assessment of key job characteristics across different countries. Findings further stress the importance of treating job demands and resources as multifaceted job characteristics rather than global constructs for theoretical and practical implication. On one side the consideration of cognitive, emotional and physical dimensions improves the measurement of job demands and job resources, as it corroborates the idea that job characteristics are multi-dimensional (Hockey, 2000; De Jonge and Dormann, 2003). In the other side the DISQ could provide a “job profile” in terms of job characteristics, hence organization will be more able in managing the different kinds of job demands and job resources.

The present study shows some limitations. A first limitation concerns the nature of databases. As most participants were working in healthcare or education, it is recommended to examine the DISQ’s properties in other work domains as well.

A second limitation regards the internal consistence of cognitive resources. In accord to authors the items of cognitive resources will be revised.

A last limitation deals with the cross-sectional nature of the research design used to investigate the psychometric properties of the DISQ. Future research should use longitudinal approaches to

estimate the longitudinal stability of the six-factor structure as well as test-retest reliability.

To conclude, this is the first promising study based on psychometric properties of the DISQ. Future psychometric research on the instrument in other countries, and in different sectors is highly recommended.

Finally, as it is the first study using the DISQ in Italian context we recommend future research investigating also the other Model's principles (e.g. compensation, balance, etc).

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CHAPTER 2

*Emotional labour, work-family interface and emotional
exhaustion.
A Longitudinal study on health care workers*

Emotional labour, w-f interface and emotional exhaustion.

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Abstract

The purpose of the present longitudinal study was to examine, using the DISC model, the relationship between emotional job characteristics, work-family interface and emotional exhaustion among a health care population. First we tested the moderation role of matching job resources in the relation between emotional job demands and emotional exhaustion. Furthermore, the direct and mediating process of emotional W-F conflict and facilitation, emotional job characteristics and emotional exhaustion were examined. Finally the mediation hypotheses were tested separately for workers involved in caring activity at home and workers who are not involved. In addition to descriptive statistics, structural equation models and multiple-groups analyses (AMOS 5.0) were conducted. Despite the direct effect of emotional job characteristics and emotional exhaustion, findings showed no evidence for buffer role of emotional job resources. Results showed the mediator role of emotional work-family conflict in job demands-emotional exhaustion relationship and also for mediator

role of emotional work-family facilitation in job resources-emotional exhaustion relationship. The present study plugs some literature limitations taking in to account both negative and positive aspects of work-family interface (for instance conflict and facilitation) and using an innovative stress framework (DISC Model). Finally the study offers some reflections on emotional labour.

Keywords: work-home interface, Demand-Induced Strain Compensation Model, emotional exhaustion, emotional labour, longitudinal study

Introduction

The need and the interest of understanding work-family interface comes from changes in balancing family and work responsibilities (Edwards and Rothbard, 2000; Geurts and Demerouti, 2003; Marks, 2006) and from the consequences that the lack of balance has for individuals (Cullen and Hammer, 2007; Rantanen, Kinnunen, Feldt, and Pulkkinen, 2008; Rupert, Stevanovic, and Hunley, 2009) and organizations as well (Wyatt, 2007). The emergency in giving consideration on work-family interface in organizational settings is recognised also by *European Agency for Safety and Health at Work* that consider the lack of work-family balance as an emergent psychosocial risk factor in the 6% of workers of European Union (2007).

The complexities of the field, the multiplicity of theoretically prospective and the amount of instruments developed to investigate it have generated variation in findings and obstacles in knowledge accumulation and policy development (Kossek and Lambert, 2005).

Our longitudinal study starting with work-family issues, branches out to different fields of organizational psychology. Specifically our general aim was to investigate work-family interface in health care workers taking into consideration the emotional dimensions of their work. Specifically we declined our aim in three steps. First, we linked emotional labour and work-

family interface, investigating an issue that has rarely been studied (Montgomery, Panagopolou, Wild and Meenks, 2006). Secondly, we based our hypotheses on the stress prospective using the *Demand Induced Strain Compensation Model* (DISC, De Jonge and Dormann, 2003, 2006).

Finally we examined the place of WHI in the stressor–strain relationship not focusing exclusively on the negative side of work-interface but also on the possible facilitative impact (Voydanoff, 2004; Van Steenbergen, Ellemers, and Mooijaart 2007).

Theoretical framework and hypotheses

Emotional labour and stress models

Working in health care services is characterized by the interaction with how people have to cope with health problems. This means being involved in a social relationship in which the regulation of emotions plays a key role because of its importance for providers and also for recipients of care (cf. Hunter and Smith, 2007). To describe the process in which workers have to control their emotions in order to achieve job performance standard, Hochschild (1983) used the label *emotional labour*. As observed by Brotheridge and Grandey (2002) emotional labour has usually been conceptualized as employee-focused (that denotes the employees' efforts to manage their own emotions) or job-focused emotional labour (that denotes the level of emotional job demands in occupations).

The hypothesis of Hochschild (1983) is that emotional labour comes at a personal cost was supported by large literature that studies emotional exhaustion as outcome of emotional labour (e.g., Bakker and Demerouti, 2007). Moreover for Saxton, Phillips and Blakeney (1991) emotional exhaustion is the state of depleted energy resulting in excessive emotional demands made on people interacting with customers or clients. The two considerations are in line with the stress literature that supposed job demands and job

resources are responsible for stress reactions (e.g. De Jonge, Spoor, Sonnentag, Dormann, and Van den Tooren, 2012, in press.; Bova, Panari, Simbula and Guglielmi, 2011). Job demands are those physical, psychological, social, or organizational aspects of the job that require physical and/or psychological effort, and are therefore related to physiological and/or psychological costs (e.g. dealing with aggressive clients) (Jones and Fletcher, 1996). Job resources, on the other hand, are instrumental or psychological means at work that can be employed to deal with job demands (e.g. emotional support from colleagues) (Van den Tooren, De Jonge and Dormann, 2011). In the recent Demand Induced Strain Compensation Model (DISC), applied particularly to service work, De Jonge and Dormann (2006) considered the direct impact of job demand and job resources in insurgence of job strain as well as the buffer effect of job resources in the relation between job demands and job-related strain (De Jonge and Dormann, 2006; De Jonge, Dormann, and Van den Tooren, 2008). The central assumption of the model is the *multi-dimensionality of construct*, which means that demands, resources, and strain are either cognitive ('head'), emotional ('heart'), or physical ('hands') in nature (Hockey, 2000; De Jonge and Dormann, 2003). The model also assumes the *matching principle* for the components of job stress process (Frese, 1999; De Jonge and Dormann, 2003) arguing moderating effects of job demands to be most likely in a situation of *Triple*

Match (TPM) between the kind of job demands, job resources and job outcomes. For instance, emotional job resources may help to reduce emotional stress reactions caused by emotional job demands which at best could facilitate employees' ability to cope with job stress (De Jonge, Le Blanc, Peeters and Noordam, 2008). Recently, Daniels and De Jonge (2010) presented an overview of empirical evidence for the key assumptions in the DISC Model. In regards of matching principle's test of the DISC Model results in general have been supportive. Specifically, 15 out of 19 DISC studies (included 2 longitudinal studies) showed evidence in support of the model.

In line with literature (De Jonge et al., 2008; De Jonge and Dormann, 2006) and with the Triple-Match Principle (TMP) of DISC model (Daniels and De Jonge, 2010; De Jonge and Dormann, 2003) we expect that in job-focused emotional labour, job resources moderate the time-lagged relationship between emotional job demand and emotional exhaustion (Hypothesis 1).

Mediating role of work-family interface

The approaches in regard to the sequence between WHI and job stressors, are substantially two (Bakker and Geurts, 2004; Peeters, De Jonge, Janssen and van der Linden, 2004): (a) the *classical approach* and (b) the *reverse causation* approach. The first approach assumed that w-f conflict is a job stressor in itself that,

alongside other job stressors, could be considered an important predictor of health and well-being (e.g., Burke, 1994; De Jonge, Peeters, Hamers, van Vegchel, and van der Linden, 2003; Edwards and Rothbard, 2005). The second approach assumed that certain job stressors caused w-f conflict which in turn leads to strain. As observed by Peeters and colleague (2004) the mediator role of w-f conflict can be quite well explained by the Effort–Recovery (E-R) model (Geurts and Demerouti, 2003; Meijman and Mulder, 1998). When job demands are associated with the building up of negative load, this effect spills over to the home domain with the consequent difficulty in sufficient recovering at home from the job efforts. Definitely this will increase the possibility that job demands play negative effects on psychological health. The *reverse causation* approach is likewise evidence based (Montgomery, Peeters, Schaufeli, and Den Ouden, 2003; Kinnunen and Mauno, 1998; Geurts, Kompier, Roxburgh, and Houtman; 2003; Peeters, Montgomery, Bakker and Schaufeli, 2005). While there are many studies based on the mediation hypothesis of w-f conflict, the idea that also the positive side of w-f interface which could play the same role, has received very little attention until now with some exception (e.g. Masuda, McNall, Allen and Nicklin, 2012).

Starting from the mediation approach our second hypothesis is formulated as follows: emotional job demands will have a positive

cross-lagged impact on emotional exhaustion via an increase in emotional w-f conflict (Hypothesis 2a) (we will refer to it as “strain-based” process). On the contrary emotional job resources will have a negative cross-lagged impact on emotional exhaustion via an increase in emotional w-f facilitation (Hypothesis 2b) (we will refer to it as “energy-based” process).

Chronic home demands and w-f boundaries

The *Segmentation* of work and family roles, has gained recent attention in literature. Two prospective can be recognised in this field: the first one considers segmentation as a coping strategy to maintain a boundary between work and family roles (Edwards and Rothbard, 2000); the second one considers the two roles as separate spheres (Ashforth, Kreiner, and Fugate, 2000). For the second approach two roles are segmented when their boundaries are *inflexible* and *impermeable* to one another and when they are very *different* from one another in terms of role requirements. For Ashforth and colleague (2000) the consequence of segmentation is both positive (less blurring or confusion between work and family responsibilities) and negative (difficulty in crossing the boundary from one role to the other). Starting with Ashforth’s prospective we took into consideration a specific situation in which characteristics of work and family roles are similar in some respects. Generally speaking the “responsibility for caring for a

chronically ill family member at home was a risk factor for the onset of work-family conflict” which was shown “to be a strong risk factor for the onset of elevated need for recovery for work and fatigue” (Jansen, Kant, Kristensen and Nijhuis, 2003, p.309).

On the basis of the reflections of Ashforth and colleagues (2000) and Jansen and colleagues (2003) and considering them jointly we acknowledge the hypothesis of a higher risk for care workers who have to also care for chronically ill family members. This is partly determined due to the fact that they conduct the same type of assistance at work and at home but also because the care need at home is in itself a cause of work-family conflict.

In line with mentioned reflection our last proposition is that health care workers who have to deal with chronic home demands (taking care of elderly or not sufficient people) are characterized by strain-based process (emotional w-f conflict is a mediator between emotional job demands and future emotional exhaustion) while workers who are not involved in caring activities at home are characterized by energy-based process (emotional w-f facilitation is a mediator between emotional job resources and future emotional exhaustion) (Hypothesis 3).

Methodology

Procedure and participants

This study was part of a research project focused on psychosocial working conditions, work family interface and stress. The project was designed for an Italian Health Care Service. In agreement with the organization's health and safety unit, the survey focused on those services which have had more organizational changes in the past years. So workers participated in data collection of two services (administration and family planning clinic) of the seven district units of the organization. The data were collected during thirty training occasions, with a self-reporting anonymous questionnaire compiled in small groups. All questionnaires contained a personal code for second round identification. The two-wave longitudinal study was with an interval of 10 months between the first (June 2010) and second wave (April 2011).

In the first wave 364 questionnaires were collected. In the second wave 277 workers had fully completed the questionnaire. The final sample consisted of 267 workers (73.35% of the initial group) whose personal code of T1 could be matched with the one of T2. Of these 90.8% were women. Participant's average age was 47.99 years (SD = 6.99) and most of them (47.9%) have been working from 21 to 30 years. The 64,8% of the sample were

administrative personnel, the 35.2% family planning clinic staff; who work on average 34.52 (SD = 6.12) hours per week.

Regarding their personal condition 84.1% have at least one child, 83 workers are involved in care activities at home (taking care of elderly or not sufficient people) and 169 aren't involved in this kind of activity (while 15 workers didn't respond).

Instruments

Emotional job demands ($\alpha T_1 = .77$) and *emotional job resources* ($\alpha T_1 = .77$) were measured using respectively six and five items of DISQ (2.0) (De Jonge, Dormann, van Vegchel, von Nordheim, Dollard, Cotton, and van den Tooren, 2007). Simple items are respectively “employee X will have to do a lot of emotionally draining work” and “other people (e.g. clients, colleagues or supervisors) will be a listening ear for employee X when he/she has faced a threatening situation”. The two sub-scales were scored on a 5-point frequency scale, ranging from 1 (never or very rarely) to 5 (very often or always), higher scores mean higher levels of the investigated dimensions. The DISQ instrument tried to respond to an attempt to measure work situations in a more objective way (Frese, 1985).

Emotional work family conflict ($\alpha T_1 = .86$; $\alpha T_2 = .86$) was measured with three items developed by Carlson, Kacmar, and Williams (2000), to measure *strain-based WF conflict*. Strain-

based conflict, referring to strain feeling (e.g. tension, fatigue, irritability) due to the participation in one domain that makes it difficult to comply with the demands from the other domain (Geurts and Demerouti, 2003). An example item is “I am often so emotionally drained when I get home from work that it prevents me from contributing at Home”

Emotional work family facilitation ($\alpha T_1 = .81$; $\alpha T_2 = .86$), also defined *energy-based WF facilitation* (van Steenbergen, et al., 2007), was measured with two items developed by Wagena and Geurts (2000) and one item developed by van Steenbergen and colleague (2007). energy-based WF facilitation refers to energy felling due to the fact that participation in one role creates energy for the use in that or other role’s performance (Marks, 1977). An example item is “When I get home from work I often feel emotionally recharged, enabling me to make a better contribution at home”.

Items of conflict and facilitation emotional aspects of work-family interface were measured using 5-point scales from 1 (strongly disagree) to 5 (strongly agree) and for both Italian versions the multistage translation/back-translation procedure was used as recommended by Brislin, Lonner, and Thorndike (1973).

Emotional strain (5 items, $\alpha T_2 = .90$) was assessed using the emotional exhaustion dimension of the Maslach Burnout Inventory (Maslach and Jackson, 1986). In the study the Italian

version was used (Borgogni, Galati, Petitta, and Centro Formazione Schweitzer, 2005). An example item is ‘I feel emotionally drained from my work’. All items were rated on a seven-point scale (0 = never, 6 = always).

Chronic illness demands at home were measured with a one item scale: “Do you actually take care of an elderly person or a non sufficient person at home?” The item was rated on a two-point scale (0 = yes, 2 = no).

Strategy of analysis

Due to the high amount of observed variables and to relatively small sample size, we reduced the number of freely estimated parameters by using manifest variables (Joreskog and Sorbom, 1993).

The latent’s emotional job demands and emotional job resources were indicated by the corresponding manifest dimensions measuring at T1. In the first step, to test moderator effects of emotional job resources on emotional exhaustion (H1), interaction term (emotional job demands combined with emotional job resources) was calculated and added separately to the regression equations. Following Tabachnick and Fidell (2001) to avoid multicollinearity that could be introduced in a regression equation by an interaction term, emotional demand and resources were centered (i.e., deviation scores from the means were used instead of raw scores) before the interaction. Following Aiken and

West (1991) in the first step of the hierarchical regression with emotional exhaustion as criterion the main effects of emotional job demands and emotional resources were entered while in the second step interaction terms between emotional job demands and emotional job resources was entered in the third step.

In the second step (H2) the mediator variables (emotional work-family conflict and facilitations) were indicated by the corresponding manifest dimensions of T1–T2 changes in conflict and facilitation measured as residual scores (Δ EW-FC, Δ EW-FF). Following Smith and Beaton (2008), these change scores were obtained by regressing T2 scores of the conflict and facilitation on the corresponding T1 scores. The differences between the predicted and the observed scores of T2 are the standardized residual scores that were used in the analyses. Finally, emotional exhaustion was indicated by the corresponding manifest dimension measured at T2.

Descriptive analyses, internal consistencies (Cronbach's α) zero-order correlation and moderation tests have been conducted by using different analytical tools as implemented by SPSS 18.0.

Hypotheses of direct and mediation effects (H2 and H3) were tested using Structural Equation Modelling methods (SEM) as implemented by AMOS 5 software package (Arbuckle, 2003) with maximum likelihood estimation methods. As strongly recommended by Bentler (1990) the goodness-of-fit of the models

was evaluated using the χ^2 goodness-of-fit statistic, the Adjusted Goodness of Fit Index (AGFI, Jöreskog and Sörbom, 1989), the Comparative Fit Index (CFI; Bentler, 1990), the Tucker-Lewis coefficient (TLI; Bentler and Bonnett, 1980; Tucker and Lewis, 1973), and the Root Mean Square Error of Approximation (RMSEA; Steiger, 1989). The fit model -for number of observations greater than 250 and number of observed variables lower than 12-, can be considered acceptable when the CFI and TLI are equal or greater than .95 and the RMSEA is equal to or less than .07 (Anderson, Hair, Black, and Babin, 2010).

The several nested models were compared by means of chi-square difference tests (Jöreskog and Sörbom, 1993).

In order to test the statistical significance of mediation effects the innovative non-parametric bootstrapping procedure recommended by Davidson and MacKinnon (2000) was followed. This bootstrapping procedure assumes that the distribution of the measured variables approximates that of the population while it avoids making the often tenuous assumption that the indirect effect is distributed normally. Finally, for testing the last hypothesis (H3), a non significant difference in fit between the constrained and unconstrained models was taken to indicate that the factor loadings and correlations did not differ significantly across groups (cfr. Vandenberg and Lance, 2000). In order to ascertain significant differences at least two out of these three

criteria had to be satisfied: $\Delta\chi^2$ significant at $p < .05$ (Byrne, 2001); $\Delta\text{CFI} > .01$ (Cheung and Rensvold, 2002); and $\Delta\text{TLI} > .02$ (Vandenberg and Lance, 2000).

Results

Descriptive statistics

The means, standard deviations and correlations of all variables are shown in Table 1. The pattern of correlations were as we expected. Emotional job demands measured at T1 are positively correlated with emotional exhaustion T2 and Δ emotional W-F conflict. In contrast, emotional job resources measured at T1 are negatively correlated with emotional exhaustion but not significantly with Δ emotional W-F facilitation. In addition, the dimensions of emotional job demands and emotional job resources, in line with previous studies (for a review cf. Zapf, 2002), are correlated negatively while there is no correlation among conflict and facilitation (Grzywacz and Marks 2000; Wayne, Randel, and Stevens 2003).

Table 1

Means standard, deviations and Correlations between the study variables (N=267)

Variables	M (SD)	1	2	3	4	5
1. Emotional demand T1	3.39 (.71)	1				
2. Emotional resource T1	3.07 (.75)	-.20**	1			
3. Emotional Exhaustion T2	3.20 (1.42)	.25**	-.18**	1		
4. Δ Emotional W-F conflict	.00 (1.00)	.15*	-.10	.37**	1	
5. Δ Emotional W-F facilitation	.00 (1.00)	-.06	.12	-.30**	-.09	1

Note: W-F = work-family; *p < .05. **p < .01

Moderation Hypothesis

The table 2 showed the time-logged moderating effect of emotional job resources on relation between job demands (T1) and emotional exhaustion (T2). As shown in Table 2 the impact of emotional job demand on emotional exhaustion, doesn't depend on the level of emotional job resources as the increase of the variance explained by the interaction term (emotional job demands x emotional job resources) was not significant ($\Delta R^2 = .00$; $\Delta F(1, 267) = 3.92$; $p = ns$). These findings didn't support our first hypothesis. Anyway it is interesting to note that both emotional demands and resources have a direct effect on emotional exhaustion measured 10 months later in expected direction.

Table 2

Model of Emotional Exhaustion with moderating term of matching job demands and job resources

	Emotional Exhaustion (T2)							
	Model 1				Model 2			
	<i>B</i>	<i>SE</i>	<i>T</i>	β	<i>B</i>	<i>SE</i>	<i>T</i>	β
<i>Main effects</i>								
ED (T1)	.45	.12	3.77	.23***	.45	.12	3.78	.23***
ER (T1)	-.25	.11	-2.23	-.13*	-.25	.11	-2.24	-.13*
<i>Interaction effect</i>								
ED (T1) × ER (T1)					.06	.16	.37	.02
Adjust R²				.07				.07
ΔR^2								.00

Note: $N = 267$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Mediation Hypotheses

In order to test the mediating role of work-family emotional conflict and work-family emotional facilitation we compared two models. The first one is a full mediation model (M1), the second a partial mediation model (M2), in which we included the direct paths from emotional job demands to emotional exhaustion and from job resources to emotional exhaustion. The fit indices of the models are reported in Table 2. As shown in the table 2 the inclusion of the additional paths (M2) improve the model fit ($\Delta\chi^2(2) = 14.71, p < .001$) with all fit indices reaching their criteria, so

the full mediation model was rejected in favor of the partial mediation model (see Figure 1).

Table 3
Goodness-of-Fit indices of the nested models (N = 267)

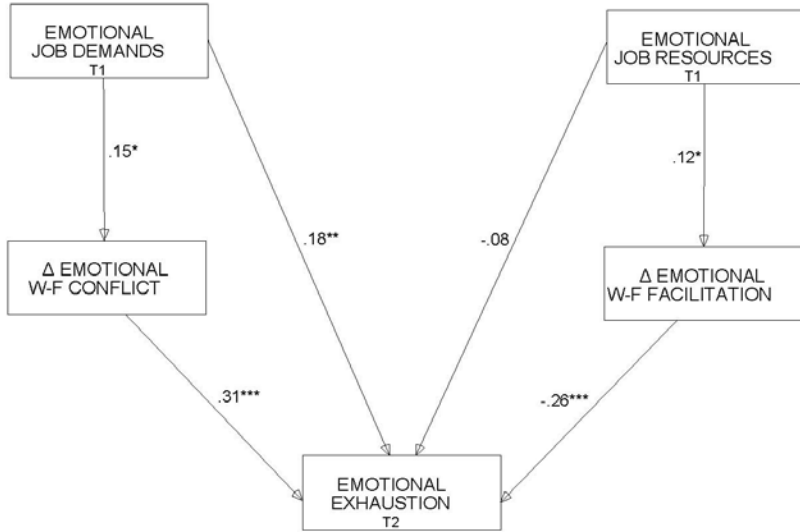
<i>Model</i>	χ^2	<i>df</i>	<i>RMSEA</i>	<i>TLI</i>	<i>CFI</i>	<i>AGFI</i>	<i>Model Comparison</i>	$\Delta\chi^2$	Δdf
M1. Full Mediation Model	18.12**	5	.10	.71	.86	.92	-	-	-
M2. Partial Mediation Model	3.41	3	.02	.99	1.00	.98	M2-M3	14.71***	2

Note. RMSEA = Root Mean Square Error of Approximation; NNFI = Non-Normed Fit Index; AGFI = Adjusted Goodness-of-Fit Index; CFI = Comparative Fit Index.

* $p < .05$. ** $p < .01$. *** $p < .001$

In regard to direct paths the inspection of the AMOS output revealed that in the strain-based process the standardised coefficient of the direct path from emotional job demands (T1) to emotional exhaustion (T2) was .18 ($p < .01$), the coefficient of the direct path from emotional job demands (T1) to changes in emotional w-f conflict was .15 ($p < .05$). Moreover, in the energy-based process, the coefficient of the direct path from emotional job resources (T1) to emotional exhaustion (T2) was -.08 ($p = ns$) while the coefficient of the direct path from emotional job resources (T1) to changes in emotional w-f facilitation was .12 ($p < .01$).

Figure 1. Standardized solution of Partial mediation model (M2).



Note. N = 267 * $p < .05$; ** $p < .01$; *** $p < .001$. The dotted lines are non significant

To test the statistical significance of mediation effects we created the bias-corrected bootstrap, with Maximum Likelihood (ML) estimator, using 5,000 samples generating at 95% confidence interval (CI) of the point estimations as implemented in AMOS 5.0 (Efron and Tibshirani, 1993). If the confidence interval excludes zero, it is considered statistically significant at

the .05 level. The analyses were run from the original data in the best-fitting partial mediation structural model.

The analysis revealed that the indirect effect of emotional job demands on emotional exhaustion (i.e., the difference between the total and direct effect) was significant with a point estimate of .05 and a 95% BCa (bias-corrected and accelerated) bootstrap confidence interval of .01 to .10 also if the direct effect was still significant. The results also revealed that the indirect effect of emotional job resources on emotional exhaustion was significant with a point estimate of -.03 and a 95% BCa bootstrap confidence interval of -.07 to -.01. The direct effect was no more significant. Findings confirm our second hypothesis: Δ work-family conflict mediates the relationship between emotional job demands and emotional exhaustion results, (H2a), whereas Δ work-family facilitation mediates the relationship between emotional job resources and emotional exhaustion (H2b).

Multigroup Hypothesis

Furthermore, we examined the variance of hypothesized model between workers who are involved in caring activities for a chronically ill family member at home and workers who are not. To accomplish this, we estimated and compared three nested models: an unconstrained model in which all structural weights and structural residual were free to vary across the two groups, a

constrained model in which all structural weights were set equal across groups and a constrained model in which also structural residual was set equal across groups. Findings from these invariance analysis indicated that the model fit the data adequately but and not equivalently across the two groups (M3-M1) ($\Delta\chi^2$ (12) = 11.89, $p = ns$; $\Delta TLI > .02$; $\Delta CFI < .01$).

Table 4
Goodness-of-Fit indices of multi-group models (N = 267)

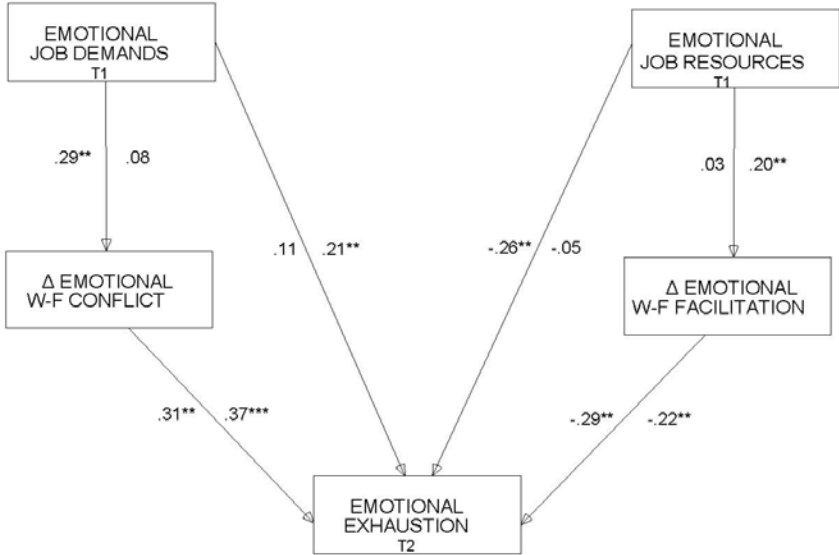
<i>Model</i>	χ^2	<i>df</i>	<i>RMSEA</i>	<i>TLI</i>	<i>CFI</i>	<i>AGFI</i>	<i>Model Comparison</i>	$\Delta\chi^2$	Δdf	ΔTLI	ΔCFI
M1. Unconstrained	9.76	6	.05	.88	.96	.93		-	-	-	-
M2. Constrained (Structural weights fixed)	18.76	12	.05	.89	.93	.93	M2-M1	9.00	6	.01	.03
M3. Constrained (Structural residuals fixed)	21.65	18	.03	.96	.96	.94	M3-M1	11.89	12	.08	.00

Inspection of the parameter estimates of the indirect effects revealed that in workers how have to deal with caring demands at home the indirect effect of emotional job demands on emotional exhaustion was significant with a point estimate of .05 and a 95% BCa bootstrap confidence interval of .02 to .11 and the effect of emotional job resources on emotional exhaustion was significant with a point estimate of -.04 and a 95% BCa bootstrap confidence interval of -.08 to -.01. This means that emotional w-f conflict and facilitation are both mediators in those workers.

The results of the indirect effects in workers who have not caring demands at home revealed that the indirect effect of emotional job demands on emotional exhaustion was not significant with a point estimate of .03 and a 95% BCa bootstrap confidence interval of -.02 to .09 and the effect of emotional job resources on emotional exhaustion was significant with a point estimate of -.04 and a 95% BCa bootstrap confidence interval of -.10 to -.01. This means that in those workers only emotional work-family facilitation plays a mediation role.

Finally our third hypothesis was partially supported: workers who have to deal with chronic illness demands at home are characterized more by a strain-based process than by an energy-based one while workers who do not have to are characterized solely by energy-based process.

Figure 2. The research model (standardized path coefficients) in multi-groups comparison. Left: coefficients in Group 1 (workers involved in caring activities for a chronically ill family member at home, N= 83). Right: coefficients of Group 2 (workers not involved in caring activities for a chronically ill family member at home, N = 169)



Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

Discussion

The current longitudinal study was designed to examine, in a group of health care workers, three questions regarding three important fields of organizational psychology: the moderating effect of matching job resources in the relation between emotional job demand and emotional exhaustion (cf. De Jonge and Dormann, 2006); the mediator role of w-f interface in the classical stressor–

strain relationship (Montgomery, Panagopoulou, and Benos, 2006); the boundary-spanning process specifically the role played by emotional job demands at home for job-focused emotional workers (cf. Jansen et al., 2003; Voydanoff, 2005) .

Our hypotheses were tested, as in previous studies (De Jonge et al. 2008), in a group of health care workers of north Italy as prototypes of workers who are involved in emotional labour (Mann and Cowburn, 2005).

The results regarding the test of the Triple-Match Principle (TMP) of DISC model did not support our first hypothesis: emotional job resources is not a moderator of time-lagged relationship between emotional job demand and emotional exhaustion despite direct effects of demand and resources on emotional exhaustion. These findings are not in line with some previous studies that have shown a significant effect of emotional job resources (e.g. De Jonge et al., 2008; De Jonge and Dormann, 2006; van Vegchel, De Jonge, Söderfeldt, Dormann and Schaufeli, 2004) but are in the same direction of longitudinal findings concerning the main effect of emotional job demands and resources in determining emotional exhaustion (Vegchel et al., 2004; van den Tooren, De Jonge, Vlerick, Daniels and Van de Ven, 2011).

The findings regarding mediation, supports our second hypothesis: emotional w-f conflict mediates the relationship

between emotional job demands and emotional exhaustion while emotional w-f facilitation mediates the relationship between emotional job resources and emotional exhaustion. The results are in the same direction of recent findings (Janssen, Peeters, De Jonge, Houkes, and Tummers, 2004, Zap and Holz, 2006).

The current findings add knowledge both at w-f and burnout literature. While there are many studies showing evidence for the existence of such relation between work demands, w-f conflict and exhaustion (Demerouti, Bakker and Bulters, 2004), to our knowledge no previous studies have used an emotional component of w-f interface (measures as stress based w-f conflict and energy based w-f facilitation) as mediator. Considering the different types of w-f conflict/facilitation it could help better to understand which aspect is involved in the w-f positive or negative relations (Greenhaus and Beutell, 1985). In addition the inclusion in the model of work family facilitation in its energetic dimension gave us the opportunity to not only reduce our reflection on strain-based process but also reflect on the energetic one.

Our study also confirmed that job demands are antecedents of w-f conflict and job resources are antecedents of w-f facilitations (Voydanoff, 2004; 2005).

Findings based on our last hypotheses gave more support recognizing that the boundary between work and families roles is permeable and that employee health is influenced by both home

and family demands (Brought and O’Driscoll, 2010). The results are in accordance with our frameworks: the similitude of roles could have a negative impact on work-family interface (Ashforth et al., 2000) and employees involved in caring for parents are more exposed to work-family conflict. Moreover our results could also be in line with Worthon and Erickson (1995) for whom w-f conflict should be higher when work and family require high degrees of emotion management.

Finally it is evidence base that when people are exposed to daily work demands it is important to be able to rest before starting the new working day due to the benefits that detaching from work has for well-being (Sanz-Vergel, Demerouti, Bakker, Moreno-Jiménez, 2011). However, our results offer an important reflection about the possibility that people involved in the same activities in the work and family domain have less opportunity of detachment compared with workers who have the opportunity to do so.

Limitations and suggestions for future research

Our study also included some limitations. The first concerned the measures of variables based only on self-report questionnaires, which meant increasing the likelihood of common method variance effects (Podsakoff, MacKenzie, Lee, and Podsakoff, 2003). To face this problem, we used a more objective approach to

measure emotional job characteristics using two subscales of DISQ (De Jonge et al., 2007). Therefore an important line of future research would be to include objective measures of stress (i.e. cardiovascular indicators, biomedical measures, or gastrointestinal indicators) or different sources of evaluation (e.g. superior, colleague or partner). Secondly, we did not assess the cognitive and physical aspect of job resources, which have been identified as important buffer for emotional stress process (De Jonge and Dormann, 2006). Besides we did not consider the need for recovery or detachment for work that could play important roles in strain-based and energy-based processes. Furthermore we only focused on negative emotional outcome neglecting positive ones. Finally in regard to w-f interface we considered work-family direction in negative and positive ways. We believe that future studies should contemplate also family-work direction. Although the longitudinal nature of our study gives us confidence about the causation role of job characteristics on work-family interface and on emotional exhaustion, future studies should use a reverse causation approach (Zapf, Dormann, and Frese, 1996). Additionally if the size of the two groups was small the findings could consider generalizables as are based on longitudinal survey. Moreover future studies should try to replicate the findings in different contexts from health care services, with bigger groups and in other countries.

Practical Implications

Our findings have some practical implications for organizational contests. First they suggest the importance of taking into account that the maximisation of emotional job resources could be used to promote the feeling of w-f facilitation (Voydanoff, 2004) as well as to avoid emotional exhaustion.

In respect of burnout literature De Jonge and colleague (2008) observed that although research on emotional job demands has been increasing the question remains how the negative impact of emotional job demands on employees' health can be combated best. Considering our results, emotional exhaustion could be reduced directly by the reduction of demands and the raising of resources or better obstructing the perilous effect of w-f conflict and promoting the protective function of w-f facilitation. In addition, our findings suggest that w-f interface is not only a determinant factor (in positive or negative ways) of emotional exhaustion, but also a reducer factor (in case of conflict) of the future insurgence of emotional exhaustion or a factor of amplification (in case of facilitation) struggling against the future emotional exhaustion. In addition, our results indicate that the acknowledgment of employees' work demands could be useful for the development of work-family supportive culture or family-friendly policies (Brough and O'Driscoll, 2010).

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GENERAL DISCUSSIONS

GENERAL DISCUSSION

Work-family interface has been recognized as an important topic in occupational health psychology for the past three decades (Eby, Casper, Lockwood, Bordeaux, and Brinley, 2005), as it has serious implications for both individuals and organizations (Allis and O'Driscoll 2008; Casper and Harris 2008).

Although the several perspective used to investigate the issue (e.g. individual, organizational, cultural and social perspectives), has largely recognized the utility of approaching work-family issues with theoretical stress models. In fact as noted by Greenhaus (1989) the stress paradigm is particularly appropriate for work-family research, as many constructs (e.g., situational stressors, conflict, wellbeing, coping, social support) are common to both areas of inquiry.

As remembered by Edwards and Rothbard (2005) several investigators have brought theoretical rigor to work-family research by drawing from theories in other areas, such as stress research, several years ago (Frone, Russell, and Cooper, 1992; Grandey and Cropanzano, 1999; Greenhaus and Parasuraman, 1986; Higgins, Duxbury, and Irving, 1992) and more recently as well (Edwards and Rothbard, 2005; Greenhaus and Beutell, 1985; Meijman and Mulder, 1998; Demerouti, Bakker, Nachreiner, and Schaufeli, 2001).

Although there has been an amount of these contributions, no previous works have been based on the application of the Demand-Induced Strain Compensation (DISC) Model (De Jonge and Dormann, 2003, 2006) on work and family issues. In light of these considerations, the general aim of this dissertation is to investigate work-family conflict and facilitation, using the DISC Model on Italian health care workers. The general aim was declined in two studies reported in the two chapters.

In *Chapter 1* we investigated psychometric properties of the Demand-Induced Strain Compensation Questionnaire (De Jonge, Dormann, van Vegchel, von Nordheim, Dollard, Cotton and van den Tooren, 2007) used to measure different aspects of job demands and job resources, seeing as previous studies had focused solely on the psychometric properties of the scale.

First of all we investigated the factorial validity of the instrument adopting a multiple-group (Italian and Dutch) confirmatory factor analysis approach. So we based our analysis on 429 Italian version questionnaires and 1,637 Dutch version questionnaires. Results indicated that the six-factor model, consisting of cognitive, emotional and physical demands as well as cognitive, emotional and physical resources, provided a better fit to the data than alternative two-factor models (i.e. demands and resources only). Results showed invariance across the Italian and Dutch samples. Secondly we checked internal consistencies of the

six supposed dimensions, finding satisfactory results. Finally we assessed the convergent validity of the DISQ studying its correlations with three different employee outcomes. Results showed meaningful relation to measures of active learning, emotional exhaustion and physical health. All the findings suggested that the DISQ is a valid and reliable instrument to measure cognitive, emotional and physical dimensions of job demands and job resources in Italian and Dutch work contexts.

In *Chapter 2* a longitudinal study has been presented that, using the DISC model, examined the relationship between emotional job characteristics, work-family interface and emotional exhaustion (measured ten months later) among a health care population. First, in accordance with the Triple Match Principle (De Jonge and Dormann, 2003) we tested the moderation role of matching job resources in the relation between emotional job demands and emotional exhaustion. Although the main effects of emotional job demands and resources in determining emotional exhaustion, the interaction effect between job demands and job resources in the prediction of emotional exhaustion was not significant, therefore no buffer role of emotional job resources was found. Our findings are in line with some of the previous studies (for a review, cf. Van den Tooren, De Jonge, and Dormann, 2011). However future research should further investigate the issue in order to make definite conclusions about the moderator role of

matching job resources on the relation between job demands and employee well-being.

Furthermore, the direct and mediating process of emotional W-F conflict and facilitation, between emotional job characteristics and emotional exhaustion were examined. Findings showed that job demands, and work-family conflict had a negative and direct impact on emotional exhaustion while job resources and work-family facilitation had a positive impact on emotional exhaustion. Results confirmed also the mediator role of emotional work-family conflict in job demands-emotional exhaustion relationship and the mediator role of emotional work-family facilitation in job resources-emotional exhaustion relationship. Findings are in line with the studies of Janssen, Peeters, De Jonge, Houkes, Gladys and Tummers (2004), and Zap and Holz, (2006).

Finally the mediation hypotheses were tested separately for workers involved in chronic illness home demands and workers who are not involved. Results partially confirmed our hypotheses: workers who were involved in caring activities at home are characterized by both conflict and facilitation processes while workers who were not involved in caring activities at home are characterized solely by facilitation process. From our results in our last hypothesis we can carefully conclude that being involved in caring activity at home plays an important role in work-family

conflict determination. Findings are in line with previous studies (e.g. Demerouti, Bakker and Bulters, 2004).

Overall, the results of this thesis gave empirical evidence about the valid properties of the DISQ instrument, pointing to the potential use of the DISC Model in work-family investigation and, confirmed the cross-lagged roles of job demands and resources in the determining of emotional exhaustion and the mediator role of work-family conflict and facilitation.

Strengths, limitations, and directions for future research

The results of the present work contribute to the growing evidence in stress and work-family fields. This evidence should have a theoretical and practical implication as well. Before discussing these implications some important strengths, limitations and future directions should be further acknowledged.

The present work has given some contribution to stress and work-family fields in fact, although the attention and the empirical evidences on the DISC Model, the present, was the first work based solely on psychometric investigation of the instrument (DISQ; De Jonge, et al., 2007). In addition, no previous studies have used the DISC, as a model or a measurement instrument, in an Italian context or in relation to work-family facilitation.

At most this thesis contributes to the research by providing additional support for the mediator role of work-family interface.

Strengths of the present work also include methodological aspects as the use of both cross-sectional (Chapters 1) and longitudinal designs (Chapters 2); homogeneous (i.e. health care workers in Chapter 2) as well as heterogeneous samples (i.e. Italian and Dutch employees in Chapter 1), large sample sizes (Chapters 1); different analytical strategies to analyze the data (i.e. hierarchical regression analyses, confirmative factor analyses, structural equation models and multigroup structural equation models) and the innovative application of DISC model in work-family field.

Before discussing the implications for practice of the obtained results, however, some important limitations of the thesis should be further acknowledged.

The first limitation is due to the fact that all studies only used self-reported data, which raises questions of a common method bias. This is a recurrent issue in research on work and organizational psychology (Spector, 1992; Coyne, 1994). However, Spector (2006) stated that the influence of common method variance is not as high as could be expected and he found that using self-report methodology is no guarantee of finding significant results, even with very large samples. Furthermore, a temporal separation of measurement is also beneficial for the

prevention of common method variance (Podsakoff, MacKenzie, Lee, and Podsakoff, 2003). On the positive side, however, we were very attentive in reducing the risks of common method bias using a quite objective measure of job characteristics (i.e. DISQ), a large sample and a cross-national comparison (in the first chapter) and a longitudinal design (in the second chapter) (Doty and Glick, 1998).

A second limitation regarded the homogeneity of participants as they were, as in almost all previous studies based on DISC Model (cfr. Van den Tooren et al., 2011), employees of a service sector, which restricted the possibility to generalize the results across other occupations. Moreover the two studies are partially based on data collected in the same organization, even if in different services. As observed by Kristensen (1995) homogeneity could cause power problems due to a lack of variance in job demands and job resources. On the positive side ours is the first study using the DISC Model in an Italian context and the DISC Model applied at work-family issue.

Finally the last limitation concerns the instrument used to investigate the chronic illness demands at home (Chapter 2) as was measured with a single item with a two point scale.

Based on limitations of this thesis we have some recommendations for future research. First of all more samples of different occupations would be needed in order to generalize the

power of the findings. We strongly recommend for the future to replicate the finding of the second study on samples characterized by cognitive or physical work. Therefore to test the DISC Model, also in a work-family field, it is recommended a complete test of the model that includes cognitive, emotional and physical dimensions of variables (i.e. demand, resources and outcomes) as well as both negative and positive outcomes.

Theoretical and practical implications

The knowledge acquired with our studies could be useful as they suggest some theoretical and practical implications. In line with the first aim of this dissertation, our results suggest that the DISQ is a suitable tool with which to examine cognitive, emotional and physical dimensions of job demands and job resources in service sectors across different countries. However the consideration of cognitive, emotional and physical dimensions improves the measurement of job demands and job resources, as it corroborates the idea that job characteristics are multi-dimensional (Hockey, 2000; De Jonge and Dormann, 2003). This theoretical consideration should be applied in an organizational context to achieve different goals. First the DISQ could provide a “job profile” in terms of job characteristics, hence organization will be more adept in determining what kind of job demands have to be reduced or what kind of job resources have to be improved.

Consistent with prior studies (for a review, cfr. Van den Tooren et al., 2011), our results indicate that cognitive job demands and resources were found to be positively related to active learning behaviour. Similarly, emotional job demands and resources were found to be positively and negatively related to emotional exhaustion (the result was found also in Chapter 2). Finally physical job demands and resources were found to be positively and negatively associated with physical health problems. As a consequence of the funds, it is evident that monitoring job characteristics is important for individual employees, but also for organizations. Thus, it is recommended organizational interventions to promote (i.e. active learning behaviour) or prevent (i.e. emotional exhaustion, physical health problems) individual outcomes through the reduction (i.e. cognitive, emotional or physical job demands) or the increase (i.e. cognitive, emotional or physical job resources) of equivalent job characteristics.

With regard to the second aim, our results did not support the moderating effect of matching job resources in the relation between emotional job demand and emotional exhaustion (cf. De Jonge and Dormann, 2006). Therefore our findings could suggest to organizations the importance of considering that the maximization of emotional job resources could be used to promote the feeling of w-f facilitation (Voydanoff, 2004) as well as to avoid the insurgence of emotional exhaustion ten mounts later.

Moreover, if possible, it is interesting also to consider the other side of the coin, that is the reduction of emotional job demands in order to prevent the feeling of w-f conflict and cross-lag emotional exhaustion (Jansenn et al., 2004; Montgomery, Panagopolou, de Wildt and Meenks, 2006). Findings suggest also the mediator role of emotional work-family interface (i.e. conflict and facilitation), this means that when reducing job demands or increasing job resources is not possible, the alternative should be to project interventions to reduce work-family conflict or to amplify work-family facilitation (Montgomery, Panagopolou and Benos, 2005). Finally, our results indicate that the acknowledgment of employees work demands could be useful for the development of work-family supportive culture or family-friendly policies (Brough and O'Driscoll, 2010).

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Appendix A

The Demand-Induced Strain Compensation Questionnaire Italian Version

Istruzioni

Pensi ad una persona (“il lavoratore X”) che fa il suo stesso lavoro all’interno della sua organizzazione. I compiti, gli utenti, i colleghi, il superiore, etc. sono identici ai suoi. Il lavoratore X ha anche le sue stesse qualifiche (livello d’istruzione, formazione, capacità, esperienza, etc.).

Pensi a come il lavoratore X valuterebbe il suo nuovo lavoro dopo un anno di attività. Per favore valuti le situazioni così come sono oggi, piuttosto che come potrebbero essere in futuro.

Indichi la categoria di risposta che riflette meglio la situazione del lavoratore X.

Dopo un anno di esperienza in un lavoro simile al mio, il lavoratore X...

<i>Domande Cognitive</i>		Mai o quasi mai	Rraramente	Occasionalmente	Sspesso	Molto spesso o sempre
1.	dovrà prendere delle decisioni complesse.	1	2	3	4	5
2.	dovrà mostrare elevati livelli di concentrazione e precisione.	1	2	3	4	5
3.	dovrà risolvere i problemi lavorativi in un arco temporale limitato.	1	2	3	4	5

- | | | | | | | |
|-----------|--|---|---|---|---|---|
| 4. | dovrà ricordare molte cose contemporaneamente. | 1 | 2 | 3 | 4 | 5 |
| 5. | dovrà fare molto lavoro mentalmente gravoso. | 1 | 2 | 3 | 4 | 5 |

Domande Emotive

- | | | | | | | |
|------------|--|---|---|---|---|---|
| 6. | dovrà avere a che fare con persone (es: utenti, colleghi, o superiori) che hanno aspettative irrealistiche. | 1 | 2 | 3 | 4 | 5 |
| 7. | dovrà tenere le proprie emozioni sotto controllo per completare le mansioni in un arco temporale limitato. | 1 | 2 | 3 | 4 | 5 |
| 8. | dovrà avere a che fare con persone (es: utenti, colleghi, o superiori) i cui problemi lo coinvolgono emotivamente. | 1 | 2 | 3 | 4 | 5 |
| 9. | dovrà avere a che fare con persone (es: utenti, colleghi, o superiori) che si arrabbieranno facilmente con lui. | 1 | 2 | 3 | 4 | 5 |
| 10. | dovrà fare molto lavoro gravoso emotivamente. | 1 | 2 | 3 | 4 | 5 |
| 11. | dovrà mostrare emozioni (es: con utenti, colleghi, o superiori) che sono in contrasto con i propri sentimenti. | 1 | 2 | 3 | 4 | 5 |

Dopo un anno di esperienza in un lavoro simile al mio, il lavoratore X...

Domande Fisiche

	Mai o quasi mai	Rraramente	Oo casualmente	Sspesso	Molto spesso o sempre
12. per portare a termine il proprio lavoro, dovrà eseguire molti compiti gravosi fisicamente.	1	2	3	4	5
13. dovrà chinarsi e/o allungarsi molto a lavoro.	1	2	3	4	5
14. dovrà assumere delle posture non comode o non pratiche per svolgere il proprio lavoro.	1	2	3	4	5
15. dovrà sollevare o muovere persone o oggetti pesanti (più di 10 Kg).	1	2	3	4	5
16. dovrà effettuare attività fisica in modo rapido e continuo.	1	2	3	4	5

Risorse Cognitive

1. avrà l'opportunità di prendersi una pausa mentale quando i compiti richiedono molta concentrazione.	1	2	3	4	5
2. avrà l'opportunità di alternare i compiti complessi con compiti semplici.	1	2	3	4	5
3. riceverà informazioni da altre persone (es: colleghi, o superiori) per risolvere compiti complessi.	1	2	3	4	5
4. potrà utilizzare le proprie conoscenze e competenze intellettuali per risolvere compiti complessi.	1	2	3	4	5

5. potrà accedere (da computer, libri, archivi, colleghi e manuali) ad informazioni utili a risolvere compiti complessi. 1 2 3 4 5

Risorse Emotive

6. potrà interrompere per un istante, ogni volta che desidera, le interazioni interpersonali cariche emotivamente. 1 2 3 4 5
7. si sentirà stimato sul lavoro dagli altri (es: utenti, colleghi, o superiori). 1 2 3 4 5
8. riceverà supporto emotivo da altri (es: utenti, colleghi, o superiori) nel momento in cui si presenta una situazione lavorativa critica. 1 2 3 4 5
9. dopo una situazione critica, avrà l'opportunità di esprimere le proprie emozioni, senza subire conseguenze negative (es: da parte di utenti, colleghi, o superiori). 1 2 3 4 5
10. alcune persone (es: utenti, colleghi, o superiori) saranno un punto d'ascolto per il lavoratore X quando si troverà di fronte ad una situazione critica. 1 2 3 4 5

Dopo un anno di esperienza in un lavoro simile al mio, il lavoratore X...

Risorse Fisiche

	Mai o quasi mai	Rraramente	Occasionalmente	Spesso	Molto spesso o sempre
11. potrà pianificare il proprio lavoro in modo che i compiti fisici non richiedano più sforzo di quello che può affrontare.	1	2	3	4	5
12. potrà utilizzare le attrezzature adeguate per portare a termine i compiti fisicamente gravosi.	1	2	3	4	5
13. potrà decidere che postura assumere per portare a termine i compiti fisicamente gravosi	1	2	3	4	5
14. potrà prendersi una pausa fisica nel momento in cui la situazione sta diventando gravosa fisicamente.	1	2	3	4	5
15. riceverà aiuto da altri (es: utenti, colleghi, o superiori) per sollevare o spostare persone o oggetti pesanti.	1	2	3	4	5

Appendix B

The Demand-Induced Strain Compensation Questionnaire Dutch Version

Instructie

Stel dat iemand anders ("werknemer X") dezelfde baan in de organisatie heeft als u. De taken, cliënten, collega's, leidinggevend en al het andere is hetzelfde als in uw baan. Werknemer X heeft dezelfde kwalificaties (scholing, training, vaardigheden, ervaring, et cetera) als u voor dit werk.

Beoordeel hoe het werk eruit zou zien voor werknemer X, als deze persoon een jaar werkzaam is in zijn/haar nieuwe baan. Beoordeel alstublieft hoe het nu is, in plaats van hoe het zou zijn in de toekomst.

Omcirkel de antwoordmogelijkheid die volgens u het meest van toepassing is op werknemer X.

Na een jaar ervaring in eenzelfde functie als ik...

<i>Cognitive Demands</i> (to traslate in Dutch)		(Bijna) Nooit	Zelden	Soms	Vaak	(Bijna) Altijd
1.	zal werknemer X moeilijke beslissingen in het werk moeten nemen.	1	2	3	4	5
2.	zal werknemer X een grote mate van concentratie en zorgvuldigheid in het werk moeten tonen.	1	2	3	4	5
3.	zal werknemer X werkgerelateerde problemen moeten oplossen binnen een beperkte tijd.	1	2	3	4	5

- | | | | | | | |
|----|--|---|---|---|---|---|
| 4. | zal werknemer X veel dingen tegelijkertijd moeten onthouden. | 1 | 2 | 3 | 4 | 5 |
| 5. | zal werknemer X veel geestelijk inspannend werk moeten verrichten. | 1 | 2 | 3 | 4 | 5 |

Emotional Demands (to traslate in Dutch)

- | | | | | | | |
|-----|---|---|---|---|---|---|
| 6. | zal werknemer X moeten omgaan met personen (zoals cliënten, collega's en leidinggevendenden) die onrealistische verwachtingen hebben. | 1 | 2 | 3 | 4 | 5 |
| 7. | zal werknemer X zijn/haar emoties onder controle moeten houden om de taken binnen een beperkte tijd te volbrengen. | 1 | 2 | 3 | 4 | 5 |
| 8. | zal werknemer X moeten omgaan met personen (bijv. cliënten, collega's of leidinggevendenden) wier problemen hem/haar emotioneel raken. | 1 | 2 | 3 | 4 | 5 |
| 9. | zal werknemer X moeten omgaan met personen (bijv. cliënten, collega's of leidinggevendenden) die snel boos op hem/haar worden. | 1 | 2 | 3 | 4 | 5 |
| 10. | zal werknemer X veel emotioneel inspannend werk moeten verrichten. | 1 | 2 | 3 | 4 | 5 |
| 11. | zal werknemer X emoties moeten tonen (bijv. aan cliënten, collega's of leidinggevendenden) die <u>niet</u> overeenkomen met zijn of haar gevoelens. | 1 | 2 | 3 | 4 | 5 |

Na een jaar ervaring in eenzelfde functie als ik...

	<i>Physical Demands</i> (to traslate in Dutch)	(Bijna) Nooit	Zelden	Soms	Vaak	(Bijna) Altijd
12.	zal werknemer X veel lichamelijk inspannende taken moeten verrichten om zijn/haar werk te doen.	1	2	3	4	5
13.	zal werknemer X veel moeten bukken of hoog moeten reiken tijdens het werk.	1	2	3	4	5
14.	zal werknemer X in ongemakkelijke of inspannende houdingen moeten werken om zijn/haar werk te doen.	1	2	3	4	5
15.	zal werknemer X zware personen of objecten (meer dan 10 kg) moeten tillen of verplaatsen.	1	2	3	4	5
16.	zal werknemer X op een snelle en ononderbroken manier lichamelijke activiteit moeten verrichten.	1	2	3	4	5
	<i>Cognitive Resources</i> (to traslate in Dutch)					
1.	zal werknemer X zelf de mogelijkheid hebben een mentale rustpauze te nemen wanneer taken veel concentratie vergen.	1	2	3	4	5
2.	zal werknemer X zelf de mogelijkheid hebben om complexe taken af te wisselen met eenvoudige taken.	1	2	3	4	5
3.	zal werknemer X informatie ontvangen van anderen (bijv. collega's of leidinggevenden) om complexe taken op te lossen.	1	2	3	4	5

- | | | | | | | |
|----|---|---|---|---|---|---|
| 4. | zal werknemer X in staat zijn om zijn/haar kennis en intellectuele vaardigheden te gebruiken om complexe taken op te lossen. | 1 | 2 | 3 | 4 | 5 |
| 5. | zal werknemer X toegang hebben tot bruikbare informatie (van computers, boeken, bestanden, collega's en gebruiksaanwijzingen) om complexe taken op te lossen. | 1 | 2 | 3 | 4 | 5 |

Emotional Resources (to traslate in Dutch)

- | | | | | | | |
|-----|---|---|---|---|---|---|
| 6. | zal werknemer X in staat zijn emotioneel beladen contacten met andere personen even te stoppen wanneer hij/zij dat wil. | 1 | 2 | 3 | 4 | 5 |
| 7. | zal werknemer X zich tijdens het werk gewaardeerd voelen door anderen (zoals cliënten, collega's of leidinggevenden). | 1 | 2 | 3 | 4 | 5 |
| 8. | zal werknemer X emotionele steun van anderen (zoals cliënten, collega's of leidinggevenden) krijgen wanneer zich een aangrijpende situatie voordoet. | 1 | 2 | 3 | 4 | 5 |
| 9. | zal werknemer X de mogelijkheid hebben om zijn/haar emoties te uiten nadat een aangrijpende situatie zich voordoet, zonder negatieve gevolgen daarvan te ervaren (afkomstig van bijvoorbeeld leidinggevenden, collega's of cliënten). | 1 | 2 | 3 | 4 | 5 |
| 10. | zal werknemer X een luisterend oor vinden bij anderen (bijv. cliënten, collega's en leidinggevenden) wanneer hij/zij een aangrijpende situatie heeft meegemaakt. | 1 | 2 | 3 | 4 | 5 |

Na een jaar ervaring in eenzelfde functie als ik...

<i>Physical Resources</i> (to traslate in Dutch)		(Bijna) Nooit	Zelden	Soms	Vaak	(Bijna) Altijd
11.	zal werknemer X in staat zijn om zijn/haar werk zodanig in te delen dat fysieke taken niet meer lichamelijke inspanning vergen dan hij/zij aan kan.	1	2	3	4	5
12.	zal werknemer X in staat zijn gebruik te maken van geschikte technische hulpmiddelen om lichamelijk inspannende taken te vervullen.	1	2	3	4	5
13.	zal werknemer X in staat zijn om zelf zijn/haar werkhouding te bepalen om lichamelijk inspannende taken te vervullen.	1	2	3	4	5
14.	zal werknemer X in staat zijn een fysieke rustpauze te nemen wanneer het lichamelijk erg inspannend wordt.	1	2	3	4	5
15.	zal werknemer X fysieke hulp ontvangen van anderen (zoals cliënten, collega's of leidinggevenden) bij het tillen of verplaatsen van zware personen of objecten.	1	2	3	4	5