UNIVERSITAT JAUME I

FACULTAT DE CIÈNCIES HUMANES I SOCIALS

DEPARTAMENT DE PSICOLOGIA EVOLUTIVA, EDUCATIVA, SOCIAL I

METODOLOGIA

Burnout and Engagement among Information and

Communication Technology Users: a Test of the Job

Demands-Resources Model

[Burnout y engagement en usuarios de Tecnología de la Información y

Comunicación: validación del modelo de Demandas-Recursos]

Doctoral Thesis

SUSANA LLORENS GUMBAU

Directors:

MARISA SALANOVA

WILMAR B. SCHAUFELI

ARNOLD B. BAKKER

Castellón (Spain), June 2004

Com sempre per a vosaltres:
papà, mamà, pare i mare.
Gràcies per fer possible
el meu paradís

AGRADECIMIENTOS

Por fin llegó la hora de escribir los agradecimientos. Pensamientos y emociones que aunque han estado presentes día a día resultan difícil de escribir y de transmitir. Quizá porque le deba tanto a tanta gente.

Gracias a mis padres y a mis abuelos por las veces que han tenido que soportar mis neuras en los días de análisis desventurados y por su paciencia ante "no, encara no l'acabe". Pues ya està. A mis amigos, con los que he dejado de compartir muchas cosas importantes pero que supongo que hoy entenderán. A mi pequeña Keisy que me haces la vida más fácil y alegre. A mi familia WONT que tanto han sabido comprenderme y animarme y con los que he compartido todo. Gracias a Rosa, Isabel, Eva, Mónica, Raül, Edgar, Alma, Merche, Andrés y Joan. También quiero agradecer el apoyo de mis compañeros del departamento de *Psicologia Evolutiva, Educativa, Social i Metodologia,* y al *Servei de Llengües* de la Universitat Jaume I.

Por último quiero dar las gracias a mis "padres científicos": Marisa, Wilmar y Arnold por su paciencia, ánimo y por sus sabios consejos y e-consejos. De ellos he aprendido muchas cosas, sobre todo su ilusión por la ciencia y la investigación. Pero sobre todo, quiero agradeceros la posibilidad que me habéis dado de crecer con vosotros. Para mi sois el "climax de la eficacia personalizada" y sois un ideal a seguir en todos los sentidos. El esfuerzo realizado en esta tesis ha valido la pena. Espero que este reto redunde en la calidad científica que mis directores y mi equipo de investigación se merecen. Espero haber cumplido mi objetivo y gracias por todo.

TABLE OF CONTENTS

FIGURES

TABLES

CHAPTER 1

Introduction

Introduction

In the most advanced countries, the impact of Information and Communication Technology (ICT) at the workplace is nowadays a reality. ICT is on the increase in most productive sectors, such as in the service sector, in production and in all functional areas of organisations. Data from the Economic and Social Committee (ECOSOC) (Dhondt, Kraan, & van Sloten, 2002) indicate that 34% of all workers use computers, while 36% report no use technology in their work, as opposed to the use of machine technologies (21% of workers) or machine technologies combined with computers (9%). These data are similar to findings reported by the *Third European Survey on Working Conditions* in 2000 which revelas that 41% of all European employees use computers at work (Paoli & Merllié, 2001). According to Dhondt *et al.* (2002) The Netherlands has the highest use of machine technology and computers (around 70% of the work force), while Spain is nearly at the other end of the spectrum with about half of its workers using technologies.

Despite of these differences between the two countries, from 1995 to 1997, the 77.3% of out-dated machines and equipments were replaced in Spanish companies (III National Survey on Work Conditions; INSH, 1997). This significant technological investment continued during 1998 and 1999, with 65% of companies making important or very important renovations and 67.1% use totally new equipments (see IV National Survey on Work Conditions; INSH, 2001). This increase in the use of ICT at work is also observed in the rest of Europe (from 48% of workers in 1991 to 56% in 2000) and the trend is predicted to continue in the future (Paoli & Merllié, 2001). Governments and organisations are conscious of the beneficial aspects of investing resources in innovation. Such investments will allow

organisations' competitiveness to be maintained or enhanced, improving work, company performance, quality of work, economical prosperity and survival in the international market (Peiró, 1990). Despite these benefits of ICT at work, technological changes can produce certain undesired psychosocial effects on workers. These should be prevented and controlled to avoid risks and the negative effects of technological changes (Korunka, Weiss, & Zauchner, 1997c). In this context, the European Union, through its Directives, is attempting to harmonise various occupational prevention measures in all European member states. In Spain, article 16 of the Labour Risk Prevention Law (31/1995, 8th November) states that a risk evaluation must be carried out when work conditions change, such as when a technology is implemented in the workplace. This law appears as a unitary, formal and current measure to establish the bases for efficient job risk prevention. It provides for certain preventive measures concerning both physical and psychosocial risks, such as: the identification of risk factors, taking preventive measures, integrating occupational health and safety and designing jobs accurately. Despite of the relevance of this Law's recognition of the psychosocial factors prevention, more work is still needed in Spain (see Peiró & Bravo, 1999). The picture in The Netherlands is similar but more advanced in prevention than in Spain. Following the introduction of the Working Conditions Act (WCA; 1st October 1990) in The Netherlands, more attention is now paid to the reduction and prevention of psychological risks and job stress, which in turn lead to a decrease in levels of absenteeism and work incapacitation. The WCA is not based on a negative definition of health (i.e., absence of illness) but on a positive definition (i.e., well-being) (see Schaufeli, 1999). In sum, at a European level we can observe a need to adopt measures to assess and prevent the negative

impact of the technology at an individual, social and organisational level (Salanova, Cifre, & Martín, 1999).

One of the most important psychological risks is the phenomenon of *techno*-stress. This is a type of stress related to the introduction of technologies at work. Although technology may turn into a stressor, technology is not responsible *per se* for the negative consequences (e.g., headaches, muscular problems, mental fatigue, physical fatigue, anxiety, boredom) of using technology (Salanova *et al.,* 1999). The problem of *techno*-stress should be studied from a model of `Demands and Resources' (Bakker, Demerouti, de Boer, & Schaufeli, 2003b; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001a) in which job demands and job resources are implicated. Thus, the consequences of *techno*-stress are not direct, but it depends on the relationships established between job demands and job resources. However, Salanova (2004) points out the benefit to consider not only job resources but personal resources in the *techno*-stress process. According to this, the psychosocial impact of demands may be buffered by the presence of available job resources, as well as by personal resources (e.g., efficacy beliefs) (see Salanova, 2004). The relevance of studying *techno*-stress phenomenon lies in evidence found to show how technostress can also lead to burnout in the long term (Salanova & Schaufeli, 2000). As with people who work with `people' (i.e., human service professions), people who work with `data' may also feel exhausted and show cynical attitudes towards their work with ICT, and not feel very competent in the use of technology. Despite the importance of this issue, few studies focus on the relationship between ICT use and burnout (Schaufeli, Keijsers, & Reis-Miranda, 1995a; Salanova & Schaufeli, 2000). In fact, the study of burnout has primarily been restricted to the human

service professions (i.e., people who work with `people'), although it has recently been extended to other occupational groups such as ICT users. Furthermore, recent studies based on Positive Psychology (Seligman & Czikszentmihalyi, 1990) also show technology can facilitate the occurrence of positive experiences at work, such as flow (Chen, Wigand, & Nilan, 1999), individual and group enthusiasm for the task (Cifre, Llorens, Martínez, & Salanova, 2000), a reduction in cynicism and an increase in self-confidence (Salanova & Schaufeli, 2000), motivation and self-efficacy (Coffin & MacIntyre, 1999), and work engagement - the presumed opposite of burnout (Salanova, Grau, Llorens, & Schaufeli, 2001). Since the study of the positive consequences of technology at work is recent, few studies have tested the positive spirals of resources (Hobfoll, 2001) in people working with `data'. Similarly, there is a lack of studies focusing on the antecedents, consequences of technological innovations, and personal variables (i.e., efficacy beliefs) in order to prevent their impact and also optimize the well-being of ICT workers (see Salanova, 2004).

Against this background, the main objective of this dissertation is to test an extension of the Job Demands-Resources Model (Demerouti *et al.,* 2001a) among ICT users, that integrates both negative (in terms of burnout) and positive (in terms of engagement) approaches of employees well-being and one withdrawal consequence (i.e., organisational commitment). Although in general, employees work mainly with either `people' (e.g., nurses, doctors, teachers), `things' (i.e., workers on factory production lines, for example tile workers) and `data' (i.e., ICT users), this thesis is concerned only with this last group: those who work with `data'. Various steps are performed in order to achieve this objective. First, and for a cross-national validation purposes, the model is tested simultaneously

with ICT employees from two European countries: Spain and The Netherlands. In this case, Confirmatory Factor Analyses, Structural Equation Modeling, as well as multigroup analyses were conducted. Secondly, given the relevance of Positive Psychology and personal resources such as efficacy beliefs as intervenient variables in the stress process, the positive spiral models including positive concepts are tested among ICT users in a laboratory longitudinal study. It is expected that the perception of job resources lead to greater levels of efficacy beliefs, which in turn enhance levels of engagement. These levels of engagement lead to more levels of job resources, thus generating a positive circle. The final step, involves testing the intervening role of perceived collective efficacy among ICT users in a motivational process of group work. In this case, interaction effects are tested between job demands and collective efficacy on collective well-being and task performance.

The contributions of this thesis are as follows: (1) the inclusion of specific *techno*-stressors in ICT jobs, since most studies of burnout have focused on human service occupations; (2) negative and positive states of mind, comprise burnout and engagement are included in the model, together with the relationship between them; (3) also for a cross-national validation of the structure and the relationship between burnout and engagement, ICT employees from Spain and The Netherlands are tested together; (4) the role played by efficacy beliefs, as being responsible for the generation of gain spirals models of resources is included; finally, (5) collective efficacy beliefs to explain the effects on collective well-being and performance are analysed.

But why compare Spain and The Netherlands? The answer lies in the differences between the economies, work conditions and cultures of the

two European countries. At an economic level it could be said that in view of its small population (16.25 million inhabitants), the Dutch economy is relatively large (Gross Domestic Product (GDP) of 52.4%). On the other hand, Spain has 42.71 million inhabitants and a GDP of 53.8% (National Institute of Statistics, 2004). The proportion of workers in employment is about 96% in The Netherlands while in Spain it is about 76%, while the average for European countries is 83%. One distinction between Spain and The Netherlands is the relatively high percentage of part-time workers: the highest rates are observed in The Netherlands, where 87% of workers are employed in part-time jobs. This figure falls to 62% of workers in Spain, which occupies the bottom position in the European ranking. Another difference between the two countries is in the hours employees work per week: Spanish (38.4%) workers put in more hours per week than their Dutch counterparts (32.5%) (Paoli & Merllié, 2001). The current unemployment rate is 6.2% in The Nehterlands, lower than in Spain (11.2%) (Statistic Netherlands, 2003; National Institute of Statistics in Spain, 2004). Concerning the work conditions, at present, mental disorders (i.e., chronic job stress and burnout) are the largest diagnostic group for work incapacity, followed by musculoskeletal disorders (28% in Spain and 22% in The Netherlands). Workers in The Netherlands experience the highest levels of work pressure: that is, 58% of the Dutch workers indicate that their work pace is (too) high, against the European average of 42%. Moreover, 32% of Dutch employees report a higher speed of continuous work, against only 16% in Spain. On the other hand, Spanish employees reported a lower degree of control over working hours (30%) compared with Dutch employees (53%). A marked difference is also found between the two countries in the opportunities available to employees to discuss

working conditions and organisational change. While Spanish employees reported the lowest availability of opportunities for discussing such changes (62% of employees), The Netherlands constitutes the country with the greatest responsabilities for this discussion (87% of employees) (see Paoli & Merllié, 2001).

Finally, certain cultural differences might be pointed out between Spain and The Netherlands. According to Hofstede's (1980) classic survey, compared to Spain, The Netherlands is essentially characterised as (1) extremely individualistic (i.e., the Dutch define their identity in terms of personal choices and achievement) (80% in The Netherlands and 51% in Spain), (2) feminine (i.e., Dutch people give more importance to the quality of interpersonal relations and the gender role is less differentiated) (86% in The Netherlands and 58% in Spain), (3) having lower power distance (i.e., subordinates and superiors consider each other as existentially equal and subordinates expect to be consulted (86% in The Netherlands and 38% in Spain). In contrast, Spain is characterised as a higher uncertainty avoidance society (86% in Spain and 53% in The Netherlands). Consequently, the Spanish have a low tolerance for uncertainty and ambiguity, which creates a rule-oriented society that institutes laws, rules, regulations, and controls in order to reduce the amount of uncertainty. Consistently, Smith, Dugan, and Trompenaars (1996) in their study among 11,000 business employees from 43 nations, showed that Dutch employees are more autonomous and egalitarian than Spanish employees (see also Smith, Fischer, & Sale, 2001).

Techno-stress

Stress is considered as a universal phenomenon. Despite of the difficulty of providing a comprehensive definition of psychosocial *stress*, it can be defined as the occurrence of negative emotions (e.g., anger, anxiety and depression) that are evoked by demanding situations (Gaillard & Wientjes, 1994; Warr, 1987). Moreover, it can be conceptualised as a transactional relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being (see Buunk, de Jonge, Ybema, & de Wolff, 1998, p. 149). European Surveys on work conditions in 1995 and 2000 (Paoli & Merllié, 2001) reveal stress to be the second work-related health complaint in European countries. Back pain (which increased from 30% in 1995 to 35% in 2000) lies in the first place, followed by the stress (28% in 1995 and 2000), and finally fatigue (with an increase from 20% in 1995 to 23% in 2000). Similar data are obtained for Spain (IV National Survey on Work Conditions; INSH, 2001), where stress problems are also the second health complaint. Back pain is also responsible for the greatest number of health complaints, increasing from 20% in 1997 to 39% in 1999, while in third place are the muskleskeletical problems affecting upper and lower limbs (increasing from 5.4% in 1997 to 26% in 1999). The most significant data is that although in Spain and the rest of Europe stress is considered the second health complaint, the levels of stress in Spain increased from 15.5% in 1997 to 28% in 1999. In The Netherlands the main diagnosis of incapacitation is related to mental problems (30%) and 27% of long-term sick-leave (6 weeks or more) is stress related (Houtman, 1997). One of the most important consequences of stress at work is absenteeism. This consequence can generate huge costs (i.e., individual

suffering as well as economical or financial costs). Specifically, absenteeism in Europe affects 33% of workers per year (8% in Spain and 17% in The Netherlands), what supposes a mean of four lost working days (Paoli & Merllié, 2001).

One of the reasons behind the increase in European stress levels is related to the introduction of ICT at work. Technology is being rapidly introduced into the workplace and changes are continuous. The latest European Survey shows that 40% of jobs involve the use of ICT. Although the use of technology at work can be seen as a competitive advantage for organisations (for increasing product quality and facilitating communication in and between organisations), certain personal and organisational disadvantages should be taken into account. Rapid changes in technology, difficulties involved in knowing how technology works or the continuous learning process to which ICT users are submitted, are examples of disadvantages of technology which can generate psychosocial problems in both people and in organisations. In this context, *techno-*stress is a specific type of stress related to the use of Information and Communication Technologies at work. *Techno-*stress is not a new phenomenon since it first appeared at the end of the last century. In Salanova's (2004) revision of the concept up to the present, she points out that the term *techno-*stress was first coined by Craig Brod in 1984 in his book *TechnoStress: The Human Cost of the Computer Revolution*. This psychologist defined *techno-*stress as a modern disease of adaptation caused by an inability to cope with new computer technology in a healthy manner. It manifests itself like an "illness" related to the struggle to accept computer technology, which is produced by a lack of efficacy in technology users. This definition was refined and completed by Weil and Rosen in 1997. In their book

Technostress: coping with Technology @work, @home and @play, *techno*-stress is defined as any negative impact on attitudes, thoughts, behaviours, or body physiology that is caused either directly or indirectly by technology. Similarly to the above, *techno*-stress is related to "illness" since the impact technology has taken over our lives including work, through the invasion of e-mails, mobiles, microwaves, television, VCR, hand-held pocker games and calculators, to mention just a few examples. However, this definition is too broad to use in scientific research. Finally, Salanova *et al.* (1999) propose a practical and more comprehensive definition of *techno*-stress as *"a negative psychological state associated to the use of ICT of anticipatory threat of its future use. This state is based on a mismatch between demands and resources related to ICT use, which leads to a high level of unpleasant psycho-physiological activation and to the development of negative attitudes towards ICT"*. According to this definition, *techno*-stress is not produced as a consequence of the negative impact of technology *per se*, but by a relationship between demands and available resources. Moreover, it establishes two main dimensions within *techno*-stress: (1) affective symptoms or anxiety related to the high psycho-physiological activation of the organism and (2) the development of negative attitudes towards ICT (see Salanova, 2004). Because of its ease of comprehension and operationalisation, this will be the definition on which we focus the present thesis.

Research on the consequences of the *techno*-stress phenomenon has shown mixed results (for a revision see Hamborg, & Greif, 2003 and Salanova, 2004). In fact, the use of ICT can influence psychosocial well-being both negatively and positively. Thus, exposure to ICT can generate anxiety, dissatisfaction and burnout over time (Korunka, Weiss, Huemer, &

Karetta, 1995; Prieto, Zornoza, Orengo, & Peiró, 1996; Salanova & Schaufeli, 2000), but also enthusiasm, optimal experiences and engagement (Chen *et al.,* 1999; Cifre *et al.,* 2000). Several scholars have proposed that technology *per se* is neutral. That is, it is not the mere exposure to ICT that is responsible for employee well-being, but rather the quality of the effects depends on other variables intervening in the process such as job demands (e.g., quantitative overload), job resources (e.g., job control) and personal resources (e.g., efficacy beliefs) (Chua, Chen, & Wong, 1999; Salanova *et al.,* 2001; Salanova, Grau, Cifre, & Llorens, 2000a; Salanova & Schaufeli, 2000). If ICT users have the available job resources and personal resources to cope with the demands associated with ICT use, positive consequences will be shown (e.g., engagement and organisational commitment) (Baumeister & Leary, 1995; Meyer & Allen, 1991). On the other hand, if ICT demands exceed job resources and go beyond the user's beliefs in one's own competence, negative effects may be shown (e.g., burnout and low levels of commitment) (Bakker, Demerouti, & Schaufeli, 2003a; Salanova, Schaufeli, Llorens, Peiró, & Grau, 2000b). In view of this, we can only speak of *techno*-stress when we are referring to the negative consequences of ICT use (Salanova, 2004).

Job Burnout

Burnout is defined as a consequence of the exposure to chronic occupational stress because of a low sense of efficacy in managing job demands and enlisting social support in times of difficulties (Leiter, 1992). It refers to the draining of energy, smothering of a fire, extinguishing of a candle or exhaustion of a battery. Burnout is a multidimensional response and is characterised by a breakdown in adaptation. Burnout symptoms are

work-related and are shown in "normal" people with no history of psychopathological suffering. Finally, a decrease in effectiveness and work performance occur because of negative attitudes and behaviours (Maslach & Schaufeli, 1993; Schaufeli & Buunk, 2003).

Burnout has become a key subject with an important interest for researchers. This interest is shown by the increase in the number of articles published on burnout from 2,500 articles in 1990 when the First European Conference about Burnout was held in Poland to 5,500 articles in 1998 (Schaufeli & Enzmann, 1998). An analysis of the *Psycinfo Data Base* reveals 819 articles about burnout from 1999 to the first week of 2004. Different factors are responsible for the interest, development, prevention and treatment of the syndrome (see Gil-Monte & Peiró, 1997; Schaufeli & Enzmann, 1998). Firstly, the high pace of life in western society has increased stress levels and absenteeism rates. Secondly, transformation in the socio-economic and labour market and changes in the economic sector structure (i.e., increment of the service sector, new types of work, introduction of technology at work). The third reason lies in the costs to the company of mitigating problems caused by burnout at individual and organisational levels. Specifically, at an individual level burnout may produce poor levels of physical health, emotional tension, inability to work well, lack of motivation and job satisfaction. On the other hand, at an organisational level, burnout syndrome is characterised by high job turnover, absenteeism, delays, low productivity and low quality. Finally, another reason behind the interest in burnout is found in current legislation that sets out to improve health and the quality of life at work.

The study of burnout has developed in different phases (for a revision see Maslach, Schaufeli, & Leiter, 2001 and Schaufeli & Buunk,

2003). The *pioneering phase* (mid way 1970 to early 1980) was exploratory. Its main contribution was to describe and to identify the basic phenomenon of burnout based on the experience of human service and health care employees. In this phase, the study of burnout focused on care-giving and service occupations (Freudenberger, 1975; Maslach, 1976). Secondly, in the *empirical phase* (1980-1990) more quantitative analyses were conducted using questionnaires and survey methodology. The most important instrument developed in this phase was the Maslach Burnout Inventory-Human Services (MBI-HSS; Maslach & Jackson, 1981) which was designed exclusively for human service occupations. Originally, burnout was defined as "*…a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment than can occur among individuals who do 'people work' of some kind"* (Maslach & Jackson, 1986, p. 1). Emotional exhaustion refers to the depletion or draining of emotional resources caused by interpersonal demands. Depersonalization is identified through the development of negative, callous and cynical attitudes toward the recipients of one's services. Finally, lack of personal accomplishment is the tendency to evaluate one's work with recipients negatively.

In the 1990's burnout research took on new directions, and was boraden out and extended to all occupations, including ICT workers (Bakker, Demerouti, & Schaufeli, 2002; Salanova & Schaufeli, 2000; Salanova, Peiró, & Schaufeli, 2002). Schaufeli and Enzmann (1998) found that "general" job demands (e.g., workload, role conflicts) correlated higher with burnout than recipient-related stressors such as interactions with difficult clients and frequency of contact with chronically ill patients. Moreover, meta-analyses (Cordes & Dougerthy, 1993; Lee & Ashforth, 1996) have identified many correlates of burnout, including lack of social

support, lack of autonomy and poor performance feedback. Outside human service work, burnout was defined as "*a persistent, negative, work-related state of mind in "normal" individuals that is primarily characterised by exhaustion, which is accompanied by distress, a sense of reduced effectiveness, decreased motivation, and the development of dysfunctional attitudes and behaviours at work. This psychological condition develops gradually but may remain unnoticed for a long time by the individual involved. It results from a misfit between intentions and reality at work. Often burnout is self-perpetuating because of inadequate coping strategies that are associated with the syndrome*" (Schaufeli & Enzmann, 1998, p. 36). The Maslach Burnout Inventory-General Survey (MBI-GS; Schaufeli, Leiter, Maslach, & Jackson, 1996) was also developed. In the same way as the original MBI-HSS, the MBI-GS is composed of three dimensions: exhaustion (i.e., the basic individual stress dimension), cynicism (i.e., the attitudinal dimension) and a sense of ineffectiveness (i.e., self-evaluation dimension) (Maslach *et al.,* 2001; Schaufeli, Maslach, & Marek, 1993). Exhaustion is measured by items tapping fatigue but without any explicit reference to 'others' as a source of these negative emotions (i.e., the draining of energy due to excessive efforts at work). Cynicism reflects indifference, detached and distant attitudes towards work in general but not necessarily towards other people. Finally, lack of professional efficacy has a broader focus compared to the parallel original MBI-HSS scale, encompassing both social and non-social aspects of occupational accomplishments. It is the tendency to evaluate one's work negatively and a reduction in feelings of job competence and work performance. High levels of exhaustion and cynicism and low levels of professional efficacy are indicative of burnout. However, there is evidence that exhaustion and

cynicism form the "core of burnout" (Green, Walkey, & Taylor, 1991, p.463). Thus, professional efficacy has been criticised as the third dimension of burnout, since it may be considered nearer to a variable of personality (Cordes & Dougherty, 1993; Shirom, 1989). Empirical research shows the independent role of professional efficacy compared to the dimensions of exhaustion and cynicism (Leiter, 1992; Maslach *et al.,* 2001). Recent meta-analyses confirm this independent role of professional efficacy (Lee & Ashforth, 1996). In fact, some models on the development process of burnout provide evidence in favor that a "crisis of efficacy" as being responsible for burnout. For example, Cherniss (1980, 1993) assumes that lack of confidence in one's own competence is a critical factor in the development of burnout. In the same vein, Leiter (1992) considers that burnout is a consequence of a "crisis in efficacy".

The relevance of burnout and the use of the MBI instruments to evaluate burnout is nowadays evident. The study of burnout has been generalised in different countries around the world as well as in different occupations, such as clerical workers, technical staff and managers (Leiter & Schaufeli, 1996), engineers, university staff (Taris, Schreus, & Schaufeli, 1999), blue and white collar workers (Schutte, Toppinnen, Kalimo, & Schaufeli, 2000), managers, technicians and software developers (Bakker *et al.*, 2002) and in ICT workers (Salanova & Schaufeli, 2000). Since burnout was originally studied in the human services, only a few studies have been carried out into the relationship between *techno*-stress and burnout in ICT workers. Despite this, previous research shows that ICT users are vulnerable to burnout as a consequence of a chronic process of *techno*-stress (Salanova *et al.*, 2000a; Salanova & Schaufeli, 2000; Schaufeli *et al.,* 1995a). Thus, ICT workers can suffer long-term burnout,

feel exhausted and show cynical attitudes towards the use of technology at work. They may feel also their level of competence in their use of ICT is low. Schaufeli *et al.* (1995a) found a positive relationship between burnout and technology use (specifically, complex mechanical ventilation equipment) among intensive care nurses. In this case, results show that the higher the use of technology, the greater the levels of burnout. However, this study did not assume a mediating process of cognitive appraisal and burnout was treated as a latent variable, and therefore differential effects on the three dimensions could not be investigated. Salanova and Schaufeli (2000) also found an effect of technology use on burnout. However, in this case this relationship was not direct but mediated by the experience or appraisal with ICT. Furthermore, Salanova *et al.* (2000a) found a relationship between ICT experience (i.e., computer training) and cynicism through the impact of efficacy beliefs. These results may suggest that burnout is related to feelings of personal, professional and collective incompetence (Grau, Salanova, & Peiró, 2001; Salanova, Cifre, Grau, Llorens, & Martínez, 2003; Salanova *et al*, 2002b).

The 'opposite' of Burnout: Work Engagement

A recent development in burnout research is the shift towards its opposite: work engagement. This is to be seen as part of a more general emerging trend towards a 'Positive Psychology' that focuses on human strengths and optimal functioning rather than on weaknesses and malfunctioning (Seligman & Csikszentmihalyi, 2000). Hence, after 25 years of research on burnout, the recent development based on Positive Psychology is a change towards its opposite: 'engagement' (Maslach *et al.,* 2001). There are two ways of conceptualising engagement. The first is that

burnout and engagement are real opposites. Thus, engagement is defined as the absence of burnout symptoms (i.e., no exhaustion, no cynicism and no reduced competence). Consequently, the same instruments would be used to measure burnout and engagement. Engagement is thus characterised by energy, involvement and efficacy which are the direct opposite of the three burnout dimensions (Maslach & Leiter, 1997). The second conceptualisation considers 'work engagement' as the presence of certain characteristics of its own (i.e., vigor, dedication and absorption). Here, 'engagement' is defined in its own right (Schaufeli, Salanova, González-Romà, & Bakker, 2002b), conceptualised as the positive antithesis of burnout and consequently it can be measured by a specific instrument and not by the opposite profile of MBI score. In this case, burnout and engagement are considered as two independent but related dimensions of energy and identification (Schaufeli & Bakker, 2004). From this point of view, burnout is characterised by low levels of energy and low levels of identification, and engagement is characterised by high levels of energy and high levels of identification.

Accordingly, Schaufeli *et al.* (2002b) define 'work engagement' as a persistent, positive affective-cognitive state of fulfilment in employees that is characterised by vigor, dedication and absorption. Although the concept of engagement is closely related to others such as job involvement, job commitment and job satisfaction, some differences may be established. According to Maslach *et al.* (2001) job commitment and engagement can be differentiated since the former is focuses on the organisation, whereas the latter focuses on the work itself. On the other hand, job satisfaction is the extent to which work is a source of need fulfilment and contentment, or a means of freeing employees from hassles or dissatisfactions; it does not

encompass the person's relationship with the work itself. Finally, job involvement is similar to the dimension of engagement, but in this case energy and effectiveness dimensions are not included. Although empirical research on "engagement" is very recent, there is evidence in favour of the three-factor structure in different samples using tourism workers (Grau, Llorens, Burriel, Salanova, & Agut, 2004), secondary school teachers (Llorens, García, Salanova, & Cifre, 2003) and technology workers (Salanova *et al.* 2000b, 2001; Schaufeli *et al.,* 2002b). In the same way as in burnout studies, only vigor and dedication are considered the "core of engagement" (Llorens *et al.,* 2003a; Salanova *et al.*, 2003). The third dimension (i.e., absorption) has been criticised as a component of engagement. Absorption was found to be a constituting element of engagement following some thirty in-depth interviews (Schaufeli, Taris, Le Blanc, Peeters, Bakker, & de Jonge, 2001) and it comes close to the "flow" concept: a state of optimal experience that is characterised by focused attention, clear mind, mind and body union, effortless concentration, complete control loss of self-consciousness, distortion of time and intrinsic enjoyment (Csikszentmihalyi, 1999, 2000). In fact, Salanova, Martínez, Cifre, and Schaufeli (2002a) points out the factor structure of flow, which includes the three following dimensions: perceived competence, intrinsic motivation and absorption.

According to Schaufeli and Bakker (2004) burnout and engagement are considered as two independent but negative related states of mind that may be part of a more comprenhensive taxonomy, comprising the two independent dimension of energy and identification. Accordingly, burnout can be characterised by a combination of low energy (i.e., exhaustion) and low identification (i.e., cynicism), whereas engagement is characterised by

high energy (i.e., vigor) and high identification (i.e., dedication). Moreover, empirical research provides evidence to suggest that exhaustion and vigor and likewise cynicism and dedication (i.e., identification dimension) are strongly related to each other (García *et al*., 2004; Grau *et al.,* 2004; Llorens *et al.*, 2003a). Finally, the dimensions of professional efficacy and absorption are *not* direct opposites; rather, they are conceptually distinct aspects that are not the end points of some underlying continuum.

While the studies of burnout in ICT samples are few, those in which the relationship between positive consequences and technology is tested are even more scarce. Despite the lack of studies, there is evidence for positive consequences on well-being of technology at work (for a revision see Salanova, 2004). According to Chen *et al.* (1999) the Internet can facilitate the occurrence of positive experiences at work (i.e., flow). In these situations, Internet users feel enjoyment, challenges, a sense of control over the system and absorption in tasks. Moreover, other research has shown that ICT use may increase both individual and group enthusiasm for the task (Cifre *et al.,* 2000), a reduction in cynicism and an increase in self-confidence (Salanova & Schaufeli, 2000), motivation, self-efficacy (Coffin & MacIntyre, 1999) and engagement (Salanova *et al.,* 2001). According to this, when the use of ICT involves an increase in job resources (e.g., increase in job control, social support, competence) these act as work motivators, which can increase the levels of vigor and dedication at work (i.e., engagement). This positive experience can also generate optimal experiences at work (flow) (Chen *et al.,* 1999).

The Job Demands-Resources Model: a Framework to Integrate Techno-stress, Burnout and Engagement

A model that allows the process of *techno-*stress to be explained is the Job Demands-Resources model (JD-R) (Bakker *et al.,* 2003b; Demerouti *et al.,* 2001a). This is a heuristic and parsimonious model based on the previous models to explain the job stress. Following recent approaches to explain stress, it is based on the interactive process between person and environment. According to this, the cognitive, appraisal and mediational processes intervene between stressors and stress reactions (Karasek & Theorell, 1990; Lazarus & Folkman, 1984). Consequently, job stress is a complex process in which job demands, job resources and stress consequences play a key role. The Demands-Control model developed by Karasek (1979; Karasek & Theorell, 1990) has partly inspired the JD-R model. According to Karasek's model (1979) stress consequences are provoked by the combination of two job characteristics: job demands and job control. Thus, jobs with high psychological demands and low job control are the most stressful jobs. However, the multiplicative effects of demands x control proposed by the model were not always obtained. Because of this, research has suggested the need to extent the model to include other job resources, such as social support, feedback, and task variety (Karasek & Theorell, 1990; Salanova *et al.,* 2002b; Schaufeli, 1999).

In this sense, the Demands-Resources model (Bakker *et al.,* 2003a; Demerouti *et al.,* 2001a) involves a further step characterised by its generality: it can be used in different occupations, regardless of the specific demands/resources of a particular job. Accordingly, the JD-R model proposes two general assumptions. The first is that risk factors can be classified into two general categories: job demands and job resources. Job

demands refer to those physical, psychological, social or organisational aspects of the job that require sustained physical and/or psychological effort and are therefore associated with certain physiological and/or psychological costs. Accordingly, job demands are not necessarily negative, but they may turn into job stressor when implies high effort and it is associated with high cost which may produce negative outcomes (e.g., anxiety, burnout) (cf. Schaufeli & Bakker, 2004). For instance, work overload, time pressure, role conflict and emotional demands are considered examples of job demands in different studies (e.g., Dorman & Zijlstra, 2003; Llorens & Salanova, 2000; Wall, Corbet, Jackson, & Martin, 199). In addition, based on the theories of health promotion (Antonovski, 1987) this model includes `protector' factors, known as resources. Job resources refer to the physical, psychological, social or organisational aspects of the job that are functional in achieving work goals, reducing job demands and their associated physiological and psychological costs and, stimulating personal growth, learning, and development. For instance, the presence of job control, social support and feedback are examples of relevant resources in previous studies on different samples (e.g., Grau *et al.*, 2001; Pallarés & Rosel, 2001; Salanova & Schaufeli, 2000).

An innovation in the model is that it allows for the integration of the most traditional negative (i.e., burnout) as well as positive approaches (i.e., engagement) of employee's well-being. Accordingly, the second assumption of the model is that irrespective of the type of job or occupation, two psychological processes are involved in explaining burnout and engagement: *erosion* and *motivation processes*. The first process begins with chronic job demands which may result in constant overtaxing and may lead in the long term to exhaustion, health problems (e.g.,

burnout), sickness absenteeism, turnover intentions and lack of organisational commitment (e.g., Bakker *et al.,* 2003a; Demerouti, Bakker, & Bulters, 2004; Demerouti *et al.,* 2001a). In the *motivation process*, job resources have motivational potential and in addition, a lack of job resources may have detrimental effects on workers´ motivation and performance, as they preclude actual goal accomplishment, which causes failure and hence frustration and further leads to withdrawal behaviour. In job positions with high job demands and limited job resources, we expect that employees develop exhaustion, cynicism and lack of professional efficacy (Bakker *et al.,* 2002; Demerouti, Bakker, de Jonge, Janssen, & Schaufeli, 2001b). In that situation, a reduction of motivation and withdrawal from the job may constitute important self-protection mechanisms that may prevent the future frustration of not obtaining work-related goals (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003c). In contrast, the availability of resources stimulates personal development and increases motivation (Bakker, Demerouti, & Verbeke, 2004c). This process may be responsible for the increase in engagement (Bakker *et al.*, 2003a; Demerouti *et al.*, 2001a, 2001b) and in different positive outcomes such as job satisfaction, low absenteeism, low personnel turnover, and high organisational commitment (Baumeister & Leary, 1995; Schaufeli & Bakker, 2004; Schaufeli *et al.,* 2002b). Various scholars have provided evidence of the relevance of the JD-R model in different occupations (Bakker *et al.,* 2003c; Bakker, Euwema, & Demerouti, 2004a; Demerouti *et al.*, 2001a) including ICT workers (Bakker *et al.,* 2003a; Lewig & Dollard, 2003). Accordingly, the JD-R model can be applied in different contexts, by integrating a broad range of demands and resources regardless of the type of occupations. Consequently, the JD-R model can also be used to predict

*techno-*stress. According to the basic assumption of the model, *techno-*stress may be produced as a consequence of the presence of high demands related to ICT through the *erosion process*. On the other hand, if the use of ICT implies an increase in job resources (i.e., increase in job control, social support) these resources may play a motivator role and positive consequences can be shown (e.g., engagement, flow) through the *motivation process* (see Salanova, 2004).

Within this framework, *techno-*stressors can be divided in two general categories: demands and resources. The demands refer to the physical, psychological, social or organisational aspects of the job related to technology, that require sustained physical and/or psychological effort and are therefore associated with certain physiological and/or psychological costs (e.g., anxiety, burnout). Various studies with ICT workers point out that the main demands related to technology are the quantitative overload, routine (Salanova *et al.,* 1999; Wall *et al.,* 1990) as well as emotional demands (Dorman & Zijlstra, 2003; Zapf, Isic, Bechtoldt, & Blau, 2003). Carrying out many tasks under time pressure is considered to be a major demand in ICT contexts (Carayon-Sainfort, 1992; Hovmark & Norell, 1993). Monotonous work, or few demands without mental effort is also considered a demand in the ICT context (see also Salanova, 2004; Salanova *et al.,* 1999; Warr, 1987). The increasing pace of innovation is also responsible for emotional load. Although emotional overload has been considered a specific demand in employees who work with `people' (Bakker, Schaufeli, Sixma, Bosveld, & Van Dierendonck, 2000b), research shows that it may also be observed in other occupations, for example among ICT workers (Bakker *et al.,* 2003a; Dorman & Zijlstra, 2003). Llorens and Salanova (2000) in a study on 140 workers using ICT, found that the workers with

high emotional overload felt higher levels of anxiety, depression and burnout and lower levels of engagement. The relevance of emotional demand in technology contexts coincides with the fact that organisations have turned into emotional places, which are involved in delivering services of a kind (Ashkanasy, Haertel, & Zerbe, 2000; Dorman & Zijlstra, 2003; Lewig & Dollard, 2003; Zapf, Seifert, Schmutte, Martini, & Holz, 2001). Contrary to expectations about the negative effects of mental load as responsible of mental fatigue (Salanova *et al.,* 1999; Wall *et al.,* 1990) and a reduction in performance (Lorist, Klein, Nieuwenhuis, de Jong, Mulder, & Meijman, 2000), stress and well-being (Zijlstra, 1993), mental overload is not considered a demand in recent research on stress in ICT samples (Bakker *et al.,* 2003a). In fact, Llorens and Salanova (2000) found in a sample of 140 ICT workers that those workers with high mental demands (in terms of attention, concentration, multi-tasking) showed lower levels of burnout and higher levels of well-being (i.e., engagement and professional efficacy). Zijlstra, Roe, Leonora, and Krediet (1999) found interesting results in an experiment with professional office workers in Dutch and Russian employees: although the Russian participants respond negatively to mental demands, the emotional state of Dutch employees improved and their effort decreased. According to these authors differences in professional background, skills and expectations of the employees are explaining this divergence. Thus, employees who are accustomed to work with high levels of mental overload perceive this mental work as normal, an consequently is interpreted as a challenge rather than stressors. Consequently, this may stimulates positive feelings and a reduction of effort .

On the other hand, job resources refer to the physical, psychological, social or organisational aspects of the job with technology that are either/or functional in achieving work goals, reducing job demands and the associated physiological and psychological costs and, stimulating personal growth, learning, and development. The main resources in ICT contexts are the level of job control, social support, as well as the feedback related the performance of the task with ICT, training and supervision (Grau *et al.,* 2001; Korunka, Weiss, & Kareta, 1997a, 1997b; Salanova *et al.,* 1999; Salanova & Schaufeli, 2000). Thus, the capacity to decide when to carry out given tasks and the method used to do them (Jackson, Wall, Martin, & Davis, 1993; Jones & Fletcher, 2003; Zapf *et al.,* 2003); receive social support from co-workers and supervisor about the use of ICT and computers problems (Bliese & Britt, 2001; Jones & Fletcher, 1996); receive adequate information about the performance of the work with ICT (Bakker *et al.*, 2003a; Hackman & Oldham, 1980), as well as training courses (Korunka & Vitouch, 1999; Korunka, Weiss, & Kareta, 1993; Llorens, Salanova, & Grau, 2003b) are recognised as an important resources in technology contexts which have positive effects on subjective well-being of ICT users.

Efficacy Beliefs as a Personal Resource on Techno-stress

As mentiones above, according to the JD-R model *techno-stress* will occur when two general condition are present: high job demands and low job resources. In this model, as well as in previous ones (e.g., the Demands-Control Model), *only* demands and resources related to the job are included. However, there is now evidence of the crucial role of personal resources in coping with job demands (Salanova *et al.,* 1999). One

personal resource with a great impact on the process of *techno-stress* is efficacy beliefs. According to the Bandura's Social Cognitive Theory (1997, 1999, 2001) efficacy is defined as the "*beliefs in one's capabilities to organise and execute the course of action required to produce given attainments*" (Bandura, 1997; p.3). The principal source of efficacy beliefs is mastery experiences, which depend on both real and perceived execution of the task. Other sources are verbal persuasion of others, vicarious experience and the interpretation of somatic and emotional activation. Research shows that one's own belief of efficacy can determine the motivation, affect, thought and action (Bandura, 2002; see also Garrido, 2000). People avoid doing tasks that exceed their capacities and do those they are capable of managing. Moreover, efficacy beliefs may act as an important determinant of the effort and persistence in pursuing goals (Bandura, 1997). According to Schwarzer (1999) individuals with low efficacy beliefs show pessimistic thoughts about their performance and personal development, and consequently, these low efficacy beliefs are associated with depression, anxiety and helplessness. In contrast, a strong sense of belief in oneself facilitates cognitive and executive processes in multiple contexts, influencing for example, decision making and academic achievement (Bandura, 1997; Schwarzer, 1999). In the same way, positive efficacy beliefs are related to persistency, dedication and satisfaction with tasks undertaken (Garrido, 2000; Salanova *et al.,* 2000a, 2003; Salanova & Schaufeli, 2000).

Although research often does not explicitly differentiate between *generalised* (Schwarzer, 1999) (i.e., the confidence in one's own coping skills that is manifested in a wide range of challenging situations; it is broad and stable nature) and *specific* efficacy beliefs (Cherniss, 1993; Murphy,

Coover, & Owen, 1989; Schaubroeck & Merrit, 1997), previous research supports the use of *specific* measures of efficacy beliefs in specific domains since it produces more robust results (e.g., Grau *et al.*, 2001; Salanova *et al.*, 2002b). Theoretically speaking, efficacy beliefs are domain-specific, since a person's efficacy beliefs are very likely to differ depending on the activity to which they are related (Bandura, 1997, 1999). Accordingly, efficacy beliefs as a specific construct are understood as the beliefs concerning the level of competence in particular situations. Therefore, in the current study, instead of generalised efficacy, we included a specific measure of work-related efficacy. In the field of work, Cherniss (1993) introduced the concept of professional efficacy, understood as the belief in the ability to correctly fulfil one's professional role, and operationalised it using the *Maslach Burnout Inventory-General Survey (MBI-GS;* Schaufeli *et al.*, 1996).

There is considerable research evidence for the direct (main) effect of efficacy beliefs on performance and well-being at work (Bandura, 1999, 2001). However, there has been little empirical research on the moderating role played by efficacy beliefs in job stress processes. For example, Jex and Bliese (1999) found a two-way interaction effect between job demands and generalised efficacy beliefs. Efficacy beliefs moderated the relationships between work hours, quantitative overload and the task meaning with some strain variables such as job dissatisfaction, physical symptoms, and poor organisational commitment. In the same way, but using specific measures of efficacy beliefs, Schaubroeck and Merrit (1997) provide evidence for the moderated role of job efficacy beliefs between job demands and job control predicting blood pressure. A similar moderating role of efficacy beliefs has been obtained in ICT samples. For instance,

Grau *et al.* (2001) found a two-way interaction effect between demands (routine and role conflict) and efficacy beliefs (in this case professional efficacy) on burnout in employees working with ICT. In the same situation with high demands (high routine and high role conflict), workers with high levels of efficacy beliefs, showed lower levels of cynicism than those with lower efficacy. Similar results were obtained by Salanova *et al.* (2000a) who found a two-way interaction between ICT exposure (i.e., computer training) and efficacy beliefs on cynicism. For workers higher in computer efficacy beliefs, the levels of cynicism decreased when computer training was intensive. However, for workers lower in computer efficacy beliefs, the opposite effect was found. The basis for this is control as a key factor in the stress process. According to Bandura (1997), the experience of stress is produced by a low efficacy for exercising control over stressful situations. Thus, if people believe that they can , they produce the desired results through their actions. Contrarily, if the environment hinders them, they will give up and become exhausted and cynical.

A recent development in the research on efficacy beliefs is the study of collective efficacy. Social Cognitive Theory has extended the concept of human agency to collective agency. Perceive collective efficacy can be defined as a group's shared belief in its conjoint capabilities to organise and execute the courses of action required to produce given levels of attainment (Bandura, 1997, see also Martínez, 2004). As Bandura (1999) highlights, group performance is the product of interactive and coordinated dynamics of its members. Therefore, perceived collective efficacy is not simply the sum of the efficacy beliefs of individual members. Rather, it is an emergent group-level property. Although individual and collective efficacy differ in their unit of agency, both efficacy beliefs serve similar

functions and operate through similar processes (Bandura, 2001). For example, research has shown that the stronger the belief individuals hold on their collective capabilities, the more the group achieves. It was found that a strong collective sense of efficacy fosters high group effort and task performance (Bandura, 1993; Gibson, 1995; Hodges & Carron, 1992; Little & Madigan, 1994; Prussia & Kinicki, 1996; Sampson, Raudenbush, & Earls, 1997). Additionally, similarly to individual-level efficacy beliefs, group-level efficacy beliefs may buffer occupational stress by providing group members with social support when dealing, for instance, with new technological systems and/or when under time pressure (Cohen & Wills, 1985; Gore, 1987). Also, perceived collective efficacy may have a buffering effect by providing group members with the means necessary to actually reduce job demands (Beehr, 1995; Jex & Bliese, 1999). Moreover, similarly to individual efficacy beliefs, a strong sense of perceived collective efficacy may boost collective well-being as well as group task performance (Jex & Bliese, 1999; Schaubroeck, Lam, & Xie, 2000). According to Social Cognitive Theory (Bandura, 2001; see also Garrido, 2000), both types of efficacy have similar functions and are construed by the same sources. Mastery experiences and the interpretation of emotional and somatic states are two of the main sources for increasing both individual and collective efficacy beliefs.

To sum up, individual and collective efficacy beliefs play a relevant variables that seems to buffer the negative effects of job demands on strain at work. Accordingly, we should integrate efficacy beliefs as a personal resource into the JD-R Model. *Techno-*stress should be considered a process in which two general job conditions are implicated: job demands and job resources. However, in this relationship the presence of personal

resources like efficacy beliefs is intervening in the process. In fact, ICT users may feel optimal experiences and engagement when ICT increase levels of job resources and personal resources which can cope the high levels of job demands.

Positive Spirals of Resources, Efficacy Beliefs and Engagement

If the study on the moderator effects of efficacy beliefs in the stress process is recent, few research has shown the mediator role of efficacy beliefs. Despite of this, different studies have pointed out the mediator role of efficacy generating positive spirals of resources in different samples. For instance, Salanova (2003) and Salanova, Bresó, and Schaufeli (2004a) provide evidence of this mediator role of efficacy beliefs between past success and levels of engagement in a sample of university students from Spain and Belgium. Past academic success leads to greater levels of efficacy beliefs, which in turn, increase the levels of engagement, which in turn lead to higher levels of efficacy beliefs in future academic success. Thus, a positive spiral of past success, efficacy beliefs, engagement and future efficacy was generated. Similar positive spiral has been obtained using a longitudinal study in secondary teachers (Llorens *et al.,* 2003a). In this study, the perception of facilitators at work leads to high levels of engagement (i.e., vigor and dedication), which in turn enhance levels of efficacy beliefs. These efficacy beliefs then generated the perception of more facilitators in the future and so on.

These studies give empirical support towards the pure mediator role of efficacy beliefs in the positive approach of employees well-being, and find evidence for the positive spiral of resources proposed by the Conservation Of Resources theory (COR; Hobfoll, 1989, 2001, 2002).

According to this theory, resources are defined as "*… those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, conditions or energies*" (Hobfoll, 1989, p. 516). The model identifies four kinds of resources whose loss and gain results in stress or well-being, respectively: (1) *Object resources* which are valued because of some aspects of their physical nature or because of their acquiring secondary status value based on their rarity and expense (e.g., a home, a car, cloth), (2) *Conditions* which are resources to the extent that they are valued and sought after (e.g., marriage, tenure, emplyment), (3) *Personal characteristics* which are resources to the extent that they generally aid stress resistance (e.g., social support, efficacy beliefs, skills), and (4) *Energies* since their value in aiding the acquisition of other kinds of resources (e.g., time, money, knowledge) (cf. in Hobfoll, 1989). In general, the COR theory states that resources are important since (1) they have instrumental value to people and (2) they serve as a means of obtaining those resources that are valued (Hobfoll & Freedy, 1993). According to this, resources are motivating in their own right. Consequently, "*people strive to retain, protect and build resources and what is threatening to them is the potential or actual loss of these valued resources*" (Hobfoll, 1989, p. 156). Stress is produced when: (1) resources are threatened, (2) resources are lost, or (3) when individuals invest resources and do not reap the anticipated level of benefits (Hobfoll, 1989, Hobfoll & Freedy, 1993).

Furthermore, the COR model also suggest the acquisition and facilitation of resources as a central motivational construct, which may generate positive gain spirals of resources (Hobfoll, 2001). Since resources are valued either in their own right or because they enable the acquisition

ore preservation of other valued resources, people are motivated to create resources. This motivation drives people to invest resources in order to enrich their resource pool. For instance, individuals invest their love and affection to receive a return love, esteem, affection and security; people also can invest their time and energy in order to receive power and money. Once resources are obtained two positive effects may be produced. Firstly, the vulnerability to future loss is reduced. For example, individuals who posses self-esteem are less shaken by job lay-offs, and in turn, are less likely to have marital problems that ensue, with the likelihood of further loss of self-esteem during a prolonged job search. Secondly, people are motivated to protect resources by enhancing other resources (Hobfoll, 1989, 2002). For instance, people invest money to increase knowledge; workers invest time for the salary that will afford them a reasonable life style, job security (Hobfoll, 1993). In the same way, those people with social skills are likely to successfully engage their environment and receive more positive feedback from others (Hobfoll & Leiberman, 1987; Hobfoll & Lerman, 1989). The COR model predicts that when such investment does provide a good return and, consequently the goals are achieved, people experience this as a gain. This resource gain increases the resource pool, which makes it more likely that more resources will subsequently be acquired. Accordingly, those people who gain resources are most vulnerable to gain more resources, generating a positive spiral of resources. Consequently, resource gain may develop efficacy beliefs (Ozer & Bandura, 1990; Bandura, 1997) and increase motivation and well-being (e.g., engagement) (Antonovski, 1987; Bakker *et al.*, 2004c; Hobfoll, 2001; Ryan & Frederick 1997) generating the positive spirals found previously (e.g., Llorens *et al.,* 2003a; Salanova *et al.,* 2004a).

The Present Thesis

This doctoral thesis details five empirical studies. The main research questions can be summarised as follows.

In *Study 1* (see Chapter 2), the factorial structure of individual 'burnout' and its opposite 'work engagement' is tested in two European countries, on Spanish and Dutch ICT employees. Specifically, the central aim of this chapter is to examine the factorial structure of the MBI-GS (*Maslach Burnout Inventory-General Survey*; Schaufeli *et al.,* 1996) and the UWES (*Utrecht Work Engagement Scale*; Schaufeli *et al.,* 2002b) instruments among employees working with ICT. In addition, we examine cross-national differences on the psychometric properties of these instruments by comparing data collected from Spain and The Netherlands. This study also contributes to the current discussion on the relationship between burnout and engagement by investigating the higher-order factor structure of the burnout and work engagement measures in the two countries. In this case, certain research questions are posed: (a) *Is the basic three-factor structure of `burnout´ the best one in Spain and The Netherlands?*, (b) *Is the basic three-factor structure of the 'engagement' the best one in the two countries?* and (c) *How are burnout and engagement related in the two countries?* At this point, we expect that: (1) the original three factors of the MBI-GS (i.e., exhaustion, cynicism and professional efficacy) will fit the data better than the one-factor structure model independently and *across* the two countries; (2) the three-factor structure of the UWES (i.e., vigor, dedication and absorption) will show a better fit to the data than a one-factor model independently and *across* the two countries; (3) we expect that a two-factor model that includes the original three-dimensions of burnout (i.e., exhaustion, cynicism, professional efficacy) and the original

three-dimensions of engagement (i.e., vigor, dedication, absorption) will be obtained independently and *across* the two samples. However, factor loadings and covariances between the dimensions may obtaine *across* both Spain and The Netherlands.

Study 2 focused on the structure of the demands and resources between Spain and The Netherlands. In Chapter 3, several job characteristics known 'demands' and 'resources' are explored in the Spanish and Dutch workers using Confirmatory Factor Analyses. The research question related to this section is the following: *How are job demands and job resources related in the two countries?*. We expect that a two-factor model with correlated dimensions of demands (i.e., quantitative and emotional overload) and resources (i.e., job control, social support and performance feedback) will fit the data better than a one-factor model, independently and *across* the two countries and (2) all specific demands and resources will be negatively correlated for each of these samples independently and across Spain and The Netherlands.

Study 3 tests the Job Demands-Resources model using Structural Equation Modeling analyses including both negative (i.e., burnout) and positive approaches to employee well-being (i.e., work engagement) and organisational commitment as an outcome (see Chapter 4). For cross-cultural purposes, this model is also tested in two European countries: Spain and The Netherlands. This study comprises two different research questions which are: (a) *How do job demands and job resources relate to burnout and engagement across both countries?*, and (b) *How do burnout and engagement relate to organisational commitment across both countries?* At this point, we expect that: (1) the JD-R model with dual processes (i.e., erosion and motivational processes) will fit the data better independently

and *across* the two countries; (2) job demands will be primarily and negatively related to organisational commitment through the impact of burnout (i.e., erosion process). Thus, burnout will mediate the relationship between job demands and organisational commitment independently and *across* the two countries, and (3) job resources will be primarily and positively related to organisational commitment through their impact on engagement (i.e., motivational process). Specifically, we hypothesize that engagement will mediate the relationship between job resources and organisational commitment independently and *across* Spain and The Netherlands. However, factor loadings, covariances and regression weights in the model may be different *across* both European countries.

Given the relevance of the positive approach, we carry out a field study. In this case, students rather than employees are used in a laboratory setting. In **Study 4**, we use a two-wave longitudinal design among 110 ICT users working in internet-chat groups (see **Chapter 5**). We are interested in discovering the relationship between task resources (i.e., time control and method control), the core of engagement (comprising vigor and dedication), and efficacy beliefs. In this study, more complex analyses are made including causal, reverse and reciprocal relationships between the variables in order to test the positive spiral of resources, efficacy and engagement. The research questions posed are as follows: (a) *do personal resources mediate the relationship between job resources and work engagement?* and (b) *does engagement increase personal and job resources?* At this point, we expect that: (1) specific work-related efficacy beliefs mediate the relationship between task resources (i.e., time and method control) on the one hand and engagement (i.e., vigor and dedication) on the other hand; (2) there are

reciprocal relationships between task resources, efficacy beliefs and engagement. That is, it is supposed that work engagement leads to stronger efficacy beliefs and more perceived task resources.

Taking into account the relevance of collective efficacy beliefs, in **Chapter 6** we also perform ***Study 5*** which comprise another longitudinal lab experiment as well. This study investigates the relevance of collective efficacy beliefs as intervening variable in collective well-being and group performance. In this case, MANOVAs are using to test interaction effects between the group communication system (i.e., chat vs. face-to-face), time pressure and collective efficacy beliefs on collective subjective well-being (i.e., collective anxiety and engagement) and task performance. We ask the following questions regarding subjective well-being: (a) *does perceive collective efficacy moderate the relationship between Group Communication System (chat vs. face-to-face) and collective well-being (i.e., anxiety, engagement)?,* (b) *does perceive collective efficacy moderate the relationship between time pressure (time pressure vs. no time pressure) and collective well-being?* and (c) *does perceive collective efficacy moderate the relationship between Group Communication System X time pressure on collective well-being?* At this point we expect that: (1) the combination of a chat system and low levels of perceived collective efficacy will lead to an increase in collective anxiety and a decrease in collective engagement; (2) the combination of time pressure and low levels of perceived collective efficacy will lead to an increase in collective anxiety and a decrease in collective engagement and (3) the combination of a chat system, time pressure and low levels of perceived collective efficacy will lead to an increase in collective anxiety and a decrease in collective engagement. As far as task performance is concerned, we ask the

following: (d) *does perceive collective efficacy moderate the relationship between Group Communication System and task performance?,* (e) *does perceive collective efficacy moderate the relationship between time pressure and task performance?* and (f) *does perceive collective efficacy moderate the relationship between Group Communication System X time pressure on task performance?* At this point we expect that: (4) the combination of a chat system and low levels of perceived collective efficacy will lead to poorer task performance; (5) the combination of time pressure and low levels of perceived collective efficacy will lead to poorer task performance; (6) the combination of a chat system, time pressure and low levels of perceived collective efficacy will lead to poorer task performance.

Finally, in **Chapter 7** general conclusions and the most salient results of each chapter are summarised and discussed. The studies' theoretical and practical implications, limitations and directions for future research are also presented.

CHAPTER 2

The Measurement of Burnout and Engagement

The Measurement of Burnout and Engagement[1]

Summary

This study examines the psychometric properties of job burnout and work engagement in two countries, namely Spain and The Netherlands. More specifically, the factorial structures of the Maslach Burnout Inventory – General Survey (MBI-GS) and the Utrecht Work Engagement Scale (UWES) were examined simultaneously, as well as the relationship between burnout and engagement. The sample was made up of 654 Spanish and 477 Dutch employees, all working with Information and Communication Technology. Results of multi-group analyses confirmed the proposed three-factor structure of both the MBI-GS (consisting of exhaustion, cynicism and professional efficacy) and the UWES (comprising vigor, dedication and absorption). Furthermore, additional higher-order factor analyses showed that an alternative model including the core of burnout (exhaustion and cynicism) and the core of engagement (vigor and dedication) best fitted the data of both samples. Although the lower- and higher-order factor structure of burnout and engagement were very similar across samples, some cross-national differences were observed as well. The findings are discussed in the light of the ongoing debate on burnout and its presumed opposite, i.e., work engagement.

Introduction

Two recent trends characterise burnout research (Maslach, Schaufeli, & Leiter, 2001). First, the concept of burnout has been expanded to other occupations than the human services. Research has indeed confirmed that the basic characteristics of burnout – feelings of exhaustion, cynicism and reduced professional efficacy – can be observed in virtually any occupational group (e.g., Bakker, Demerouti, & Schaufeli, 2002; Demerouti, Bakker, Vardakou, & Kantas, 2003; Leiter & Schaufeli, 1996). Second, researchers

---

[1] Llorens, S., Salanova, M., Bakker, A.B., & Schaufeli, W.B. (2004). Burnout and Engagement among Information and Communication Technology Workers: A Cross-Cultural Study. *Submitted for publication*

have started to investigate the presumed opposite of burnout – work engagement.

The central aim of this study is to examine the factorial structure of two instruments that can be used for the assessment of burnout and engagement. The *Maslach Burnout Inventory – General Survey* (MBI-GS; Schaufeli, Leiter, Maslach, & Jackson, 1996) and the recently proposed *Utrecht Work Engagement Scale* (UWES; Schaufeli, Salanova, González-Romà, & Bakker, 2002b) will be investigated among employees working with Information and Communication Technology (ICT). In addition, we will examine cross-national differences in the psychometric properties of the MBI-GS and UWES, by comparing data collected in Spain and The Netherlands. The study also contributes to the debate on the relationship between burnout and work engagement by investigating the higher-order factor structure of the measures used to assess both constructs.

Burnout and its Measurement

Burnout has been defined as a persistent, negative, work-related state of mind in "normal" individuals that is primarily characterised by feelings of exhaustion, the development of dysfunctional attitudes at work (cynicism), and a sense of reduced professional efficacy (Schaufeli *et al.,* 1996; see also Schaufeli & Enzmann, 1998). This definition is broader than the original definition of Maslach and Jackson (1986), who argued that burnout would particularly occur among individuals who do 'people work' of some kind. To enable the assessment of burnout in any occupational group, Schaufeli *et al.* (1996) developed the MBI-GS. This instrument includes three subscales: exhaustion, cynicism, and reduced professional efficacy. Exhaustion is measured by items tapping fatigue but without any explicit

reference to 'others' as a source of these negative emotions (i.e., the draining of energy due to excessive efforts at work). Cynicism reflects indifference, detached and distant attitudes towards work in general but not necessarily towards other people. Finally, lack of professional efficacy encompasses both social and non-social aspects of occupational accomplishments. It is the tendency to evaluate one's work negatively and a reduction in feelings of job competence and work performance. High levels of exhaustion and cynicism and low levels of professional efficacy are indicative of burnout. Thus, burnout not only includes an affective response (i.e., exhaustion) that is similar to an orthodox job strain variable, but it also includes a cynical and sceptical attitude towards work together with a negative evaluation of one's efficacy at work.

Research on the psychometric qualities of the MBI-GS has shown that the three-factor structure of the MBI-GS is invariant across different occupations, including clerical workers, technical staff, nurses and managers (Leiter & Schaufeli, 1996), engineers and university staff (Taris, Schreus, & Schaufeli, 1999), blue and white collar workers (Schutte, Toppinnen, Kalimo, & Schaufeli, 2000), human services, managers, technicians and software developers (Bakker *et al.,* 2002), and ICT employees (Salanova, Schaufeli, Llorens, Peiró, & Grau, 2000b; Schaufeli *et al.,* 2002b). In addition, cross-cultural studies on burnout using the MBI-GS suggest that its three-factor structure is invariant across different nations, including Finland, Sweden and The Netherlands (e.g., Schutte *et al.,* 2000). It should be noted that the majority of these studies have shown that one cynicism item ('I just want to do my job and not be bothered') does not load on the intended factor, and is therefore excluded from the cynicism scale (Salanova & Schaufeli, 2000; Salanova *et al.,* 2000b; Schutte *et al.,* 2000). On

the basis of these findings, the first objective of this chapter is to test the invariance of the three-factor structure of the MBI-GS across a sample of Spanish and Dutch ICT workers.

Work Engagement and its Measurement

The second development in burnout research is the shift towards the study of the presumed opposite of burnout – work engagement (see Maslach *et al.,* 2001; Schaufeli *et al.,* 2002b). This development coincides with the recent trend in psychology to focus on human strengths, virtues and optimal functioning rather than on weaknesses and malfunctioning (Seligman & Csikszentmihalyi, 2000). Engagement is defined as a persistent, pervasive and positive affective-motivational state of fulfilment in employees, a work-related state of mind that is not focused on any particular object, event, individual or behaviour (Schaufeli *et al.,* 2002b). It includes three dimensions, namely vigor, dedication and absorption. Vigor refers to a high level of energy and mental resilience while working, the willingness to invest effort in one's work, the ability to not be easily fatigued and persistence even in the face of difficulties. Dedication is a strong involvement in one's work, accompanied by a sense of significance, enthusiasm, inspiration, pride and challenge. Finally, absorption is characterised by being fully concentrated on and deeply engrossed in one's work, whereby time passes quickly and difficulties are encountered in detaching oneself from work.

The first studies on work engagement support the psychometric quality of the instrument used to assess the construct, the *Utrecht Work Engagement Scale* (UWES; Schaufeli *et al.,* 2002b). The same three-factorial structure of engagement has been obtained in different

occupations, such as workers in the tourism sector (Grau, Llorens, Burriel, Salanova, & Agut, 2004), ICT workers (Llorens, Salanova, & Cifre, 2001; Salanova *et al.,* 2000b), and in samples of university students (Martínez, Marques-Pinto, Salanova, & Lopes da Silva, 2002b; Schaufeli, Martínez, Marques-Pinto, Salanova, & Bakker, 2002a). So far, only one study tested the structure of work engagement across different countries. This study was carried out by Schaufeli *et al.* (2002a) among university students from Spain, Portugal and The Netherlands. The findings indicated that engagement, as measured with the UWES-Student Version, consists in all three samples of three independent but highly correlated factors. Futhermore, it appeared that the factor structure of the UWES was only partially invariant across the three countries. On the basis of these findings, the second objective of this chapter is to corroborate the three-factor structure of the UWES engagement inventory (Schaufeli *et al.,* 2002b) found in previous studies. Moreover, in order to test cross-cultural differences results will be compared through multi-group analyses using the data on Spanish and Dutch ICT employees.

Relationship Between Burnout and Work Engagement

Two main approaches can be distinguished regarding the relationship between burnout and engagement. According to Maslach and Leiter (1997), engagement is characterised by energy, involvement and efficacy, which are considered to be the direct opposite terms of the three burnout dimensions (measured by the MBI-GS): exhaustion, cynicism and lack of professional efficacy, respectively. Consequently, this perspective assumes that burnout and engagement are the opposite poles of the same continuum. Thus, engagement can be assessed by the opposite pattern of

scores on the three MBI dimensions (i.e., low exhaustion and cynicism, and high on professional efficacy). According to Maslach and Leiter (1997), engaged workers have a high level of energy, connect in an effective way with their work activities and see themselves as able to deal completely with the demands of their jobs.

However, based on results that positive and negative affects are independent states and not two opposite poles of the same dimension (Rusell & Carroll, 1999), Schaufeli and Bakker (2004) take a different approach to the concept of engagement that is operationalised in its own right. From their perspective, engagement can be seen as the positive antithesis of burnout. Hence, it should be measured independently by using different scales (i.e., vigor, dedication and absorption). Burnout and engagement are considered as two independent but negative related states of mind that may be part of a more comprehensive taxonomy comprising the two independent dimensions of energy and identification. Based on their theoretical analysis, Schaufeli and Bakker (2004) delineate that burnout can be characterised by a combination of low energy (i.e., exhaustion) and low identification (i.e., cynicism), whereas engagement is characterised by high energy (i.e., vigor) and high identification (i.e., dedication). Moreover, empirical evidence shows that exhaustion and vigor (i.e., energy dimension) but particularly cynicism and dedication (i.e., identification dimension) are strongly negatively related to each other (García, Llorens, Salanova, & Cifre, 2004; Grau *et al.,* 2004; Llorens, García, Salanova, & Cifre, 2003a).

The dimensions of professional efficacy and absorption are *not* direct opposites; rather, they are conceptually distinct aspects that are not the end points of some underlying continuum. As a matter of fact, lack of

professional efficacy was added as a third component on second thoughts, after it appeared as a third factor from a factor-analysis of a preliminary version of the *Maslach Burnout Inventory - Human Services* (MBI-HSS; Maslach, 1993). Moreover, generally, low correlations with exhaustion and cynicism have been obtained (Lee & Ashforth, 1996). In a somewhat similar vein, absorption also seems to play a less crucial role in the engagement construct (Llorens *et al.,* 2003a; Salanova, Cifre, Grau, Llorens, & Schaufeli, 2003). Several studies have shown a higher-order structure of burnout and engagement that is characterised by a so-called `core of burnout' factor, consisting of exhaustion and cynicism, and an extended engagement factor, consisting of the three UWES-engagement dimension plus MBI-GS in professional efficacy (Salanova, Grau, Llorens, & Schaufeli, 2001; Schaufeli & Bakker, 2004; Schaufeli *et al.,* 2002b).

Since burnout and work engagement are two multidimensional and different constructs, we predict that the best model will that which assumes two second-order and negative correlated latent factors, namely burnout and engagement. This model will show a better fit to the data than one that assumes one second-order underlying general factor namely well-being. According to the rule proposed by Cohen and Holliday (1982) the two latent factors will be moderately negatively related[2]. On the basis of this findings the third objective is to test the relationship between burnout and engagement.

---

[2] Correlations between 0.40 and 0.69 are considered moderate and correlations that exceed 0.69 are high

The Present Study

In the current study we used a sample of ICT workers from two European countries: Spain and The Netherlands. The use of ICT at work is a crucial aspect for industrial organisations in the improvement of quality and survival in competitive and global markets. In Europe, 34% of the workforce uses computers at work (Dhondt, Kraan, & Van Sloten, 2002); in The Netherlands this proposition is with 70% much higher than Spain (57%). Working with ICT can be seen as a challenge, but also as a potential stressors in that it may bring about unstable changes and/or increases in job requirements (e.g., higher mental demands and time pressure) that may negatively influence employee well-being (Hamborg & Greif, 1996; Korunka, Weiss, Huemer, Karetta, 1995; Korunka, Weiss, Zauchner, 1997c; Martínez, Cifre, Llorens, & Salanova, 2002a; Salanova, Cifre, & Martín, 1999). The problem increases when the urgency with which employees have to adapt to permanent technological innovations is taken into account. It therefore comes as no surprise to find that ICT users have been considered as a focus group in stress studies. On the other hand, computer use may also lead to happiness (Chen, Wigand, & Nilan, 1999) and engagement (Salanova *et al.,* 2001). Only few studies have examined the psychometric qualities of the MBI-GS and the UWES among ICT employees. Schaufeli *et al.* (2002b) factor-analysed the responses of 619 ICT employees and confirmed the original three-factor structure of the MBI-GS (i.e., exhaustion, cynicism, and professional efficacy). The same pattern of results was obtained in a sample of 514 Spanish ICT workers (Salanova *et al.,* 2000b). In a similar way, different studies on UWES instrument in ICT workers show the three-dimensions of the work

engagement (Llorens *et al.,* 2001; Salanova *et al.,* 2000b; Schaufeli *et al.,* 2002b). At this point, we expect that:

1)   *Hypothesis 1:* the original three factors of the MBI-GS (i.e., exhaustion, cynicism and professional efficacy) will fit the data better than the one-factor structure model independently and *across* the two samples. However, factor loadings and covariances between the dimensions may be different across both Spain and The Netherlands.

2)   *Hypothesis 2:* the three-factor structure of the UWES (i.e., vigor, dedication and absorption) will show a better fit to the data than a one-factor model independently and *across* the two samples. However, there may be differences between the Spanish and Dutch samples in factor loadings and covariances.

3)   *Hypothesis 3:* we expect that a two-factor model that includes the original three dimensional structure of burnout (i.e., exhaustion, cynicism, professional efficacy) and a three-dimensional structure of engagement (i.e., vigor, dedication, absorption) will be obtained independently and *across* the two samples. However, factor loadings and covariances between the dimensions may obtained *across* both Spain and The Netherlands.

Method

Participants and Procedure

The study was conducted using two samples, namely Spanish and Dutch employees who all use ICT as an inherent part of their jobs. The

Spanish sample included 654 employees (48% females and 52% males) from different public and private Spanish companies. They work in heterogeneous jobs and occupational fields which include clerical jobs (33%), technical and support staff (11%), sales (7%), management (3%), laboratory settings (10%), human services (6%), blue-collar workers (8%) and education (22%). However, the common denominator for all employees is the use of ICT in the performance of their jobs for more than 10% of their working time. Their ages ranged from 20 to 60 and the mean age of this sample was 31.8 (SD=8.2). All employees received self-report questionnaires at work. Risk prevention experts or Human Resources officers in each firm distributed the questionnaires, which were delivered in an envelope. A covering letter explained the purpose of the study, and emphasised that participation was on a voluntary basis. In addition, the confidentiality of the data was expressed, and anonymity guaranteed. Employees were asked to return filled-out questionnaires in a sealed envelope either to the person who had distributed them or directly by mail to the research team.

The Dutch sample included 477 customer service employees working in the call centre of a telecom company (response = 88%). After meetings with the floor managers and the human resources department, it was agreed that all employees would be able to fill out an electronic questionnaire during work time, in a silent, separate room. Moreover, the human resource management department helped to make arrangements for all employees to be approached to participate in the study. The questionnaire was published on the Internet throughout May and June 2001. A newsletter and an email from the management informed all employees that the questionnaire could be filled out during working hours.

After completion of the questionnaire, they could indicate that they had participated on an attendance register. Sick employees received a questionnaire on paper by surface mail at home. In total, 467 employees filled out the questionnaire online, and 10 sick employees filled out the version on paper at home (total $N = 477$). The study population was made up of 205 men (43%) and 272 women (57%) and the mean age was 30 (SD= 8.80).

Instruments

Burnout was assessed with the Spanish and Dutch versions of the Maslach Burnout Inventory-General Survey (MBI-GS; Salanova *et al.,* 2000b; Schaufeli *et al.,* 1996) which are made up of 16 items scored on three subscales. *Exhaustion* (EX) comprises five items (e.g., *"I feel emotionally drained by my work"*). *Cynicism* (CY) is measured with four of the five items from the original version (e.g., *"I have become more cynical about whether my work contributes anything"*). Item 13 from the original scale (*"I just want to do my job and not be bothered"*) was omitted, as suggested by Schaufeli and Van Dierendonck (2000) and Schutte *et al.* (2000). They have shown that this item does not load on the intended factor, and thus creates problems with factorial validity. *Professional efficacy* (PE) is assessed through six items (e.g. "*In my opinion, I am good at my job"*). Participants were asked to indicate the extent to which they agreed with each sentence on a seven-point rating scale (0 = never, 6 = every day). High scores on exhaustion and cynicism and a low score on professional efficacy are indicators of burnout. The original version of the MBI-GS was translated into Spanish and Dutch and was subsequently checked by a bilingual psychologist for accurate equivalences of both versions.

Engagement was assessed by using the Spanish and Dutch versions for employees of the Utrecht Work Engagement Scale (UWES; Schaufeli *et al.,* 2002b) with 15 items that are assumed to reflect three underlying dimensions: *Vigor* (VI) (5 items; e.g*. "When I get up in the morning, I feel like going to work"*); *dedication* (DE) (5 items; e.g., *"I am enthusiastic about my job"*), and *absorption* (AB) (5 items; e.g., *"When I am working, I forget everything else around me"*). Items were rated on a seven-point scale ranging from 0 "never" to 6 "always". In this case, the Dutch version of the UWES instrument was translated into Spanish and subsequently checked by a bilingual psychologist for accurate equivalences of both versions.

Data Analyses

In the first stage*, internal consistencies* (Cronbach's alpha) and descriptive analyses were computed for the three burnout and engagement scales. Secondly, *Confirmatory Factorial Analyses* (CFA) implemented by the AMOS computer program (Arbuckle, 1997) were used to test the structural dimensions of burnout and engagement and to test the higher-order relationship between these two constructs on Spanish and Dutch employees separately. Next, multi-group analyses were computed to test for cross-national differences between the two samples (Spain vs. The Netherlands) in burnout and engagement on factor structure, factor loadings and covariances. Finally, a test of the equality of covariance structures and factor loadings across samples was used by placing constraints on particular parameters (see Byrne, 2001). Maximum likelihood estimation methods were employed to examine the covariance matrix of the items. The goodness-of-fit of the models was evaluated by comparing the mean of the χ^2 difference test (Jöreskog & Sörbom, 1986). Since this

index is sensitive to the sample size (the probability to reject the hypothesized model increases when the sample size is increased) (Byrne, 2001) other measures of goodness-of-fit indices are recommended (Bentler, 1990; Bollen, 1989): the Root Mean Square Error of Approximation (RMSEA), the Goodness-of-Fit-Index (GFI) and the Adjusted Goodness-of-Fit-Index (AGFI). In addition, AMOS provides several relative indices that reflect the discrepancy between the hypothesized model and the baseline or Null model (Marsh, Balla, & Hau, 1996). In the present series of analyses, the Tucker-Lewis Index (TLI) –also known as the NNFI (Bentler-Bonett non-normed fit index), the Comparative-Fit-Index (CFI), and the Incremental-Fit-Index (IFI) are used. In general, models with fit indices > .90 and RMSEA < .08 indicate a good fit (Hoyle, 1995). In order to compare models that are not ordered in a nested sequence, the Expected Cross-Validation Index (ECVI; Browne & Cudeck, 1993) was used. Models that fit the data well receive low scores, while complicated and poorly fitting models score highly.

Results

In the first stage, internal consistencies were computed for the three burnout and engagement scales separately in each sample. All alpha-values met the criterion of .70 (Cortina, 1993; Nunnaly & Bernstein, 1994) in the two samples, with one exception (professional efficacy = .67 in Dutch sample). Table 2.1 shows the descriptive analyses (i.e., mean values, standard deviations, internal consistencies, and inter-correlations) of the burnout and engagement scales in both samples. The pattern of correlations is as expected in both samples. Exhaustion and cynicism are

positively correlated, and they both show a negative relationship with professional efficacy. The three engagement scales show significant and positive intercorrelations. The engagement scales are negatively related to exhaustion and cynicism dimensions of burnout and positively related to professional efficacy. Furthermore, the engagement scales are more strongly interrelated (mean r = .73 and .75 in the Spanish and Dutch sample, respectively) than the burnout scales (mean r = .39 and .37). Of the burnout scales, exhaustion shows the weakest relationship with the engagement dimensions (particularly with absorption), whereas professional efficacy is most strongly related to them. As expected, dedication is fairly strongly and negatively related to cynicism (r = -.53 and -.57 in the Spanish and Dutch sample), but vigor is *not* particularly strongly negatively related to exhaustion (r = -.26 and -.38 in the Spanish and Dutch sample).

Multivariate analyses of variance (MANOVAs), using the country as the independent variable and the six burnout and engagement dimensions as dependent variables, show a significant multivariate effect $F_{(6, 1124)}$= 37.59, p<.001. Consistent differences between Spain and The Netherlands are found since Dutch employees show lower levels of burnout and higher levels of engagement than Spanish employees. Specifically, Dutch sample shows lower levels of exhaustion ($F_{(1, 1131)}$= 67.98, p<.001) and cynicism ($F_{(1, 1131)}$= 4.32, p<.01) and higher levels of professional efficacy ($F_{(1, 1131)}$= 44.27, p<.001), vigor ($F_{(1, 1131)}$= 49.89, p <.001), and dedication ($F_{(1, 1131)}$= 16.08, p <.001) than Spanish employees. However, *non* significant differences between both samples were obtained in absorption ($F_{(1, 1131)}$= 1.73, *n.s.*) (see Table 2.1).

Table 2.1: Descriptive analyses (Cronbach's α for Spanish/Dutch employees on the diagonal) of burnout and engagement scales in the Spanish (*N*=654) and Dutch sample (*N*=477).

	Spanish		Dutch			Correlations					
						(1)	(2)	(3)	(4)	(5)	(6)
	M	SD	*M*	SD	*F*						
1.Exhaustion (EX)	2.25	1.21	1.64	1.26	67.98**	.86 /.85	.55**	-.19**	-.38**	-.32**	-.22**
2.Cynicism (CY)	1.62	1.28	1.46	1.31	4.32*	.54**	.84/.78	-.38**	-.40**	-.57**	-.37**
3.Professional efficacy (PE)	4.33	.83	4.68	.92	44.27**	-.18**	-.46**	.73/.67	.57**	.63**	.52**
4.Vigor (VI)	3.92	.95	4.37	1.23	49.89**	-.26**	-.46**	.61**	.77/.80	.73**	.74**
5.Dedication (DE)	3.79	1.25	4.13	1.56	16.08**	-.23**	-.53**	.58**	.71**	.89/.90	.79**
6.Absorption (AB)	3.71	.99	3.62	1.44	1.73	-.16**	-.42**	.50**	.74**	.73**	.74/.78

Notes: Correlations for the Spanish sample below the diagonal; **p* <.01.; ***p* < .001.

Structure of Burnout

In order to test Hypothesis 1, two alternative models for burnout were fitted to the data separately for each sample: a one-factor model (M1) that assumes *one* hypothetical latent variable underlying all burnout items and a three-factor model and (M2) that assumes that items load on *three* independent but correlated scales (i.e., exhaustion, cynicism and professional efficacy). In Spanish sample, the proposed three-factor model (i.e., exhaustion, cynicism and professional efficacy) with correlated factors and no cross-loadings did not fit the data very well. None of three fit indices have values of $\geq .90$ and the RMSEA value is .09, but the proposed three-factor model fits the data much better than the one-factor model ($\Delta\chi^2(3)= 1012.28$, $p<.001$). However, based on the Modification Indices, the fit of the three-factor burnout model could be improved by allowing two pairs of errors to correlate (M3. $_{\text{Three-Factor revised}}$) (EX1-EX4 and CY1-CY4). Our revised three-factor model fits the data significantly better than the original three-factor model ($\Delta\chi^2(2)=132.99$, $p<.001$) with all fit indices close to or higher than .90 (see Table 2.2 and Figure 2.1).

On the other hand, results of the CFA for the Dutch sample show that the proposed three-factor model with correlated factors and no-cross-loadings provided a good fit to the data. As can be seen, all fit indices have values close to .90, the RMSEA value is .07 and all items load significantly ($p< .05$) on the predicted factors (see Table 2.2 and Figure 2.2). Moreover, the proposed M2. $_{\text{Three-Factor}}$ model fits the data better than the one-factor model (general burnout factor) ($\Delta\chi^2(3)= 539.23$, $p<.001$). However, unlike the case of the Spanish workers, no error covariances are needed in The Netherlands to improve the model and show better fit values than in Spain.

Table 2.2: The structure of burnout for Spanish (*N*=654) and Dutch sample (*N*=477).

Model	χ^2	df	GFI	AGFI	RMSEA	TLI	CFI	IFI	$\Delta\chi^2$	df
Spain										
M1. One-factor	1627.58	90	.67	.59	.16	.55	.62	.62		
M2. Three-Factor	615.30	87	.88	.84	.09	.84	.87	.87	1012.28*	3
M3. Three-Factor revised	482.31	85	.91	.87	.08	.88	.90	.90	132.99*	2
The Netherlands										
M1. One-Factor	840.14	90	.75	.66	.13	.61	.67	.67		
M2. Three-Factor	300.91	87	.92	.89	.07	.90	.91	.91	539.23*	3

Notes: χ^2 = Chi-square; df=degrees of freedom; GFI=Goodness-of-Fit Index; AGFI=Adjusted Goodness-of-Fit Index; RMSEA=Root Mean Square Error of Approximation; TLI=Tucker-Lewis Index; CFI=Comparative Fit Index; IFI = Incremental Fit Index; *p* < .001.

Figure 2.1: Standardised maximum likelihood estimates of the burnout factors in the Spanish sample (*N*=654).

Figure 2.2: Standardised maximum likelihood estimates of the burnout factors in the Dutch sample (*N*=477).

Next, the best three-factor model of burnout (i.e., including the two correlated error terms in the Spanish sample) was simultaneously fitted to the data of both samples using multi-group analyses (MLG) to test whether the factorial structure of burnout is invariant *across* the two countries. An advantage of MLG is that it provides a test for the significance of any differences found between the groups and more efficient parameter estimates than single-group models (Arbuckle, 1997). First, the best model was freely fitted to the data from the two countries. Because two pairs of errors are included in only the Spanish sample, these parameters are estimated freely for the Spanish data but constrained to 0.00 for the Dutch.

As can be seen in Table 2.3, the proposed (M1.$_{\text{Three-Factor free}}$) of the *MBI-GS* was found to provide an adequate fit to the data when the two samples are simultaneously analysed. Moreover, a significant worsening in fit is obtained when the factor loadings and the covariance between the latent factors are assumed to be equal for the two samples ($\Delta\chi^2(15) = 125.11$, *p*<.001). Hence, the process of constraining successive covariances between the three latent factors and factor loadings is then applied. Results show a final model (M5 $_{\text{Final model}}$) in which all of the covariances between the three burnout dimensions were equal across the countries. Moreover, two out of five exhaustion items (EX1, EX4), two out of four cynicism items (CY1, CY3) and three of the six items of professional efficacy (PE1, PE4, PE5) were invariant across the samples. In conclusion, results of a series of CFAs provide evidence for Hypothesis 1, that the three-factor structure model of the *MBI-GS* could be replicated in both samples. However, some differences were obtained across countries regarding some factor loadings and two pairs of error covariances which are only significant in Spanish sample.

Table 2.3: Results of Multi-group analyses (MLG) of first-order factor structures of the burnout including both Spanish (*N*=654) and Dutch (*N*=477) samples.

Model	χ^2	df	GFI	AGFI	RMSEA	TLI	CFI	IFI	$\Delta\chi^2$	df
M1.$_{\text{Three-Factor free}}$	783.20	172	.91	.88	.05	.88	.90	.90		
M2. $_{\text{All constrained}}$	908.31	187	.90	.87	.06	.87	.88	.88	125.11*	15
M3. $_{\text{Equal covariance}}$	786.32	175	.91	.88	.05	.88	.90	.90	3.12	3
M4. $_{\text{Equal loadings}}$	907.55	184	.90	.86	.06	.87	.88	.88	124.35*	12
M5. $_{\text{Final model}}$	794.59	179	.91	.88	.05	.88	.90	.90	11.39	7

Notes: χ^2 =Chi-square; df=degrees of freedom; GFI=Goodness-of-Fit Index; AGFI=Adjusted Goodness-of-Fit Index; RMSEA=Root Mean Square Error of Approximation; TLI=Tucker-Lewis Index; CFI=Comparative Fit Index; IFI = Incremental Fit Index; *p*<.001.

Structure of Work Engagement

In order to test Hypothesis 2, two plausible models of engagement were compared: the one-factor model (M1) in which all the items loaded on the same latent factor (i.e., one hypothetical engagement factor) and the three-factor model (M2), where the items load on the three dimensions of engagement (i.e., vigor, dedication and absorption). The analyses of the Spanish data (see Table 2.4) indicate that the three-factor model with correlated factors and no cross-loadings provided a reasonable fit to the data with the RMSEA satisfying the criterion of .08, and the GFI, CFI, and IFI of .90. As can be seen from Figure 2.3, the correlations between the latent factors are high, ranging from .86 to .96. Therefore, the one-factor model (M1.$_{One-Factor}$) that assumes all UWES items load on *one* single factor was fitted to the data. Compared to the proposed three-factor model (M2.$_{Three-Factor}$) the fit of this alternative model was significantly inferior ($\Delta\chi^2(3) = 116.97$, *p*<.001). The same pattern of results appears for The Netherlands. The three-factor model (i.e., vigor, dedication and absorption) with correlated factors and no cross-loadings provided a good fit to the data, which is again better than the fit found for the Spanish data. Consistently, the correlations between the three dimensions of engagement are high ranging from .87 to .97. Because the results may suggest that engagement is composed of *one* single dimension, the proposed three-factor model was compared to a one-factor model. As can be seen, a model with three independent but related dimensions (M2. $_{Three-Factor}$) fits the data better than the model with only one factor ($\Delta\chi^2(3)= 95.15$, *p*<.001) (see Table 2.4 and Figure 2.4).

Table 2.4: The structure of engagement for Spanish (*N*=654) and Dutch (*N*=477) samples.

Model	χ^2	df	GFI	AGFI	RMSEA	TLI	CFI	IFI	$\Delta\chi^2$	df
Spain										
M1. One-Factor	629.77	90	.87	.83	.09	.87	.89	.89		
M2. Three-Factor	512.80	87	.90	.86	.08	.89	.91	.91	116.97*	3
The Netherlands										
M1. One-Factor	480.52	90	.87	.83	.09	.88	.90	.90		
M2. Three-Factor	385.37	87	.90	.86	.08	.91	.92	.93	95.15*	3

Notes: χ^2 =Chi-square; df=degrees of freedom; GFI=Goodness-of-Fit Index; AGFI=Adjusted Goodness-of-Fit Index; RMSEA=Root Mean Square Error of Approximation; TLI=Tucker-Lewis Index; CFI=Comparative Fit Index; IFI = Incremental Fit Index; * $p < .001$.
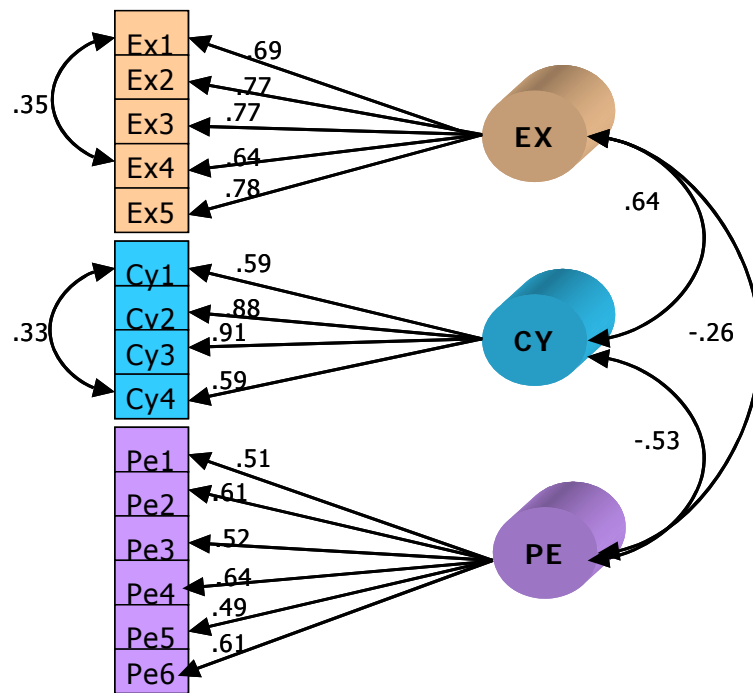

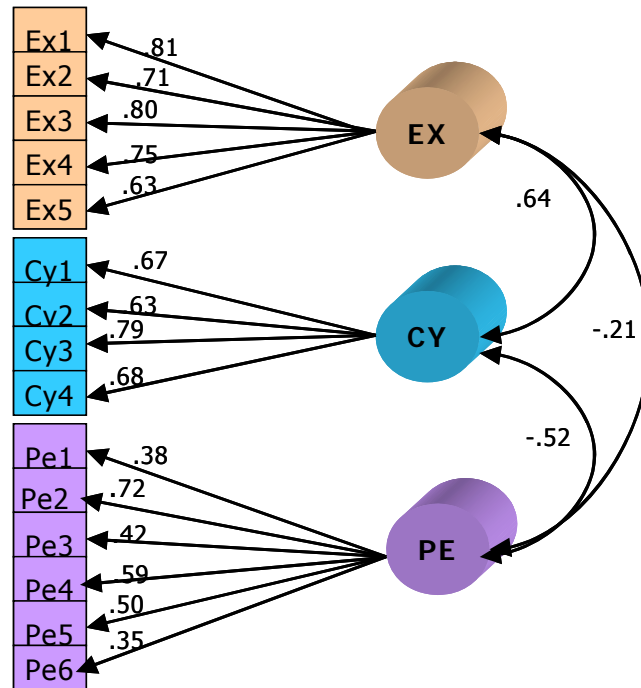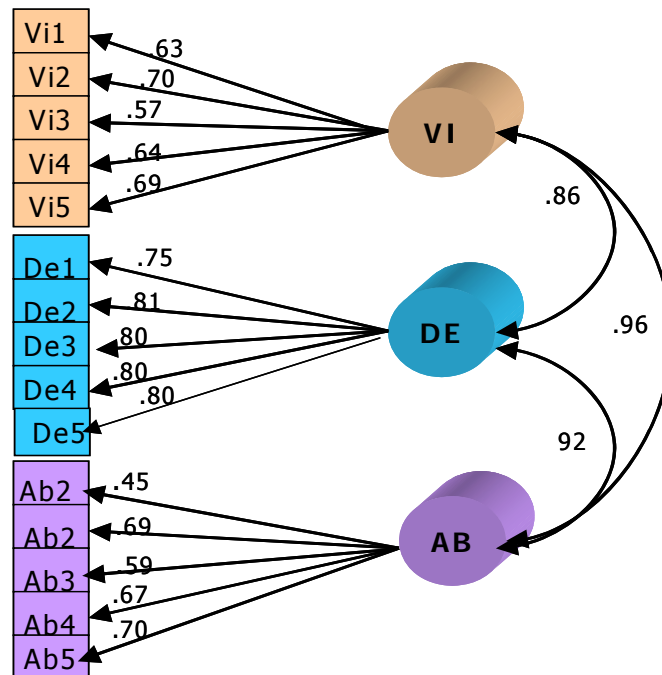*Figure 2.3:* Standardised maximum likelihood estimates of the engagement factors in the Spanish sample (*N*=654).
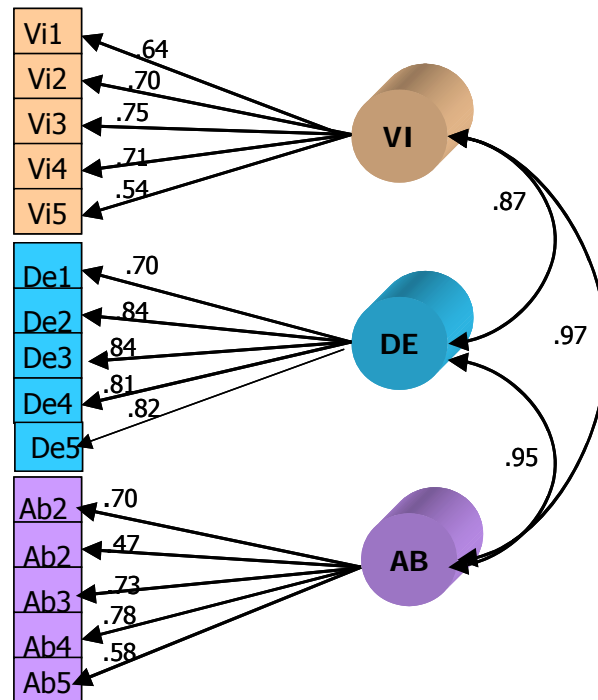
Figure 2.4: Standardised maximum likelihood estimates of the engagement factors in the Dutch sample (*N*=477).

The results of multi-group CFA analyses for the two countries are shown in Table 2.5. Results of the invariance test of the factor loadings and latent factor covariances between the three dimensions of the UWES scale show that the freely estimated model (M1. Three-Factor free; which allows for differences in factor loadings and covariances in the two-countries) is significantly better than the model that constrains the factor loadings and covariances to be equal (M2.All constrained) across both samples ($\Delta\chi^2(14) =$ 195.23, *p*<.001). Hence, the process of constraining successive covariances between latent factors and factor loadings is again applied. Results show a final model (M5. Final model) in which only the covariance between vigor and

dedication, together with three out of five vigor items (VI1, VI2, VI5), one item of dedication (DE1) and three out of five absorption items (AB1, AB3, AB4) are invariant across Spain and The Netherlands. Thus, the vigor and absorption dimensions are the most invariant factors in the two-country comparison, while dedication significantly differs across the samples. To sum up, results of a series of CFAs provide evidence for Hypothesis 2, by showing that the hypothesized three-factor structure of the UWES with vigor, dedication, and absorption as separate but highly correlated factors can be replicated *across* the two countries. Moreover, only one covariance latent factor and some vigor and absorption factor loadings were invariant.

Table 2.5: Results of Multi-group analyses (MLG) of first-order factor structures of the engagement including both Spanish (*N*=654) and Dutch (*N*=477) samples.

Model	χ^2	df	GFI	AGFI	RMSEA	TLI	CFI	IFI	$\Delta\chi^2$	df
M1. Three-Factor free	898.17	174	.90	.86	.06	.90	.92	.92		
M2. All constrained	1093.40	188	.87	.84	.06	.88	.89	.89	195.23*	14
M3. Equal covariance	1041.09	186	.88	.85	.06	.89	.90	.90	142.92*	12
M4. Equal loadings	936.43	177	.89	.86	.06	.90	.91	.91	38.26*	3
M5. Final model	904.01	179	.90	.86	.06	.90	.92	.92	5.84	5

Note. χ^2 =Chi-square; df=degrees of freedom; GFI=Goodness-of-Fit Index; AGFI=Adjusted Goodness-of-Fit Index; RMSEA=Root Mean Square Error of Approximation; TLI=Tucker-Lewis Index; CFI=Comparative Fit Index; IFI=Incremental Fit Index. *p < .001.

Relationship between Burnout and Engagement

Finally, second-order factor analyses were conducted to examine the relationship between burnout and engagement scales (Hypothesis 3). In contrast with the previous analyses, scale-scores instead of item-scores are considered, so that more parsimonious models are assessed. Several plausible and alternative models were tested: the one-factor model (M1), the traditional two-factor model (M2), the extended model (M3) and the core model (M4). Model 1 assumes that all burnout and engagement scales refer to one general underlying second-order factor (i.e., the 'well-being' dimension) (M1), while the traditional two-factor model (M2) assumes that burnout and engagement are two different but correlated constructs on which the intended burnout (i.e. exhaustion, cynicism, professional efficacy) and engagement (i.e., vigor, dedication and absorption) indicators load. The two-factor extended model (M3) assumes that burnout and engagement are two different but correlated constructs on which the core of burnout (i.e., exhaustion and cynicism) and an extended engagement (i.e. vigor, dedication, absorption and professional efficacy) indicators load. Finally, the core model (M4) puts forward the core model of burnout and engagement in which only exhaustion and cynicism are considered as core dimensions of burnout, and vigor and dedication as core dimensions of engagement. Results of the CFAs for the Spanish sample are shown in Table 2.6. In order to avoid computation problems arising from the negative variance of the cynicism scale, the error of the cynicism scale was constrained using the formula[3]: $(1-\alpha)*\sigma^2$. The original two-factor model proposed (M2. $_{Two\ Factor}$) is better than the model that assumes one general well-being dimension (M1. $_{One\ Factor}$). However, the extended model of

---

[3] It is referred to: 1 - cronbach´s alpha of cynicism * variance of cynicism.

burnout (M3. $_{Two\ Factor\ extended}$) comprised only of the core of burnout and the extended engagement is considered the best model in Spain. However, this may be an arte-factual result. That is, since the two dimensions of burnout are negative and the four dimensions of engagement are positive, the burnout factor can be considered a "method factor" that includes all negative items in a factor analysis. Consequently, other analyses were carried out which included only the core dimensions of burnout (exhaustion and cynicism) and engagement (vigor and dedication). Results show that the core model (M4. $_{Core\ model}$), is considered a good model with reference to Spain. Based on the ECVI index, it appears that the core model of burnout and engagement best fit the data when compared with M1.$_{One\ Factor}$, M2.$_{Two\ Factor}$ and M3.$_{Two\ Factor\ extended}$ (see Figure 2.5). According to the rule of thumb proposed by Cohen and Holliday (1982), the correlation between the latent burnout and engagement core-factors are moderate and negatively correlated in the Spanish sample (r=-.63).

The pattern of results for the relationship between burnout and engagement in The Netherlands is highly comparable to that obtained from data on the Spanish employees (see Table 2.6). As in the Spanish case, the extended model of burnout and engagement (M3) fits the data significantly better than the one-factor model and than the traditional three burnout and three engagement dimensions. However, based on the ECVI index, it appears that the core model of burnout and engagement (M4.$_{Core\ model}$) best fit the data compared with previous models (see Figure 2.6), although a correlation between the errors of cynicism and dedication is needed in the Dutch sample in order to find a good fit to the data (M5.$_{Revised\ Core\ model}$). This means that there is a high correlation between these two burnout and engagement dimensions, which is reasonable since they comprised the two

poles of the same identification dimension, where cynicism and dedication were characterised by low and high identification, respectively (Schaufeli & Bakker, 2004). Thus, the two-core dimensions of burnout (i.e., exhaustion and cynicism) and the two opposite dimensions of engagement (i.e., vigor and dedication) with a correlation between the errors of cynicism and dedication, meet the criteria for good fit in the Dutch sample. On the other hand, the relationship between the latent burnout and engagement factors continues to be moderately and negatively correlated in the present case (r=-.53) (Cohen & Holliday, 1982).

Table 2.6: Results of competing factor structures of burnout and engagement for Spanish (*N*=654) and Dutch (*N*= 477) samples.

Model	χ^2	df	GFI	AGFI	RMSEA	TLI	CFI	IFI	ECVI	$\Delta\chi^2$	df
Spain											
M1. One Factor	257.71	9	.89	.75	.21	.79	.87	.87	.43		
M2. Two Factor	221.22	8	.90	.74	.20	.79	.89	.89	.38	36.49*	1
M3. Two Factor extended	94.38	9	.96	.90	.12	.93	.96	.96	.18	126.84*	1
M4. Core model	18.77	2	.98	.93	.11	.95	.98	.98	.05		
The Netherlands											
M1. One Factor	224.58	9	.88	.72	.22	.77	.86	.86	.52		
M2. Two Factor	215.46	8	.88	.68	.23	.75	.87	.87	.51	9.12*	1
M3. Two Factor extended	118.43	8	.92	.80	.17	.86	.93	.93	.30	97.03*	0
M4. Core model	41.26	2	.96	.80	.20	.84	.95	.95	.12		
M5. Revised core model	7.43	1	.99	.92	.11	.95	.99	.99	.05	33.15*	1

Notes: χ^2 = Chi-square; df=degrees of freedom; GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index; RMSEA = Root Mean Square Error of Approximation; TLI= Tucker-Lewis Index; CFI = Comparative Fit Index; IFI = Incremental Fit Index; ECVI = Expected Cross-Validation Index; * *p* < .001.
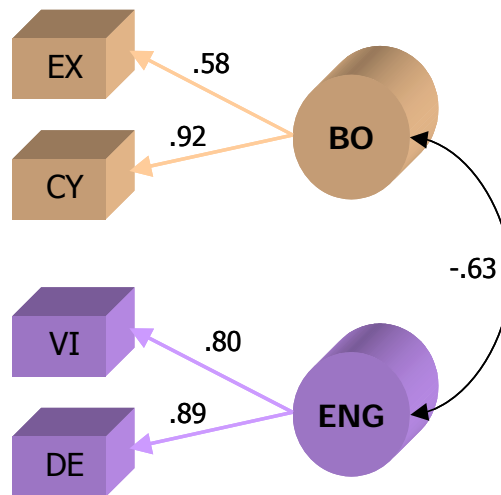
Figure 2.5: Standardised maximum likelihood estimates of the second-order burnout and engagement factors in the Spanish sample (*N*=654).
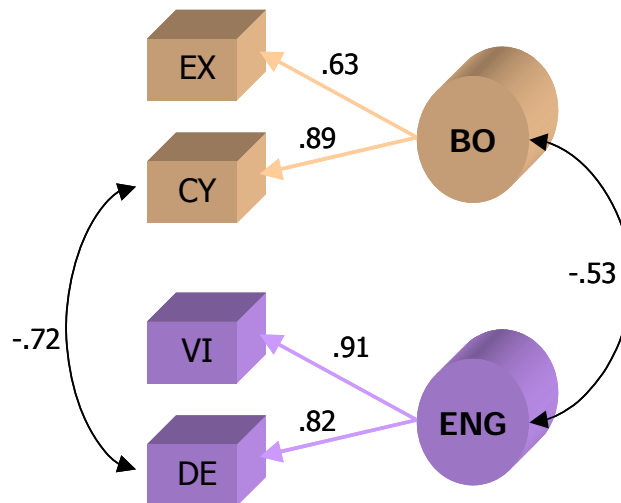
Figure 2.6: Standardised maximum likelihood estimates of the second-order burnout and engagement factors in the Dutch sample (*N*=477).

In a final series of analyses, the core model of burnout and engagement (i.e., the revised model that includes the error covariance between cynicism and dedication which is only significant in the Dutch sample) was freely fitted to the data of both countries (Spain and The Netherlands) using multi-group analyses (MLG). To avoid unidentified problems arising from the negative variance of cynicism and the consequently inadmissible solution, the variance of the cynicism error coefficient in both the Spanish and the Dutch samples was constrained using the formula[4]: $(1-\alpha)*\sigma^2$ Because the errors between cynicism and dedication are only related significantly in The Netherlands, these parameters are freely estimated for the Dutch sample, but are constrained to zero for the Spanish sample. As can be seen from Table 2.7, the proposed core model of burnout and engagement (M1. $_{\text{Core model free}}$). provided an adequate fit to the data *across* the two samples and the latent burnout and engagement factors are moderately negatively correlated (i.e., -.63 and -.53 in Spain and in The Netherlands, respectively) (Cohen & Holliday, 1982). Moreover, a non-significant worsening in fit is obtained when the factor loadings as well as the covariance between the two latent burnout and engagement factors are assumed to be equal across the two countries (M2. $_{\text{Full constrained}}$). In conclusion, the results of a series of CFAs do not confirm Hypothesis 3, by showing that the country comparison reveals that the core factor structure composed of the core of burnout (i.e., exhaustion and cynicism) and the core of engagement factor (i.e., vigor, and dedication) is the best model to explain the relationship between burnout and engagement in the two countries. Moreover, only one

---

[4] It is referred to: 1 - cronbach´s alpha of cynicism * variance of cynicism.

significant difference between the two groups exist regarding the covariance between one pair of errors.

Table 2.7: Results of Multi-group analyses (MLG) of competing second-order factor structures of the burnout and engagement including both Spanish (*N*=654) and Dutch (*N*=477) samples.

Model	χ^2	df	GFI	AGFI	RMSEA	TLI	CFI	IFI	$\Delta\chi^2$	df
M1.Core model free	26.54	3	.98	.92	.08	.94	.98	.98		
M2.Full constrained	32.93	6	.98	.95	.06	.97	.98	.98	6.39	3

Notes: χ^2 = Chi-square; df=degrees of freedom; GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index; RMSEA = Root Mean Square Error of Approximation; TLI= Tucker-Lewis Index; CFI = Comparative Fit Index; IFI = Incremental Fit Index.

Discussion

The cross-cultural study described in this chapter attempted to examine the psychometric properties of burnout and engagement, as well as the relationships between these two constructs in a specific ICT context. For the purpose of cross-national validation on burnout and engagement between Spain and The Netherlands, a heterogeneous sample of 654 Spanish ICT workers and 477 Dutch call-centre employees from a telecom company made up the study. CFA results for the two samples separately and with multi-group analyses, confirmed the original three-factor structure of the MBI-GS and corroborated the three-factor structure of the UWES instrument of engagement across the two countries. Regarding the relationships between the burnout and engagement scales used in the current study, neither refer to one common, undifferentiated construct nor, as expected, to two separate but moderate related constructs: burnout and engagement with its three original dimensions. However, a core of burnout (comprising exhaustion and cynicism) and a core of engagement (with

vigor and dedication) represented the best structure in the two samples. These illustrate the robustness of the findings, the cross-national validation of the burnout and engagement structure as well as the relationship between the two constructs (i.e., core of burnout and core of engagement), although some measurement differences have been obtained *across* the two countries.

Burnout

Results showed exhaustion was the most reliable burnout scale (Lee & Ashforth, 1996; Schaufeli & Enzmann, 1998) in both countries. It is interesting to note the high alpha value of the cynicism scale obtained in the Spanish employees (α=.84), which has been shown in other studies using comparable ICT samples (Salanova *et al.*, 2000b; Salanova & Schaufeli, 2000). This may suggest that cognitive aspects of psychological well-being (i.e., cynicism as a distant attitude towards ICT) are relevant for workers who use mental information at work, as in the case of ICT workers. Confirmatory Factor Analyses confirm the three-factor structure of the burnout is invariant across Spain and The Netherlands. This result are in line with previous studies into different occupations (Bakker *et al.,* 2002; Leiter & Schaufeli, 1996; Llorens *et al.,* 2003a; Salanova *et al.,* 2003), and specifically among ICT workers (Salanova *et al.,* 2000b; Schaufeli *et al.,* 2002b). Consequently, burnout should be measured using these original three scales across both countries. However, some minor measurement deviations were obtained. Compared to the cynicism burnout scale, exhaustion and professional efficacy may be considered the dimension with the greatest differences between the two samples since three factor loadings differ in the data on Spain and The Netherlands. Another deviation

is the inclusion of a correlation between two pairs of errors in the Spanish sample. Although the correlation of errors may be considered as not good practice, Jöreskog and Sorbom (1993) point out that there are many situations where these parameters can make strong substantive sense and should be included in the model. In fact, similar minor differences were observed between a Portuguese, Dutch and Spanish cross-cultural study with a sample of university students (Schaufeli *et al.,* 2002a) as well as in a sample of ICT users (Salanova *et al.,* 2000b). A possible explanation for the correlated errors is a high degree of overlap in item content. That is, although the two items are worded differently, they essentially ask the same question (Byrne, 1993). In the case of the Spanish questionnaire, both item 1 and 4 on the exhaustion scale refer to the feeling of being drained and used up as a consequence of work, while the other items are related to fatigue or feeling tense. In the same way, items 1 and 4 on the cynicism scale refer to the employees' concerns that they are not contributing to the organisation through their job, while the other two items are more related to feelings of indifference about the job. In the present study, the translation processes of the questionnaires or cultural differences between the two countries may be responsible for these minor deviations between the samples.

On the other hand, the same pattern of correlations between the three burnout dimensions were observed in the two samples. Consistent with the literature (Green, Walkey, & Taylor, 1991), the highest correlations were between exhaustion and cynicism, which constitute the essential dimensions of burnout, but low correlations were found between exhaustion and cynicism with professional efficacy (Schaufeli, Leiter, & Kalimo, 1995b). These results are comparable with previous cross-cultural

studies (Martínez *et al.,* 2002b; Schaufeli *et al.,* 2002a; Schutte *et al.,* 2000). This may suggest that professional efficacy may constitute an independent factor, and exhaustion and cynicism may be considered the core of burnout (Green *et al.,* 1991). According to Schaufeli and Bakker (2004) these core burnout dimensions may be referred to two independent dimensions: activation (i.e., exhaustion) and identification (i.e., cynicism).

Work Engagement

As far as engagement is concerned, three internally consistent scales (i.e., vigor, dedication and absorption) were found in the two countries. These results are also comparable with findings of other samples (Schaufeli & Bakker, 2004; Schaufeli *et al.,* 2002a) and in ICT contexts (Salanova *et al.,* 2001; Schaufeli *et al.,* 2002b) in which the traditional three-factor model was confirmed. It suggests the three factor structure of the UWES instrument is corroborated and replicated across samples and across Spain and The Netherlands. It is important to note the strong correlations found between the three engagement scales. Despite this, they do not appear to load on one underlying general engagement factor in either country. This high correlation between the engagement dimensions is consistent with the findings obtained in previous research (Llorens *et al.,* 2001; Salanova *et al.,* 2001; Schaufeli *et al.,* 2002b). Thus, those who are highly dedicated to their work also usually seem to lose track of time, and feel absorbed in their work activities. In addition, engaged workers also experience energy and feel vital and strong. This may suggest that although theoretically engagement is composed of three factors, in practice engagement may be one latent construct. That is, it may be useful to consider the three dimensions of engagement to explain the characteristics of the construct at

a theoretical and research level, but ultimately a single scale can be used in the practical field. Despite these similarities in the engagement structure, some minor deviations were obtained *across* the countries. Dedication was the scale that showed the most differences in factor loadings between Spain and The Netherlands. Moreover, the covariances between vigor and absorption and dedication and absorption were also considered to be different. In the same way than in burnout, the origin of these differences may be based on the cultural differences between Spain and The Netherlands or in the Spanish and Dutch translation of the questionnaire.

Relationship between Burnout and Engagement

According to the structure of burnout and engagement considered together, results revealed that neither the model that assumed that all scales refer to one underlying construct (Maslach & Leiter, 1997) nor the original two-factor model nor the extended model that included professional efficacy as an engagement dimension, fitted well to the data. In fact, the fit of these two models to the data was fairly similar but significantly inferior compared to the fit of a core model that included only the core of burnout and the core of engagement in Spain and in The Netherlands. Although the structure about the relationship between burnout and engagement is similar across countries, only a difference is shown: a negative covariance among cynicism and dedication errors in Dutch sample. This result is not strange since it has been shown in other previous studies on Spanish secondary school teachers (Llorens *et al.,* 2003a), university students (Schaufeli *et al.,* 2003a) and workers in the tourism sector (Grau *et al.,* 2004). According to our results, burnout and engagement can be considered as two independent but modestly

negatively related constructs (Cohen & Holliday, 1982). Maybe the most important contribution of the present study is that burnout and engagement are characterised by two core and antithetical dimensions which may represent the essence of the two constructs in Spain and in The Netherlands (de Rijk, Le Blanc, Schaufeli, & De Jonge, 1998; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001a; Green *et al.,* 1991). This suggests that professional efficacy and absorption may be not considered as a real dimensions of burnout and engagement, respectively. Various scholars show that professional efficacy should not be considered as a burnout dimension, but as a personality characteristic akin to self-efficacy or competence and then it is nearer to the positive affect (Cordes & Dougherty, 1993; Cherniss, 1993). The same occurs with absorption, which had been considered as an engagement dimension after some thirty in-depth interviews (Schaufeli, Taris, Le Blanc, Peeters, Bakker, & De Jonge, 2001). The core model of burnout and engagement are in line with Shaufeli and Bakker (2004) who have argued that only energy (i.e., exhaustion-vigor) and identification (i.e., cynicism-dedication), should be considered as the main elements of burnout and engagement. In the same vein as other researches on ICT samples (Salanova *et al.,* 2000b; Schaufeli *et al.,* 2002b), secondary school teachers (Llorens *et al.,* 2003a), with multi sample studies (Schaufeli & Bakker, 2004) and with cross-national studies on university students from Spain, Portugal and The Netherlands (Schaufeli *et al.,* 2002a), cynicism and dedication (identification dimension) together with exhaustion and vigor (energy dimension) are considered to be the real opposites and the core dimensions of burnout and engagement.

Practical and Theoretical Implications

The present results may have some important implications for future burnout and engagement research and practice. Firstly, the present study corroborates and extends to ICT samples and different countries (Spain and The Netherlands) the three-factor structure of burnout and engagement. Secondly, despite the high correlations obtained between the three engagement dimensions, work engagement is conceived as a three-dimensional concept in both countries. It may suggest the possibility to consider the three scales of engagement for theoretical and research purposes and a short version for practical purposes. Another implication is that burnout and engagement are considered as two different but correlated states of mind, which are measured by specific instruments. According to this burnout and engagement are antithetical but they are not mutually exclusive states. The last implication of the present study is to consider this relationship among burnout and engagement in terms of the *core* dimensions. Its mean that exhaustion-vigor and cynicism-dedication may be considered each other's opposite, and the essence of burnout and egagement. As we noted before, absorption and professional efficacy seem to play a different role when compared with vigor and dedication, which seem to be the opposite scales of the core of burnout (i.e., exhaustion and cynicism). The correspondence between the results obtained in the two different samples (Spanish and Dutch) in the ICT context suggests that the findings are robust and can generalised.

Limitations

One of the limitations of this study is that the data were obtained by self-report measures and, consequently, the results may be contaminated by the variance of the common method. Thus, it would be interesting to complement this measures with other, more objective measures. Although the burnout and engagement instruments that have been used are the same in the two samples, certain differences may be considered to have arisen as a result of the questionnaire translation process.

Directions for further Research

The findings in this study suggest the need to continue the study of the factorial structure of burnout and engagement and its relationship from a cross-cultural perspective. Regarding the engagement structure, further studies are required to examine the development process of the engagement dimensions in a similar way as has been carried out with burnout (Lee & Ashforth, 1996; Schaufeli & Enzmann, 1998). More analyses are needed to corroborate the core model of burnout and engagement in other samples and in other countries and to investigate its relationships with other aspects of work (i.e., job demands and job resources) and with some outcomes (e.g., absenteeism, job commitment, job satisfaction). This research may provide an insight into whether or not the 'opposite' engagement scales yield similar patterns with similar correlates but with reversed signs. This in general terms, will allow us to improve engagement in the job and to prevent the burnout syndrome.

Demands and Resources
in ICT Jobs

Demands and Resources in ICT Jobs

Summary

This study examines the factorial structure of two types of workplace factors: job demands and job resources. For the purpose of cross-national validation, confirmatory factor analyses were performed using the data from two samples of Spanish (N=654) and Dutch Information and Communication Technology employees (N=477). Results show that a two-factor model with a latent 'demands' factor (including workload and emotional load) and a latent 'resources' factor (including job control, social support, and performance feedback) best fits the data for both samples. Although the factor structure of this two-factor model was highly equivalent across samples, some differences were found. The practical and theoretical implications are discussed, together with perspectives for future research.

Introduction

The revolutionary advances in electronic technology are radically changing our society and in particular the workplace environment. Data from the Third European Survey on Working Conditions (2000) reported that 41% of all European employees use computers at work and this trend is predicted to increase in the future (Paoli & Merllié, 2001). Governments and organisations are conscious of the beneficial aspects of investing resources in innovation. It is believed that such an investment will allow organisations' competitiveness and survival in the international market to be maintained or enhanced, and productivity and quality of work to be improved (Peiró, 1990). Because of the high percentage of people working with Information and Communication Technology (ICT), it seems increasingly relevant to study the characteristics of ICT jobs that may be responsible for the rise in stress at work (Korunka, Weiss, & Zauchner, 1997c; Martínez, Cifre, Llorens, & Salanova, 2002a; Salanova, Cifre, & Martín, 1999). Taking into account the two main types of workplace factors

that are considered to be responsible for stress in current job stress models, the central aim of the study is to examine the factorial structure of demands and resources. In addition, cross-national differences are examined regarding the psychometric properties of measures for assessing workplace conditions, by comparing data collected among ICT employees in Spain and The Netherlands.

Job Demands-Resources Model

A common aspect in most stress theories (Hobfoll, 1989, 2001; Karasek, 1979; Karasek & Theorell, 1990; Lazarus & Folkman, 1984) is that the working conditions relevant to the stress experience can be implicitly or explicitly split into two categories, namely demands and resources. For example, the basic assumption of the Effort-Reward Imbalance (ERI) model is that job stress is the result of an imbalance between effort (e.g., extrinsic job demands) and reward (e.g., salary, esteem, job security) (Siegrist, 1996). A misfit produced by high efforts and low rewards may lead to an increase in physiological activation, which, in turn, may produce high levels of cardiovascular risk, psychiatric disorders and burnout (Bakker, Killmer, Siegrist, & Schaufeli, 2000a). In a similar vein, the Demand-Control Model (DCM) (Karasek, 1979; Karasek & Theorell, 1990) attempts to study the determinants of workers´ health and motivation by means of the interaction of two psychosocial job characteristics, namely psychological demands (i.e., time pressure and workload) and job control. This model postulates that high strain jobs are characterised by a combination of *high* job demands and *low* job control (Kahn & Byosiere, 1992; Salanova, Peiró, & Schaufeli, 2002b). Despite the relevance of these job stress models, some criticisms have been put forward, particularly of

their simplicity and static nature (see Bakker, Demerouti, & Euwema, 2004b; Buunk *et al.,* 1998).

The recently proposed Job Demands-Resources Model (JD-R) (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001a) integrates and expands the previously mentioned models, thereby considering the complex reality of the work context. The main proposition of the JD-R model is that although employees in different organisations may be confronted with different working conditions, these can be grouped in one of two different categories, i.e., demands or resources (Bakker, Demerouti, de Boer, Schaufeli, 2003b; Demerouti *et al.,* 2001a; Lewig & Dollard, 2003). The JD-R model is more flexible than the ERI and the DCM models since it offers the opportunity to include different kinds of demands and (lack of) resources depending on the type of job. Confirmatory Factor Analyses carried out on different samples confirm that models which include these two working dimensions (i.e., demands and resources) fit the data better than models which consider only one general dimension (Bakker *et al.,* 2003b; Bakker, Euwema, & Demerouti, 2004a; Demerouti *et al.,* 2001a). According to this model, health impairment (e.g., burnout) and motivation (e.g., engagement) may be produced as a result of the presence of these job demands and resources, respectively (see Bakker, Demerouti, Taris, Schaufeli, & Schreus, 2003c). Generally speaking, job demands can be conceptualised as working conditions that potentially evoke stress-reactions since they tax the workers´ personal resources. Job demands refer to "*physical, social or organisational aspects of the job that require sustained physical and/or mental effort and are associated with certain physiological and/or psychological costs*" (see Demerouti *et al.,* 2001a, p.501). Job resources, the second important aspect in the theory,

refer to those physical, psychological, social or organisational aspects of the job that are functional in achieving work goals, reduce job demands and stimulate personal growth and development (see Demerouti *et al.,* 2001a). Obviously, high levels of demands may concur with low levels of job resources and vice versa. Research show that health impairment (e.g., burnout) is the result of an imbalance caused by high job demands and lack of resources (Bakker *et al.,* 2004b; Lee & Ashforth, 1996; Schaufeli & Enzmann, 1998). In fact, if resources are lacking or there are no available resources, demands will remain high. As a consequence, a negative relationship is expected between demands and resources, in the same way as in previous research with different samples (Bakker, Demerouti, & Schaufeli, 2003a; Bakker *et al.,* 2004a; Llorens, García, Salanova, & Cifre, 2003a). On the other hand, one of the assumptions of the JD-R model is that several *different* resources can act as buffers for several *different* demands. It may be suggested that job resources are relevant in reducing the impact of job demands on job stress. This implies that job resources are the characteristics of work that may reduce job demands and the associated physiological and psychological costs (Demerouti *et al.,* 2001a). However, job resources are also motivating in their own right. According to the Conservation Of Resources (COR) Theory *"people strive to retain, protect, and build resources and that what is threatening to them is the potential or actual loss of these valued resources"* (Hobfoll, 1989, p. 516). Consequently, stress is produced when resources are threatened, when resources are lost, or when individuals invest resources and do not reap the anticipated level of benefits.

Job Demands in ICT Contexts

Recent research has shown that specific job characteristics are considered as important job demands by ICT workers (Bakker *et al,* 2003a; De Ruyter, Wetzels, & Feinberg, 2001). However, these studies are only descriptive and an overall theoretical framework including various ICT working conditions is still lacking. Based on a review of the literature and on previous analyses, two major ICT demands are selected in the present study. First, quantitative overload may be considered to be an important demand responsible for job stress in general and stress in ICT contexts in particular (Carayon-Sainfort, 1992; Yang & Carayon, 1995). Specifically, multi-tasking (i.e., combining e-mail, voice messages, web pages, ringing phones, printing documents) is considered to be quite demanding. Moreover, the work is done under pressure for different reasons such as the rhythm of the production system, and the continuous change in software and equipment (Hovmark & Norell, 1993; Korunka, Weiss, huemer, & Karetta, 1995). In addition, the increasing pace of innovation is not only responsible for the increase in pressure arising from work intensification, but also for the increase in emotional load. Thus, although emotional demands are considered to be extremely relevant in certain types of occupations performed by nurses, teachers and doctors etc (Bakker, Schaufeli, Sixma, Bosveld, Van Dierendonck, 2000b), they are also prevalent in other occupations, for example among ICT workers (Bakker *et al.,* 2003a; Llorens & Salanova, 2000). In this last study of 140 ICT workers, findings showed that the greater the emotional overload, the higher were the levels of anxiety, depression and burnout and the lower the levels of engagement. The relevance of emotional demand in technology contexts coincides with the increase in emotional work, since

organisations have turn into emotional places which are involved in delivering services of a kind (Ashkanasy, Haertel, & Zerbe, 2000; Dorman & Zijlstra, 2003; Lewig & Dollard, 2003). In fact, according to the Third European Survey on Working Conditions, 43% of all European employees have to deal with direct demands from customers and colleagues (Paoli & Merllié, 2001).

Job Resources in ICT Contexts

In order to cope with the specific job demands mentioned above, ICT users may resort to several job resources. Job control, social support from co-workers and supervisors, and performance feedback constitute important job resources in technology contexts and they may help to reduce the negative impact of job demands (Grau, Salanova, & Peiró, 2001; Hamborg & Greif, 1996; Salanova, Cifre, Martín, 1999; Salanova, & Peiró, 2001). First, the role of job control for mental health is emphasized in different stress models such as the DCM (Karasek, 1979), Warr's (1987) vitamin model, and the Job Characteristics Model (JCM; Hackman & Oldham, 1980). Recent research has also considered the relevance of job control in ICT settings, distinguishing two aspects of control: timing control and method control. The former refers to the extent to which the operator can decide when to carry out given tasks, rather than having to respond to the demands made by technology. The latter refers to the way in which a certain task is carried out. Specifically, it refers to the extent to which the individual is able to carry out the work in his or her own way, rather than being externally controlled by technology or by associated procedures (Jackson, Wall, Martin, & Davis, 1993; Jones, & Fletcher, 2003). Carayon

and Zijlstra (1999) gives evidence for the effect of control on strain by increasing the job satisfaction in 958 Dutch and 273 US employees.

Secondly, social support is probably one of the most well-known resources that has been studied in job stress research (Kahn & Byosiere, 1992). In fact, employees who receive more support at work are better able to mitigate job demands (Lee & Ashforth, 1996). This resource can be defined as a positive interpersonal relationship with significant people at work (i.e., from co-workers, supervisors) as expressed through feelings of empathy, love and trust as well as by providing instrumental support (e.g., help from a co-worker when there is a computer problem or in case of understanding incomprehensible computer instructions) (Bliese & Britt, 2001; Jones, & Fletcher, 1996).

Finally, performance feedback is considered as an important resource in the stress process (Hackman & Oldham, 1980; Demerouti *et al.,* 2001a; Schaufeli & Bakker, 2004) as well as in the ICT context (Grau *et al.,* 2001; Salanova *et al.,* 2002b; Salanova & Schaufeli, 2000). As a key aspect in the Job Characteristics Theory (Hackman & Oldham, 1980), feedback is understood as the information received about one's accomplishment in the job. Usually, this information is provided by the way the job is designed, by one's supervisor and one's colleagues. In fact, it has been demonstrated that organisations that provide their employees with performance feedback enhance employee efficacy beliefs, well-being, satisfaction and productivity level, while lack of feedback is related to stress and burnout (Buunk *et al.,* 1998; Schaufeli & Enzmann, 1998). In sum, healthy ICT jobs are characterised by the presence of employee control over method and timing, social support, and feedback on employee performance (Cahill,

Landsbergis, & Schnall, 1995; Grau *et al.,* 2001; Salanova *et al.,* 2002b; Salanova & Schaufeli, 2000).

The Present Study

The central aim of this chapter is to examine the factorial structure of workplace factors, i.e. job demands and job resources in relation to ICT employees. We also examine cross-national differences in this structure, by comparing data collected from ICT employees in Spain and The Netherlands. Because of the differences in the characteristics of work between the two countries (see Dhondt, Kraan, & Van Sloten, 2002; Paoli & Merllié, 2001), factor loadings and covariances between the variables included in the model may be different across both samples. Moreover, working conditions in ICT contexts have not previously been studied in a cross-national study between Spain and The Netherlands. We predict that:

1) *Hypothesis 1:* a two-factor model with correlated dimensions of demands (i.e., quantitative overload, emotional overload) and resources (i.e. job control, social support and performance feedback) will fit the data better than a one-factor model, independently and *across* the two samples

2) *Hypothesis 2:* all specific demands and resources will be negatively correlated for each of these samples independently and across Spain and The Netherlands.

Method

Participants and Procedure

The study presented in this chapter was conducted by means of two samples made up of employees from Spain ($N = 654$) and The Netherlands ($N = 477$), who all use ICT as an inherent part of their job. For a description of the sample, please see chapter 2 (*Participants and Procedure*).

Instruments

It should be noted that the instruments used in this chapter are slightly different for the two samples. For this reason the measures for the two sub-samples are shown separately.

Two *job demands* in ICT contexts were assessed: quantitative overload and emotional overload. In Spain, *quantitative overload* was assessed using the Beehr, Walsh, and Taber (1976) instrument that includes three items (e.g., *"I have too much work to be able to carry it out properly"*). *Emotional overload* was measured on a self-constructed scale (Equip WONT Prevenció Psicosocial, 1999). This scale includes three items (e.g., *"There are situations in my work that wear me out emotionally"*). Both scales were scored on a five-point Likert-scale, ranging from (1) "totally disagree" to (5) "totally agree". In The Netherlands, *quantitative overload* was assessed through three items based on Karasek's (1985) job content questionnaire (e.g., *"My work requires me to work very hard"*). Items are scored on a five-point Likert-scale, ranging from (1) "never" to (5) "always". *Emotional overload* was based on a scale developed by Van Veldhoven and Meijman (1994) that included six items. An example item is: *"Is your work emotionally demanding?* (1 = never, 5 = always). Participants were asked to indicate how often they were confronted with

these demands in their job using a five-point rating scale (1= never, 5= always).

Three *resources* in ICT contexts were measured: job control, social support, and performance feedback. In Spain, *job control* was assessed by five items of Jackson *et al's* (1993) instrument (e.g., *"How much control do you have to decide when a specific task should start?"*) (1= none, 5= very much). *Social support* was measured on a five-item scale from the FOCUS questionnaire (Van Muijen *et al.*, 1999). (e.g., *"How many people with personal problems in your company or organisation receive help?"*). Scoring ranged from (1) "never/nobody" to (5) "always/everybody" Finally, *performance feedback* was measured with Hackman and Oldham's (1975) instrument that includes three items (e.g., *"My supervisor gives me information about how I am performing in my work"*). Scoring ranged from (1) "totally disagree" to (5) "totally agree". In The Netherlands, *job control* was based on a Dutch version (Furda, 1995) of Karasek's (1985) job content instrument. It included three items (e.g., *I can decide myself how I carry out my work"*), scoring on a five-point Likert scale (1 = never, 5 = always). *Social support* was measured with six items of the scale developed by Van Veldhoven and Meijman (1994). Exemplary items are: *"Can you ask your colleagues for help if necessary?"* and *"Can you count on your colleagues when you face difficulties at work?"* (1 = never, 5 = always). Finally, *performance feedback* was assessed using three items, partly based upon Karasek's (1985) job content instrument. For example: *"I receive sufficient information about the goal of my work"* (1 = never, 5 = always).

All Spanish and Dutch responses were coded in such a way that higher scores referred to higher job demands and more job resources, respectively. Psychometrical properties (i.e., means, standard deviations,

correlations and internal consistencies) of the demands and resources scales are presented in Table 3.1.

Data Analyses

First, internal consistencies (Cronbach's alpha) were computed and descriptive analyses were carried out for the demands and resources scales (means, standard deviations, internal consistencies). *Confirmatory Factor Analyses* (CFA) as implemented by the AMOS software package (Arbuckle, 1997) were then used to establish the dimensionality of the demands and resources in the Spanish and Dutch samples separately. Thirdly, multi-group analyses (MLG) were carried out to test for cross-national differences in the factor loadings and covariances of both samples. Finally, a test of equality of covariance structures and factor loadings across samples was used by placing constraints on particular parameters (see Byrne, 2001).

Maximum likelihood estimation methods were employed to examine the covariance matrix of the items. The goodness-of-fit of the models was evaluated by comparing the mean of the χ^2 difference test (Jöreskog & Sörbom, 1986). Since this index is sensitive to sample size (the probability that the hypothesized model will be rejected is higher when the sample size increases) (Byrne, 2001), other measures of goodness-of-fit indices are recommended (Bentler, 1990; Bollen, 1989): the Root Mean Square Error of Approximation (RMSEA), the Goodness-of-Fit-Index (GFI) and the Adjusted Goodness-of-Fit-Index (AGFI). In addition, AMOS provides several relative indices that reflect the discrepancy between the hypothesized model and the baseline or Null model (Marsh *et al.,* 1996). In the present series of analyses, the Normed-Fit-Index (NFI), the Comparative-Fit-Index (CFI), and the Incremental-Fit-Index (IFI) are used. In general, models with fit indices > .90 and RMSEA < .08 indicate a good fit (Hoyle, 1995).

Quantitative overload, emotional overload, job control, social support and performance feedback were used as indicators of two second-order latent factors, namely demands and resources. Two models were compared using CFAs which are described below: (1) a one-factor model (M1. $_{One-Factor}$), assuming that all demands and resources load on one general underlying second-order factor that might be labeled 'working conditions' (2) the proposed two-factor model (M2. $_{Two-Factor}$) in which demands and resources are considered to be two different but related latent factors. In the latter model, demands are specified to load on a latent 'demands' factor, whereas resources are specified to load on a latent 'resources' factor.

Results

Previous Analyses

In order to clarify the first structure of the demands and resources, *Exploratory Factor Analyses* using the SPSS program were previously calculated and included items of demands and resources in both samples (Spain and The Netherlands) separately. Results using principal components by varimax rotation showed five factors, which explains the 69% variance in Spain and the 63% variance in The Netherlands. The first factor (19%/13% of the explained variance in the Spanish/Dutch sample) includes items referring to 'job control'. The items referring to 'social support' are saturated in factor two (16%/14% of the explained variance in Spain/The Netherlands). The third factor (13%/11% of the explained variance in Spanish/Dutch) includes items from the 'quantitative overload' scale. The fourth factor (13% of the explained variance in both samples) includes saturations of the items from 'emotional overload'. Finally, the fifth

factor is called 'performance feedback' since it includes items referring to the information received about work goals (8%/13% of the explained variance in Spain/The Netherlands). In order to confirm the first-order structure of demands and resources obtained in the exploratory analyses, Confirmatory Factor Analyses (CFA) using the AMOS program were calculated for each sample. The proposed five-factor model (i.e., quantitative overload, emotional overload, job control, social support and performance feedback) with correlated factors and no cross-loadings fit the data well in the Spanish sample (χ^2 (142)=405.65; GFI=.94; AFGI=.92; RMSEA=.05; NFI=.95; CFI=.95; IFI=.95) and in the Dutch sample (χ^2 (125)=381.14; GFI=.92; AFGI=.90; RMSEA=.06; NFI=.87; CFI=.90; IFI=.90).

Descriptive Analyses

Internal consistencies were calculated for all study variables in each sample separately. As can be seen in Table 3.1, the reliability coefficients of all variables meet the criterion of .70 (Cortina, 1993; Nunnaly & Bernstein, 1994) in both samples, with one exception. The internal consistency of the performance feedback scale had a value of .60 in the Spanish sample. Table 3.1 also shows the mean values, standard deviations, and inter-correlations of the variables for the Spanish and Dutch samples.

Table 3.1: Descriptive analyses (Cronbach's α Spanish/Dutch employees on the diagonal) of the demands and resources scales in the Spanish (*N*=654) and Dutch (*N*=477) sample.

	Spanish		Dutch			Correlations				
						(1)	(2)	(3)	(4)	(5)
	M	SD	*M*	SD	*F*					
1.Quantitative overload	2.77	1.15	2.81	.88	.31	.90/.72	.35***	-01	-.12**	-.05
2.Emotional overload	2.38	1.21	2.24	.60	5.75*	.35***	.88/.74	-.15**	-.07	-.01
3.Job Control	3.62	.99	2.81	.83	208.16***	.01	.09*	.90/.77	.37***	.31***
4.Social support	3.37	1.03	3.41	.71	.26	-.07	.13***	.19***	.83/.73	.32***
5.Feedback	3.51	.75	2.66	.85	314.53***	-.14***	-.09*	.15***	.32***	.60/.83

Notes: Correlations for Spanish employees below the diagonal; *p* < .05; **p* < .01.; ***p* < .001.

Generally speaking, the pattern of correlations shows that in both samples quantitative and emotional overload are positively and similarly related (r=.35), whereas the interrelations of the three job resources are positive in both samples, but slightly stronger in the Dutch sample (mean r= .22/r= .33 for the Spanish/Dutch sample).

A multivariate analyses of variance (MANOVA), using the country as the independent variable and the five working characteristics as the dependent variables, shows a significant multivariate effect (F(5, 1125)= 105, p<.001). More specifically, compared to Dutch employees, Spanish workers report significantly *higher* levels of emotional overload (F(1, 1131)= 5.75, p < .05; M=2.38 in Spain and M=2.24 in The Netherlands) but there are *no* significant differences regarding quantitative overload between the countries (F(1, 1131)= .31, *n.s.*). As for job resources, the Spanish sample shows *higher* levels of job control (F(1, 1131)= 208.16, p<.001; M=3.62 in Spain and M=2.81 in The Netherlands) and performance feedback (F(1, 1131)= 314.53, p<.001; M=3.51 in Spain and M=2.66 in The Netherlands). There are *no* significant differences between both countries regarding social support (F(1, 1131)= .26, *n.s.*). Thus, although Spanish employees report higher levels of emotional demands, they also report more resources (i.e., job control and performance feedback). The largest differences between the two samples concern performance feedback and job control.

Structure of Demands and Resources

Results of CFAs for the Spanish sample (N=654) are shown in Table 3.2. In order to avoid identification problems, the variance of the emotional overload error was fixed using the formula[5] $(1-\alpha)*\sigma^2$. The proposed two-factor model (M2) that assumes that demands and resources are considered to be two different but related latent factors did not fit the data very well: $\chi^2(5)$ = 39.73, GFI = .98, AGFI= .93, RMSEA = .10, NFI = .83, CFI = .84, IFI = .85. Only two of the five fit indices have values of $\geq$ .90. However, the proposed two-factor model fits the data much better than the one-factor model ($\Delta\chi^2(1)$= 86.35, p<.001). Based on an inspection of the Modification Indices, the fit of the two-factor model may be improved by allowing one pair of errors to correlate between emotional overload and social support. This revised two-factor model (M3. Two-Factor revised) fits the data significantly better than the original two-factor model (M2. Two-Factor) ($\Delta\chi^2(1)$= 20.67, p<.001) with all fit indices higher than .90 and an RMSEA equal to .07. In addition, all items load significantly (p< .05) on the predicted factors (see Table 3.2 and Figure 3.1). In accordance with Hypothesis 2, the relationship between job demands and resources is significant and negative. Consequently, Hypothesis 2 is confirmed in this sample.

---

[5] This can be read as: 1 - Cronbach´s alpha of emotional overload * the variance of emotional overload

Table 3.2: The structure of demands and resources for the Spanish (*N*=654) and Dutch (*N*=477) samples.

Model	χ^2	df	GFI	AGFI	RMSEA	NFI	CFI	IFI	$\Delta\chi2$	df
Spain										
M1. One-Factor	126.08	6	.92	.81	.17	.45	.46	.47		
M2. Two-Factor	39.73	5	.98	.93	.10	.83	.84	.85	86.35*	1
M3. Two-Factor revised	19.06	4	.98	.96	.07	.92	.93	.93	20.67*	1
The Netherlands										
M1. One-Factor	78.39	5	.94	.83	.17	.66	.67	.68		
M2. Two-Factor	17.13	4	.98	.96	.07	.93	.95	.95	61.26*	1

Notes. $\chi2$ = Chi-square; df=degrees of freedom; GFI=Goodness-of-Fit Index; AGFI=Adjusted Goodness-of-Fit Index; RMSEA=Root Mean Square Error of Approximation; NFI=Normed-Fit- Index; CFI=Comparative Fit Index; IFI = Incremental-Fit-Index; *p < .001.
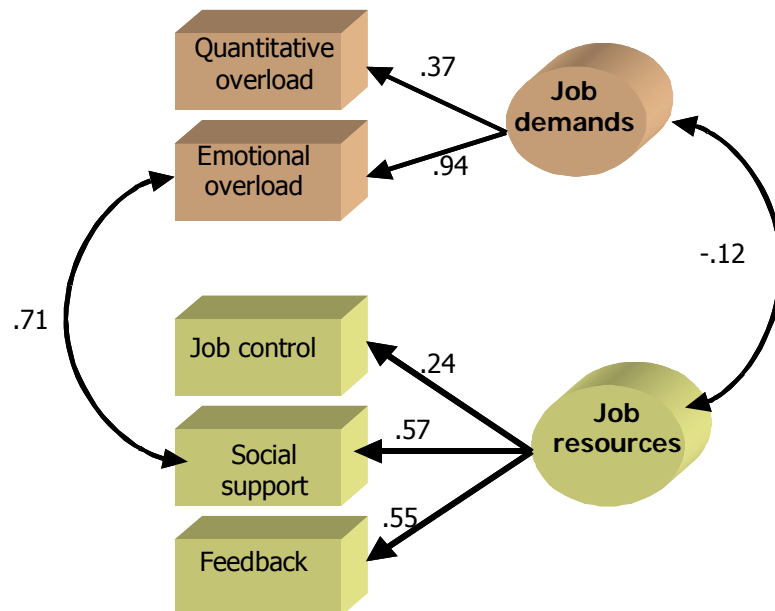
Figure 3.1: Standardised maximum likelihood estimates of the demands and resources in the Spanish sample (*N*=654).

Similarly, Table 3.2. presents the results of CFAs for the Dutch sample (*N*=477). As can be seen, the proposed two-factor model (demands and resources) with correlated factors and no cross-loadings provides a good fit to the data. That is, all fit indices have values higher than .90 and the RMSEA is equal to .07. Moreover, the chi-square difference test shows that the proposed two-factor model (M2. $_{Two-Factor}$) fitted the data better than the one-factor model ($\Delta\chi^2(1)$= 61.26, *p*<.001). Consistent with the findings for the Spanish sample, all coefficients are significant. Figure 3.2. shows the factor loadings and the covariance between the factors. It is interesting to note that the relationship between emotional overload and social support is not relevant in the Dutch sample. As expected, results referring to the relationship between demands and resources also show a negative and significant correlation in the Dutch sample.
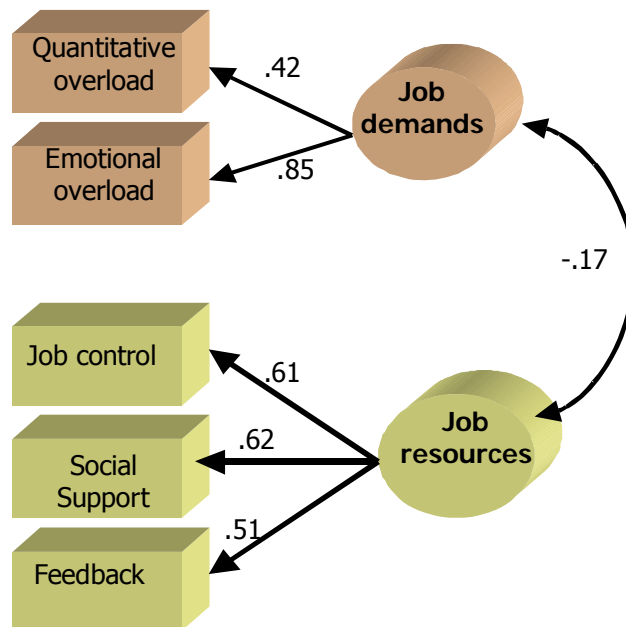
Figure 3.2: Standardised maximum likelihood estimates of demands and resources in the Dutch sample (*N*=477).

Based on the best-fitting model for each group, a multi-group (MLG) model is tested with no constraints imposed (M1. _{Two-Factor free}) to test how well the hypothesized model fits *across* both samples simultaneously (Byrne, 2001; p. 173-179). Accordingly, the best model (i.e., including the covariance between emotional overload and social support in the Spanish sample) is simultaneously fitted *across* the Spanish and Dutch samples. Next, M2. _{All constrained} with all factor loadings and the covariance between demands and resources constrained to be equal is tested across the samples. Because the covariance between emotional overload and social support is only included in the Spanish sample, this parameter is estimated freely for Spanish employees but constrained to zero for The Netherlands. As in the previous analyses, in order to avoid identification problems, the error-variance of emotional overload is fixed using the formula[6]: $(1-\alpha)*\sigma^2$ in both samples.

Comparison of the models (see Table 3.3.) shows that for both countries the fit of the freely estimated model (M1._{Two-Factor free}) is superior to that of a model that constrains the factor loadings and covariances (M2. _{All constrained}) to be equal across samples. In order to determine equivalence across groups in greater detail, the constrained factor loadings model (M3. _{Equal loadings}) and the constrained covariance model (M4._{Equal covariance}) were tested. An iterative process was used in which the factor loadings and covariances that are found to be invariant were held cumulatively constrained equal across the two samples. Results show a final model (see M4. _{Equal covariance}) in which only the covariance between the two latent factors is invariant across samples. This means that the factor loadings of emotional overload, social support and feedback and the error covariance

---

[6] Refers to: 1 - cronbach´s alpha of emotional overload * variance of emotional overload

between emotional overload and social support are different across the samples. In sum, the results of a series of CFA provide evidence for Hypothesis 1, by showing that the proposed two-factor structure of demands and resources fits well *across* the two samples of Spanish and Dutch employees. However, there is some measurement discrepancy between Spanish and Dutch ICT samples as far as the strengths of the factor-loadings is concerned. Moreover, Hypothesis 2 is also confirmed since a negative relationship between demands and resources is observed across both samples.

Table 3.3. Results of Multi-group analyses (MLG) of the working environment including both Spanish (*N*=654) and Dutch (*N*=477) samples.

Model	χ^2	df	GFI	AGFI	RMSEA	NFI	CFI	IFI	$\Delta\chi2$	df
M1. Two-Factor free	36.20	9	.99	.95	.05	.92	.94	.94		
M2. All constrained	61.75	13	.98	.95	.06	.87	.89	.89	25.55*	4
M3. Equal loadings	61.59	12	.98	.95	.06	.87	.89	.89	25.39*	3
M4. Equal covariance	37.61	10	.98	.96	.05	.92	.94	.94	1.41	1

Notes. χ^2 =Chi-square; df=degrees of freedom; GFI=Goodness-of-Fit Index; AGFI=Adjusted Goodness-of-Fit Index; RMSEA=Root Mean Square Error of Approximation; NFI=Normed-Fit Index; CFI=Comparative Fit Index; IFI= Incremental-Fit Index; *p* < .001.

Discussion

The current cross-national study described the structure of workplace conditions in Dutch and Spanish organisations where employees work with Information and Communication Technology. It was hypothesized that these conditions could be categorized in two main factors, namely demands and resources. Results provided evidence for this hypothesis: in both countries, the working conditions in ICT contexts could be categorized

either as a demand, or as a resource. These findings lend support to the basic premise in the Job Demands-Resources model (Bakker *et al,* 2003b; Demerouti *et al.,* 2001a). That is, although employees in different organisations may be confronted with different demands and resources, these working conditions can be grouped in one of two different categories, i.e., demands or resources. The present study shows that this categorization can be found among ICT-workers and in different countries, namely Spain and The Netherlands. The two specific ICT demands analyzed (i.e., quantitative overload and emotional overload) loaded significantly on the demands factor and the specific resources (i.e., job control, social support and performance feedback) loaded significantly on a latent resources factor. The conclusion can therefore be drawn that job demands and job resources should be considered as two different kinds of working conditions. These results give evidence in favor of the basic assumption of the JD-R model. According to these results, independently of the type of work and the country, job characteristics can be divided into job demands and job resources (Bakker *et al.,* 2003b; Demerouti *et al.*, 2001a).

Demands and Resources in ICT Contexts

Thus, results provided support for the two different hypothesized working conditions: job demands and job resources in both ICT samples. Working hard, having too much work to do, "multi-tasking" simultaneously under pressure, along with the interaction at an emotional level with co-workers and supervisors are considered as the two specific demands in ICT work (Bakker *et al.,* 2003a; Dorman & Zijlstra, 2003; Lewig & Dollard, 2003; Llorens & Salanova, 2000). Moreover, the extent to which ICT

employees can decide when and how to carry out given tasks, rather than this being externally prescribed by technology (job control), as well as the climate of social support from co-workers and supervisors (social support) and receiving information regarding the performance from the job, supervisor or colleagues (performance feedback), constitute important resources in technology contexts (Bliese & Britt, 2001; Jackson *et al.,* 1993; Grau *et al.,* 2001; Salanova *et al.,* 2002b).

In both Spain and The Netherlands, emotional overload and social support showed the highest loadings, which implies that these job characteristics contribute substantially to explaining variance in the `demand' and in the `resource' factor, respectively. Interestingly, the equivalence test shows that the factor loadings of emotional overload, social support and performance feedback differed *across* both samples. Another difference between the samples was due to the covariation between the measurement errors of `emotional overload' and `social support' that was only observed in the Spanish sample. The existence of one additional latent variable that is not included in the model may be responsible for this correlation between error terms of emotional overload and social support (de Jonge, Dormann, Janssen, Dollard, Landeweerd, & Nijhuis, 2001). A similar covariance was also obtained in workers in a call-center between emotional overload and time control (Bakker *et al.,* 2003a). Byrne (1989) states that the statistical explanation for this correlation is that items with comparable rating scales often have measurement errors that are correlated. Further analyses should be done to determine whether a latent factor (e.g., emotional factor) explains this relationship.

The differences in factor loadings between both samples may be explained in different ways. One of the reasons may be the difference in

the type of jobs performed by the Spanish and Dutch ICT employees. Dutch employees worked in a call-center, whereas Spanish employees came from a variety of backgrounds (e.g., teachers, factory workers, health workers). In order to explore differences between Spanish and Dutch ICT employees, MANOVA was carried out, with the country as the independent variable and the variables in the model as the dependent variables. The results show that employees in different countries differed in terms of their demands and resources. Specifically, Spanish ICT users scored relatively highly on emotional overload. The Spanish sample reported the highest scores on job control and perceived more performance feedback. Dutch employees reported lower scores on emotional overload and on performance feedback.

Relationship between Demands-Resources

Our findings are all the more convincing since the two latent variables (demands and resources) are negatively related in both samples (r=-.12/-.17 in the Spanish/Dutch sample). This negative relationship between demands and resources is consistent with previous models such as the ERI, DC, and the JD-R models. The reason is that according to the JD-R model, the presence of specific job demands and the absence of specific job resources predicts negative consequences, such as burnout. This implies that job resources may reduce job demands and the associated physiological and psychological costs (Demerouti *et al.,* 2001a). This same negative relationship between these two job conditions has been obtained in previous research with different samples of home care workers, nurses, human services, industry and transport and call-center workers (for example, Bakker *et al.*, 2003a; Demerouti *et al.*, 2001a; Schaufeli &

Bakker, 2004). Taken together, these findings replicate previous research with the JD-R model carried out on other occupational groups (ICT) and countries (Spain and The Netherlands), showing that job demands and job resources are the two-factor structure of working conditions. Thus, regardless of the occupation, job characteristics can be divided into demands and resources (e.g., Bakker *et al.,* 2003b; Demerouti *et al.,* 2001a). Specifically for ICT contexts, we can say that quantitative overload and emotional overload are demands, while job control, social support and performance feedback are resources. Results suggest that in order to reduce job demands, specific job resources (in the present study: job control, social support and performance feedback) should be available and optimized by means of job (re)design, job coaching and organisational development programs (Schaufeli & Enzmann, 1998). Owing to the significantly different levels of demands and resources obtained between Spanish (higher levels of demands and resources) and Dutch (the same level of quantitative overload as Spanish, but lower emotional overload and lower job resources) ICT employees, intervention should be focused differently in the two countries.

Limitations

The main limitation of this chapter is that the data was collected by means of self-report questionnaires and consequently the results could be contaminated by common method variance. Thus, objective methods, such as observers´ ratings may provide an alternative, although these methods suffer from other problems such as observers bias and halo and stereotyping effects (de Jonge, Van Breukelen, Landeweerd, & Nijhuis, 1999). Another limitation is that although the constructs are identical, the

scales used to measure demands and resources were not exactly the same across the two countries considered.

Directions for further Research

Our study was limited to two demands and three resources. Future research should examine a broader range of demands and resources in ICT contexts. Since every organisation may have its own specific risk factors associated with job stress, a previous qualitative analyses, including organisational document research and exploratory interviews with job incumbents, will be useful to select the most potentially relevant job demands and job resources in each organisation. After this initial checklist, a wide range of demands and resources should be included in the questionnaire and analyzed quantitatively (Bakker *et al.*, 2003b; Demerouti *et al.,* 2001a).

Moreover, the evidence for the negative relationship between demands and resources suggests that in future studies it would be of interest to study the role of resources as buffers in the impact of different job demands on the stress process (Kahn & Byosiere, 1992). This would involve studying the interaction effect between high demands and low resources which are responsible for health impairment (e.g., burnout) as well as the interaction effect of low demands and high resources in the motivation process (e.g., engagement) (Bakker *et al.*, 2004b).

To conclude, future studies are needed to clarify the role of mental load in workers who work with `data'. Although traditional literature has shown the negative effects of mental load on performance, stress and well-being (Lorist, Klein, Nieuwenhuis, de Jong, Mulder, & Meijman, 2000; Salanova *et al.,* 1999; Zijlstra, 1993), it has not yet been included in recent

research on stress in ICT contexts (Bakker *et al.* 2003a). It is true that the use of technology involves mental effort since the high level of attention and concentration required may lead to mental fatigue and overload (Salanova *et al.,* 1999; Wall *et al.,* 1990). However, a recent study of a sample of 140 ICT workers showed that the greater the mental demands, the higher were the levels of engagement and professional efficacy and the lower the levels of cynicism. According to Zijlstra *et al.* (1999) those employees who are accostumed to work with high levels of mental overload perceive this mental work as normal, and consequently, it is interpreted as a challenge rather than a stressor. Hence, mental load may stimulate positive feelings and a reduction of effort.

CHAPTER 4

Testing the `Job Demands-Resources' Model in two ICT Field Studies

Testing the 'Job Demands-Resources' Model in two ICT Field Studies[7]

Summary

According to the Job Demands-Resources (JD-R) model, job demands and resources evoke two relatively independent processes: those of erosion and motivational impairment. This hypothesis was tested in a cross-national study among 654 Spanish and 477 Dutch employees working with Information and Communication Technology. Results of Structural Equation Modeling (SEM) analyses provided partial evidence for these independent processes. In both countries, job demands were important predictors of burnout, whereas job resources were the most important predictors of work engagement. In turn, burnout and engagement both explained unique variance in organisational commitment. However, job resources were also negatively related to burnout. Furthermore, multi-group analyses showed that these structural paths were invariant over countries, although the strength of the relationships differed significantly between Spain and The Netherlands. The theoretical and practical implications, as well as perspectives for future research are discussed.

Introduction

The use of Information and Communication Technology (ICT) has become a necessary and crucial element in many work contexts nowadays (Dean & Snell, 1991; Majchrzak & Borys, 1998). Increasing numbers of employees (70% of workers in The Netherlands and 57% in Spain) use ICT for communication in their daily work (Dhondt, Kraan, & Van Sloten, 2002). Despite the benefits of ICT at work (e.g., the facilitation of task execution, the reduction of costs and the improve of customer service) it can also be converted in a potential stressors that may negatively influence employee

---

well-being (Korunka & Vitouch, 1999; Martínez, Cifre, Llorens, & Salanova, 2002a; Salanova & Schaufeli, 2000). On the other hand, computer use may also lead to happiness (Chen, Wigand, & Nilan, 1999) and engagement (Salanova, Grau, Llorens, & Schaufeli, 2001). Research with technology users has not take into account how job demands and job resources influence their psychological well-being. The current study uses the recently proposed Job Demands – Resources model (Bakker, Demerouti, de Boer, & Schaufeli, 2003b; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001a) to examine how ICT employees' working conditions influence their commitment to the organisation through two independent processes: the erosion process and the motivational impairment process. Moreover, two important indicators of well-being, namely burnout and its positive antithesis (i.e., engagement) have been used. In addition, cross-national differences with regard to the JD-R model will be examined, by comparing data collected among ICT employees from Spain and The Netherlands.

Burnout and Engagement: Definition and Measurement

Research on burnout has inspired recent studies on its presumed opposite: engagement. An overview of 25 years of burnout research (Schaufeli & Buunk, 2003) shows that originally burnout was exclusively measured in the human service professions but recently it has been broaden to include all kinds of occupations (Cordes & Dougherty, 1993; Lee & Ashforth, 1996). Although theoretically burnout is composed of three dimensions, empirical studies report that the syndrome has two different sides (Bakker, 2001) which represent the core of burnout: employees who are burned-out, are exhausted due to frequent or intense exposure to job-related demands, and have developed extremely negative, cynical attitudes

and feelings towards their work. Recent studies show that professional efficacy is not the "third" dimension of burnout. In fact, a "crisis in professional efficacy" is a source of the increase of burnout (Cherniss, 1980, 1993; García, Llorens, & Salanova, 2003) and the "boost in professional efficacy" is a source of engagement levels (Salanova, 2003; Salanova, Bresó, & Schaufeli, 2004a). According to Schaufeli and Bakker (2004) burnout and engagement may be positioned on a dimension ranging from fatigue to energy (energy dimension), and a dimension ranging from low and high identification (identification dimension). This raised the question of whether there is an opposite of burnout: engagement.

Work engagement is defined as a persistent, pervasive and positive affective-motivational state of fulfilment in employees (Schaufeli, Salanova, González-Romá, & Bakker, 2002b). It is composed by three dimensions, namely vigor, dedication, and absorption. *Vigor* refers to high levels of energy and mental resilience while working, the willingness to invest effort in one's work, the ability to not be easily fatigued, and persistence in the face of difficulties. *Dedication* is a strong involvement in one's work, accompanied by feelings of enthusiasm and significance, and by a sense of pride and inspiration. These two dimensions may constitute the direct opposites of the two burnout dimensions (i.e., exhaustion and cynicism). Finally, *absorption* refers to a state in which a person is fully concentrated and engrossed in his or her job, whereby time passes quickly and one has difficulties with detaching oneself from work. Although originally three dimensions of engagement were distinguished, recent empirical research suggest that vigor and dedication constitutes the core dimensions (Llorens, García, Salanova, & Cifre, 2003a) which may be the direct opposites of the

dimensions of burnout (Schaufeli & Bakker, 2004). Therefore, in this study the core of burnout (i.e., exhaustion and cynicism) together with its opposite dimensions of core of engagement (i.e., vigor and dedication) were used. Exhaustion-vigor refers to energy and cynicism-dedication refers to attitudinal aspects.

Job Demands-Resources Model

The Job Demands-Resources (JD-R) model (Bakker *et al.,* 2003b; Demerouti *et al.*, 2001a; Schaufeli & Bakker, 2004) is a heuristic, overarching and parsimonious model, that specifies how health impairment (e.g., burnout) and motivation (e.g., engagement) may be produced as a consequence of two general working conditions: job demands and job resources. *Job demands* are defined as working conditions that potentially evoke stress-reactions, when they overwhelm workers´ personal limits and abilities (Demerouti, Bakker, Nachreiner, & Schaufeli, 2000). They refer to "*physical, social or organisational aspects of the job that require sustained physical and/or mental effort and are associated with certain physiological and/or psychological costs*" (see Demerouti *et al.,* 2001a, p. 501). On the other hand, *job resources* refer to physical, psychological, social or organisational aspects of the job that are functional in achieving work goals, reduce job demands or, stimulate personal growth, learning, and development (see Demerouti *et al.,* 2001a). The central proposition of the JD-R model is that job demands and job resources evoke two different psychological processes: the erosion process and the motivational impairment process. The erosion process begins with chronic job demands which may reduce the employee's energy resources and may therefore lead to the depletion of energy (i.e., exhaustion). This depletion of energy can

enhance burnout and health impairment and lead to various stress consequences such as a sickness absence and lack of organisational commitment (e.g., Bakker *et al.,* 2003a; Salanova, Peiró, & Schaufeli, 2000b; Schaufeli, González-Romá, Peiró, Geurts, & Tomás, 2004).

The second process is the so-called motivation impairment process: the availability of job resources stimulates employee's motivation in the form of work engagement and positive work outcomes such as organisational commitment (Schaufeli & Bakker, 2004). Work environments that are characterised by many resources, foster the willingness to dedicate one's effort and abilities to the work task (Bakker *et al.*, 2003a; Demerouti, Bakker, de jonge, Janssen, & Schaufeli, 2001b). In fact, resources are responsible for health protecting factors and for employee motivation (cf. Antonovski, 1987; Hackman & Oldham, 1980) and may stimulate different positive outcomes such as job satisfaction, and high organisational commitment via psychological states (e.g., job engagement) (Baumeister & Leary, 1995; Schaufeli *et al.,* 2002b). Specifically, Schaufeli and Bakker (2004) lend support to this motivation process in reporting that engagement is only predicted by job resources and that engagement is a mediator between job resources and turnover intentions in four occupational groups (i.e., workers in an insurance company, occupational health and safety service, pension food, and a home care institution).

Organisational Commitment

Organisational commitment can be defined as *"a strong belief in and acceptance of the organisation's goals and values, a willingness to exert considerable effort on behalf of the organisation, and a definite desire to maintain organisational membership"* (Porter, Steers, Mowday, & Boulian,

1974, p. 604). This psychosocial construct concerns workers' appraisal of their organisations. Therefore, the referent is not their 'work' or 'job' but the 'organisation'. The broadest investigatory approach considers it as an affective or emotional bond with the organisation (Mowday, Porter, & Steers, 1982). Despite the differences in the conceptualisation of organisational commitment, the different approaches (Allen & Meyer, 1990; Mowday *et al.,* 1982) coincide in considering that employees with strong affective relationships with the organisation can be expected to not only remain in an organisation, but also to exert considerable effort on its behalf (Keita & Sauter, 1992; Meyer, 1997).

Organisational antecedents of commitment have traditionally been studied but less is known about the individual antecedents it involves (i.e., psychological well-being). Mathieu and Hamel (1989) consider mental health and job characteristics to be the most proximal and indirect causes of commitment, respectively. Various authors (Cordes & Dougherty, 1993; Schaufeli & Buunk,1996; Schaufeli & Enzmann, 1998) consider that affect (particularly negative affect, i.e., burnout) is related to absenteeism, and lower organisational commitment. That is, the exhaustion that employees feel interferes with his or her attendance in the job (Tett & Meyer, 1993). On the other hand, Meyer and Allen (1991) provide evidence to suggest that commitment is associated with positive work experiences. That is, having positive experiences at work (e.g., engagement) might be more likely to contribute to the development of an affective attachment to the organisation as having been responsible for those experiences. Many researchers point the direct relationships established between job demands/resources and organisational commitment. Meyer (1997) and Meyer and Allen (1991) show the positive relationship between

commitment and job resources and negative with job demands. Finally, other studies take into consideration all types of effects (i.e., proximal and indirect effects) together. Schaufeli *et al.* (2004) and Taris, Schreurs, and van Iersel van Silfhout (2001) report a direct effect between job demands and burnout (i.e. exhaustion), and between job resources and organisational commitment in different samples (i.e., health care workers and academic staff, respectively).

The Present Study

The relevance of the JD-R model has been obtained in various occupations such as nurses (Demerouti *et al.*, 2000), employees in home care organisations (Bakker, Demerouti, Taris, & Schaufeli, 2003c), employees of a home care organisation, a pension fund and a food production company (Bakker, Euwema, & Demerouti, 2004a), human services industry workers and air-traffic controllers (Demerouti *et al.*, 2001a). However, the testing of the model in ICT contexts is recent. We are only aware of it being used in this context (call-center) in the study carried out by Bakker, Demerouti, and Schaufeli (2003a). The introduction of ICT at job may be converted in a potential stressors in that it may bring about unstable changes and/or increases in job requirements (e.g., higher mental demands, quantitative overload, time pressure) that may negatively influence employee well-being (Korunka, Weiss, & Zauchner, 1997c; Martínez *et al.,* 2002a; Salanova, 2004; Zapf, Seifert, Schumutte, martini, 6 Holz, 2001). The problem increases when the urgency with which employees have to adapt to permanent technological innovations is taken into account. It therefore comes as no surprise to find that ICT users have been used as a focus group in stress studies. On the other hand, the literature points out the benefits of certain particular resources to reduce

the negative influence of ICT demands (e.g., social support, performance feedback and control) (Grau, Salanova, & Peiró, 2001, Salanova, 2004; Salanova & Schaufeli, 2000).

The central aim of this chapter is to test an extension of the recently proposed JD-R model (Demerouti *et al.,* 2001a) by including both negative (in terms of burnout) and positive (in terms of engagement) approaches of employees well-being (as a mediator variables) and organisational commitment (as an organisational outcome) in a sample of ICT employees. In addition, it will examine cross-national differences through the JD-R model, by comparing data collected among ICT employees from Spain and The Netherlands in a cross-national study. Taking into account the results of previous chapters, quantitative overload and emotional overload are considered as job demands, whereas job control, social support, and performance feedback are included as job resources. On the other hand, only the core of burnout (i.e., exhaustion, cynicism) together with the core of engagement (i.e., vigor, dedication) have been considered. Finally, organisational commitment as an outcome has been included in our research model. At this point, we expect that:

1) *Hypothesis 1:* the JD-R model with dual processes (i.e., erosion and motivational processes) will fit better to the data independently and *across* the two samples. However, factor loadings, covariances and regression weights between the variables in the model may be different by countries.

2) *Hypothesis 2:* job demands will be primarily and negatively related to organisational commitment through the impact of burnout (i.e., erosion process). Burnout will mediate the

relationship between job demands and organisational commitment independently and *across* the two samples. However, factor loadings, covariances and regression weights may be different across both Spanish and Dutch samples.

3)   ***Hypothesis 3:*** job resources will be primarily and positively related to organisational commitment through their impact on engagement (i.e., motivational process). Specifically, we hypothesize that engagement will mediate the relationship between job resources and organisational commitment independently and *across* the two samples. However, factor loadings, covariances and regression weights in the model may be different across both Spain and The Netherlands.

Method

Participants and Procedure

The study presented in this chapter was conducted using two samples composed of employees from Spain (N = 654) and The Netherlands (N = 477), who all use ICT as an inherent part of their job. For a description of the sample, see chapter 2 (*Participants and Procedure*).

Instruments

In the same way as in chapter 3, it should be noted that the operationalisation instrument used for measuring *Job Demands* and *Job Resources* are different in the two samples and thus the measures for the two sub-samples are shown separately. For a description of the demands and resources, see chapter 3 (*Instruments*).

Following the conclusions drawn in chapter 2, only the *'core of burnout'* is used in this chapter 4. It is assessed with the Spanish version of the *Maslach-Burnout Inventory-General Survey* (MBI-GS; Schaufeli, Leiter, Maslach, &Jackson, 1996) for Spanish employees and with the Dutch version in the case of the Dutch sample. Burnout is composed of 9 items which are scored on *two* subscales that are the core of burnout: exhaustion (EX) and cynicism (CY). In the same way, only the *'core of engagement'* with the same two opposite burnout dimensions was used to measure engagement through the *Utrecht Work Engagement Scale* (UWES; Schaufeli *et al.,* 2002b). Thus, the engagement scale was composed of 10 items that supposedly reflect two underlying dimensions: *vigor* (VI) and *dedication* (DE). Participants were asked to indicate the extent to which they agreed with each sentence on a seven-point rating scale (0 = never, 6 = every day) (for a more detailed description see chapter 2).

Finally, *organisational commitment* in the Spanish sample was assessed by four items from the Cook and Wall (1980) instrument. They are related to *affective commitment,* which refers to the degree to which employees feel proud to belong to the organisation and have a sense of belonging (e.g., *"I am proud to be able to tell people where I work"*). The four answer categories ranged from 1 (totally disagree) to 5 (totally agree). In the Dutch sample *organisational commitment* refers to the relationship of employees to the organisation in which they work. It was measured with the three items from Mowday, Steers, and Porter's (1979) *affective commitment* scale. One example is: *"I tell my friends and family that my organisation is a pleasant organisation to work for"*. The three response categories ranged from 1 (totally disagree) to 5 (totally agree).

Data Analyses

As a first step, internal consistencies (Cronbach's alpha) and descriptive analyses were computed for all the variables considered in the present study. *Structural Equation Modeling (SEM)* methods as implemented by the AMOS computer program (Arbuckle, 1997) were then used to test the Job Demands-Resources model (JD-R) in the two samples separately as well as *across* both samples simultaneously using multi-group analyses (*N* Spanish=465 and *N* Dutch=477). Finally, a test of the equality of covariance structures and factor loadings across samples was used by placing constraints on particular parameters (see Byrne, 2001).

Maximum likelihood estimation methods were employed to examine the covariance matrix of the items. The goodness-of-fit of the models was evaluated by comparing the mean of the χ^2 difference test (Jöreskog & Sörbom, 1993). Since this index is sensitive to the sample size (Byrne, 2001) other measures of goodness-of-fit indices are recommended (Bentler, 1990; Bollen, 1989): the Root Mean Square Error of Approximation (RMSEA), the Goodness-of-Fit-Index (GFI) and the Adjusted Goodness-of-Fit-Index (AGFI). In addition, AMOS provides several relative indices that reflect the discrepancy between the hypothesized model and the baseline or Null model (Marsh, Balla, & Hau, 1996). In the present series of analyses, the Normed-Fit-Index (NFI), the Comparative-Fit-Index (CFI), and the Incremental-Fit-Index (IFI) are used. In general, models with fit indices > .90 and RMSEA < .08 indicate a good fit (Hoyle, 1995).

Several plausible models were compared using SEM analyses which are described below: the proposed *basic dual processes model* (M1) includes only indirect paths from job demands and resources to organisational commitment through the core of burnout and the core of

engagement, respectively. Additionally, another alternative model was tested, namely the *partial cross-linked model* (M2), which includes all the paths from M1 together with two additional ones: the path from job demands to engagement and from job resources to burnout. Finally, the *partial mediation model* (M3) includes all the paths from the previous models, together with the direct paths from job demands and from job resources to organisational commitment.

Results

Internal consistencies were calculated for the variables in the JD-R model separately in each sample. As a result, all of them emerged with a minimum number of items and maximum internal consistencies. All alpha-values variables met the arbitrary criterion of .70 (Cortina, 1993; Nunnaly & Bernstein, 1994) in the two samples, with one exception (feedback= .60 in the Spanish sample). Table 4.1 shows the descriptive analyses (i.e., mean values, standard deviations, internal consistencies, and inter-correlations) of the variables included in the JD-R model in both samples.

The pattern of correlations is very similar and as expected in both samples, although stronger interrelations were shown in Dutch sample. A positive relationship among job demands and burnout dimensions, as well as between job resources, engagement and organisational commitment are obtained in both countries. In addition, a negative correlation between job resources and burnout as well as between burnout and organisational commitment is also obtained in all the samples. Despite the similarities there are also some differences between countries. The first of these lies in the relationship between quantitative overload and job resources, which is

only significant and negative with feedback in Spain ($r = -.14$) and with social support ($r = -.12$) in The Netherlands. Secondly, emotional overload also runs differently in the two samples, showing an unexpected relationships in the Spanish sample: a negative correlation only occurs with feedback ($r = -.09$) but it is positive with the rest of the resources ($r = .09$ with job control, $r = .14$ with social support), engagement ($r = .12$ with vigor, $r = .16$ with dedication) and with organisational commitment ($r = .12$). Moreover, non-significant relationships are shown with the core of engagement in The Netherlands.

Multivariate analyses of variance (MANOVAs), using the country as the independent variable and the rest of the variables in the model as dependent variables, show a significant multivariate effect $F(10, 1120)= 218.69$, $p<.001$). Consistent differences between Spain and The Netherlands are found. Spanish employees report significantly *higher* levels of emotional overload ($F(1, 1131)= 5.75$, $p<.05$), job control ($F(1, 1131)= 208.16$, $p<.001$), feedback ($F(1, 1131)= 314.53$, $p<.001$), exhaustion ($F(1, 1131)= 67.21$, $p<.001$), cynicism ($F(1, 1131)= 4.32$, $p<.05$) and organisational commitment ($F(1, 1131)= 751.96$, $p<.001$) than Dutch employees. However, the Dutch employees show *higher* levels in engagement: vigor ($F(1, 1131)= 36.77$, $p<.001$) and dedication ($F(1, 1131)= 15.94$, $p<.001$) than Spanish employees. Finally, non-significant differences between both samples were obtained in quantitative overload ($F(1, 1131)= .31$, *n.s.*) and social support ($F(1, 1131)= .26$, *n.s.*) (see Table 4.1).

Table 4.1: Descriptive analyses (Cronbach's α Spanish/Dutch employees on the diagonal) of job demands, job resources, core of burnout, core of engagement and organisational commitment scales in the Spanish (*N*=654) and Dutch sample (*N*=477).

| | Spnish | | Dutch | | | Correlations and Internal consistencies | | | | | | | | | |
	M	SD	M	SD	*F*	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.Quantitative overload (QLOAD)	2.77	1.15	2.81	.88	.31	.90/.72	.35**	-.01	-.12**	.05	.26**	.19**	.01	-.01	-.15**
2.Emotional overload (ELOAD)	2.38	1.21	2.24	.60	5.75*	.35**	.88/.74	-.15**	-.07	-.01	.30**	.25**	-.05	-.03	-.10*
3.Job control (JC)	3.62	.99	2.81	.83	208.16**	.02	.09*	.90/.77	.37**	.31**	-.19**	-.29**	.31**	.40**	.34**
4.Social Support (SUP)	3.37	1.03	3.41	.71	.26	-.07	.14**	.19**	.84/.73	.33**	-.22**	-.21**	.26**	.27**	.28**
5.Feedback (FEED)	3.51	.75	2.66	.85	314.53**	-.14**	-.09*	.15**	.32**	.60/.83	-.18**	-.34**	.27**	.38**	.38**
6.Exhaustion (EX)	2.25	1.21	1.64	1.26	67.21**	.37**	.30**	-.14**	-.19**	-.15**	.86 /.85	.55**	-.38**	-.31**	-.36**
7.Cynicism (CY)	1.62	1.28	1.46	1.31	4.32*	.20**	.12***	-.15**	-.33**	-.29**	.54**	.84/.78	-.40**	-.57**	-.55**
8.Vigor (VI)	3.92	.95	4.37	1.23	36.77**	-.04	.12**	.20**	.30**	.19**	-.26**	-.48**	.77/.80	.73**	.52**
9.Dedication (DE)	3.79	1.25	4.13	1.56	15.94**	-.01	.16**	.24**	.35**	.27**	-.23**	-.54**	.70**	.89/.90	.64**
10.Organisational commitment (ORG.COMM)	4.48	.69	3.35	.67	751.96**	-.05	.12**	.13**	.36**	.12**	-.21**	-.48**	.41**	.46**	.77/.88

Notes: Correlations for the Spanish sample below the diagonal; *p* < .05; **p* < .001.

Testing the extension of Job Demands-Resources Model

Results of SEM-analysis for the Spanish sample (N=654) are presented in Table 4.2. In order to avoid an identified problem, the variance of organisational commitment error was constrained using the formula[8]: $(1-\alpha)*\sigma^2$. The proposed basic dual process model provided an inadequate fit to the data, χ^2 (32) = 524.30, GFI = .87, AGFI= .79, RMSEA = .15, NFI = .70, CFI = .71, IFI = .71. Inspection of the modification indices revealed that the fit may be improved ($\Delta\chi^2(1)$ = 188.18, p<.001) by allowing one pair of errors to correlate between the two latent factors: burnout and engagement (M1). The alternative partial cross-linked model (M2) that also includes cross-effects from demands to engagement and from job resources to burnout resulted in a significant improvement of the fit compared to the proposed model. However, the best model is the (M3. Partial mediation) that also includes the direct relationships from job demands and job resources to organisational commitment with all the coefficients being significant (see Table 4.2 and Figure 2.1).

---

[8] Refers to: 1 - Cronbach's alpha of organisational commitment * variance of organisational commitment

Table 4.2. The structure of Job Demands-Resources model for Spanish (*N*=654) and Dutch (*N*=477) sample.

Model	χ^2	df	GFI	AGFI	RMSEA	NFI	CFI	IFI	$\Delta\chi^2$	df
Spain										
M1. Basic dual	336.12	31	.91	.84	.12	.80	.82	.82		
M2. Partial cross-link	205.94	29	.94	.89	.09	.88	.90	.90	130.18**	2
M3. Partial mediation	189.36	27	.95	.90	.09	.90	.90	.91	16.58**	2
The Netherlands										
M1. Basic dual	193.11	31	.93	.87	.10	.87	.89	.89		
M2. Partial cross-link	124.93	29	.95	.91	.08	.92	.94	.94	68.18**	2
M3. Partial mediation	118.08	27	.95	.91	.08	.92	.94	.94	6.85*	2

Note. χ^2 = Chi-square; df=degrees of freedom; GFI=Goodness-of-Fit Index; AGFI=Adjusted Goodness-of-Fit Index; RMSEA=Root Mean Square Error of Approximation; NFI= Normed-Fit Index; CFI=Comparative Fit Index; IFI = Incremental-Fit-Index; *p < .05 and **p < .001.
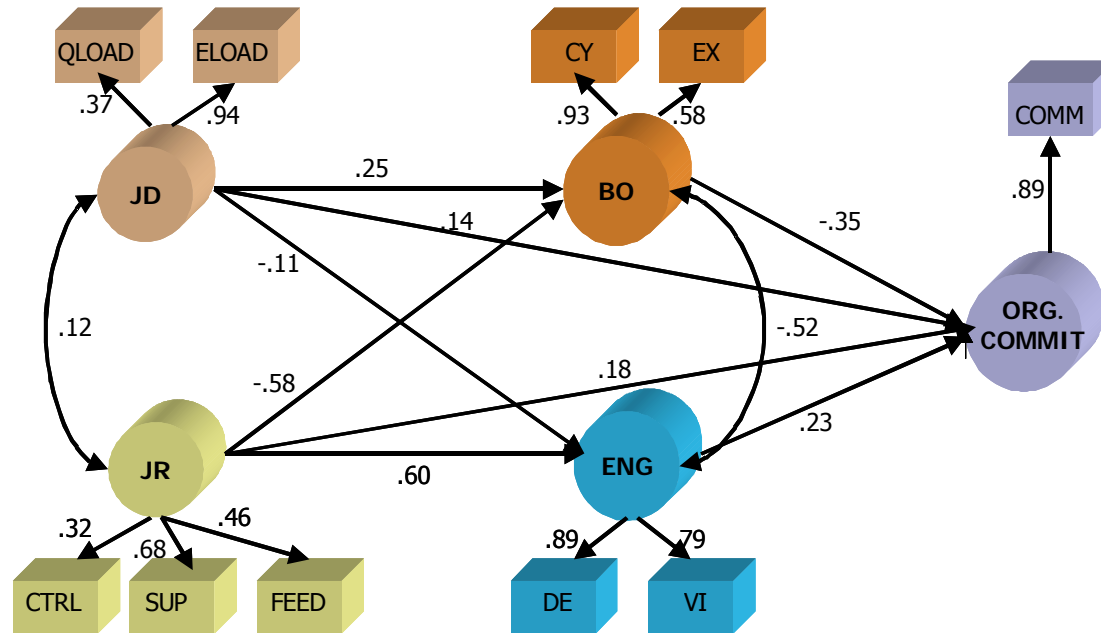
Figure 4.1: Standardised maximum likelihood estimates of the Job Demands-Resources model in the Spanish sample (*N*=654).

On the other hand, SEM-analyses for Dutch sample (N= 477) show that the proposed basic dual processes (M1) did *not* fit adequately to the data, χ^2 (32)=313.92, GFI=.89, AGFI=.82, RMSEA=.13, NFI=.79, CFI=.81, IFI=.81. Inspection of the modification indices shows that the fit of the model can be improved by allowing a correlation between the measurement errors of burnout and engagement ($\Delta\chi^2(1) = 120.81$, *p*<.001) (see Table 4.2). In the same way than in the Spanish sample, the alternative diagonal model that includes the element that job demands are also related to engagement and job resources are also related to burnout (M2. Partial cross-link) improves the model significantly compared to the proposed model (M1. Basic dual). However, of the two additional paths, only job resources showed a significant and negative relationship with burnout. Finally, compared to the previous model, the inclusion of the direct effects of work characteristics (i.e., job demands and job resources) on organisational commitment (M3. Partial mediation) can be considered to be the best model. Despite this, the coefficients of the path from job demands on organisational commitment ($\beta = .02$, $t = 1.16$) and the path from job demands to engagement ($\beta = -.06$, $t = .27$) are non-significant in The Netherlands (see Table 4.2 and Figure 4.2).
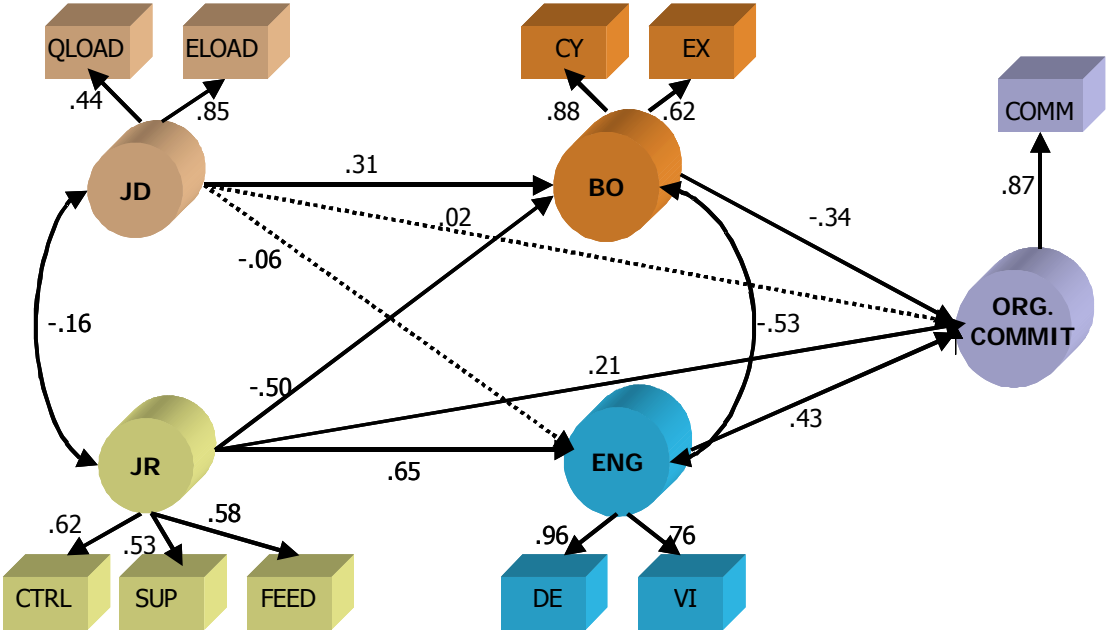
Figure 4.2: Standardised maximum likelihood estimated of the Job Demands-Resources model in the Dutch sample (N=477) (Dotted lines represent non-significant relationships).

Following Byrne (2001; p. 173-199) and based on the best-fitting model for each group, a multi-group model (MLG) was tested in other to test whether the JD-R model is invariant across the two countries (M1. Partial mediation model free). An advantage of the MLG is that it provides more efficient parameter estimates than single-groups models (Arbuckle, 1997). The best partial mediation model (M1) (i.e., including the direct relationship from job demands to engagement and from job demands to organisational commitment obtained in the Spanish sample) was simultaneously fitted *across* the two countries. Next, (M2) with all factor loadings, regression weights and covariances constrained was tested across groups. Because the effect of job demands on engagement and the direct effect of job demands on organisational commitment are included only in the Spanish sample, these parameters are estimated freely for Spanish but constrained to 0.00 for Dutch employees. As can be seen from Table 4.3, the fit of the freely estimated model (M1) deteriorated significantly in both countries when it was compared with the fit of a constrained model (M2) ($\Delta\chi^2(13) =$ 99.00, $p<.001$). In order to determine which measurement are not operating equivalently across groups, the process of constraining successive factor loadings (M3. Equal loadings), regression weights (M4. Equal regression weights), and covariances (M5. Equal covariance) is then applied. Results show a final model (M6. Final model) in which, with the exception of the invariant parameters constrained by one for identification purposes, the factor loadings of feedback, exhaustion and dedication are invariant across samples. Additionally, the regression weights from demands to burnout, resources to engagement, resources to organisational commitment, and burnout and engagement to organisational commitment, along with the error covariance between burnout-engagement are also equivalent across

Spanish and The Netherlands. Thus, the factor loadings of emotional overload, social support, and the path from demands to organisational commitment and resources to burnout as well as the covariance between demands-resources are different across the samples. To summarise, results of a series of SEM provided evidence for Hypothesis 1, by showing that the proposed extension of Job Demand-Resources model of burnout with the inclusion of the new engagement concept and the organisational commitment outcome in ICT jobs can be shown *across* countries, but certain measurement differences between the Spanish and Dutch samples should be taken into consideration. Furthermore, Hypothesis 2 was confirmed since job demands are primarily a predictor of burnout, which in turn predicts a decrease in organisational commitment (i.e., erosion process). In addition, we found that job resources also had a significant negative relationship with burnout, which in turn predicts organisational commitment. Finally, Hypothesis 3 was also confirmed since resources are the most important and negative predictors of engagement (i.e., motivation impairment process), which in turn predicts organisational commitment.

Table 4.3: Results of Multi-group analyses (MLG) of the Job Demands-Resources model including both Spanish (*N*=654) and Dutch (*N*=477) samples.

Model	χ^2	df	GFI	AGFI	RMSEA	NFI	CFI	IFI	$\Delta\chi^2$	df
M1. Partial mediation model free	308.84	56	.95	.90	.06	.91	.92	.92		
M2. All constrained	407.84	69	.94	.90	.06	.87	.89	.89	99.00**	13
M3. Equal loadings	367.02	61	.94	.90	.07	.89	.90	.90	58.18**	8
M4. Equal regression weights	327.12	62	.95	.91	.06	.90	.92	.92	18.28**	1
M5. Equal covariance	316.78	58	.95	.90	.06	.90	.92	.92	7.94*	2
M6. Final model	315.52	65	.95	.92	.05	.90	.92	.92	6.68	9

Note. χ^2 =Chi-square; df=degrees of freedom; GFI=Goodness-of-Fit Index; AGFI=Adjusted Goodness-of-Fit Index; RMSEA=Root Mean Square Error of Approximation; NFI=Normed-Fit Index; CFI=Comparative Fit Index; IFI= Incremental-Fit Index; **$p < .001$, *$p < .01$.

Discussion

The cross-national study described in this chapter aimed to test an extension of the Job Demands-Resources model of burnout (Bakker *et al.*, 2003a; Demerouti *et al.,* 2001a) with the inclusion of both negative (the core of burnout) and positive (the core of engagement) approaches of employee well-being and an organisational outcome variable (i.e., organisational commitment) in a specific ICT context. For the purpose of cross-national validation of the job demands-resources model, 654 ICT Spanish workers and 477 telecom call-centre employees in The Netherlands were taken as our sample. Specifically, the goal of the present study was to examine how different categories of working conditions –job demands and job resources- are related to organisational commitment through the dual processes of *erosion* and *motivation* using the Job Demands-Resources

model in ICT contexts. Structural Equation Modelling (SEM) analyses for the two samples separately and with multi-group analyses confirmed the extended Job Demands-Resources model in both samples. Thus, two different processes were revealed to be responsible for organisational commitment. The first *erosion* process starts with high job demands (i.e., high emotional and quantitative overload), which lead to burnout (i.e., higher levels of exhaustion and cynicism) and consequently, to lower organisational commitment. The second process is *motivational* in nature and starts with job resources. In this way, ICT employees with job resources in terms of job control, social support and performance feedback feel more engaged (i.e., more vigorous and more dedicated) at work, which leads to higher levels of commitment to the organisation. However, some measurement differences were obtained *across* the samples. These findings agree with previous studies that support the idea that, regardless of the occupation, two sets of working characteristics (i.e., job demands and job resources) may evoke two different psychological processes: the traditional and negative erosion process as well as the motivational driven process based on the Positive Psychology (Seligman & Csikszentmihalyi, 2000) which can lead to different stress consequences such as absenteeism, turnover intentions and organisational commitment (e.g., Bakker *et al.,* 2003b; Demerouti *et al.,* 2001a; Salanova *et al.,* 2000b).

Dual Psychosocial Processes at Work in ICT Contexts

The hypothesized dual processes of the JD-R model fits reasonably well do the data in Spanish and Dutch ICT employees, although some important differences were obtained *across* samples. Generally, types of working conditions, so-called job demands and job resources play a key

role in the prediction of the core of burnout (i.e., exhaustion and cynicism), engagement (i.e., vigor and dedication) and organisational commitment in both samples. This result illustrates the robustness of the findings and the cross-national validation of the Job Demands-Resources Model (JD-R). According to this, two underlying processes exist: (a) an erosion process in which job demands lead to burnout which plays a key role and that might lead to negative organisational outcome (less organisational commitment); and (b) a motivation process that is driven by the availability of job resources and in which engagement plays a key role in the increase of organisational commitment.

However, burnout and engagement do not act as a pure mediator in both process since cross-links have been found. In the case of Spain, job demands primarily predicted burnout, but also predicted a decrease in engagement levels. The relationships between job demands and engagement have been also reported in the literature in ICT samples (Bakker *et al.,* 2003b) as well as by using multiple samples with university teachers and students (Salanova, Cifre, Grau, Llorens, & Martínez, 2003). In the same way, job resources predicted primarily engagement but also was the responsible of a decrease in burnout levels in both samples. This suggest the idea that some job resources may directly prevent the erosion process. This relationship has also been identified by Schaufeli and Bakker (2004) who found a cross-link between job resources and burnout in four independent samples.

On the other hand, an alternative model that also includes direct paths from job demands and job resources to organisational commitment fits the data better than the proposed models (i.e., basic dual and partial cross-link models). Consequently, burnout and engagement do not act as

full mediator variables, since direct relationships can also be observed *across* samples from job resources to organisational commitment. Moreover, a direct and positive effect was obtained from job demands to organisational commitment only in Spain. This non-expected positive effect might be an arte-factual problem since job demands and organisational commitment are negatively correlated. Another reason to explain this result only in Spain, is a sample difference: Dutch employees were call-center workers while Spanish comprised a more heterogeneous sample. In addition we should point out that concepts and the questions for job demands and job resources are not exactly the same in both countries. Future research should explore why these results arise, and examine whether differences occur in relation to the job level or individual differences, such as efficacy beliefs. Concerning the relationships between job demands/resources and job commitment, research shows that the more positive perceptions of job characteristics are (e.g., job control, feedback), the higher the organisational commitment of employees will be (Mathieu & Zajac, 1990; Zurriaga, Ramos, González-Romá, Espejo, & Zornoza, 2000). In this line, Van Dierendonck, Schaufeli, & Buunk (1998) in a sample composed of 149 direct care professionals with a low level of support either from colleagues or from their supervisors increased their turnover intention as they were more inclined to restore the sense of equity by expanding their horizons outside the organisation, whereas among those with high levels of support, turnover intention decreased.

Taken together, these findings replicate and expand previous findings with the JD-R model among specific ICT samples, by including not only the traditional and negative psychological states (e.g., burnout) but the positive psychological states (e.g., engagement) in a cross-cultural perspective. Our

results corroborate the existence of the basic dual processes involved in job stress. Thus, job demands are mainly related to organisational commitment (negative relationship) through burnout, giving evidence for the erosion process in both samples. Secondly, job resources were the most important predictor of organisational commitment through their impact on engagement, following a motivational impairment process. Thirdly, available resources also might lead to organisational commitment by their influence on burnout (cross-link effect) and by a direct effect in both samples. Although within these similarities across countries, some differences have been obtained: in some factor loadings (emotional overload and social support), in the cross-link relationship from job demands and engagement and in the direct effect of job demands on organisational commitment, which were only significant in Spain. Hence, the inclusion of the positive psychological state increases our understanding of the stress process.

In order to explore differences between ICT workers in Spain and The Netherlands, MANOVAs were carried out, with the country as the independent variable and the model variables as the dependent variables. Results showed that ICT employees in different countries (Spain and The Netherlands) differed with regard to emotional overload, job control, performance feedback, burnout, engagement, and organisational commitment. Specifically, Spanish ICT employees reported the highest scores on emotional overload, job control, and performance feedback and organisational commitment and felt more exhausted and cynical at work. However, Dutch employees reported the highest levels on vigor and dedication. Finally, the employees from the two countries did not differ in the levels of quantitative overload and social support, showing relatively

high scores on these factors. All these differences between the two countries may be understood more easily if cross-national differences between these two European countries are taken into account (Paoli & Merllié, 2001). Thus, in The Netherlands 58% of employees experience a high work pace and 32% indicate a higher speed of work continuously (only 16% in Spain). On the other hand, Spanish employees reported a lower degree of control over working hours (30%) compared to Dutch employees (53%).

Practical and Theoretical Implications

The present findings may have important theoretical and practical implications for organisations. One of the most important contributions of the present chapter is that provides evidence for the extension of the JD-R (e.g., Bakker *et al.,* 2003c; Demerouti *et al.,* 2001a) model including not only burnout, but also the positive perspective in a specific ICT sample. Because this is a cross-cultural study, results provide evidence for the JD-R model across countries despite the fact that certain differences were obtained. Generally speaking, the JD-R model can be replicated and generalised across jobs and countries. Our findings basically suggest that organisational commitment is the result of two basic-dual processes. Results suggest that in order to reduce or prevent burnout and consequently to increase the levels of organisational commitment, specific job demands (e.g., quantitative overload and emotional overload) should be reduced and available job resources could be considered. In addition, in order to increase engagement, which in turn increases levels of organisational commitment, the presence of available resources should be considered. This could be achieved by following various strategies such as

job redesign, job coaching and organisational development programs at organisational level (Schaufeli & Enzmann, 1998) or at individual level by training and the increase of efficacy levels (Bandura, 2001; Grau *et al.*, 2001; Korunka, Weiss, & Karetta, 1993; Llorens, Salanova, & Grau, 2003b). Moreover, one important result in both samples is the pivotal role of the new positive psychological approach (i.e., the motivational impairment process) in the stress process (Seligman & Csikszentmihalyi, 2000).

Limitations

The main limitation of this chapter is that research design is cross-sectional. It implies that the relationships obtained between job demands-job resources on burnout and engagement processes and, in turn, on organisational commitment need to be interpreted with caution, and no causal inferences should be made. Our research model need to be tested longitudinally. That is, it should be investigated whether job demands and job resources in Time 1 predict burnout and engagement at Time 2, and whether burnout and engagement in their turn predict organisational commitment at Time 3. As far as burnout is concerned, few longitudinal studies have been conducted regarding its antecedents and consequences (Schaufeli & Enzmann, 1998, p. 93-98). So far, few longitudinal studies on positive psychological approach (e.g., engagement) have been carried out. Another important limitation is the fact that the data has been collected by self-report questionnaires, whose results may be contaminated by variance of the common method.

Although the same basic processes were shown in the two samples when both separately and simultaneously analysed, some differences were obtained, which indicates that it may be desirable to replicate the study in

other samples, using longitudinal designs. Moreover, it should be noted that the specific job demands and job resources included in the research were all measured with only a limited number of items and clearly, only one outcome can be considered to test the Job Demands-Resources model. Finally, one of the most important limitations may be that the instruments used to measure job demands and job resources were not exactly the same in the two samples.

Directions for further Research

The present study could be taken as a starting point for further empirical studies to test cross-national differences (e.g., in secondary-school teachers, in university students) in Spain and The Netherlands. Our study was restricted since only two specific job demands and three job resources in ICT contexts were analysed. For this reason, future studies should examine a broader range of job demands and job resources and test the model by including moderator variables between job characteristics, burnout and engagement and organisational commitment, such as efficacy beliefs, using longitudinal designs. According to Bandura (1997) efficacy belief is a powerful personal resource in the fulfilment of job demands. In this way, those with low efficacy are stressed by perceived overload in which task demands exceed their perceived capabilities, whereas those who hold a high belief in their efficacy are unfazed by heavy workloads (Jex & Bliese, 1999). Moreover, according to Cherniss (1980) the lack of confidence in one's own competence is a critical factor in the development of burnout, while high levels of efficacy beliefs lead to increase levels of engagement (Llorens *et al.,* 2003a; Salanova *et al.,* 2001, 2004a).

Does a Positive Gain Spiral of Resources, Efficacy Beliefs and Engagement exist?

Does a Positive Gain Spiral of Resources, Efficacy Beliefs and Engagement exist?[9]

Summary

The present study among 110 Spanish university students expands previous research on work engagement by investigating the causal relationships between two potentially important resources in the use of Information and Communication Technology (i.e., time control and method control), efficacy beliefs and engagement. More specifically, two questions are addressed: (1) do personal resources mediate the relationship between task resources and work engagement?; (2) does engagement increase personal and task resources? Results show that efficacy beliefs play a mediating role between task resources and engagement. Engagement increases efficacy beliefs, which in turn increase task resources over time. These findings suggest a positive gain spiral in which efficacy beliefs play a central role.

Introduction

Recent studies have suggested that job resources are related to work engagement through a process of work motivation (Bakker, Demerouti, de Boer, & Schaufeli, 2003b; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001a; Schaufeli & Bakker, 2004). However, these studies were cross-sectional in nature and only one type of resources (i.e., task resources) was included. The present longitudinal and experimental study expands previous research on engagement by disentangling the (reversed) causal relationships between work task resources (i.e., time control and method control), personal resources (i.e., efficacy beliefs), and engagement. More specifically, two research questions are addressed: (1) do personal

---

resources mediate the relationship between task resources and work engagement?; (2) does engagement increase personal and task resources? If the answer to both questions is affirmative, a reciprocal causal relationship would exist that is indicative of the "gain spiral" proposed by the Conservation Of Resources (COR) Theory (Hobfoll, 1989, 2001, 2002). That is, task resources would foster efficacy beliefs and engagement, which in turn would have a positive impact on efficacy beliefs and task resources.

The Motivational Potential of Job Resources

Several studies have pointed to the motivational potential of (job) resources. For instance, according to Job Characteristics Theory (JCT; Hackman & Oldham, 1976; 1980) every job has a specific motivational potential that depends on the presence of five core job characteristics: i.e., skill variety, task identity, task significance, autonomy, and feedback. The presence of these resources is linked to positive outcomes such as high quality work performance, job satisfaction, low absenteeism, low turnover and high work motivation (Fried & Ferris, 1987; Tierney & Farmer, 2002). The Conservation Of Resources (COR) Theory also states that job resources can potentially be motivating in their own right through the creation, maintenance and accumulation of resources (Hobfoll, 1989). Resources are defined as "… *those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, conditions or energies"* (Hobfoll, 1989, p. 516). For example, job control and efficacy beliefs are considered to be resources, in the same way as health and well-being, since they are valued and sought after. COR-theory assumes that "… *people strive to retain, protect, and build resources and what is threatening*

to them is the potential or actual loss of these valued resources" (Hobfoll, 1989, p. 516). Consequently, stress is produced when resources are threatened, or lost, and when individuals invest resources and do not reap the anticipated level of benefits. Furthermore, COR theory assumes that resources may diminish as a result of so-called "loss spirals" and that resources may increase as a result of "gain spirals" (Hobfoll, 2001). The former implies that people who lack resources are susceptible to losing even more resources. On the other hand, gaining resources increases the resource pool, which makes it more likely that more resources will subsequently be acquired. Resource loss decreases motivation, and may eventually lead to burnout (Demerouti, Bakker, & Bulters, 2004; Hobfoll & Freedy, 1993), whereas resource gain increases motivation and well-being (Hobfoll, 2001; see also Houkes, Janssen, de Jonge, & Nijhuis, 2001).

Finally, the Job Demands-Resources (JD-R) model (Bakker *et al.,* 2003b; Bakker, Demerouti, & Verbeke, 2004c; Demerouti *et al.,* 2001a; Schaufeli & Bakker, 2004) constitutes a heuristic and parsimonious model that specifies how health impairment (e.g., burnout) and motivation (e.g., work engagement) may be produced as a consequence of two sets of working conditions: job demands and job resources. It is an overarching model that can be used, irrespective of the particular demands and resources of a specific job. According to the JD-R model, job resources are those aspects of the job that are functional in achieving work goals, reduce job demands, or stimulate personal growth and development (see Demerouti *et al.,* 2001a). The central proposition of the JD-R model is that job demands and job resources each evoke two different processes: job demands drain the employee's energy resources, thus leading to burnout and health impairment, whereas the availability of job resources stimulates

employee motivation in the form of work engagement and positive work outcomes such as organisational commitment (Schaufeli & Bakker, 2004). That is, work environments that are characterised by many resources foster the willingness to dedicate one's efforts and abilities to the work task, which in that case is likely to be accomplished successfully (see also Meijman & Mulder, 1998). It is plausible that successful goal accomplishment is accompanied by work engagement.

Work engagement is defined as a persistent, pervasive and positive affective-motivational state of fulfilment in employees (Schaufeli, Salanova, Gonazález-Romá, & Bakker, 2002b). It is composed of three dimensions: vigor, dedication, and absorption. *Vigor* refers to high levels of energy and mental resilience while working, the willingness to invest effort in one's work, the ability to not be easily fatigued, and persistence in the face of difficulties. *Dedication* refers to a strong involvement in one's work, accompanied by feelings of enthusiasm and significance, and by a sense of pride and inspiration. Finally, *absorption* refers to a state in which individuals are fully concentrated on and engrossed in their activities, whereby time passes quickly and they have difficulties in detaching themselves from work. Although originally three dimensions of work engagement were distinguished, recent empirical research suggests that vigor and dedication constitute the core dimensions (de Rijk, Le Blanc, Schaufeli, & de Jonge, 1998; Llorens, García, Salanova, & Cifre, 2003a; Schaufeli & Bakker, 2004), which are the direct opposites of the dimensions of burnout (exhaustion and dedication respectively). Therefore, this study includes only these two indicators of engagement.

Reciprocal Relationships

Most occupational stress studies are cross-sectional in nature so that no causal inferences can be made and reversed causation cannot be ruled out. For instance, Zapf, Dormann, and Frese (1996) reviewed 16 longitudinal studies on job stress, of which six provide evidence for reversed causation. That is, instead of job stressors leading to strain, it was found that strains such as job dissatisfaction and emotional exhaustion lead to higher perceived levels of stressors such as work overload and work-home interference. Also, reversed causal relationships between resources and mental health have been observed. For instance, Schwarzer, Hahn and Jerusalem (1993) found that mental health predicted levels of social support, instead of the other way around.

So far, only a few studies have been conducted that combine causal and reversed causal effects into one model of reciprocal causation. In a longitudinal study, Demerouti *et al.* (2004) showed that work pressure leads to work-home interference and to exhaustion; and vice versa, that exhaustion results in more work-home interference and work pressure. In a similar vein, De Lange, Taris, Kompier, Houtman, and Bongers (2003) found evidence for reciprocal effects between work characteristics and health, showing that high job demands lead to ill-health, whereas ill-health is associated with higher job demands across a three-year period. Reciprocal effects have also been shown between efficacy beliefs and burnout in a two-wave longitudinal study among teachers (García *et al.,* 2003). That is, poor efficacy beliefs lead to burnout, and vice versa. The previous studies are indicative of the existence of a loss-spiral: job stressors lead to resource loss (i.e., health impairment), which via increased job stress leads to further loss of resources.

Finally, only one longitudinal study has been carried out that is suggestive of the existence of gain spirals. Llorens *et al.* (2003a) studied the affective antecedents (i.e., burnout and engagement) of self-efficacy in a sample of 274 Spanish secondary-school teachers measured in two waves (Time 1 and Time 2). Results of structural equation modeling provide strong evidence for the mediating role of burnout and engagement in the relationship between obstacles and facilitators on the one hand, and self-efficacy on the other. Particularly relevant to the present chapter are findings from the study by Llorens *et al.* (2003a) showing that job resources (e.g., easy access to information and relevant materials) increase work engagement and future efficacy beliefs, and in the opposite direction, engagement and efficacy increase the availability of resources. This process goes on over time and consequently a positive "gain spiral" model of efficacy is obtained. These results provide evidence in favor of the motivation process of the JD-R model (Bakker *et al.,* 2003b; Demerouti *et al.,* 2001a) and show empirical support for the motivational boost of efficacy beliefs found in previous cross-sectional studies with University students (Salanova, 2003; Salanova, Bresó, & Schaufeli, 2004a).

The Present Study: Resources, Efficacy Beliefs and Engagement

The present longitudinal study focuses on the causal relationships between task resources, efficacy beliefs and engagement in a sample of university students in a laboratory setting. More specifically, it refers to "gain spirals". Recently, Salanova (2003) showed the mediating role of engagement in the relation between academic success and efficacy beliefs among university students. That is, academic success had a positive influence on efficacy beliefs via engagement. Another study among Spanish

and Belgian university students suggested that past academic success enhances levels of efficacy beliefs, which in turn, provoke an increase in engagement, which itself leads to future efficacy beliefs (Salanova *et al.,* 2004a). Although these results suggest the existence of a gain spiral, definite conclusions cannot be drawn because a cross sectional design was used. Therefore, the current study employs a longitudinal design.

As noted previously, efficacy beliefs play a pivotal role because they are expected to mediate the relationship between task resources and engagement (see Figure 5.1). According to Social Cognitive Theory (Bandura, 1997; p.3; see also Garrido, 2000), efficacy beliefs are defined as the "*beliefs in one's capabilities to organise and execute the course of action required to produce given attainments*". Although research often does not explicitly differentiate between *generalised* (Schwarzer, 1999) and *specific* efficacy beliefs, previous research supports the use of specific measures of efficacy beliefs in specific domains since it produces more robust results (e.g., Grau, Salanova, & Peiró, 2001; Salanova, Peiró, & Schaufeli, 2002b). Therefore, in the current study, instead of generalised efficacy, we included a specific measure of work-related efficacy. In the field of work, Cherniss (1993) introduced the concept of professional efficacy, understood as the belief in the ability to correctly fulfill one's professional role, and operationalised it using the *Maslach Burnout Inventory-General Survey* (MBI-GS*;* Schaufeli, Leiter, Maslach, & Jackson, 1996).

Bandura's (1997; see also Garrido, 2000) efficacy beliefs are based on judgments of one's own capabilities, of which the key aspect is control. Success behaviours lead people to rely on their own competence, thereby producing more levels of efficacy in the future, following a positive gain

spiral. In our study, control is measured by two resources: time control and method control. Moreover, people also partly rely on their emotional states to judge their capabilities. They interpret their affective states as signs of efficacy; that is, positive affective states such as engagement enhance perceived efficacy beliefs, for instance among ICT employees (Chen, Wigand, & Nilan, 1999; Salanova, Grau, Llorens, & Schaufeli, 2001) and students (Salanova, 2003; Salanova *et al.*, 2004a). On the other hand, Social Cognitive Theory (Bandura, 1997) also assumes that high levels of efficacy are related to motivation, which in our case is indicated by levels of engagement. There is indeed evidence to show that efficacy beliefs may act as an important determinant of the effort and persistence in pursuing goals (Bandura, 1997). This is in line with the idea that both engagement dimensions (i.e., vigor and dedication) may constitute the main characteristics of "motivated" behaviour (i.e., effort and persistence) (Katzell & Thompson, 1990; Locke & Latham, 1990). This means that people are motivated at work when they feel vigorous and are dedicated to doing their work.

In sum, our research model (see Figure 5.1) focuses on the mediating role of specific work-related efficacy beliefs in the relationship between task resources (i.e., time and method control) on the one hand, and engagement (i.e., vigor and dedication) on the other (*Hypothesis 1*). Moreover, our model proposes reciprocal relationships between task resources, efficacy beliefs and engagement. In addition to the effect of task resources on engagement (via efficacy beliefs) it is hypothesized that work engagement leads to stronger efficacy beliefs (*Hypothesis 2a*), and more perceived task resources (*Hypothesis 2b*).
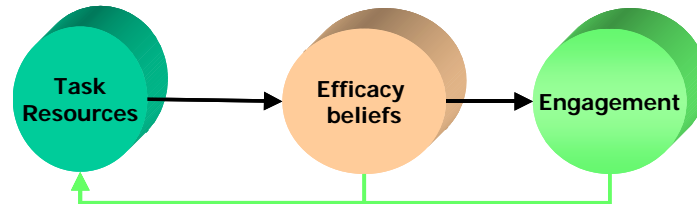
Figure 5.1: Theoretical Gain Spiral Model.

Method

Participants and Procedure

A field study in an artificial environment in a laboratory setting with a longitudinal design in two waves was carried out among 110 Psychology students (85% females – and 15% males) from Universitat Jaume I (Castellón, Spain). Ages ranged from 21 to 31 and the mean age was 22.58 years (SD = 1.63). The participation in the study was voluntary and the sessions were run in 22 groups of five members each, randomly distributed in the groups. The members of the group had never done activities together before, so the groups in the study may be considered as new or emergent ones. The groups carried out the tasks using the *mIRC32* chat software in a laboratory with an intranet and five work-stations. In order to solve the tasks, each subject could only communicate with the rest of the group members by computer, and any direct or personal contact was avoided. All subjects received the same information about the development of the study. Before the first session, the groups were trained in the use of the *mIRC32* by the experimenter.

To avoid the "learning" effect (Rowden, 2003; Ziessler & Nattkemper, 2001) all groups performed two tasks: an innovative task (task 1) and an intellective task (task 2) in two separate experimental sessions. In Task 1 (innovative task) participants had to come up with a slogan to promote house sales in a specific area of Spain. Both tasks were first solved individually and then a group decision was made based on a group discussion. The individual Task 1 consisted of generating three slogans without interacting with any other group member. Next, participants communicated with each member of their group (using chat) and finally, the five best slogans were selected at group level. After three weeks, the same groups met again in the second experimental session to perform Task 2. This time, groups performed an intellective task consisting of associating the name, surname and job of four employees from a specific company. Each member had only partial and complementary instructions to solve the task, so that all information had to be brought to the group in order to solve the task correctly. To avoid communication between groups about the correct solution to the task, a prize of €120 was promised for the best group performance. Moreover, the experimenters varied the names of the task examples in each group, but the same level of difficulty was guaranteed.

Instruments

Two *task resources* dimensions were assessed: time control and method control. *Time control* was measured with four items adapted from Jackson *et al.* (1993) that refer to the extent to which group members have the freedom to make decisions regarding the time invested in the task (e.g., "*I can decide when to start with this specific task*"). *Method control*

was measured with four items that determine the degree to which members of the group have the freedom to make decisions regarding to how to do the task (e.g., "*I can determine how many tasks I am going to do*") (Van de Ven & Ferry, 1980). Items for both task resources were scored on a five-point Likert scale (1=not at all, 5= to a large extent). The psychometrical properties (i.e., means, standard deviations, correlations and internal consistencies) of all research instruments are presented in Table 5.1.

Task engagement was assessed by using the vigor and dedication subscales of the Utrecht Work Engagement Scale (UWES) (Schaufeli *et al.,* 2002b) that had been slightly adapted for use in work groups. Vigor (VI) is measured by 6 items (e.g., *"During the task, I felt full of energy"*) and dedication (DE) is measured by 5 items (e.g., *"My group felt enthusiastic about the task"*). Both scales were scored on a five-point Likert scale (1=never, 5=most of the time).

Efficacy beliefs were measured by 6 items of the Spanish version (Salanova *et al.,* 2001) of the professional efficacy scale of the *Maslach Burnout Inventory-General Survey* (MBI-GS; Schaufeli *et al.,* 1996) that had been slightly adapted for use in work groups. An example item is: *"During the task, I was sure that I was efficacious in completing the activity".* Items were scored on a seven-point Likert scale (0=never, 6=always).

<div align="center">

Data Analyses

</div>

Structural Equation Modeling (SEM) methods as implemented by the AMOS software program (Arbuckle, 1997) using the Maximum Likelihood Estimation methods, were used to establish the relationships between the model variables. Time control and method control were used as indicators

for the latent factor 'task resources', whereas vigor and dedication were used as indicators of the latent 'engagement' construct. Professional efficacy was used as the only indicator of efficacy beliefs. First, the model was tested without cross-lagged structural paths but with temporal stabilities and synchronous correlations (M1). Temporal stabilities were specified as correlations between the corresponding constructs at T1 and T2. This model estimates the total stability coefficient between T1 and T2 without specifying the variance in direct or indirect paths (Pitss, West, & Tein, 1996).

Secondly, the fit of this stability model was compared to that of three more complex models: (a) the *Causality Model* (M2), which is identical to M1 but includes additional cross-lagged structural paths from T1 task resources to T2 efficacy beliefs and to T2 engagement, as well as from T1 efficacy beliefs to T2 engagement; (b) the *Reversed Causation Model* (M3) which is also identical to M1, but includes additional cross-lagged structural paths from T1 engagement to T2 efficacy beliefs and T2 task resources, as well as from T1 efficacy beliefs to T2 task resources; (c) the *Reciprocal Model* (M4), which includes reciprocal relationships between task resources, efficacy beliefs and engagement and thus includes all paths of M2 and M3. In addition, the measurement errors of the same indicators in T1 and T2 were allowed to covary over time. For example, a covariance is specified between the measurement error of vigor in T1 and the measurement of vigor in T2. While in the case of cross-sectional data, measurement errors should generally not covary, in longitudinal measurement models the errors of measurement corresponding to the same indicator should covary over time. According to Pitts, McArdle and Bell (2000) and Pitss *et al.* (1996) it accounts for the systematic (method) variance associated with each

specific indicator. In fact, failing to specify the covariances between the measurement errors leads to high stability coefficients and a poor fit of the model.

Fit indices. Maximum likelihood estimation methods were used and the input for each analysis was the covariance matrix of the items. The goodness-of-fit of the models was evaluated using the following absolute goodness-of-fit indices (cf. Jöreskog & Sörbom, 1986): (1) the χ^2 goodness-of-fit statistic; (2) the Root Mean Square Error of Approximation (RMSEA); (3) the Goodness of Fit Index (GFI); (4) the Adjusted Goodness of Fit Index (AGFI). Moreover, three relative goodness-of-fit measures were calculated: (1) Normed Fit Index (NFI); (2) Non-Normed Fit Index (NNFI); (3) Comparative Fit Index (CFI), and (4) Incremental Fit Index (IFI). Since the distribution of the GFI and the AGFI is unknown, no statistical test or critical value is available (Jöreskog & Sörbom, 1986). Values smaller than .08 for RMSEA are indicative of an acceptable fit, and values greater than 0.1 should lead to model rejection (Cudeck & Browne, 1993). For all three relative fit-indices, as a rule of thumb, values greater than .90 are considered as indicating a good fit (Hoyle, 1995).

Results

Table 5.1 displays the means, standard deviations, internal consistencies (Cronbach's α), stabilities, and intercorrelations of all study variables. All alpha values meet the criterion of .70 (Nunnaly & Bernstein, 1994), with one exception (time control at T1). The highest test-retest reliabilities were observed for dedication and vigor, followed by efficacy beliefs, method control and time control, respectively.

Generally speaking, the pattern of correlations shows that, as expected, task resources (i.e., time control and method control) are positively related to efficacy beliefs and engagement (vigor and dedication) in T1 and T2. In the same way, efficacy beliefs are positively correlated with engagement in both waves.

Testing the Gain Spiral Model

As can be seen from Table 5.2, the fit to the data of the *causality model* (M2) is superior to that of the stability model (M1) ($\Delta\chi^2(2) = 14.11$, $p<.001$). This suggests the relevance of cross-lagged paths from T1 task resources to T2 efficacy beliefs and T2 engagement, as well as from efficacy beliefs at T1 to engagement at T2.

Furthermore, the *reversed causality model* (M3) fitted the data significantly better than the stability model (M1) ($\Delta\chi^2(3) = 15.08$, $p<.01$) and its fit was similar to that of the causality model (M2) ($\Delta\chi^2(1) = .97$, *n.s.*). This indicates that the model with the cross-lagged path from T1 efficacy beliefs to T2 task resources, and from T1 engagement to T2 task resources and efficacy beliefs, shows a better fit to the data than the model including only temporal stabilities and synchronous correlations (M1).

Finally, it appeared that the *reciprocal causation model* (M4) with the addition of reciprocal effects improved the stability model M1 ($\Delta\chi^2(6)= 41.81$, $p<.001$), the causality model M2 ($\Delta\chi^2(4)= 27.7$, $p<.001$), and the reversed causality model M3 ($\Delta\chi^2(3)= 26.73$, $p<.001$; see Table 5.2). This means that the theoretical model including cross-lagged reciprocal relationships between task resources, efficacy beliefs and engagement best fits the data. Figure 5.2 shows the path coefficients of M4 $_{\text{Reciprocal}}$.

Table 5.1: Descriptive statistics for all study variables (*N*=110).

	M	SD	alpha	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Correlations												
1.Method control T1	3.03	.61	.74									
2.Method control T2	3.13	.56	.76	.37***								
3.Time control T1	3.27	.61	.67	.30**	.26***							
4.Time control T2	3.33	.61	.77	.22*	.47***	.43***						
5. Efficacy beliefs T1	4.04	.87	.75	.31**	.23**	.32***	.33***					
6. Efficacy beliefs T2	4.11	.89	.78	.15*	.25***	.17*	.35***	.48***				
7.Vigor T1	2.90	1.01	.73	.22*	.17*	.23**	.23**	.36***	.28***			
8.Vigor T2	2.98	.98	.76	.18*	.29***	.24**	.31***	.38***	.46***	.68***		
9.Dedication T1	3.49	1.24	.88	.14*	.14*	.23**	.27***	.46***	.26**	.67***	.56***	
10.Dedication T2	3.18	1.12	.88	.19**	.23**	.25***	.29***	.44***	.55***	.56***	.81***	.61***

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

Table 5.2: Model fit (*N*=110).

Model	χ^2	df	GFI	AGFI	RMSEA	NFI	NNFI	CFI	IFI	$\Delta\chi^2$	df
M1. Stability	67.49	26	.89	.77	.12	.86	.84	.90	.91		
M2. Causality	53.38	24	.92	.80	.10	.89	.87	.93	.93	M2-M1= 14.11**	2
M3. Reversed	52.41	23	.92	.81	.10	.89	.87	.93	.94	M3-M1 = 15.08*	3
										M3-M2 = .97	1
M4. Reciprocal	25.68	20	.96	.88	.05	.95	.97	.98	.98	M4-M1 = 41.81**	6
										M4-M2 = 27.7**	4
										M4-M3 = 26.73**	3

Note. χ^2 = Chi-square; df=degrees of freedom; GFI=Goodness-of-Fit Index; AGFI=Adjusted Goodness-of-Fit Index; RMSEA=Root Mean Square Error of Approximation; NFI=Normed Fit Index; NNFI = Non-normed Fit Index; CFI=Comparative Fit Index; IFI = Incremental Fit Index; *$p <$ .01, **$p <$ .001.

The significant paths of the reciprocal model (M4. Reciprocal), which overlap with the significant paths of the causality and reversed models, are displayed in Figure 5.2. According to the specific structural relationships obtained, it is important to note that all the manifest variables loaded significantly on the intended latent factors. All indicators of task resources have loadings on the intended latent factor higher than .42, both at T1 and T2. Furthermore, the loadings of vigor and dedication on the engagement factor were higher than .74. The autocorrelations between T1 and T2 are .36 for task resources, .28 for professional efficacy and .57 for engagement.

What can be said about longitudinal support for Hypothesis 1? Hypothesis 1 asserted that task resources would have lagged positive effects on engagement via efficacy beliefs. The model that includes these causal relationships (M2. Causality) resulted in significant lagged and positive effects of T1 task resources on T2 efficacy beliefs (β = .37, t = 1.92, p<.05), as well as of T1 efficacy beliefs on T2 engagement (β = .32, t = 3.52, p<.001). However, a non-significant effect was obtained of T1 task resources on T2 engagement (β = .02, t = .10, *n.s.*). Hence, Hypothesis 1 is supported: the availability of task resources (time and method control) increases efficacy beliefs after the completion of the laboratory task, which in turn has a positive impact on levels of engagement three weeks later.

Hypothesis 2a stated that T1 efficacy beliefs would have a lagged positive effect on T2 task resources, and that T1 engagement would have positive effects on T2 efficacy beliefs. The model including these reversed causal paths (M3. Reversed), also resulted in significant cross-lagged structural relationships. Specifically, a reversed causal effect of T1 efficacy beliefs on T2 task resources (β = .17, t = 3.20, p<.01), as well as of T1 engagement

on T2 efficacy beliefs (β = .28, t = 2.28, p<.05) was observed. Obviously, high levels of engagement after the completion of the laboratory task at T1 increased levels of efficacy beliefs three weeks later. Moreover, the students who had strong efficacy beliefs after completing the laboratory task at T1 perceived more task resources at T2, compared to those with lower levels of T1 self-efficacy. This result confirms Hypothesis 2a. In addition, Hypothesis 2b stated that work engagement leads to more perceived task resources. However, a non-significant reversed effect was obtained of T1 engagement on T2 task resources (β = .02, t = .24, *n.s.*), so Hypotheses 2b is not supported.

Finally, the results from M4._{Reciprocal} (including the reciprocal relationships) showed that both causal and reversed causal relationships were simultaneously active. The significant paths of the reciprocal model are graphically presented in Figure 5.2. The model explained 28% of the variance in T2 task resources, 14% of the variance in T2 efficacy beliefs and 22% of the variance in T2 engagement. These findings illustrate the pivotal role that efficacy beliefs play in the relationship between task resources and engagement. More specifically, efficacy beliefs play a *mediating* role in the relationship between task resources at T1 and engagement at T2 (Hypothesis 1), and between engagement at T1 and task resources at T2 (Hypothesis 2a). That is, resources at T1 enhance efficacy beliefs at T2, which in turn, foster engagement at T2 (lagged effect). In addition, engaged students at T1 feel more efficacious at T2. Finally, efficacy beliefs at T1 increase the perception of task resources at T2. Several other paths did not reach significance. For instance, T1 task resources are not related to T2 engagement, and T1 engagement is not related to T2 task resources.
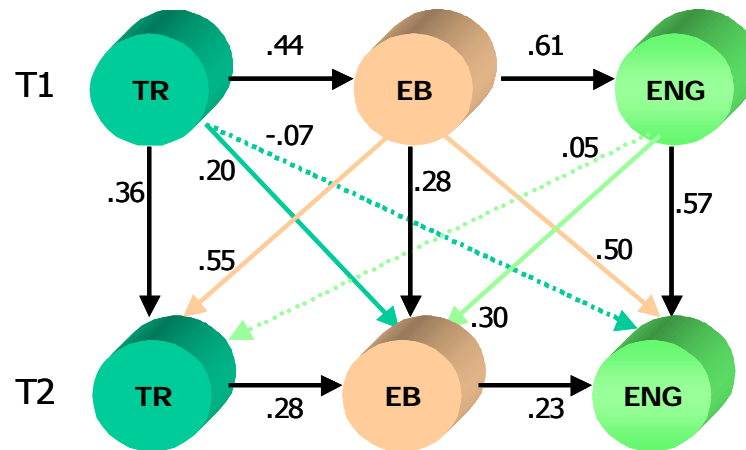
Figure 5.2: Structural path coefficients of the reciprocal model (*N*= 110).

Notes: Solid lines represent significant Standardised coefficients; Dotted lines are non-significant paths. TR= task resources; EB= efficacy beliefs; ENG= engagement

Discussion

The present longitudinal study among university students working in groups with ICT in a laboratory setting was designed to investigate the role of efficacy beliefs in the relationship between two potential task resources (i.e., time control and method control), and engagement. These variables were assessed in two different waves with a three-week time lag between each measurement. This research allowed us to test the positive "gain spiral" model of resources, efficacy and engagement by investigating how these variables are related to each other over time. Two central questions have been addressed in this study.

The first question posed was: *"Do personal resources mediate the relationship between task resources and work engagement?"*, to which the

answer is affirmative. Results of the cross-lagged *SEM* analyses showed that task resources have a positive effect on efficacy beliefs, which in turn show a short-term (3 weeks) lagged effect on task engagement. That is, the more task resources the students perceived for completing the task, the higher their levels of efficacy beliefs and the higher their levels of vigor and dedication three weeks later. According to the Social Cognitive Theory put forward by Bandura (1997), the perception of control anticipates the success experience with the task and consequently the levels of efficacy beliefs increase. Moreover, this perception of efficacy in doing the task leads to high levels of energy and persistence in the face of demands (i.e., vigor) and fulfillment of personal needs and job identification (i.e., dedication). There is empirical evidence that efficacy beliefs *"regulate emotional states by supporting effective courses of action to transform the environment in ways that alter its emotional potential"* (Bandura, 2002, p. 137). Efficacy beliefs are a self-motivator mechanism: people perceive their own competences, and consequently they set themselves goals, which in turn lead to the spending of a greater effort and persistence over time to cope with obstacles (Bandura, 2001; Garrido, 2000). According to the *Motivation Process* of the Job Demands-Resources Model (Bakker *et al.,* 2003b; Demerouti *et al.,* 2001a), the presence of available resources stimulates motivation in the form of engagement and positive outcomes such as efficacy beliefs and organisational commitment (Llorens *et al.,* 2003a; Schaufeli & Bakker, 2004).

The second question was the following: *"does engagement increase personal and task resources?"* In the same way as before, efficacy beliefs played a mediator role between engagement and task resources. Students with high levels of engagement felt more efficacious doing the task, which

in turn, led to the perception of more task resources in the future. As in previous studies, engagement acts as a "motivation motor" derived from high levels of efficacy beliefs (Salanova *et al.,* 2004a). Thus, engagement only increases task resources via personal resources (i.e., efficacy beliefs). That is, vigor and dedication are also a source of efficacy beliefs across time. According to the Social Cognitive Theory (Bandura, 1997; see also Garrido, 2000) people's beliefs in their personal efficacy can be developed by four main sources of influence. One of the most effective ways of creating a strong sense of efficacy is through mastery experiences. That is, successes build a robust belief in one's personal efficacy, while failures lower it. A second way is through the vicarious experiences provided by social models. Social persuasion is a third way of increasing people's beliefs. Finally, the fourth, and the focus of our study, is that people also partly rely on their somatic and emotional states in judging their capabilities. People interpret their stress reactions and tensions as signs of inefficacy, while positive emotional states (in our study, engagement) enhance efficacy beliefs. In circumstances involving a positive state of mind (e.g., engagement) individuals may perceive themselves as more efficacious in doing the tasks, which in turn can generate high perceptions of task resources. According to the Broaden-and-Build Theory of Positive Emotions, the experiences of positive emotions broaden people's momentary thought-action repertories, which in turn serve to build their enduring personal resources, which function as reserves to be drawn on later to manage future threats (Fredrickson, 2001, 2002).

Does a positive gain spiral of resources, efficacy beliefs and engagement exist? Generally speaking, results imply that none of the constructs included in the study can be considered as only a cause or only

a consequence, generating a "gain" spiral of resources, efficacy beliefs and engagement. That is, over time task resources increase efficacy beliefs which in turn foster engagement. In addition, engagement boosts future efficacy beliefs, which in turn increase the perception of more task resources. Thus, evidence was found for a pure mediational role of efficacy beliefs in the spiral of resources: task resources predicted later engagement and engagement predicted later task resources through efficacy beliefs. These short-term reciprocal relationships are consistent with the "gain spirals" proposed by Hobfoll (1989, 2001, 2002). According to Conservation Of Resources (COR) theory, resources are motivators through which individuals strive to maintain, protect and expand their resources in order to offset the possibility of future loss and consequently people develop efficacy beliefs (Bandura, 1997) and positive well-being (e.g., engagement) (Antonowski, 1987; Ryan & Frederick 1997), generating a positive circle (Fredrickson, 2001, 2002; Salanova *et al.,* 2004a). These results are also in line with the Job Characteristics Theory (Hackman & Oldham, 1980), which shows how the presence of resources is linked to psychological states (e.g., engagement) and to positive outcomes (e.g., efficacy beliefs). Specifically, results are in line with the "gain spiral" models of efficacy beliefs previously tested in students, which show that resources generate more levels of efficacy beliefs in the present, which in turn lead to greater engagement in the future which enhances more task resources and so on (Llorens *et al.,* 2003a; Salanova *et al.,* 2004a).

In sum, our findings confirm the *Gain Spiral Model* between task resources, efficacy beliefs and engagement in a longitudinal and field study in a laboratory setting obtained in previous studies (Llorens *et al.,* 2003a; Salanova, 2003). An important result is the confirmation of the pivotal and

mediating role of efficacy beliefs which has recently been obtained in previous studies (Salanova *et al.*, 2004a). Moreover, these results provide evidence in favor of the benefits of efficacy beliefs in different contexts such as academic performance (Salanova, 2003; Salanova *et al*, 2004a; Schaufeli *et al.*, 2002a), job stress in Information and Communication Technology (Salanova *et al.*, 2001), and proactive behaviour (Salanova, Carrero, Pinazo, & Schaufeli, 2004b).

Practical and Theoretical Implications

The present results may show some important advances. Regarding theoretical implications, results have enabled the important role of the COR theory "gain spiral" model to be seen. Thus, the present study corroborates previous studies about positive models of efficacy beliefs, but using a longitudinal and field study in a laboratory context. The study provides evidence that task resources, efficacy beliefs and engagement have reciprocal relationships over time. However, results point out the key role of efficacy beliefs as a mediator between task resources and engagement. In terms of practical implications, results emphasize the importance of providing good resources to students that enhance efficacy and engagement, which in turn, also increase efficacy beliefs, thus closing the spiral by leading to more perception of resources to do the task. Although efficacy and engagement are traditionally seen as an outcome, our two-wave longitudinal study shows that both can be considered as causes *and* consequences in the gain spiral.

Limitations

One of the limitations of this longitudinal study is that the data were obtained by self-report measures and, consequently, the results may be contaminated by the common method variance. Thus, it would be interesting to complement these with more objective measures. On the other hand, it should be pointed out that the participants in the study were not `real´ employees in `real´ organisations and thus our findings cannot be generalised to the universe of employees and jobs.

Directions for further Research

Results of this study point to the need to continue longitudinal research on gain spiral models in real occupational samples and from different countries. Moreover, it would be interesting to use a three-wave panel study, which will allow a more rigorous interpretation of causality and reciprocity than a two-wave panel (Burisch, 2002; Rogosa, Brandt, & Zimowski, 1982). Finally, future studies may test the model by including collective measures (i.e., collective engagement, collective self-efficacy) using multi-level methodology.

CHAPTER 6

Perceived Collective Efficacy, Subjective Well-being and Task Performance among Electronic Work Groups: An Experimental Study

Perceived Collective Efficacy, Subjective Well-being and Task Performance among Electronic Work Groups: An Experimental Study[10]

Summary

This study investigates the effects of e-groups on well-being and performance, using a collective approach and an objective performance indicator. Furthermore, it includes collective efficacy as a moderator an negative (anxiety) as well as positive (engagement) well-being. A lab experiment with an interval of 3 weeks was performed among 140 students who were randomly distributed across 18 groups using a chat-internet program and 10 groups working face-to-face. Half the groups performed under time pressure. Results confirm the moderating role of perceived collective efficacy on well-being and task performance. All groups working under time pressure and low in collective efficacy show an increase in collective anxiety. Chat- internet groups under time pressure show an increase in collective engagement but only when they feel high in collective efficacy. Finally, task performance was poorer in chat groups, working under time pressure, and with low levels of collective efficacy than in the other groups.

Introduction

Two major changes may be observed in today's organisations. Information and Communication Technologies (ICTs) are rapidly implemented and employees are working in groups rather than individually. Modern ICTs include shared computer-based databases, electronic mail and Intranets, the Internet, computer-supported cooperative work (CSCW), group communication support systems (GCSS), and video-mediated communication systems (Hollingshead, McGrath, & O'Connor, 1993;

Symon, 2000). These technologies produce changes in how individuals communicate with each other. For instance, the technological system that we are focusing on in this modifies within-group communication. We use a 'chat-internet' system that synchronically links group members who do not have to meet face-to-face and may be at different places. This new way to organise the work (i.e., so-called electronic work groups or e-groups) may have negative or positive effects on users´ subjective well-being and task performance. For example, although such technologies may make collaboration between dispersed group members more convenient, electronic groups are also exposed to job demands such as time pressure.

Typically, research on e-groups is cross-sectional and non-experimental so that no causal inferences can be made. Furthermore, research designs are relatively simple, for instance, without considering individual moderator effects. This study investigates the moderating role of perceived collective efficacy between group communication systems (GCSs) (i.e., chat vs. face-to-face) and time pressure on collective well-being (i.e., anxiety and engagement) and task performance. On a more general level, we attempt to bridge the gap between two research traditions on group communication support systems and job stress, respectively.

Perceived Collective Efficacy

People differ in beliefs about their competence and success in different domains of their life. Bandura (1997, 1999, 2001) called these cognitions 'self-efficacy', which are "*…beliefs in one's capabilities to organise and execute the courses of action required to produce given attainments*" (Bandura, 1997, p. 3). Bandura's (1999) Social Cognitive Theory assumes that the individual's beliefs in his or her own coping

efficacy determines how much strain is experienced when demanding situations occur. For instance, research on job burnout shows the potential moderating effect of self-efficacy as a buffering variable (Leithwood, Menzies, Jantzi, & Leithwood, 1996; Rabinowitz, Kushnir, & Ribak, 1996; Salanova, Grau, Cifre, & Llorens, 2000a; Salanova, Peiró, & Schaufeli, 2002b; Van Yperen, 1998).

Recent developments in self-efficacy research call attention to the degree of specificity of self-efficacy and perceived collective efficacy (Bandura, 1999, 2001; Eden & Zuk, 1995; Gist & Mitchell, 1992; Lent & Hackett, 1987). It seems that more robust results are obtained when domain-specific rather than general measures of self-efficacy are used (Bandura, 1997; Brouwers & Tomic, 2001; Maibach & Murphy, 1995; Salanova *et al.,* 2000a, 2002b). The reason is that self-efficacy beliefs are domain-specific; a person's self-efficacy belief is likely to differ depending on the activity to which it is related (Bandura, 1997, 1999). Regarding the 'collective' nature of efficacy beliefs, Social Cognitive Theory recently extended the conception of human agency to collective agency (see Martínez, 2004). Perceived collective efficacy is defined as a group's shared belief in its conjoint capabilities to organise and execute the courses of action required to produce given levels of attainment (Bandura, 1997). As Bandura (1999) stressed, group performance is the product of interactive and coordinated dynamics of its members. Therefore, perceived collective efficacy is not simply the sum of the efficacy beliefs of individual members. Rather, it is an emergent group-level property. Although individual and collective efficacy differ in their unit of agency, both efficacy beliefs serve similar functions and operate through similar processes (Bandura, 2001). For example, research has shown that the stronger the belief people hold

about their collective capabilities, the more the group achieves. It was found that a strong collective sense of efficacy fosters high group effort and task performance (Bandura, 1993; Gibson, 1995; Hodges & Carron, 1992; Little & Madigan, 1994; Prussia & Kinicki, 1996; Sampson, Raudenbush, & Earls, 1997). Additionally, similar to the individual-level efficacy beliefs, group-level efficacy beliefs may buffer occupational stress by providing group members with social support when dealing, for instance, with new technological systems and/or when under time pressure (Cohen & Wills, 1985; Gore, 1987). Also, perceived collective efficacy may have a buffering effect by providing group members with the means necessary to actually reduce job demands (Beehr, 1995; Jex & Bliese, 1999). Moreover, similar to individual self-efficacy, a strong sense of perceived collective efficacy may boost collective well-being as well as group task performance (Jex & Bliese, 1999; Schaubroeck, Lam, & Xie, 2000).

In the current study, we use a collective domain-specific measure of perceived efficacy (i.e., specific to group task) that is supposed to moderate between the GCS time pressure on collective well-being and group task performance.

Subjective Well-being

Research on effects of technology on well-being and job stress is abundant. However, it is mainly focused at the individual level (i.e., user's reactions). Initially, research results were mixed: negative (i.e., computer anxiety) as well as positive (i.e., satisfaction) consequences of technology use were observed (Chua, Chen, & Wong, 1999; Igbaria & Chakrabarti, 1990; Jones & Wall, 1990; Kay, 1990; Todman & Monaghan, 1994). It

became clear that two variables were moderating these mixed results: the user's technology experience and the psychosocial factors.

Hollingshead *et al.* (1993) developed the 'Change Model' to stress the role played by the technology experience to explain the adaptation to new technology. When a group uses some new technology (i.e., chat) this change is likely to affect group task performance, the interaction process, and the members' psychological reactions. During change, the group needs to devote extra time to solve technical problems and interpersonal conflicts. Hence compared to familiar face-to-face groups that do have to deal with any change, e-groups will spend much more time mastering problems and conflicts in their first meetings. Indeed, as predicted by their model, e-groups (i.e., groups using e-mail) reported significantly lower satisfaction with the task and performed significantly less well in the first two meetings, compared to face-to-face groups. However, during the next several weeks, no differences were observed between the two media. Also, anxiety is related to technology experience. Results show that computer anxiety decreases when users have more experience with computers (Chua *et al.* 1999).

In addition, research shows no main effect of technology on subjective well-being. Instead a moderating effect is observed of psychosocial factors, such as the positive attitudes toward technology (Korunka & Vitouch, 1999; Leso & Peck, 1992; Salanova & Schaufeli, 2000) and efficacy beliefs (Salanova *et al.,* 2000a, 2002b). In other words, when users experience high levels of self-efficacy, negative effects of technology on well-being do not occur. For instance, Salanova and Schaufeli (2000) found that the mere experience with technology (i.e., time using new

technology and the frequency of its use) is not directly related with levels of burnout but is mediated by the appraisal of this experience.

So far, research on the impact of ICT is almost exclusively focussed on its negative effects (i.e., job stress). Instead of looking exclusively to the negative pole, researchers in the broader area of job stress recently extended their interest to the positive pole of worker's well-being. This development reflects an emerging trend towards a Positive Psychology that focuses on human strengths and optimal functioning rather than on weaknesses and malfunctioning (Seligman & Csikszentmihalyi, 2000; Sheldon & King, 2001). For instance, recently, engagement has been identified as the antithesis of burnout (Maslach *et al.,* 2001). It is defined as a *"positive, fulfilling, work-related state of mind that is characterised by vigor, dedication, and absorption"* (Schaufeli *et al.,* 2002b, p. 74). Vigor is characterised by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties. Dedication is characterised by a sense of significance, enthusiasm, inspiration, pride, challenge and absorption and refers to being fully concentrated and engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work. The present study focuses on both negative (i.e., collective anxiety) and positive (i.e., collective engagement) aspects of collective well-being in work groups.

Task Performance

According the Richness of Information Theory and Task-Media Fit Theory (Daft & Lengel, 1986; McGrath & Hollingshead, 1993), different technologies permit different information cues (e.g., verbal, auditory,

nonverbal, etc) to be transmitted. Also, different kind of tasks (e.g., idea generation, intellective, decision making) require different information cues. For instance, in negotiation tasks the nonverbal cues are very important for the output of the negotiation, and computer-based systems are limited in their ability to transmit these cues. This means that the effectiveness of a communication medium for a given task depends on the degree to which there is a fit between the richness of information that can be transmitted via that system and the information richness requirements of that given task. In this study, we used intellective tasks. These tasks require group members to find a demonstrably correct answer (Laughlin & Ellis, 1986). According the Task-Media Fit Theory the best technology system for such tasks is an audio-video system (no e-mail or face-to-face interaction). Unfortunately, research has shown mixed results that only partially support the assumption of the Task-Media Fit Theory. For example, Hollingshead *et al.* (1993) found that groups working face-to-face performed significantly better than e-groups for intellective tasks and only over time did these media differences disappear for later meetings on intellective tasks. Only in the first meetings were there significant differences on task performance. These results suggest that it is the newness of the medium (i.e., technology system) and not the type of task that led to poorer task performance for computer groups in the first meetings. As far as we know, there are no studies about the moderating role that variables such as perceived collective efficacy may play in the relationship between ICT and task performance. According to empirical research based on Social Cognitive Theory, it is expected that perceived collective efficacy plays such a moderating role.

On the other hand, despite the obvious importance of the effect of time pressure on the functioning of work groups, it has only scarcely been researched (e.g., Svenson & Maule, 1993). Traditionally, time pressure is considered a job demand with negative consequences on work and individual well-being (Garst, Frese, & Molenaar, 2000). Results about the relationship between time pressure and task performance are mixed. A positive linear relationship is observed; namely, the more time pressure, the better the group's performance (McCann, Baranski, Thompson, & Pigeau, 2000). But a negative lineal relationship is observed as well; the more time pressure, the pooper the group's performance (Davis, 1969; Karau & Kelly, 1992; Kelly & McGrath, 1985; Yukl, Malone, Hayslip, & Pamin, 1976). In addition, other studies show a curvilinear relationship, that is, high and low time pressure are associated with poor performance (Isenberg, 1981) or no significant relationship at all (Kelly & Karau, 1993; Sethi, 2000). Not surprisingly, research has shown that the relationship between time pressure and group performance is moderated by variables such as type of group task (i.e., innovative, intellective and negotiation task), technology system (i.e., face-to-face, e-mail and videoconferencing), and individual characteristics (i.e., personality) (Davis, 1969; Gracia, Arcos, & Caballer, 2000; Heaton & Krublanski, 1991; Hollingstead *et al.,* 1993). For instance, in intellective tasks, the time pressure is negatively associated with task performance (Davis, 1969; Gracia *et al.,* 2000). And groups working with e-mail had a significantly poorer performance compared to face-to-face and videoconferencing groups when under time pressure (Gracia *et al.,* 2000). As far as we know, there are no studies about the moderating role of perceived collective efficacy between time pressure and task performance in groups working with different communication systems

(i.e., electronic and face-to-face groups). According to Bandura's (1999) Social Cognitive Theory, it is expected that perceived collective efficacy will moderate this relationship.

The Present Study

Hence, this study explores the moderating role of perceived collective efficacy between GCS and time pressure on collective well-being (i.e., anxiety and engagement) and task performace. More particularly, according to the *subjective collective well-being*:

1) *Hypothesis 1* proposes an interaction effect of GCS by perceived collective efficacy on collective well-being (anxiety and engagement). The combination of a chat system and low levels of perceived collective efficacy will lead to an increase in collective anxiety and a decrease in collective engagement.

2) *Hypothesis 2* refers to an interaction effect of time pressure (time pressure vs. no time pressure) by perceived collective efficacy on collective well-being. The combination of time pressure and low levels of perceived collective efficacy will lead to an increase of collective anxiety and a decrease of collective engagement.

3) Finally, *Hypothesis 3* proposes an interaction effect of GCS X Time Pressure X Perceived Collective Efficacy on collective well-being. The combination of a chat system, time pressure and low levels of perceived collective efficacy will lead to an increase of collective anxiety and a decrease of collective engagement.

According to the *task performance*:

1) **Hypothesis 4** proposes an interaction effect of GCS by perceived collective efficacy on task performance. The combination of a chat system and low levels of perceived collective efficacy will lead to the poorer task performance.

2) **Hypothesis 5** establishes an interaction effect of Time Pressure X Perceived Collective Efficacy on task performance. The combination of time pressure and low levels of perceived collective efficacy will lead to the poorer task performance.

3) Finally, **Hypothesis 6** expects an interaction effect of GCS X Time Pressure X Perceived Collective Efficacy on task performance. The combination of a chat system, time pressure and low levels of perceived collective efficacy will lead to the poorer task performance.

Method

Participants and Procedure

One hundred forty students of Psychology at the Universitat Jaume I, Spain, were randomly distributed to the study's 2 (chat vs. face-to-face) X 2 (time pressure vs. no time pressure) X 2 (Time 1 vs. Time 2) repeated measures longitudinal design. The last factor (time) was treated within subjects. The participation was voluntary and the experimental sessions were run in 28 groups of 5 students. Their mean age was 23.7 years (*SD* = 3.09), 128 females (91.6%) and 12 males (8.4%) were included.

The experimental manipulation of GCS as the first independent factor was performed randomly. Eighteen groups performed the tasks using a chat communication system, and 10 groups performed the tasks using a face-to-face communication system. The experimental sessions for chat groups were performed in a test-room with an Intranet linking five workstations at which the chat-internet *'miRC32'* groupware was installed. Each member could only interact with another group member using the computer. The other groups (i.e., face-to-face) performed the same tasks as the chat-groups but they did not use any electronic system to interact; instead they interacted directly.

To vary time pressure (the second independent factor), half of the groups in each condition (chat vs. face-to-face) were performing the task without time pressure, whereas the remaining groups performed the task under time pressure. The procedure to induce time pressure was the following. First, half of the groups performed the task without time pressure. Second, the experimenters measured the total time spent to solve the task and then calculated the average time that groups used to solve the task correctly. Third, they deleted the best and the worst time, so they got two times -one time for chat-groups and another time for face-to-face groups. These times were considered deadlines for the rest of the groups that afterward were working in the condition time pressure. All groups met during two experimental sessions performing the same tasks but with different GCSs and with and without time pressure. Because in the chat groups students had to work with a computer, they received short instructions and training about the work-station and the chat system.

The first task was an idea generation task. This task was also used as a training task. Participants had to come up with a slogan to promote the house sale in a specific area. The task was performed twice: individual and in a group. The individual task consisted of formulating three slogans without interacting with any other group member. Afterwards, participants communicated with each other (using chat or face-to-face interaction) and groups discussed the five best slogans. After 3 weeks, the same groups met again in the second experimental session. This time, groups performed an intellective task: to associate the name, surname and job of four employees from a company. Each member had partial and complementary instructions to solve the task so that all information should be brought together in the group to be able to solve the task correctly. To avoid communication between groups about the right solution to the task, the experimenters varied the names, surnames and jobs of the intellective task in each group. A small fee was promised for the best performance of two groups (i.e., the chat-groups and face-to-face groups). After finishing each task, participants filled out a questionnaire (see next section).

Instruments

Perceived collective efficacy was measured with four items of the Generalised Self-Efficacy assessment by Schwarzer (1999; see also Scholz, Gutiérrez-Doña, Sud, & Schwarzer, 2002). In this study, the scale was slightly adapted for use in work groups (i.e., collective efficacy). For instance, instead of *"I can solve most problems if I invest the necessary effort"* the wording was changed to *"My group can to solve difficult tasks if we invest the necessary effort"*. The items ranged from 1 (*never*) to 5

(*most of the time*). The alpha coefficient of perceived collective efficacy was .77 at Time 1 and .88 at Time 2.

Collective anxiety was assessed with the Anxiety-Contentment Scale developed by Warr (1990). In the original scale, high scores indicate levels of job-related anxiety. Respondents are asked to think of the past few weeks and indicate the extent to which they felt tense, uneasy, worried, calm, contented and relaxed. Scores ranged from 1 (*never*) to 6 (*all the time*). Scores on the last three emotions are reversed. In current study, the scale also was slightly adapted for use in work groups (i.e., collective anxiety). For instance, instead of "During past few weeks *I felt* tense" it became "During the task *my group* felt tense". The alpha coefficient was .80 at both times (i.e., Time 1 and Time 2), thus meeting the criterion of .70 (Nunnaly & Bernstein, 1994).

Collective engagement was assessed with the Utrecht Work Engagement Scale (UWES) by Schaufeli *et al.* (2002b) that also was slightly adapted for use in work groups (i.e., collective engagement). For instance, instead of "*When I'm working, I forget everything around me*" the wording became "*When my group was working, we forgot everything else around us*". Collective engagement consists of 18 items, ranging from 1 (*never*) to 5 (*most of the time*). They are scored on three scales: Vigor (seven items; e.g., "*During the task, my group felt full of energy*"), dedication (four items; e.g., "*My group felt enthusiastic about the task*"), and absorption (seven items; e.g., "*Time was flying when my group was working*"). We did not include five items from the original questionnaire because the adaptation to the collective scales was difficult (e.g., "*When I get up in the morning, I feel like going to work*"). The alpha coefficients for collective vigor were .76 at Time 1 and .80 in Time 2. The alpha coefficients for

collective dedication were .75 at Time 1 and .78 in Time 2. After removing one item (i.e., *"My group was proud of the task"*) the initial alpha coefficient of collective absorption was substantively increased to .70 (Time 1) and .80 (Time 2).

Task performance was measured at Time 2 when groups performed an intellective task. The ask performed at Time 1 was used as a training method. Groups had to associate the name, surname and job for four employees in a company. This variable ranged from 0 (no any right answers), 1 (only 1 name-surname-job fitted), 2 (two names-surnames-job fitted) and 3 (three -and as exclusion four- names-surnames-job fitted).

Results

To test if participants in the experiment differed on previous use of chat-internet, a Chi-square test was carried out that compared participants´ previous experience with chatting in both conditions (chat vs. face-to-face). Results indicated that both groups do *not* differ significantly on previous chat software use, $\chi^2 = 0.22$, *df* = 1; *p* = .70). Therefore, it was decided to use the entire sample for testing our hypothesis. Next, descriptive statistics were computed. Table 6.1. shows mean values, standard deviations, and intercorrelations of all scales used in this study.

As expected, the three collective engagement scales are positive interrelated, and they are also positively related to perceived collective efficacy. Results are similar for Time 1 and Time 2, but at Time 2, correlations with self-efficacy are slightly higher. Furthermore, collective anxiety is negatively related to perceived collective efficacy and to the three collective engagement scales (except collective absorption at Time 1 and collective vigor at Time 2). Task performance is positively related with

perceived collective efficacy and with collective dedication and negatively related with collective anxiety in Time 1. A similar pattern was observed at Time 2, except that in addition, task performance was positively related to collective vigor.

Table 6.1: Descriptive analyses of task resources, efficacy beliefs, and the core of engagement (*N*=140).

Variables	M		SD		(1)	(2)	(3)	(4)	(5)	(6)
	T1	*T2*	*T1*	*Ti2*						
1. Collective Efficacy	4.24	4.30	.47	.62	(.43)	-.46	.56	.70	.55	.25
2. Collective Anxiety	2.34	2.60	.76	.95	-.24	(.58)	*n.s.*	-.50	-.33	-.23
3. Collective Vigor	3.85	3.82	.55	.60	.37	-.17*	(.43)	.77	.74	.22
4. Collective. Dedication	4.14	4.11	.53	.67	.43	-.21*	.78	(.43)	.72	.27
5. Collective Absorption	3.90	3.75	.50	.61	.40	*n.s.*	.76	.74	(.44)	*n.s.*
6. Task Performance (T2)	2.23		.94		.27	-.27	*n.s.*	.25	*n.s.*	__

Notes: Bellow the diagonal (Time 1) and above the diagonal (Time 2). Between parentheses correlations Time 1-Time 2. * *p*< .05. All remaining correlations are significant at the ****p*< .001 level.

Subjective Well-being

Perceived collective efficacy *at Time 1* (and not in Time 2) was used as the moderating variable in all analysis because it refers by definition to future group outcomes. To test Hypothesis 1, 2 and 3 concerning the combined effects of the GCS, time pressure, and perceived collective efficacy on well-being, a repeated measurement MANOVA was carried out with three between-group variables (chat/face-to-face, time pressure/no time pressure, levels of perceived collective efficacy) and one within-group variable (Time 1/Time 2). Collective anxiety, collective vigor, collective

dedication and collective absorption were used as dependent variables. Multivariate results (Wilks's lambda) show a significant two-way interaction effect of Time Pressure X Perceived Collective Efficacy, $F(4, 126)=2.56$, $p<.04$, and a significant three-way interaction effect of GCS X Time Pressure X Perceived Collective Efficacy, $F(4, 126)=2.11$, $p<.05$. Subsequent univariate tests show a significant two-way interaction effect of time pressure X perceived collective efficacy on collective anxiety, $F(1, 131)=2.82$, $p<.05$ (see Figure 6.1). No significant effects were observed on the three dimensions of collective engagement.
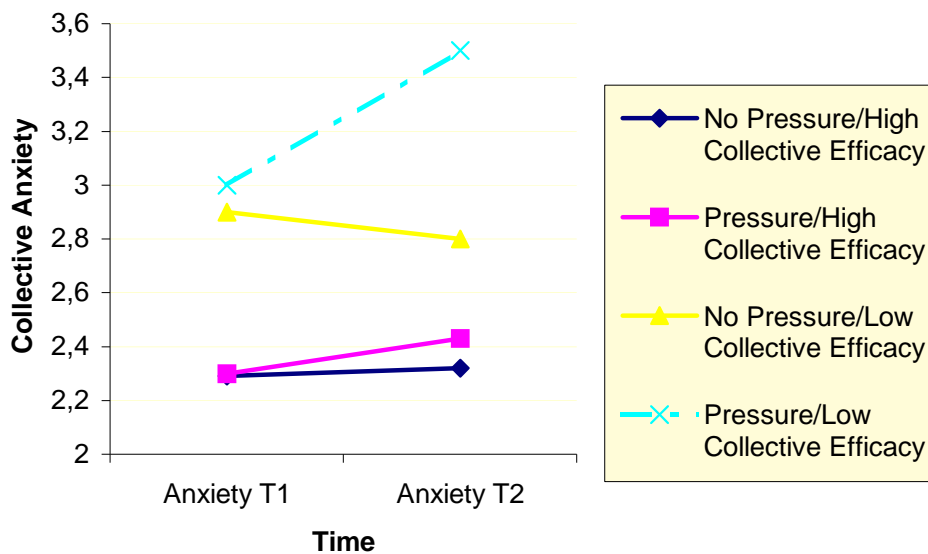
Figure 6.1: Within-subjects effect: Time Pressure X Perceived Collective Efficacy on *Collective Anxiety* (*N*= 140).

As can be seen from Figure 1, groups with low perceived collective efficacy that are under time pressure show an increase of collective anxiety over time (M= 3.0, at Time 1 vs. M=3.5, at Time 2). In addition, groups reporting low levels of perceived collective efficacy (with time pressure and without time pressure) showed the highest levels of collective anxiety at both Time 1 as well as Time 2.

Moreover, a significant three-way interaction effect was observed of GCS X Time Pressure X Perceived Collective Efficacy (see Table 6.2). Subsequent univariate tests show significant effects on collective vigor, $F(1, 131)$=2.94, p<.05, and, close to .05 on collective dedication, $F(1, 131)$=2.47, p<.07, but not on collective anxiety and collective absorption. The significant interaction effect on collective vigor is graphically represented in Figure 6.2 for high and low levels of perceived collective efficacy.

Table 6.2: Multivariate Analysis of Variance (MANOVA) with repeated measures Time 1-Time 2 (*N*=140)

Within-subjects Test	Multivariate Test (Wiks's Lambda)		Univariate Test							
			Collective Anxiety		Collective Vigor		Collective Dedication		Collective Absorption	
	F	p	F	p	F	p	F	p	F	p
Time	0.81	.51	0.01	.99	1.81	.18	1.31	.25	2.81	.09
Group communication system (GCS)	0.67	.61	1.21	.27	1.65	.20	1.54	.21	2.11	.14
Time Pressure	**2.37**	**.05**	2.21	.10	0.06	.94	0.80	.37	1.41	.23
Collective Efficacy	0.92	.45.	0.07	.78	1.73	.19	1.20	.27	3.58	.06
GCS X Time Pressure	1.87	.12	0.98	.32	2.84	.09	2.35	.12	0.09	.75
GCS X Collective Efficacy	0.43	.78	1.01	.31	0.61	.43	0.65	.41	1.25	.26
Time Pressure X Collective Efficacy	**2.56**	**.04**	**2.81**	**.05**	0.01	.98	0.81	.36	1.50	.22
GCS X Time Pressure X Collective Efficacy	**2.11**	**.05**	1.56	.21	**2.94**	**.05**	**2.47**	**.07**	0.10	.75

Note: Significant effects are printed in bold numerals

High Perceived Collective Efficacy
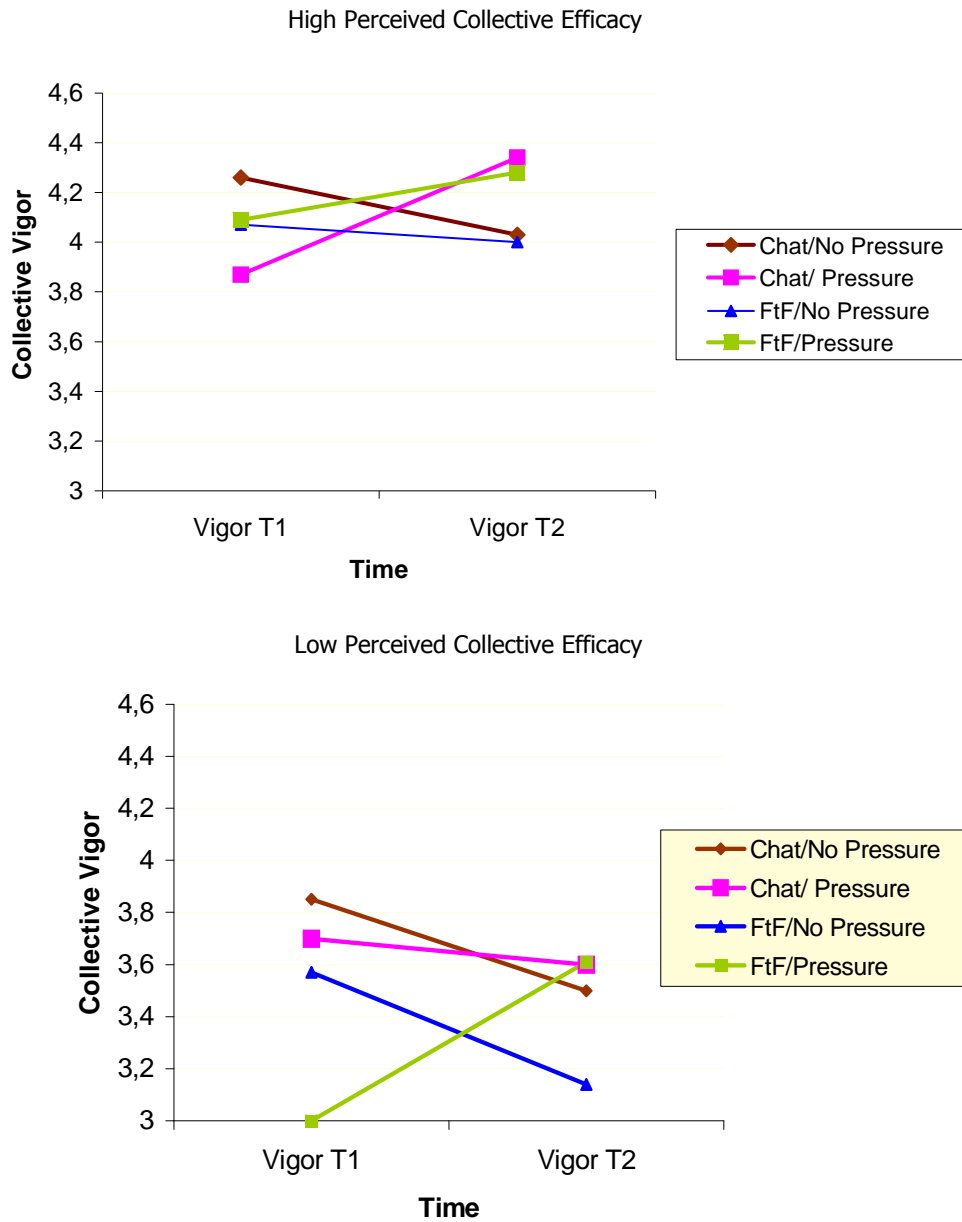

Low Perceived Collective Efficacy

Figure 6.2: Within-subjects effect: Group Communication System X Time Pressure X Perceived Collective Efficacy on Collective Vigor (*N*= 140) *Note*: FtF (Face-to-Face communication system)

When we compare both graphs, groups with high collective efficacy clearly show higher levels of collective vigor than groups with low collective efficacy. However, the patterns of changes from Time 1 to Time 2 are different between groups, depending on GCS and time pressure. Whereas groups working without time pressure decreased on collective vigor (independently of GCS and collective efficacy) groups working under time pressure show different patterns of change depending on the GCS used and the levels of collective efficacy. That is, groups working face-to-face showed an increase of collective vigor from Time 1 to Time 2 when collective efficacy was high (*M*=4.09 at Time 1 vs. *M*=4.28 at Time 2) but also when collective efficacy was low (*M*=3.0 at Time 1, vs. *M*=3.61 at Time 2). However, whereas chat-groups working under time pressure show an increase in collective vigor from Time 1 to Time 2 (*M*=3.87 at Time 1 vs. *M*= 4.34 at Time 2) when collective efficacy is high, they show a small decrease in collective vigor from Time 1 to Time 2 (*M*=3.7 at Time 1 vs. *M*= 3.6 at Time 2) when collective efficacy is low. Hence, working with a chat system under time pressure increases the levels of collective vigor, but *only* when groups feel highly efficacious. A similar pattern of results was observed for collective dedication (see Figure 6.3).

High Perceived Collective Efficacy

Low Perceived Collective Efficacy
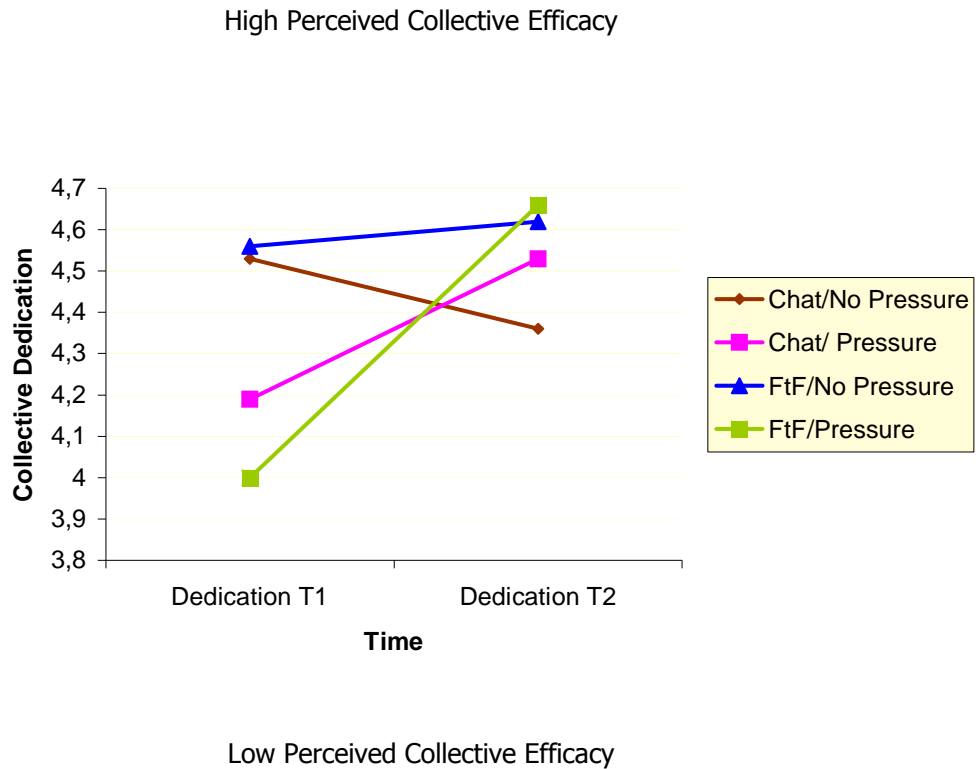
Figure 6.3: Within-subject effect: Group Communication System X Pressure X Perceived Collective Efficacy on Collective Dedication (*N*= 140). *Note*: FtF (Face-to-Face communication system)

Groups working under time pressure also show different patterns of change on collective dedication depending on GCS used and the level of perceived collective efficacy. Groups working face-to-face show an increase of collective dedication from Time 1 to Time 2. As with collective vigor, this holds for groups with high collective efficacy (*M*=4.0 at Time 1 vs. *M*=4.66 at Time 2) as well as for groups low in collective efficacy (*M*=3.9 at Time 1 vs. *M* =4.33 at Time 2). However, the pattern is also different for groups working with chat under time pressure. Although these groups show an over time increase on collective dedication from Time 1 to Time 2 (*M*=4.19

at Time 1 vs. *M*=4.53 at Time 2) when collective efficacy is high, they show a small over time decrease on collective dedication from Time 1 to Time 2 (*M*=3.71 at Time 1 vs. *M*= 3.70 at Time 2) when collective efficacy is low. Thus, working with chat under time pressure increases levels of collective dedication but *only* when groups feel highly efficacious. So far, these results are similar to collective vigor. However, compared with collective vigor, the pattern of results in groups working without time pressure is different for collective dedication. Whereas face-to-face groups show high levels of collective dedication when collective efficacy is high, with even a little over time increase from Time 1 to Time 2 (*M*=4.56 at Time 1 vs. *M*=4.62 at Time 2), they show low collective dedication when collective efficacy is low, with an over time decrease from Time 1 to Time 2 (*M*=3.75 at Time 1 vs. *M*= 3.5 at Time 2). Thus, working face-to-face without time pressure decreases levels of collective dedication, but *only* when groups feel low in collective efficacy.

To sum up, Hypothesis 1 was no supported because no two-way interaction effect of GCS and perceived collective efficacy was founded. Regarding Hypothesis 2, it was supported for collective anxiety but not for collective engagement. The combination of time pressure and low levels of perceived collective efficacy leads to the strongest increase of collective anxiety over time. Hypothesis 3 was partially supported because the multivariate test was significant, but the direction of results was unexpected. However, an interesting pattern of results emerged regarding the moderating role of perceived collective efficacy. These results will be discussed later.

Finally, we found another unexpected result, namely an over time multivariate main effect of time pressure, $F(4, 126)=2.37$, $p<.05$). However, subsequent univariate testing revealed no significant differences on any dimensions of collective well-being.

Task Performance

In order to test Hypotheses 4, 5, and 6, we analyzed the average on task performance at Time 2 using a 2 (chat vs. face-to-face) X 2 (time pressure vs. no time pressure) ANOVA (see Table 6.3).

Table 6.3: Univariate Analysis of Variance (ANOVA) (N=140)

	Task Performance	
	F	*p*
Group Communication System (GCS)	1.74	.19
Time Pressure	**3.41**	**.04**
Collective Efficacy	2.12	.14
GCS X Time Pressure	1.07	.25
GCS X Collective Efficacy	1.05	.30
Time Pressure X Perceived collective efficacy	2.21	.13
GCS X Time Pressure X Collective Efficacy	**2.91**	**.05**

Note: Multiple R = .51. R^2 = .2. Significant effects are printed in bold numerals.

We found a three-way interaction effect of GCS X Time Pressure X Perceived Collective Efficacy on task performance, $F(1, 134)=2.91$, $p<.05$. This significant interaction effect is graphically represented in Figure 6.4.
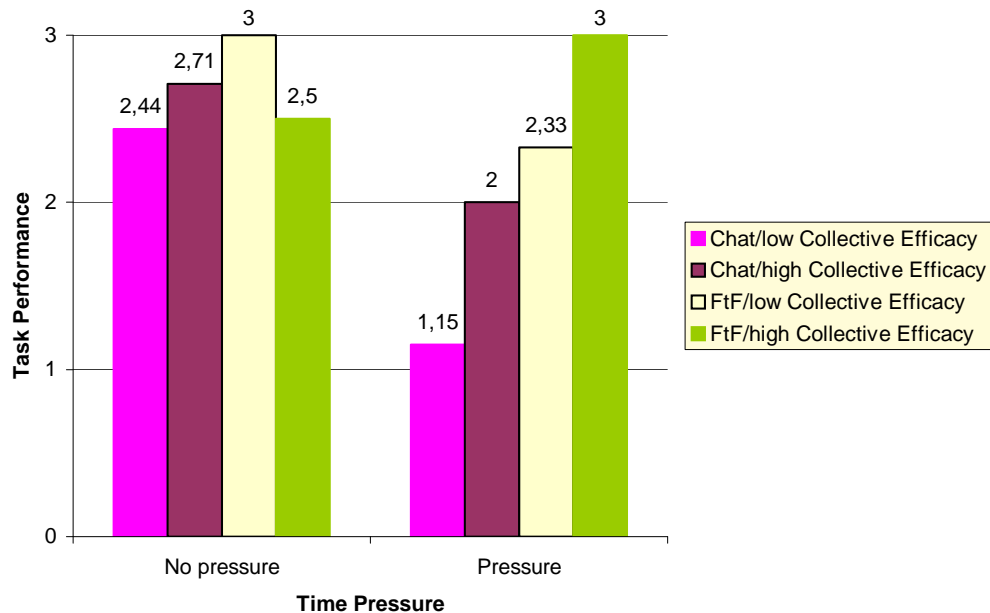
Figure 6.4: Interaction effect Group Communication System X Pressure X Perceived Collective Efficacy on Task Performance (*N*= 140). *Note:* FtF (Face-to-Face communication system).

As we expected (Hypothesis 6), the combination of Chat System X Time Pressure X Low Level of Perceived Collective Efficacy leads to poorer task performance (*M*=1.15) compared with the all other groups working under pressure: chat/high perceived collective efficacy (*M*=2.0), face-to-face/low perceived collective efficacy (*M*=2.33), and face-to-face/high perceived collective efficacy (*M*=3.0). Working under pressure leads to the best performance when groups are working face-to-face with high levels of perceived collective efficacy. In this case, time pressure seems to improve task performance. On the other hand, working without time pressure brings leads to good performance when groups interact face-to-face and experience low levels of perceived collective efficacy. The best performance

was achieved by face-to-face groups working *under* time pressure with *high* levels of perceived collective efficacy (M=3.0) and face-to-face groups working *without* time pressure with *low* levels of perceived collective efficacy (M=3.0). To sum up, Hypothesis 4 and 5 were no supported and 6 was supported. Finally, against expectations, there was a significant main effect of time pressure on task performance, F(1, 134)=3.41, p<.04. Groups working without time pressure performed significantly better (M=2.6) than groups working under time pressure (M=1.8).

Discussion

This Chapter 6 explored the moderating role that perceived collective efficacy plays in the relationship between GCSs (i.e., chat/face-to-face systems) and time pressure on collective subjective well-being (i.e., anxiety and engagement) and task performance. Two sets of similar hypotheses were tested for each outcome: collective well-being and performance. Our results corroborated the potential moderating effect of perceived collective efficacy, thus confirming the main assumptions of the current experimental study. So far, high levels of perceived collective efficacy buffered the negative effects of chat use and time pressure on collective well-being and task performance. This result is confirming the basic assumption of the Social Cognitive Theory (Bandura, 1999) because collective confidence in the group's future efficacy determines levels of collective well-being and task performance. In the current chapter, collective efficacy clearly acts as a moderator in the relationship between demands (i.e. using chat technology and working under time pressure) and subjective well-being and task performance.

Theoretical Implications

The theoretical relevance of our findings is fourfold. First, our results illustrate the robustness of perceived collective efficacy as a moderator variable. More specifically, it appeared that collective efficacy measured at Time 1 affected subjective well-being and task performance at Time 2, but a similar effect of collective efficacy measured at Time 2 was not observed. This confirms the 'future' orientation of perceived collective efficacy, as was formulated in Bandura's (1999) Social Cognitive Theory. However, the effects on subjective well-being were different depending on the nature of the dimension of subjective well-being (i.e., negative or positive). Regarding the negative dimension (i.e., collective anxiety), we found an interaction effect of time pressure and perceived collective efficacy but no effects on collective engagement. On the other hand, the three-way interaction effect of GCS, time pressure and perceived collective efficacy was exclusively found for the positive dimensions of subjective well-being (i.e. collective engagement). Furthermore, the pattern of results obtained was different depending on the collective engagement dimension under study. For example, in e-groups working under pressure, levels of collective vigor and dedication developed differently across time depending of the level of perceived collective efficacy. That is, in the case of collective engagement, perceived collective efficacy buffers the effects of time pressure on collective vigor and dedication. However, we did not find any significant interaction effects with collective absorption. As a matter of fact, compared to both other dimensions of engagement, this dimension showed a slightly different pattern of results in other studies as well (see Schaufeli *et al.,* 2002b).

Second, our research extends current models of e-groups on users' reactions and task performance. Specifically, our results may expand the Model of Change as formulated by Hollingshead *et al.* (1993) by taking into account the influence of other variables (i.e., time pressure and perceived collective efficacy) in the relationship between ICTs on group outcomes. According to this model, it is expected that during the first meetings, e-groups will have a poorer performance compared to groups working face-to-face (i.e., the novelty effect of new technology). However, in the current chapter at Time 2 no significant difference was observed on subjective well-being and task performance between e-groups and face-to-face (i.e., no main effects of GCSs were found). Only when more variables in the model (i.e., time pressure and perceived collective efficacy) are taken into account, differences were found between e-groups and face-to-face groups on subjective well-being and task performance. Future research on this topic would include these variables as well, in order to understand the complex dynamics involved in these relationships.

Third, our research contributes to the literature on time pressure as a powerful demanding factor in work groups. The current study confirms the detrimental effects of time pressure on work groups. A main effect of time pressure on task performance was found. Groups working under time pressure performed their task less well compared to groups working without time pressure. Similar results were found in other studies (see Davis, 1969; Karau & Kelly, 1992; Kelly & McGrath, 1985; Yukl *et al.,* 1976). However, e-groups working under time pressure do perform worse and feel less well only when we take into account perceived collective efficacy. This means that e-groups and face-to-face groups do not differ significantly on task performance and subjective well-being, when taking

only time pressure into account. Different results were found by Gracia *et al.* (2000), who observed a two-way interaction effect of technology system and time pressure on the performance on an intellective task. However, they used other technology systems in their study, such as e-mail and videoconferencing and not a chat-system. Future studies must confirm current results using chat-systems and even other GCSs (i.e., computer-supported cooperative work groupware).

Finally, an interesting pattern emerges when we take into account psychological moderator variables (i.e., perceived collective efficacy) on task performance. As with subjective well-being, we found a three-way interaction effect of GCS X time pressure X perceived collective efficacy on task performance. As expected, the e-groups working under time pressure and feeling less collectively self-efficacious performed their task less well than the remaining groups. On the other hand, the best-performing groups working under time pressure were for face-to-face groups feeling highly efficacious. Time pressure seems to be a powerful obstacle for a good group performance that also contributes to more collective anxiety. But time pressure is especially an obstacle for e-groups´ performance when group shared negative collective beliefs about themselves.

Practical implications

Research suggest some advantages when implementing GCSs in the workplace; for example, these synchronous electronic systems make groups work with more flexibility and autonomy. However, we should keep in mind some troubles as well. A main conclusion of this study is that introducing new GCSs may have detrimental effects on collective anxiety and task performance, especially when groups are working under time

pressure with low levels of perceived collective efficacy. On the other hand, in the same condition (e-groups working under pressure), high levels of perceived collective efficacy increase collective engagement (i.e., collective vigor and dedication). Time pressure could be not only a powerful job demand but also a challenge for groups feeling highly efficacious. However, our results may picture a positive scenario as well (i.e., to increase perceived collective efficacy) because they point in the direction of buffering the negative effects of time pressure, especially when new GCSs are being implemented at the workplace. Remember that effects were observed of Time 1 perceived collective efficacy on Time 2 outcomes (collective well-being and task performance). It follows that organisations that plan to implement new GCSs should use strategies to increase perceived collective efficacy *before* the implementation of these technologies.

For instance, *efficacy beliefs training* is one of the strategies that might be used by companies when faced with the need to make changes, specifically those related to the implementation of new communication systems, in order to control potential job demands (Llorens, Salanova, Grau, 2003b; Salanova, Cifre, & Martín, 1999). During the first stages of training, it is possible to enhance perceived collective efficacy. To achieve this aim, training should include a variety of components that are consistent with theoretical cues for self-efficacy building (Bandura, 1997, 1999). These include role-plays to provide experiences of success using the new GCS (enactive mastery), models of performance (vicarious experiences), coaching and encouragement (verbal persuasion), and reduction of the emotional threats of rejection (managing physiological states). According to Bandura (1999), the most authentic and influential

source to increase efficacy beliefs is fostering "mastery experiences". This can be achieved by tackling problems regarding the new GCS in successive, attainable steps. While successes build a robust belief in one's self-efficacy, failures undermine it, especially in earlier phases of training. Therefore, to get resilient self-efficacy, it requires experiences in overcoming obstacles through perseverant effort. In a similar way, if members see other groups succeed by sustained effort, they come to believe that they have also the capability to success (vicarious experiences). Social persuasion seeks to persuade members that they have what it takes to succeed, and so they exert more effort and are more perseverant if they have self-doubts when obstacles arise. Finally, groups also rely on their physical and emotional states to evaluate their own capabilities to use new GCSs. Negative emotions such as tension and anxiety are signs of personal deficiency. In this case, it would be adequate to enhance the member's physical condition, reduce his or her negative emotional states, and correct misinterpretations of somatic sources of information.

Limitations and Future Research

In the current experimental study, we used a longitudinal design with self-report (i.e., collective anxiety, collective engagement and perceived collective efficacy) and objective measures (i.e., task performance) to test the main hypothesis. However, although we kept the main factors in this laboratory experimental study under control, there are limitations. For example, we used participants who are not 'real' employees in 'real' organisations. Also, it is important to keep in mind that there were 28 groups in the study. Therefore, we had enough power to detect only the largest effects, and non-significant effects may reflect a lack of statistical

power. Additionally, participants were mainly young females. So far, results obtained in this study must be tested in future research, with 'real' employees working in 'real' organisations, with other kinds of GCSs (e.g., CSCW) and including participants with different gender and from different age groups.

CHAPTER 7

Discussion

Discussion

The main objective of this dissertation was to test an extension of the Job Demands-Resources Model (Demerouti *et al.,* 2001a) among Information and Communication Technology (ICT) users, integrating both negative (in terms of burnout) and positive (in terms of work engagement) approaches of employee well-being and one withdrawal consequence (i.e., organisational commitment). In order to carry this out, we followed a stepwise procedure. First, and for cross-national validation purposes, the model was tested simultaneously with ICT employees from two European countries: Spain and The Netherlands. In this case, Confirmatory Factor Analyses, Structural Equation Modeling as well as multigroup analyses were conducted. Second, considering the relevance of Positive Psychology and the inclusion of personal resources such as efficacy beliefs as intervenient variables in the stress process, the positive spiral models including resources, efficacy beliefs and engagement were tested among ICT users in a laboratory longitudinal study. Finally, in a further step, the intervening role of perceived collective efficacy was also tested among ICT users in a motivational process of group work.

The contributions of this thesis are as follows: (1) the inclusion of specific *techno*-stressors in ICT jobs, since most studies of burnout have focused on human service occupations; (2) negative and positive states of mind, comprising burnout and engagement and the relationship between them, were included in the model; (3) for a cross-national validation of the structure and the relationship between burnout and engagement, ICT employees from Spain and The Netherlands were tested together; (4) the inclusion of the role played by efficacy beliefs, as being responsible for the generation of gain spirals models. According to this, the availability of job

resources increases efficacy beliefs, which in turn leads to high levels of future engagement; and finally, (5) the inclusion of collective efficacy beliefs to explain the interaction effects on collective well-being and task performance in group work.

This doctoral thesis was conducted through five empirical studies. Their main results can be summarised as follows.

In **Study 1** (see Chapter 2), the factorial structure of individual 'burnout' and its opposite 'work engagement' was tested among Spanish and Dutch ICT employees. Specifically, the central aim of this chapter was to examine the factorial structure of the MBI-GS (Schaufeli *et al.,* 1996) and the UWES (Schaufeli *et al.,* 2002b) instruments among employees working with ICT. In addition, we examined cross-national differences regarding the psychometric properties of these instruments by comparing data collected in Spain and The Netherlands. This study has also contributed to the current discussion on the relationship between burnout and engagement by investigating the higher-order factor structure of the burnout and work engagement measures in both countries. We attempted to answer three research questions: (a) Is the basic three-factor structure of burnout the best one in Spain and The Netherlands?, (b) Is the basic three-factor structure of work engagement the best one in the two countries? and (c) How are burnout and engagement related in the two countries?

Concerning the first question, results showed that burnout was composed of three independent but related dimensions: exhaustion, cynicism and professional efficacy. These results coincide with traditional research on the subject in different samples (Bakker *et al.,* 2002; Leiter & Schaufeli, 1996; Taris *et al.,* 1999) and specifically in ICT users (Salanova *et al.,* 2000b; Schaufeli *et al.,* 2002b). Moreover, this three-factor structure

was invariant in Spain and in The Netherlands, which supports the cross-national validity of the MBI-GS. Accordingly, the answer to this first question is affirmative: results confirm the invariance of the structure of the burnout instrument across samples of Spanish and Dutch ICT employees. Despite the structure of burnout being invariant across countries, the present study showed some minor deviations between Spain and The Netherlands. Thus, some correlations and factor loadings (particularly in the exhaustion and professional efficacy dimensions) were different across the two countries. Similar differences were also observed in a Portuguese, Dutch and Spanish cross-cultural study on burnout and engagement in a sample of university students (Schaufeli *et al.,* 2002a) as well as in a sample of ICT users (Salanova *et al.,* 2000b). It seems that although the three-structure of burnout fits well across samples, the contribution of the scale scores and the relationship between them differs between Spain and The Netherlands.

Question 2 referred to the structure of the antithesis of burnout: work engagement. Results referring to the question "*Is the basic three-factor structure of the 'engagement' inventory the best one in the two samples?*" showed that as expected, work engagement is composed of three independent but related scales: vigor, dedication and absorption in both countries. Similar results have been obtained in previous studies in different samples (Grau *et al.,* 2004; Schaufeli & Bakker, 2002b) as well as among ICT employees (Llorens *et al.,* 2001; Salanova *et al.,* 2000b; Schaufeli *et al.,* 2002b). Despite the high correlations obtained between the dimensions, work engagement is conceived as a three-dimensional concept in Spain and The Netherlands. Thus, those who are highly dedicated to their work also usually seem to lose track of time, and feel absorbed in

their work activities. In addition, engaged workers also experience energy and feel vigorous and strong. Despite the structure of engagement being invariant across countries, some factor loadings (above all in the dedication scale) and the correlations between vigor-absorption and dedication-absorption were different between Spain and The Netherlands. Although the scale scores and the relationship between them differed in these two European countries, the answer to this second question is also affirmative: results corroborate the three-factor structure of work engagement as measured by the UWES inventory and this result is generalised to Spain and The Netherlands.

The relationships between burnout and engagement were framed in the third question: "*How are burnout and engagement related in the two samples?*" In this case, we were interested in studying whether burnout and engagement may be considered as the opposites poles of the same continuum, (Maslach & Leiter, 1997) or two different but correlated psychological constructs, measured by different instruments (Schaufeli & Bakker, 2004). Our results confirm that instead of being two opposite poles of the same continuum, burnout and engagement are two independent but negatively correlated states of mind in both Spain and The Netherlands. According to Schaufeli and Bakker (2004), this relationship between burnout and engagement may be understood if we consider that they are part of a more comprehensive taxonomy which includes the two independent dimensions of `energy´ and `identification´. In this vein, burnout and engagement may be considered as opposites, particularly for exhaustion and vigor, which refer to *energy* dimension, and cynicism and dedication, which refer to *identification* dimension. Furthermore, burnout and engagement are independent states of mind that are antithetical and

consequently negatively related, but they are not mutually exclusive states. This result means that an employee can feel emotionally drained as a result of his or her work once a week, but this does not necessarily preclude the same employee in the same week from feeling full of energy (see Schaufeli & Bakker, 2004).

A different picture was observed between professional efficacy and absorption, which are not considered as direct opposites. They are conceptually distinct aspects that are not the end points of an underlying continuum (Lee & Asforth, 1996; Maslach, 1993). Various scholars show that professional efficacy plays a different role from that of exhaustion and cynicism in burnout, which constitute the essence and the core of burnout (Green *et al.,* 1991; Leiter, 1992; Maslach *et al.,* 2001). Professional efficacy is perceived as a personality characteristic akin to self-efficacy or competence and is thus nearer to the positive affect (Cordes & Dougherty, 1993; Cherniss, 1993). In fact, a "crisis of efficacy" is a critical factor in the development of burnout (Cherniss, 1980; Leiter, 1992; Salanova *et al.,* 2002b), while a "boost in efficacy" causes the opposite: engagement (Salanova, 2003; Salanova *et al.,* 2004a). Similarly, absorption was found to be a constituting element of engagement following some thirty in-depth interviews (Schaufeli *et al.,* 2001) and it comes close to the "flow" concept: a state of optimal experience that is characterised by focused attention, clear mind, mind and body union, effortless concentration, complete control, loss of self-consciousness, distortion of time and intrinsic enjoyment (Csikszentmihalyi, 2000). However, flow is a more complex concept that includes many aspects and refers to short-term `peak´ experiences instead of a more pervasive and persistent state of mind, as is the case of absorption.

Based on previous results, we tested whether models that include only the `core dimensions´ of burnout and engagement are better than the traditional models in which the three-dimensions are considered. Similarly to previous empirical studies (see García *et al.,* 2004; Grau *et al.,* 2004; Llorens *et al.,* 2003a) our results suggested that in the relationship between burnout and engagement, the best model included *only* the core of burnout (i.e., exhaustion and cynicism) and the core of engagement (i.e., vigor and dedication). This core structure was replicated across Spanish and Dutch employees. Despite the structure being the same across countries, the present study showed that a negative correlation between cynicism and dedication were needed *only* in The Netherlands, which represents the ends-points of the two underlying dimensions of the *energy* dimension. Accordingly, the answer to this third question is that burnout and engagement are considered as two independent but negatively related constructs that can be measured by specific instruments. In addition, and in contrast to the traditional perspectives which assume that burnout and engagement are composed of three "opposite" dimensions (for example, Maslach & Leiter, 1997), *only* the core of burnout (i.e., exhaustion and cynicism) and the core of engagement (i.e., vigor and dedication) have been identified as the central dimensions of burnout and engagement. These results agree with previous researches in different samples (de Rijk *et al.,* 1998; Green *et al.,* 1991; Llorens *et al.,* 2003a; Schaufeli & Bakker, 2004).

Study 2 focused on the structure of the specific demands and resources between ICT employees from Spain and The Netherlands. In Chapter 3, several job characteristics or 'demands' and 'resources' were explored in the Spanish and Dutch ICT workers using Confirmatory Factor

Analyses with multigroup analyses. The research question related to this section was the following: *How are job demands and job resources related in the two countries?* Results showed that, as expected, the work characteristics in this ICT context could be divided into two main factors: `demands' (comprising quantitative and emotional overload) and `resources' (including job control, social support and performance feedback). Although a limited number of job characteristics were used, our findings lend support to the basic premise in the Job Demands-Resources model (JD-R) (Bakker *et al,* 2003b; Demerouti *et al.,* 2001a). The basic premise of this model is that, regardless of the type of work, job characteristics can be categorised as job demands and job resources (Bakker *et al.,* 2003b; Demerouti *et al.,* 2001a). In both ICT employees from Spain and The Netherlands, emotional overload and social support showed the highest loadings, which implies that these job characteristics substantially contribute to explaining variance in the `demand' and in the `resource' factors, respectively. As in previous studies (Bakker *et al.,* 2003a, 2004a; Demerouti *et al.,* 2001a) our findings showed that demands and resources are negatively related in both samples, which implies that there is an imbalance between them which may generate negative consequences on well-being. The reason for this negative relationship is that according to the JD-R Model, the presence of specific job demands and the absence of specific resources predicts burnout, which in turn is expected to lead to various negative outcomes (e.g., less organisational commitment) (Demerouti *et al.,* 2001a).

Despite the structure of job characteristics being invariant across countries, the equivalence test showed that some factor loadings (i.e., emotional overload, social support, performance feedback) and some

correlations (i.e., between emotional overload and social support) were different *across* Spain and The Netherlands. Further analyses should be done to determine whether a latent factor (e.g., emotional factor) explains this relationship. To conclude, the answer to this third question is that, as proposed in the JD-R model (Demerouti *et al.,* 2001a), working conditions in ICT contexts can be split into two general categories, namely demands and resources, in Spain and in The Netherlands. However, some minor deviations were observed between the countries.

Based on previous results, **Study 3** tested the Job Demands-Resources model (JD-R) using Structural Equation Modeling analyses including both negative (i.e., burnout) and positive approaches to employee well-being (i.e., work engagement) and organisational commitment as an outcome (see Chapter 4). For cross-cultural purposes, this model was also tested in two European countries: Spain and The Netherlands using multigroup analyses. This study was based on two research questions: (1) How do job demands and job resources relate to burnout and engagement *across* both countries? and (2) How do burnout and engagement relate to organisational commitment *across* both countries? With regard to the first question, we observed a direct relationship from job demands to the core of burnout and from job resources to the core of work engagement. Technology workers with emotional and quantitative overload felt more exhausted and more cynical. In contrast, employees with more resources in terms of job control, social support and performance feedback felt more vigorous and more dedicated. In addition, other unexpected relationships were obtained between demands-resources and burnout-engagement, such as the fact that job demands primarily predicted burnout, but also predicted a decrease in engagement levels. Despite of other research has

obtained similar results (Bakker *et al.,* 2003b; Salanova *et al.,* 2003), this effect was weak and it was only found in the Spanish sample. In a similar vein, job resources primarily predicted engagement but also reduced levels of burnout in both samples. Accordingly, ICT workers with high job resources felt not only less exhausted and cynical, but also more vigorous and dedicated in both countries. This suggests that resources may directly prevent the so-called erosion process such as is also suggested by literature (Bakker *et al.,* 2003b; Lee & Asforth, 1996; Schaufeli & Bakker, 2004).

As far as the relationship between burnout-engagement and organisational commitment (*question 2*) is concerned, results showed, as expected, a negative relationship between burnout and organisational commitment, and a positive relationship between work engagement and organisational commitment. That is, exhausted and cynical ICT employees felt less committed to their organisation. This results confirm previous research (cf. Bakker *et al.,* 2003a; Salanova *et al.,* 2000b; Schaufeli & Buunk, 1996; Schaufeli *et al.,* 2004). In contrast, vigorous and dedicated employees felt more committed to the organisation they work for (Baumeister & Leary, 1995; Meyer & Allen, 1991; Schaufeli & Bakker, 2004). Finally, it is interesting to note that organisational commitment was also directly affected by demands and resources. Availability of resources seems to lead to organisational commitment in both countries. Research shows that the more positive the perceptions of job characteristics are (e.g., job control, feedback), the higher the organisational commitment (Mathieu & Zajac, 1990; Zurriaga *et al.,* 2000). In this line, Van Dierendonck *et al.* (1998), in a sample composed of 149 direct care professionals with a low level of support either from colleagues or from

their supervisors increased their turnover intention, as they were more inclined to restore their sense of equity by expanding their horizons outside the organisation, whereas among those with high levels of support, turnover intention decreased.

Taken together, results suggest that, although some measurement differences were obtained across the countries, the main postulates of the JD-R model were confirmed in ICT workers in Spain and The Netherlands. This result illustrates the robustness of the findings and the cross-national validation of the Job Demands-Resources model. Additionally, it expands previous findings with the JD-R model, including not only the traditional and negative psychological states (burnout) but also the positive psychological states (engagement) from a cross-cultural perspective. According to this, and regardless of occupation, two sets of working characteristics (in terms of job demands and job resources) have corroborated the existence of dual psychosocial processes in organisations: (a) the traditional and negative erosion process in which job demands are mainly negatively related to organisational commitment through burnout; and (b) a motivational process that is driven by the availability of job resources which were the most important predictors of organisational commitment through their impact on work engagement. However, an alternative model that also includes direct paths from job demands and job resources to organisational commitment fits the data. Consequently, burnout and engagement do not act as full mediator variables but as partial mediators. Moreover, available resources may also lead to organisational commitment directly and through their influence on burnout (cross-link effect) in both samples. Despite the similarities across countries, some differences in factor loadings were also obtained. Moreover, the cross-link

relationship from job demands to engagement and the direct effect of job demands on organisational commitment were only significant in the Spanish sample. Despite these differences, significant results can be observed in both countries: (1) it is possible to combine negative and positive approaches of well-being in one model, (2) burnout and engagement play similar roles in different processes, (3) burnout plays a partial mediating role in the erosion process that is mainly driven by high levels of demands, which in turn may produce a reduction in levels of organisational commitment, (4) engagement also plays a partial mediating role in a motivational process that is driven by available resources and that might lead to organisational commitment, (5) the positive process (resources-engagement-organisational commitment) was stronger and more relevant than the negative one (demands-burnout-organisational commitment).

Thus, our findings give empirical support in the Positive Psychology approach in explaining psychological well-being at work. This positive focus is seen as a complementary perspective to the focus on human problems (Seligman & Csikszentmihalyi, 2000). Snyder and Lopez (2002) point out that Positive Psychology is a new paradigm that should be allowed to establish and sustain optimal functioning and satisfaction over time. According to the *Broaden-and-Build Theory* (Fredrickson, 2002), positive emotions broaden people's thought-action repertories, which in turn, builds enduring personal resources, which finally transform people into more creative and healthy individuals. Since the relevance of Positive Psychology, a great deal of attention is nowadays paid to guaranteeing a good working life for both workers and organisations. Recently, Luthans (2002a, 2002b) has defined Positive Organisational Behaviour (POB) research as *"the study*

and application of positively oriented human resource strengths and psychological capacities that can be measured, developed and effectively managed for performance improvement in today's workplace" (Luthans, 2003, p. 179). Similarly, Salanova, Llorens, Peiró, and Schaufeli (2004c) give evidence for the Positive Occupational Psychology (POP) among different occupations an among students wirking in groups. This study shows that positive emotions enhance engagement that in turn enhance efficacy beliefs. Since organisational behaviour has been characterised more by negativity than by positivity, Wright (2003) has argued that the mission of POP must also include the pursuit of employee happiness and health as viable goals in themselves, which in turn will increase performance improvement in the workplace. Accordingly, terms such as positive affectivity, engagement, strengths and psychological capabilities for development and performance improvement, are receiving attention in their own right (Luthans, 2001, 2002a, 2002b, 2003).

Given the relevance of the positive approach, we decided to carry out a field study. In this case students rather than employees were used in a laboratory setting. In **Study 4**, we used a two-wave longitudinal design among 110 ICT users working in groups in internet-chats (see Chapter 5). We were interested in discovering the relationship between task resources (i.e., time control and method control), efficacy beliefs and the core of engagement (comprising vigor and dedication). In this study, more complex analyses were conducted, including causal, reversed causal and reciprocal relationships between the variables in order to test the positive spiral of resources, efficacy and engagement. The research questions were: (1) Do personal resources mediate the relationship between job resources and work engagement? and (2) Does engagement increase personal and

job resources? As far as the first question is concerned, the answer was affirmative. Results of the cross-lagged Structural Equation Modeling showed that task resources had a positive effect on efficacy beliefs, which in turn showed a short-term (3 weeks) lagged effect on task engagement. According to this, the students using an internet chat format with more resources to complete the task felt more efficacious, which in turn increased engagement three weeks later. According to Bandura's (1997) Social Cognitive Theory, the perception of control anticipates the successful experience of the task and, consequently, the levels of efficacy beliefs increase. Moreover, this perception of efficacy in doing the task leads to high levels of energy and persistence in the face of demands (i.e., vigor) and fulfilment of personal needs and task dedication. There is empirical evidence that efficacy beliefs *"regulate emotional states by supporting effective courses of action to transform the environment in ways that alter its emotional potential"* (Bandura, 2002, p. 137). Efficacy beliefs are a motivational mechanism: people perceive their own competences, and consequently they set themselves goals, which in turn leads to greater effort and persistence over time to cope with obstacles (Bandura, 2001; Garrido, 2000). According to the *motivation process* of the Job Demands-Resources model (Bakker *et al.,* 2003b; Demerouti *et al.,* 2001a), the presence of available resources stimulates motivation in the form of engagement and positive outcomes such as efficacy beliefs and organisational commitment (Llorens *et al.,* 2003a; Schaufeli & Bakker, 2004).

Regarding the second research question, efficacy beliefs played a mediating role between engagement and task resources. Students with high levels of engagement felt more efficacious doing the task, which in

turn led to the perception of more task resources in the future. As in previous studies, engagement acts as a "motivational mechanism" derived from high levels of efficacy beliefs (Salanova *et al.,* 2004a). Thus, engagement only increases task resources via personal resources (i.e., efficacy beliefs). That is, vigor and dedication are also a source of efficacy beliefs across time. Our study corroborates the power of emotional states as a source of efficacy beliefs. According to Social Cognitive Theory, individuals also partly rely on their somatic and emotional states in judging their capabilities. People interpret their stress reactions and tensions as signs of inefficacy, while positive emotional states (in our study, engagement) enhance efficacy beliefs. In circumstances involving a positive state of mind (e.g., engagement) individuals may perceive themselves as more efficacious in doing the tasks, which in turn can generate high perceptions of task resources. Moreover, our results coincide with the Broaden-and-Build Theory of Positive Emotions (Fredrickson, 2001). The experience of positive emotions broadens the individual's momentary thought-action repertories, which, in turn, serve to build their enduring personal resources (i.e., self-efficacy), which function as reserves to be drawn on later to manage future threats.

Furthermore*,* results of the fourth empirical study imply that none of the constructs included in the study can be considered as only a cause or only a consequence, generating a "gain" spiral of resources, efficacy beliefs and engagement. This coincides with Bandura's reciprocal causation model (1997) regarding self-efficacy beliefs. Thus, our results showed that over time task resources increase efficacy beliefs, which in turn foster engagement. In addition, engagement boosts future efficacy beliefs, which in turn increase the perception of more task resources. Thus, evidence was

found for a pure mediational role of efficacy beliefs in the spiral of resources: task resources predicted later engagement and engagement predicted later task resources through efficacy beliefs. These short-term reciprocal relationships are also consistent with the "gain spirals" proposed by Hobfoll (1989, 2001, 2002). According to Conservation Of Resources (COR) theory, resources are motivators through which individuals strive to maintain, protect and expand their resources in order to offset the possibility of future loss and consequently people develop efficacy beliefs (Bandura, 1997) and positive well-being (e.g., engagement) (Antonowski, 1987; Ryan & Frederick 1997), generating a positive circle found in previous studies (Fredrickson, 2001; Llorens *et al.,* 2003b; Salanova *et al.,* 2004a). These results are also in line with Job Characteristics Theory (Hackman & Oldham, 1980), which shows how the presence of resources is linked to psychological states and to positive outcomes. Specifically, results are in line with the "gain spiral" models of efficacy beliefs previously tested in students (Salanova *et al.,* 2004a) and teachers (Llorens *et al.,* 2003a), which show that resources generate more levels of efficacy beliefs in the present, which in turn lead to greater engagement in the future which enhances more task resources, and so on.

In sum, our findings confirm the *Gain Spiral Model* between task resources, efficacy beliefs and engagement in a field study made in a laboratory setting, using longitudinal design. An important result is the confirmation of the pivotal and mediating role of efficacy beliefs which has recently been obtained in previous studies (Salanova *et al.*, 2004a). Moreover, these results provide evidence in favour of the benefits of efficacy beliefs in different contexts such as academic performance (Salanova, 2003; Salanova *et al.*, 2004a; Schaufeli *et al.*, 2002a), job stress

in ICT users (Salanova *et al.*, 2001), and proactive behaviour (Salanova *et al.,* 2004b).

Given the relevance of collective efficacy beliefs, in Chapter 6 we described ***Study 5*** which comprised a longitudinal lab experiment. This study corroborated the relevance of efficacy beliefs as intervening variables in a motivational process of work in groups. In this study, MANOVAs were used to test interaction effects between demands and collective efficacy on collective well-being and task performance. Regarding to the subjective well-being, we asked the following questions: (1) does perceive collective efficacy moderate the relationship between Group Communication System (chat vs. face-to-face) and collective well-being (i.e., anxiety, engagement)?, (2) does perceive collective efficacy moderate the relationship between time pressure (time pressure vs. no time pressure) and collective well-being? and (3) does perceive collective efficacy moderate the relationship between Group Communication System X time pressure on collective well-being?. As far as task performance is concerned, we ask the following: (4) does perceive collective efficacy moderate the relationship between Group Communication System and task performance?, (5) does perceive collective efficacy moderate the relationship between time pressure and task performance? and (6) does perceive collective efficacy moderate the relationship between Group Communication System X time pressure on task performance? Results confirm the moderating role of perceived collective efficacy between group communication systems (i.e., internet chat vs. face-to-face systems) and time pressure on collective subjective well-being (i.e., anxiety and engagement) and task performance, obtained in previous studies (Martínez, Salanova, Llorens, & Cifre, 2003). More specifically, high levels

of perceived collective efficacy buffered the negative effects of chat use and time pressure on collective well-being and task performance. This result confirms the basic assumption of Social Cognitive Theory (Bandura, 1997), since collective confidence in the group's future efficacy determines levels of collective well-being and task performance. However, the effects on subjective well-being were different depending on the nature of the dimension of subjective well-being. With regard to the negative dimension (i.e., collective anxiety), we found an interaction effect of time pressure and perceived collective efficacy, but no effects on collective engagement. On the other hand, the three-way interaction effect of group communication system, time pressure and perceived collective efficacy was exclusively found for the positive dimensions of subjective well-being (i.e. collective engagement). Furthermore, in e-groups working under pressure, perceived collective efficacy buffers the effects of time pressure on collective vigor and dedication. However, we did not find any significant interaction effects with collective absorption. Moreover, Chapter 6 confirms the detrimental effects of time pressure on group performance. Groups working under time pressure did not perform their task as well as groups working without time pressure (see Davis, 1969; Karau & Kelly, 1992; Kelly & McGrath, 1985; Yukl *et al.,* 1976). However, chat groups working under time pressure did perform worse and did not feel as good as face-to-face groups, *only* when they felt less collectively efficacious. On the other hand, the best-performing groups working under time pressure were face-to-face groups that felt highly efficacious. One of the main conclusions of this study is that introducing new group communication systems may have detrimental effects on collective anxiety and task performance, especially when groups are working under time pressure with low levels of perceived

collective efficacy. Similarly to Study 5, strong efficacy beliefs (in this case a strong collective sense of efficacy) play a key role by intervening from demands to group well-being and task performance (Bandura, 1993; Gibson, 1995; Hodges & Carron, 1992). Thus, group-level efficacy beliefs may buffer occupational stress by providing group members with social support when dealing, for instance, with new technological systems and/or when under time pressure (Cohen & Wills, 1985; Gore, 1987). In addition, perceived collective efficacy may have a buffering effect by providing group members with the means necessary to actually reduce job demands (Beehr, 1995; Jex & Bliese, 1999). Finally, a strong sense of perceived collective efficacy may boost collective well-being as well as group task performance (Jex & Bliese, 1999; Schaubroeck *et al.,* 2000).

Theoretical and Practical Implications

The findings of the present dissertation have important theoretical and practical implications for organisations. As far as burnout and engagement are concerned, the present study corroborates and extends the three-factor structure of burnout and engagement measured by the MBI-GS and UWES instruments respectively among ICT samples and in different countries (Spain and The Netherlands). Secondly, the high correlations between the three work engagement dimensions reveal the possibility of using only one single scale to evaluate engagement or reduce the items of the UWES instrument to be used for practical purposes. In other words, it may be useful to consider the three dimensions of engagement to explain the characteristics of the construct at the theoretical and research level, but, ultimately, a single scale can be used in practice. However, the great implication of the present thesis is to consider

the relationship between burnout and engagement in terms of the core dimensions when the two constructs are considered together. As we noted above, absorption and professional efficacy seem to play a different role when compared with vigor and dedication, which seem to be the opposite scales of the core of burnout (i.e., exhaustion and cynicism) (Green *et al.,* 1991; Schaufeli & Bakker, 2004). The correspondence between the results obtained in the two different samples (Spanish and Dutch) in the ICT context suggests that the findings are robust and can be generalised to other samples and countries.

Another important contribution is the evidence for the extension of the Job Demands-Resources model (JD-R) (e.g., Bakker *et al.,* 2003c; Demerouti *et al.,* 2001a) model including not only burnout, but also the new positive approach in a specific ICT sample. Because this is a cross-cultural study, results provide evidence for the JD-R model across countries (Spain and The Netherlands) despite the fact that certain differences were obtained. Generally speaking, our findings suggest that job characteristics may be divided into two general categories: job demands and job resources. Moreover, the erosion and the motivation processes have also been corroborated. Consequently, organisational commitment is the result of these two basic dual processes. Results suggest that in order to reduce or prevent burnout and consequently to increase the levels of organisational commitment, specific job demands (e.g., quantitative overload and emotional overload) should be reduced and available job resources could be considered. In addition, in order to increase engagement, which in turn increases levels of organisational commitment, resources should be increased. Moreover, one important result in both samples is the pivotal role of the new positive psychological approach (i.e.,

the motivational process) in the psychological well-being process (Seligman & Csikszentmihalyi, 2000). The relevance of the positive approach including efficacy beliefs as a mediator variable was tested in a longitudinal study in a lab setting. Theoretically, results showed the relevance of the "gain spiral" model found in previous studies (Llorens *et al.,* 2003a; Salanova, 2003; Salanova *et al.,* 2004a): task resources, efficacy beliefs and engagement have reciprocal relationships over time. For practical implications, results emphasise the importance of providing good resources that enhance their efficacy and engagement, which in turn, also increase efficacy beliefs, which close the spiral by leading to more perception of resources to do the task. Although efficacy and engagement are traditionally considered as an outcome, our two-wave longitudinal study shows that both can be considered as causes *and* consequences in the gain spiral.

As for collective efficacy, our results also illustrate the robustness of perceived collective efficacy as a moderator variable and confirm their 'future' orientation as formulated in Bandura's (1999) Social Cognitive Theory. Moreover, our results may expand the Model of Change as formulated by Hollingshead *et al.* (1993) by taking into account the influence of other variables (i.e., time pressure and perceived collective efficacy) in the relationship between ICTs on group outcomes. Although it was expected that during the first meetings, e-groups would show a poorer performance than groups working face-to-face (i.e., the novelty effect of new technology), no significant differences were observed on subjective well-being and task performance between chat and face-to-face groups. Only when further variables in the model are considered, (i.e., time pressure and perceived collective efficacy) were differences found between

e-groups and face-to-face groups on subjective well-being and task performance. Moreover, time pressure is particularly an obstacle for e-group performance when groups shared negative collective beliefs about themselves. Time pressure may not only be a powerful job demand, but also a challenge for groups feeling highly efficacious. However, our results may also illustrate a positive scenario (i.e., to increase perceived collective efficacy) because they point in the direction of buffering the negative effects of time pressure, especially when new group communication systems are implemented in the workplace. It follows that organisations that plan to implement new group communication systems should use strategies to increase perceived collective efficacy *before* the implementation of these technologies.

Limitations

Despite the contribution of the findings presented in this thesis, several limitations should be mentioned. One of the limitations is that the data were obtained by self-report measures and, consequently, the results may be contaminated by the variance of the common method. Thus, it would be interesting to complement these measures in future studies with other, more objective ones, such as observers' ratings (cf. Bakker *et al.,* 2004c). Although these methods may be an alternative, they suffer from other problems such as observer bias, halo and stereotyping effects that should be controlled (De Jonge *et al.,* 1999). Another limitation is that the research designs in Studies 1, 2 and 3 are cross-sectional. This implies that the relationships obtained between the variables should be interpreted with caution, and no causal inferences should be made. However, Studies 4 and 5 are longitudinal in nature, but in this case students, rather than 'real'

employees in 'real' organisations participated. Consequently, results of Studies 4 and 5 may not be generalisable to the universe of employees and jobs. Another limitation is that although the psychological constructs in both Spain and The Netherlands were identical, the scales used to measure demands, resources and organisational commitment were not exactly the same.

Directions for Future Research

The findings of the present thesis suggest the need to continue the study of the factorial structure of burnout and engagement and its relationship from a cross-cultural perspective. Regarding the engagement structure, further studies are required to examine the development process of the engagement dimensions in a similar way to that carried out with burnout. That is, we need to find out what the relationships are between the engagement dimensions in order to know which dimension comes first and how this positive syndrome develops (Lee & Ashforth, 1996; Schaufeli & Enzmann, 1998). Further analyses are needed to corroborate the core model of burnout and engagement in other samples and in other countries and to investigate its relationships with other aspects of work (i.e., job demands and job resources) and with other outcomes (e.g., absenteeism, performance, job satisfaction). This research may provide an insight into whether or not the 'opposite' engagement scales yield similar patterns as burnout, with similar correlates but with reversed signs. This, in general terms, will allow us to improve engagement in the job and, consequently, to prevent the burnout syndrome.

Moreover, the evidence for the negative relationship between demands and resources suggests that in future studies it would be of

interest to study the role of resources as buffers of the impact of different job demands on job strain (Kahn & Byosiere, 1992). This would involve studying the interaction effect between high demands and low resources that are responsible for health impairment (e.g., burnout) and the interaction effect of low/high demands and high resources in the motivation process (e.g., engagement) (Bakker *et al.*, 2004b).

In addition, future studies are needed to clarify the role of mental load among 'data' workers. Although mental load has traditionally been considered as a job demand, it has not yet been included in recent research on stress in ICT contexts (Bakker *et al.,* 2003a). It is true that the use of technology involves mental effort since the high level of attention and concentration required may lead to mental fatigue (Salanova *et al.,* 1999; Wall *et al.,* 1990). According to Lorist *et al.* (2000) mental fatigue leads to negative consequences (e.g., a deterioration in performance) since a decrease in the cognitive control processes involved in planning and preparation of upcoming activities is produced. Similar negative consequences of mental effort on stress and reduced well-being has been also pointed out by Zijlstra (1993). However, Llorens and Salanova (2000) in a study among 140 ICT workers showed that the greater the mental demands, the higher were the levels of engagement and professional efficacy and the lower the levels of cynicism. Similar results have been obtained by Zijlstra *et al.* (1999) in an experiment with professional office workers in Dutch and Russian employees. In this study, Dutch employees seemed to respond more favourably to complex interruptions, their emotional state improved and their effort decreased. But the opposite was true for the Russian participants. According to these authors, the reason for this divergence may be explained by the difference in professional

background, skills and expectations of the participants. Thus, we can say that employees *accustomed* to work with high levels of mental overload interpret this mental work as normal work. Consequently, mental overload may be perceived as a challenge, rather than a stressor. Therefore, mental demands may lead to an increase of positive feelings and a reduction of effort.

The extended JD-R model cross-validated in this dissertation need to be tested using at least three waves of measurement. That is, whether job demands and job resources in Time 1 predict burnout and engagement at Time 2, and whether burnout and engagement in turn predict organisational commitment at Time 3 should be investigated. As far as burnout is concerned, few longitudinal studies have been conducted regarding its antecedents and consequences (Schaufeli & Enzmann, 1998, p. 93-98). So far, no longitudinal studies on the positive psychological approach (e.g., engagement) have been carried out. Given the relevance of spirals obtained in lab studies without "real" employees, future studies should examine the JD-R model including a broader range of job demands and job resources in "real" organisations and test the model by including mediating variables (i.e., efficacy beliefs) between job conditions, burnout and engagement and organisational commitmentin longitudinal designs. According to Bandura (1997) efficacy beliefs are a powerful personal resource in the fulfilment of job demands. In this way, those with low efficacy are stressed by perceived overload in which task demands exceed their perceived capabilities, whereas those who hold a high belief of their efficacy are unfazed by heavy workloads (Jex & Bliese, 1999). Moreover, according to Cherniss (1980), the lack of confidence in one's own competence is a critical factor in the development of burnout, while high

levels of self-efficacy lead to increased levels of engagement (Salanova *et al.,* 2001, 2004a).

Focus on the positive approach our results suggests the need to continue the longitudinal research on the gain spiral models with 'real' occupational samples and from different countries, and with other kinds of Group Communication Systems (e.g., computer-supported cooperative work groupware). Moreover, it would be interesting to use a three-wave panel study, which would allow a more rigorous interpretation of causality and reciprocity than two-wave panels (Burisch, 2002; Rogosa *et al.,* 1982). Finally, future studies may test the model including collective measures (i.e., collective engagement, collective efficacy) using multi-level methodology.

Final Conclusions

The objective of the present thesis was to test an extension of the Job Demands-Resources Model (Demerouti *et al.,* 2001a) integrating both negative (burnout) and positive approaches (engagement) of employee well-being and one organisational consequence (i.e., commitment) among 'data' workers. For cross-national validation purposes, this model was tested simultaneously with employees in two different countries: Spain and The Netherlands. Furthermore, Confirmatory Factor Analyses, Structural Equation Modeling, as well as multigroup analyses were conducted to test the Job Demands-Resources Model. Moreover, not only cross-sectional but also longitudinal designs were used. Given the relevance of Positive Occupational Psychology (POP), positive constructs such as job resources, personal resources (i.e., efficacy beliefs) and engagement were tested together. These variables were shown as relevant elements in generating

positive spirals between task resources, efficacy beliefs and engagement over time. However, in this case not "employees" but students working in a laboratory were used. Finally, the intervening role of perceived collective efficacy in a motivational process was also studied in ICT users working in groups.

To sum up, ICT in the workplace is now here to stay. Changes in technology could have positive consequences for organisations in terms of guaranteeing their survival and their competitiveness in the world. Despite these benefits, certain technical, social and personal problems may have consequences for ICT users and organisations. Technology is neutral and does not produce positive or negative effects *per se*. Our results suggest that the quality of technological effects depends on the perception of demands and resources (through the erosion and motivation process) and the effect of personal resources such as efficacy beliefs. In order to avoid risks and negative psychosocial effects of technological changes (*techno-stress*) in organisational life, good prevention and assessment are fundamental in reducing job demands and increasing job and personal resources. On the other hand, ICT at work can also be a source of engagement when job resources are available and individuals have high levels of efficacy beliefs to cope with the demands. In fact, there is evidence that ICT users who perceive available resources increase their own capability to do the work, which in turn makes them feel more vigorous and more dedicated at work over time. Moreover, those who are engaged will also perceive more job resources in the future. This provides evidence for the relevance of efficacy beliefs in theory and research in order to optimise and promote workers health. Based on the new focus on Positive Psychology, the optimisation of well-being in the life of workers by

increasing the engagement and optimal experiences at work are also crucial. Positive Occupational Psychology (POP) is seen as an exciting approach in future psychosocial research and as an intervention and optimisation philosophy in the organisations. Thus, "a healthy and positive work focus is achievable" (Turner, Barling, & Zacharatos, 2002, p. 52) and a tremendous promise (Fredrickson, 2002, p. 763). We only have to believe that "we can".

References

References

ALLEN, N.J. & MEYER, J.P. (1990). The measurement and antecedents of affective continuance and normative commitment to the organisation. *Journal of Occupational and Organizational Psychology,* 63(1), 18-38.

ANTONOVSKI, A. (1987). *Unraveling the mystery of health. How people manage stress and stay well.* San Francisco: Jossey-Bass.

ARBUCKLE, J.L. (1997). *Amos Users' Guide version 4.0.* ChicagoIll: Smallwaters Corporation.

ASHKANASY, N.M., HAERTEL, C.E., & ZERBE, W.J. (2000). *Emotions in the workplace: Research, theory, and practice*. Australia.

BAKKER, A.B. (2001). How working conditions influence burnout: The JD-R model. In C.A.L. Hoogduin, W.B. Schaufeli, C.P.D.R. Schaap, & A.B. Bakker (eds.) *Treatment strategies for burnout* (pp. 21-39). Houten/Diegem, The Netherlands: Bohn Stafelu Van Loghum.

BAKKER, A.B., DEMEROUTI, E., & EUWEMA, M. (2004b). How Job Resources Buffer the Impact of Job Demands on Burnout: A Further Refinement of the Job Demands-Resources Model. *Manuscript submitted for publication*.

BAKKER, A.B., DEMEROUTI, E., & SCHAUFELI, W.B. (2002). Validation of the Maslach Burnout Inventory – General Survey: An Internet study across occupations. *Anxiety, Stress and Coping, 15,* 245-260.

BAKKER, A.B., DEMEROUTI, E., & SCHAUFELI, W.B. (2003a). Dual processes at Work in a Call Centre: An Application of the Job Demands-Resources Model. *European Journal of Work and Organizational Psychology, 12*(4), 393-417.

BAKKER, A.B., DEMEROUTI, E., & VERBEKE, W. (2004c). Using the Job Demands-Resources model to predict burnout and performance. *Human Resource Management Journal. In press*.

BAKKER, A.B., DEMEROUTI, E., DE BOER, E. & SCHAUFELI, W.B. (2003b). Job demands and job resources as predictors of absence duration and frequency. *Journal of Vocational Behavior, 62*(2), 341-356.

BAKKER, A.B., DEMEROUTI, E., TARIS, T., SCHAUFELI, W.B., & SCHREURS, P. (2003c). A multi-group analysis of the Job Demands - Resources model in four home care organisations. *International Journal of Stress Management, 10*(1), 16-38.

BAKKER, A.B., EUWEMA, M.C., & DEMEROUTI, E. (2004a). Using the Job Demands-Resources model to Predict Burnout across Occupational Contexts. *In press*

BAKKER, A.B., KILLMER, C.H., SIEGRIST, J., & SCHAUFELI, W.B. (2000a). Effort-reward imbalance and burnout among nurses. *Journal of Advanced Nursing, 31*, 884-891.

BAKKER, A.B., SCHAUFELI, W.B., SIXMA, H.J., BOSVELD, W., & VAN DIERENDONCK, D. (2000b). Patient demands, lack of reciprocity, and burnout: A five-year longitudinal study among general practitioners. *Journal of Organizational Behavior, 21*, 425-441.

BANDURA, A. (1993). Perceived self-efficacy in cognitive development and fuctioning. *Educational Psychologist, 28, 117-148.*

BANDURA, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

BANDURA, A. (1999). Social cognitive theory of personality. In L. Pervin & O. John (Eds.), *Handbook of Personality* (2nd ed., pp. 154-196). New York: Guilford.

BANDURA, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52,* 1-26.

BANDURA, A. (2002). *Self-efficacy: The exercise of control*. (5th edition). New York, NY: Freeman and Company.

BAUMEISTER, R.F. & LEARY, M.R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*(3), 497-529.

BEEHR, T.A. (1995). *Psychological stress in the workplace*. London: Routledge.

BEEHR, T.A., WALSH, J.T., & TABER, T.D. (1976). Relationship of stress to individually and organizationally valued states: Higher order needs as a moderator. *Journal of Applied Psychology, 61,* 41-47.

Bentler, P.M. (1990). Comparative fit indexes in structural equation models. *Psychological Bulleti, 107*, 238-246.

Bliese, P.D. & Britt, T.W. (2001). Social support, group consensus and stressor-strain relationships: social context matters. *Journal of Organizational Behavior, 22,* 425-436.

Bollen, K.A. (1989). *Structural equations with latent variables*. New York, NY: John Wiley.

Brod, C. (1984). *Technostress: The human cost of the computer revolution*. Reading Mass: Addison-Wesley.

Brouwers, A. & Tomic, W. (2000). A longitudinal study of teacher burnout and perceived self-efficacy in classroom management. *Teaching and Teacher Education, 16,* 239-253.

Browne, M.W. & Cudeck, R. (1993). Alternative Ways of Assessing Model Fit. In K.A. Bollen & J. Scott Long (Eds.): *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.

Burisch, M. (2002). A longitudinal study of burnout: the relative importance of dispositions and experiences. *Work & Stress, 16*(1), 1-17.

Buunk, B.P, de Jonge, J., Ybema, J.F., & de Wolff, C.J. (1998). Psychosocial aspects of occupational stress. In PJD. Drenth, H. Thierry, & C.J. de Wolff (eds.), *Handbook of industrial and organizational psychology* (vol. 2, 2nd. ed., pp. 145-182). Brighton: Psychology Press.

Byrne, B.M. (1989). *A primer of LISREL: Basic applications and programming for confirmatory factor analysis models*. New York: Springer-Verlag.

Byrne, B.M. (1993). The Maslach Inventory: Testing for factorial validity and invariance across elementary, intermediate, and secondary teachers. *Journal of Occupational and Organizational Psychology, 66,* 197-212.

Byrne, B.M. (2001). *Structural Equation Modeling with AMOS: Basic Concepts, Applications and Programming.* Mahway, New Jersey (London): Lawrence Erlbaum Associates, Publishers.

CAHILL, J., LANDSBERGIS, P.A., & SCHNALL, P.L. (1995). Reducing Occupational Stress: An Introductory Guide for Managers, Supervisors and Union Members. *Presented at the Work Stress and Health ´95 Conference*. Washington D.C.: September.

CARAYON, P. & ZIJLSTRA, F. (1999). Relationship between job control, work pressure and strain: Studies in the USA and in the Netherlands. *Work & Stress, 13(1),* 32-48.

CARAYON–SAINFORT, P. (1992). The use of computers in officers: Impact on task characteristics and worker stress. *International Journal of Human-Computer Interaction, 4,* 245-261.

CHEN, H., WIGAND, R.T., & NILAN, M.S. (1999). Optimal experience of Web activities. *Computers in Human Behavior, 15,* 585-608.

CHERNISS, C. (1980). *Professional burnout in human service organizations*. New York: Praeger.

CHERNISS, C. (1993). The role of professional self-efficacy in the etiology and amelioration of burnout. In W.B. Schaufeli, C. Maslach, & T. Marek (eds.), *Professional burnout: Recent development in theory and research* (pp. 135-149). Washington, DC: Taylor & Francis.

CHUA, S.L., CHEN, D.T., & WONG, A.F.L. (1999). Computer anxiety and its correlates: a meta-analysis. *Computers in Human Behavior, 15*, 609-623.

CIFRE, E., LLORENS, S., MARTÍNEZ, I.M., & SALANOVA, M. (2000). Contagio de emociones en grupo en una tarea de laboratorio asistida por ordenador [Emotion Group Contagion in a lab and computer assisted task]. In D. Caballero, M.T. Méndez, & J. Pastor (Eds), *La mirada psicosociológica: Grupos, procesos, lenguajes y culturas* (pp. 266-272). Madrid: Bibliotema Nueva.

COFFIN, R.J. & MACINTYRE, P.D. (1999). Motivational influences on computer-related affective states*. Computers in Human Behavior, 15*, 549-569.

Cohen, L. & Holliday, M. (1982). *Statistics for the social sciences*. London: Harper Row.

Cohen, S. & Wills, T.S. (1985). Stress social support, and the buffering hypothesis. *Psychological Bulletin, 98,* 310-357.

Cook, J. & Wall, T. (1980). New work attitude measures of trust, organisational commitment and personal need non-fulfillment. *Journal of Occupational Psychology, 53*(1), 39-52.

Cordes, C. & Dougherty, T.W. (1993). A review and an integration of research on job burnout. *Academy of Management Review, 18,* 621-656.

Cortina, J.M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology, 78*, 98-104.

Csikszentmihalyi, M. (2000). *Flow. The psychology of optimal experience*. New York: Harper.

Cudeck, R. & Browne, M.W. (1993). Alternative ways of assessing model fit. In K.A. Bollen & J. Scott Long (Eds.), *Testing structural equation models* (pp. 1-9). Newbury Park, CA: Sage.

Daft, R. & Lengel, R. (1986). Organizational information requirements, media richness, and structural design. *Management Science, 32,* 554-571.

Davis, J.H. (1969). Individual-group problem solving, subject preference, and problem type. *Journal of Personality and Social Psychology, 13,* 362-374.

De Jonge, J., Dormann, C., Janssen, P.P.M., Dollard, M.F., Landeweerd, J.A., & Nijhuis, F.J.N. (2001). Testing reciprcal relationship between job characteristics and psychological well-being: A cross-lagged structural equation model. *Journal of Occupational and Organizational Psychology, 74,* 29-46.

De Jonge, J., Van Breukelen, G.J.P., Landeweerd, J.A., & Nijhuis, F.J.N. (1999). Comparing group and individual level assessments of job characteristics in testing the job demand-control model: A multilevel approach. *Human Relations, 52,* 95-122

DE LANGE, A. H., TARIS, T.W., KOMPIER, M.A.J., HOUTMAN, I.L.D., & BONGERS, P.M. (2003). The very best of the millennium: Longitudinal research and the demand-control-(support) model. *Journal of Occupational Health Psychology, 8*(4), 282-305.

DE RIJK, A., LE BLANC, P.M., SCHAUFELI, W.B., & DE JONGE, J. (1998). Active coping and need for control as moderators of the job demand-control model: Effects on burnout. *Journal of Occupational and Organizational Psychology, 71*, 1-18.

DE RUYTER, K., WETZELS, M., & FEINBERG, R. (2001). Role stress in call-centers: Its effects on employee performance and satisfaction. *Journal of Interactive Marketing, 15,* 23-35.

DEAN, J.W. & SNELL, S.A. (1991). Integrated manufacturing and job design: Moderating effects of organizational inertia. *Academy of Management Journal, 34,* 776-804.

DEMEROUTI E., BAKKER, A.B., NACHREINER, F., & SCHAUFELI, W.B. (2001a). The Job Demands-Resources model of burnout. *Journal of Applied Psychology, 86,* 499-512.

DEMEROUTI E., BAKKER, A.B., VARDAKOU, I., & KANTAS, A. (2003). The convergent validity of two burnout instrument: A multitrait-multimethod analysis. *European Journal of Psychological Assessment, 18,* 296-307.

DEMEROUTI, E., BAKKER, A.B., & BULTERS, A.J. (2004). The loss spiral of work pressure, work-home interference and exhaustion: Reciprocal relations in a three-wave study. *Journal of Vocational Behavior, 64,* 131-149.

DEMEROUTI, E., BAKKER, A.B., DE JONGE, J., JANSSEN, P.P.M., & SCHAUFELI, W.B. (2001b). Burnout and engagement at work as a function of demands and control. *Scandinavian Journal Work Environmental Health, 27*(4), 279-286.

DEMEROUTI, E., BAKKER, A.B., NACHREINER, F., & SCHAUFELI, W.B. (2000). A model of burnout and life satisfaction amongst nurses. *Journal of Advanced Nursing, 32*(2), 454-464.

DHONDT, S., KRAAN, K., & VAN SLOTEN, G. (2002). *Work organisation, technology and working conditions.* European Foundation for the improvement of Living

and Working Conditions. Luxembourg: Office for Official Publications of the European Communities. Available from http://www.eurofound.ie/publications/files/EF0205EN.pdf

DORMAN, C. & ZIJLSTTRA, F.R.H. (2003). Call centres: High on technology – high on emotions *European Journal of Work and Organizational Psychology, 12*(4), 305-310.

EDEN, D. & ZUK, Y. (1995). Seasickness as a self-fulfilling prophecy: raising self-efficacy to boost performance at sea. *Journal of Applied Psychology, 5,* 628-635.

EQUIP WONT PREVENCIÓ PSICOSOCIAL (1999). *Cuestionario de Experiencias relacionadas con el Trabajo (CET): Escalas de Medida* [Questionnaire about Experiences related to Work: Measures scales]*.* Internal document: not published.

FREDRICKSON, B.L. (2001). The role of Positive Emotions in Positive Psychology: The Broaden-and-Build Theory of Positive Emotions. *American Psychology, 56*(3), 218-226.

FREDRICKSON, B.L. (2002). Positive Emotions. In C.R. Snyder & S. Lopez (eds.), *The Handbook of Positive Psychology* (pp. 120-134). Oxford: Oxford University Press.

FREUDENBERGER, H.J. (1975). The staff burnout syndrome in alternative institutions. *Psychotherapy Theory, Research and Practice, 12,* 72-83.

FRIED, Y. & FERRIS, G.R. (1987). The validity of the job characteristics model: A review and meta-analysis. *Personnel Psychology, 40,* 287-322.

FURDA, J. (1995). *Werk, persoon en welzijn: Een toets van het JD-C model* [Work, personality and well-being: A test of the JD-C model]. Unpublished Doctoral Dissertation, Utrecht University, The Netherlands.

GAILLARD, A.W.K. & WIENTJES, C.J.E. (1994). Mental load and work stress as two types of energy mobilization. Special Issue: A healthier work environment. *Work & Stress, 8*(2), 141-152.

GARCÍA, M., LLORENS, S., & SALANOVA, M. (May, 2003). Burnout as a consequence of a competence crisis: a longitudinal study in Secondary Teachers. *11th*

European Congress on work and Organizational Psychology. Lisbon (Portugal).

García, M., Llorens, S., Salanova, M., & Cifre, E. (2004). Affective antecedents on self-efficacy among teachers: Individual differences. In M. Salanova, R. Grau, I. Martínez, E. Cifre, S. Llorens, & M. García (Eds.), Nuevos horizontes en la investigación sobre la autoeficacia [New horizons on self-efficacy research]. *In press.*

Garrido, E. (2000). Autoeficacia en el mundo laboral. [Self-efficacy at work]. *Apuntes de Psicología, 18*(1), 9-38.

Garst, H., Frese, M., & Molenaar, P.C.M. (2000). The temporal factor of change in stressor-strain relationships: A growth curve model on a longitudinal study in East Germany. *Journal of Applied Psychology, 85(3)*, 417-438.

Gibson, C.B. (1995). *Determinants and consequences of group-efficacy beliefs in work organizations in U.S., Honk Kong, and Indonesia*. Doctoral dissertation, University of California, Irvine.

Gil-Monte, P. & Peiró, J.M. (1997). *Desgaste psíquico en el trabajo: El síndrome de quemarse.* Madrid: Síntesis Psicología.

Gist, M.E. & Mitchell, T.R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review, 17,* 183-211.

Gore, S. (1987). Perspectives on social support and research on stress moderating processes. In J.M. Ivancevich & D.C. Ganster (Eds.), *Job stress: From theory to suggestion* (pp. 85-101). New York: Haworth.

Gracia, F. J., Arcos, J.L., & Caballer, A. (2000). Influencia de la presión temporal en el trabajo en grupo en función del tipo de tarea y del canal de comunicación [Influence of time pressure on group performance in function of type of task and communication channel]. *Psicothema, 12(*2), 241-246.

Grau, R., Llorens, S., Burriel, R., Salanova, M., & Agut, S. (2004). Perceived competence as a mediator between organizational obstacles/facilitators

and well-being among costumer contact employees: A causal model. In M. Salanova, R. Grau, I. Martínez, E. Cifre, S. Llorens, & M. García (Eds.), Nuevos horizontes en la investigación sobre la autoeficacia [New horizons on self-efficacy research]. *In press.*

GRAU, R., SALANOVA, M., & PEIRÓ, J.M. (2001). Moderator effects of self-efficacy on occupational stress. *Psychology in Spain, 5*(1), 63-74.

GREEN, D.E., WALKEY, F.H., & TAYLOR, A.J.W. (1991). The three-factor structure of the Maslach burnout inventory. *Journal of Science Behaviour and Personality 6*, 453-472.

HACKMAN, J.R. & OLDHAM, G. R. (1976). Motivation through the design of work. Test of a theory. *Organizational Behavior and Human Performance, 16,* 250-279.

HACKMAN, J.R. & OLDHAM, G.R. (1975). Development of the Job Diagnostic Survey. *Journal of Applied Psychology, 60,* 159-170.

HACKMAN, J.R. & OLDHAM, G.R. (1980). *Work redesign*. Reading, MA: Addison Wesley.

HAMBORG, K.C. & GREIF, S. (1996). New technologies and Stress. In M.J. Schabracq, J.A.M. Winnubst, & C.L. Cooper (eds.), *Handbook of Work and Health Psychology* (pp. 161-181). New York: John Wiley & Sons, Ltd.

HAMBORG, K.C. & GREIF, S. (2003). New technologies and Stress. In M.J. Schabracq, J.A.M. Winnubst, & C.L. Cooper (eds.), *The Handbook of Work and Health Psychology* (pp. 161-181). New York: John Wiley & Sons Ltd.

HEATON, A.W. & KRUBLANSKI, A.W. (1991). Person perception by introverts and extroverts under time pressure: effects of need for closure. *Personality and Social Psychology Bulletin, 17,* 161-165.

HOBFOLL, S.E. & FREEDY, J. (1993). Conservation of resources: A general stress theory applied to burnout. In W.B. Schaufeli, C. Maslach, & T. Marek (eds.), *Professional burnout: Recent development in theory and research* (pp. 115-129). Washington, DC: Taylor & Francis.

Hobfoll, S.E. & Leiberman, Y. (1987). Personality and social resources in immediate and continued stress resistance among women. *Journal of Personality and Social Psychology, 52,* 18-26.

Hobfoll, S.E. & Lerman, M. (1989). Predicting receipt of social support: A longitudinal study of parents' reactions to their child's illness. *Health Psychology, 8,* 61-77.

Hobfoll, S.E. (1989). Conservation of Resources: A New Approach at Conceptualizing Stress. *American Psychologist, 44*(3)*,* 513-524.

Hobfoll, S.E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. *Applied Psychology: An International Review, 50,* 337-421.

Hobfoll, S.E. (2002). Social and psychological resources and adaptation. *Review of General Psychology, 6,* 307-324 *Psychology: An International Review, 50,* 337-421.

Hodges, L. & Carron, A.V. (1992). Collective efficacy and group performance. *International Journal of Sport Psychology, 23,* 48-59.

Hofstede, G. (1980). *Culture's consequences: International differences in Work-Related Values.* Beverly Hills: Sage.

Hollingshead, A.B., McGrath, J. E., & O'Connor, K.M. (1993). Group task performance and communication technology: a longitudinal study of computer-mediated versus face-to-face work groups. *Small Groups Research, 3,* 307-333.

Houkes, I., Janssen, P.P, de Jonge, J., & Nijhuis, F.J. (2001). Work and individual determinants of intrinsic work motivation, emotional exhaustion, and turnover intention: a multi-sample analysis. *International Journal of Stress Management, 8*, 257-283.

Houtman, I.L.D. (1997). *Trends in work and health*. Amsterdam: NIA/TNO.

Hovmark, S. & Norell, M. (1993). Social and psychological aspects of computer-aided design systems. *Behaviour and Information technology, 12*, 267-275.

HOYLE, R.H. (1995). The structural equation modeling approach: Basic concepts and fundamental issues. In R.H. Hoyle (Ed.), *Structural equation modeling, concepts, issues and applications* (pp 1-15). Thousand Oaks, Ca: Sage.

IGBARIA, M. & CHAKRABARTI, A. (1990). Computer anxiety and attitudes towards computer use. *Behavior & Information Technology, 9*(3), 229-241.

INSH (INSTITUTO NACIONAL DE SEGURIDAD E HIGIENE EN EL TRABAJO) (1997). *III Encuesta Nacional de Condiciones de Trabajo [III National Survey on Work Conditions].* Ministerio de Trabajo y Asuntos Sociales. Madrid. España.

INSH (INSTITUTO NACIONAL DE SEGURIDAD E HIGIENE EN EL TRABAJO) (2001). *IV Encuesta Nacional de Condiciones de Trabajo [IV National Survey on Work Conditions].* Ministerio de Trabajo y Asuntos Sociales. Madrid. España.

ISENBERG, D.J. (1981). Some effects of time pressure on vertical structure and decision-making accuracy in small groups. *Organizational Behavior and Human Performance, 27,* 119-134.

JACKSON, P.R., WALL, T.D., MARTIN, R., & DAVIS, K. (1993). New measures of job control, cognitive demand and production responsibility. *Journal of Applied Psychology, 78,* 753-762.

JEX, S.M. & BLIESE, P.D. (1999). Efficay beliefs as a moderator of the impact of work-related stressors: A multilevel study. *Journal of Applied Psychology, 84,* 349-361.

JONES, F. & FLETCHER, B.(C.) (1996). Job control and health. In M.J. Schabracq, J.A.M. Winnubst, & C.L. Cooper (eds.), *Handbook of Work and Health Psychology* (pp.33-50). Chichester: John Wiley & Sons.

JONES, F. & FLETCHER, B.(C.) (2003). Job control, Physical Health and Psychological Well-being. In M.J. Schabracq, J.A.M. Winnubst, & C.L. Cooper (eds.), *The Handbook of Work and Health Psychology* (pp.121-142). Chichester: John Wiley & Sons.

JONES, P.E. & WALL, R.E. (1990). Components of computer anxiety. *Journal of Educational Technology Systems, 18*(3), 161-168.

JÖRESKOG, K.G. & SÖRBOM, D. (1986). *LISREL user guide version VI* (4th. ed.).

Scientific Software International, Mooresville, I.

JÖRESKOG, K.G. & SÖRBOM, D. (1993). *LISREL 8: Structural equation modelling with the SIMPLIS command language*. Chicago: Scientific Software International.

KAHN, R.L. & BYOSIERE, P. (1992). Stress in organizations. In M.D. Dunnete & L.M. Hough (eds.), *Handbook of Industrial and Organizational Psychology* (vol. 3, pp. 571-650). Palo Alto. CA: Consulting Psychologists Press.

KARASEK, R. & THEORELL, T. (1990). *Healthy Work: Stress Productivity, and the Reconstruction of Working Life*. New York, NY: Basic Books.

KARASEK, R.A. (1979). Job demands, job decision latitude and mental strain: implications for job redesign. *Administrative Science Quarterly, 24,* 285-308.

KARASEK, R.A. (1985). *Job content questionnaire*. Los Angeles, CA: University of Southern California.

KARAU, S.J. & KELLY, J.R. (1992). The effects of time scarcity and time abundance on group performance quality and interaction process. *Journal of Experimental Social Psychology, 28,* 542-571.

KATZELL, R.A. & THOMPSON, D.E. (1990). An integrative model of work attitudes, motivation, and performance. *Human Performance, 3*(2), 63-85.

KAY, R.H. (1990). Predicting student teacher commitment to the use of computers. *Journal of Educational Computing Research, 6*(3), 299-309.

KEITA, G.P. & SAUTER, S.L. (1992). *Work and well-being: An agenda for the 1990s*. Washington, DC, US: American Psychological Association.

KELLY, J.R. & KARAU, S.J. (1993). Entrainment of creativity in small groups. *Small Groups Research, 24,* 179-198.

KELLY, J.R. & MCGRATH, J.E. (1985). Effects of time limits and task types on task performance and interaction of four-person groups. *Journal of Personality and Social Psychology, 49,* 395-407.

Korunka, C. & Vitouch, O. (1999). Effects of the implementation of information technology on employee's strain and job satisfaction: A context-dependent approach. *Work & Stress, 13,* 341-363.

Korunka, C., Weiss, A., & Karetta, B. (1993). Effects of the new technologies with special regard for the implementation process per se. *Journal of Organizational Behavior, 14,* 331-348.

Korunka, C., Weiss, A., & Karetta, B. (1997a). An interview study of `continuous' implementations of information technologies. *Behavior and Information Technology, 16,* 11-24.

Korunka, C., Weiss, A., & Karetta, B. (1997b). The management of continuous implementations of new information technologies. Paper presented at the 1997 *International Conference on Industry, Engineering and Management Systems,* Cocoa Beach, FL, March.

Korunka, C., Weiss, A., & Zauchner, S. (1997c). An interview study of continous implementations of information technology. *Behaviour & Information Technology, 16*(1), 3-16.

Korunka, C., Weiss, A., Huemer, K.H., & Karetta, B. (1995). The effect of new technologies on job satisfaction and psychosomatic complaints. *Applied Psychology: An International Review, 44*, 123-142.

Laughlin, P.R. & Ellis, A. (1986). Demonstrability and social combination processes on mathematical intellective tasks. *Journal of Experimental Social Psychology, 22,* 177-189.

Lazarus, R.S. & Folkman, S. (1984). *Stress, Appraisal and Coping.* Springer: New York.

Lee, R.T. & Ashforth, B.E. (1996). A meta-analytic examination of the correlates of the three dimensions of job burnout. *Journal of Applied Psychology 81*, 123-133.

Leiter, M.P. & Schaufeli, W.B. (1996). Consistency of the burnout construct across occupations. *Anxiety, Stress and Coping, 9*, 229-243.

Leiter, M.P. (1992). Burn-out as a crisis in self-efficacy: Conceptual and practical

implications. *Work and Stress, 6*, 107-115.

Leithwood, K., Menzies, T., Jantzi, D., & Leithwood, J. (1996). School restructuring, Transformational leadership and the amelioration of teacher burnout. *Anxiety, Stress, and Coping, 9,* 199-215.

Lent, R.W. & Hackett, G. (1987). Career self-efficacy: Empirical status and future directions. *Journal of Vocational Behavior, 30,* 347-382.

Leso, R. & Peck, K.L. (1992). Computer anxiety and different types of computer courses. *Journal of Educational Computing Research, 8*(4), 469-478.

Lewig, K.A. & Dollard, M.F. (2003). Emotional dissonance, emtoional exhaustion and job satisfaction in call centre workers *European Journal of Work nad Organizational Psychology, 12*(4), 366-392.

Little, B.L. & Madigan, R.M. (1994, August). *Motivation in work teams: A test of the construct of collective efficacy.* Paper presented at the annual meeting of the Academy of Management. Houston, TX.

Llorens, S. & Salanova, M. (February, 2000). Un modelo de demandas/recursos para explicar el proceso de tecnoestres [A demands/resources model to explain the technostress process]. *1st International Congress of PhD in Social Psychology.* Barcelona.

Llorens, S., García, M., Salanova, M. & Cifre, E. (May, 2003a). Burnout and Engagement as antecedents of self-efficacy in Secondary teachers: a longitudinal study. *11th European Congress on work and Organizational Psychology*. Lisbon (Portugal).

Llorens, S., Salanova, M. & Cifre, E. (October, 2001). Engagement among Information and Communication Technology Workers: A Confirmatory Factor Analysis. *European Academy of Occupational Health Psychology. Barcelona Congress*. Barcelona.

Llorens, S., Salanova, M., & Grau, R. (2003b). Training to technological change. *Journal of Research on Technology in Education, 35,* 206-212.

Locke, E.A. & Latham, G.P. (1990). *A theory of goal setting and task performance.* – Englewood Cliffs, NJ: Prentice-Hall.

LORIST, M.M., KLEIN, M., NIEUWENHUIS, S., DE JONGE, R., MULDER, G., & MEIJMAN, T.F. (2000). Mental fatigue and task control: Planning and preparation. *Psychophysiology, 37*(5), 614-625.

LUTHANS (2002a). Positive organizational behaviour: developing and maintaining psychological strengths. *Academy of Management Executive, 16,* 57-72.

LUTHANS, F. (2001). The case for positive organizational behavior (POB). *Current Issues in Management, 1,* 10-21.

LUTHANS, F. (2002b). The need for and meaning of positive organizational behaviour. *Journal of Organizational Behavior, 23,* 695-706.

LUTHANS, F. (2003). Positive organizational behaviour: implications for leadership and HR development and motivation. In L.W. Porter, G.A. Bigley, & R.M. Steers (eds.), *Motivation and work behaviour* (pp. 178-195).

MAIBACH, E. & MURPHY, D.A. (1995). Self-efficacy in health promotion research and practice: Conceptualization and measurement. *Health Education Research, 10*(1), 37-50.

MAJCHRZAK, A. & BORYS, B. (1998). Computer-aided technology and work: moving the field forward. In C.L. Cooper & I.T. Robertson (eds.), *International Review of Industrial and Organizational Psychology, 13*, 305-354.

MARSH, H.W., BALLA, J.R., & HAU, K.T. (1996). An evaluation of Incremental Fit Indices: A clarification of mathematical and empirical properties. In G.A. Marcoulides and R.E. Schumacker (Eds.), *Advanced structural equation modeling, issues and techniques* (pp. 315-353)*.* Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

MARTÍNEZ, I., CIFRE, E., LLORENS, S., & SALANOVA, M. (2002a). Efectos de la tecnología asistida por ordenador en el bienestar psicológico afectivo [Effects of Computer Aided Technology in the Affective Well-being]. *Psicotema, 14*(1), 118-123.

MARTÍNEZ, I., MARQUES-PINTO, A., SALANOVA, M., & LOPES DA SILVA, A. (2002b). Burnout en estudiantes universitarios de España y Portugal: Un estudio

transcultural [Burnout in university students from Spain and Portugal: A cross-cultural study]. *Ansiedad y Estrés, 8*(1), 13-23.

MARTÍNEZ, I.M. (2004). La autoeficacia aplicada al trabajo y las organizaciones [Self-efficacy at work and organisations]. In M. Salanova, R. Grau, I. Martínez, E. Cifre, S. Llorens, & M. García (Eds.): Nuevos horizontes en la investigación sobre la autoeficacia [New horizons on self-efficacy research]. *In press.*

MARTÍNEZ, I.M., SALANOVA, M., LLORENS, S., & CIFRE, E. (2003). Papel del bienestar psicológico sobre la autoeficacia en grupos de trabajo asistidos por ordenador. Un estudio experimental longitudinal [Role of Psychological well-being on self-efficacy in technology aided work groups]. *8º Congreso Nacional de Psicología Social.* Torremolinos (Málaga).

MASLACH, C. & JACKSON, S. E. (1986). *Maslach Burnout Inventory: Second Edition*. Palo Alto, CA: Consulting Psychologists Press.

MASLACH, C. & JACKSON, S.E. (1981). The measurement of experienced burnout. *Journal of Occupational Behaviour, 2,* 99-113.

MASLACH, C. & LEITER, M.P. (1997). *The truth about burnout*. San Francisco, CA: Jossey Bass.

MASLACH, C. & SCHAUFELI, W.B. (1993). Historical and conceptual development of burnout. In W. B. Schaufeli, C. Maslach, and T. Marek (Eds.), *Professional burnout: Recent developments in theory and research* (pp. 1-16). Washington, DC: Taylor and Francis.

MASLACH, C. (1976). Burn-out. *Human Behavior, 5,* 16-22.

MASLACH, C. (1993). Burnout: A multidimensional perspective. In W. B. Schaufeli, C. Maslach, & T. Marek (Eds.), *Professional burnout* (pp. 19-32). Washington, DC: Taylor and Francis.

MASLACH, C., SCHAUFELI, W.B., & LEITER, M.P. (2001). Job burnout. *Annual Review of Psychology, 52*, 397-422.

Mathieu, J.E. & Hamel, K. (1989). A causal model of the antecedents of organizational commitment among professionals and nonprofessionals. *Journal of Vocational Behavior, 34,* 299-317.

Mathieu, J.E. & Zajac, D.M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological Bulletin, 108,* 171-194.

McArdle, J.J. & Bell, R.Q. (2000). An introduction to latent growth models for developmental data analysis. In T.D. Little, K.W. Schanabel, & J. Baumert (Eds), *Modeling Longitudinal and multilevel data. Practical issues, applied approaches and specific examples* (pp. 69-107). Mahwah, NJ: Ed. Lawrence Erlbaum Associates, Inc.

McCann, C., Baranski, J.V., Thompson, M.M., & Pigeau, R.A. (2000). On the utility of experiential cross-training for team decision-making under time stress. *Ergonomics, 43*(8), 1095-1110.

McGrath, J.E. & Hollingshead, A.B. (1993). Putting the "group" back in group support systems: Some theoretical issues about dynamic processes in groups with technological enhancements. In L.M. Jessup & J.S. Valacich (Eds*.), Group support systems: New perspectives* (pp. 78-96). New York: Macmillan.

Meijman, T.F. & Mulder, G. (1998). Psychological aspects of workload. In P.J. Drenth, H. Thierry, & C.J. de Wolff (eds.), *Handbook of work and organizational psychology* (2nd ed) (pp. 5-33). Hove, England UK: Psychological Press/Erlbaum (UK) Taylor & Francis.

Meyer, J. & Allen, N. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review, 1*, 61-98.

Meyer, J.P. (1997). Organizational commitment. *International Review of Industrial and Organizational Psychology*, *12,* 175-228.

Mowday, R.T., Porter, L.W., & Steers, R.M. (1982). *Employee-organisation linkages: The psychology of commitment, absenteeism, and turnover*. San Diego, CA: Academic Press.

Mowday, R.T., Steers, R.M., & Porter, L.W. (1979). The measurement of organizational commitment. *Journal of Vocational Behavior, 14,* 224-247.

Murphy, C.A., Coover, D., & Owen, S.V. (1989). Development and validity of the computer self-efficacy scale. *Educational and Psychological Measurement, 49,* 893-899.

National Institute of Statistic. Spain (2004). www.in.es

Nunnaly, J.C. & Bernstein, I.H. (1994). *Psychometric theory* (3rd ed.). New York, NY: McGraw-Hill

Ozer, E.M. & Bandura, A. (1990). Mechanisms governing empowerment effects: A self-efficacy analysis. *Journal of Personality and Social Psychology, 58,* 472-486.

Pallares, J. & Rosel, J. (2001). Patrones de conducta Tipo A y estrés en deportistas adolescents: algunas variables mediadoras.[Type A behaviour and stress in sports-young people] *Psicotema, 13(1),* 147-151.

Paoli, P. & Merllié, D. (2001). *Third European Survey on Working Conditions 2000*. Office for Official Publications of the European Communities. Luxembourg.

Peiró, J.M. & Bravo, M.J. (1999). Factores psicosociales en la prevención de riesgos laborales: oportunidades y retos para la Psicología del Trabajo y de las Organizaciones. [Psychosocial factors in the Work Risk Prevention: Opportunities and Challenges to the Work and Organizational Psychology]. *Revista de Psicología del Trabajo y de las Organizaciones, 15*(2), 137-146.

Peiró, J.M. (1990). Aspectos psicosociales de las nuevas tecnologías en el trabajo y las organizaciones [Psychosocial aspects of new technology at work and at organization]. In J.M. Peiró (Ed.), *Organizaciones: Nuevas perspectivas psicosociológicas* (pp. 125-152). Barcelona: PPU.

PITTS, S.C., WEST, S.G., & TEIN, J.Y. (1996). Longitudinal measurement models in evaluation research: Examining stability and change. *Evaluation and Program Planning, 19;* 333-350.

PORTER, L.W., STEERS, R.M., MOWDAY, R.T., & BOULIAN, P.V. (1974). Organizational commitment, job satisfaction, and turnover among psychiatric technicians. *Journal of Applied Psychology, 59,* 603-609.

PRIETO, F., ZORNOZA, A., ORENGO, V., & PEIRÓ, J.M. (1996). Trabajo e innovaciones tecnológicas de la información [Work and Information Technogical Innovations]. In J.M. Peiró, & Prieto, F. (eds.), *Tratado de Psicología del Trabajo. La actividad laboral en su contexto* (vol 1, pp. 93-123). Madrid: Síntesis.

PRUSSIA, G.E. & KINICKI, A.J. (1996). A motivational investigation of group effectiveness using social cognitive theory. *Journal of Applied Psychology, 81,* 187-199.

RABINOWITZ, S., KUSHNIR, T., & RIBAK, J. (1996). Preventing burnout: Increasing professional self-efficacy in primary care nurses in a Balint group. *American Association of Occupational Health Nurses Journal, 44,* 28-32.

ROGOSA, D., BRANDT, D., & ZIMOWSKI, M. (1982). A growth curve approach to the measurement of change. *Psychological Bulletin, 90,* 726-748.

ROWDEN, R.W. (2003). Learning's Effect on Job Satisfaction in Small Businesses, *Managing Training & Development,* July, p. 2.

RUSELL, J.A. & CARROLL, J.M. (1999). On the bipolarity of positive and negative affect. *Psychological Bulletin, 125,* 3-10.

RYAN, R.M. & FREDERICK, C. (1997). On energy, personality, and health: Subjective vitality as a dynamic reflection of well-being. *Journal of Personality, 65,* 529-565.

SALANOVA, M. & SCHAUFELI, W.B. (2000). Exposure of information technologies and its relation to burnout. *Behaviour & Information Technology,* 19(5)*,* 385-392.

SALANOVA, M. (2003). Academic success, burnout and engagement among University students: Towards a Spiral Model of Efficacy Beliefs. Paper presented to the *5th Interdisciplinary Conference on Occupational Stress & Health*, 20-22 march, Toronto, Ontario, Canadá.

SALANOVA, M. (2004). Trabajando con tecnología y afrontando el tecnoestrés: el rol de las creencias de eficacia [Working with technology and coping technostress: the role of efficacy beliefs]. *In press.*

SALANOVA, M., BRESÓ, E., & SCHAUFELI, W.B. (2004a). Hacia un modelo espiral de autoeficacia en el estudio del burnout y del engagement entre estudiantes universitarios [Towards a spiral model of self-efficacy in the burnout and engagement study in universitary students]. *Manuscript submitted for publication.*

SALANOVA, M., CARRERO, V., PINAZO, D., & SCHAUFELI, W.B. (2004b). *Managing Job Resources and Employees´ Proactive Behaviour: The Mediating Role of Job Engagement*. Manuscript submitted for publication.

SALANOVA, M., CIFRE, E., & MARTÍN, P. (1999). El proceso de "Tecnoestres" y estrategias para su prevención [Technostress process and prevention strategies]. *Prevención, Trabajo y Salud, 1*, 18-28.

SALANOVA, M., CIFRE, E., GRAU, R., LLORENS, S., & MARTÍNEZ, I.M. (2003). Affective antecedents of Self-efficacy among University Students and Staff: A causal model. Paper presented to the *5th Interdisciplinary Conference on Occupational Stress & Health*, 20-22 march, Toronto, Oncario, Canadá.

SALANOVA, M., GRAU, R., CIFRE, E., & LLORENS, S. (2000a). Computer training, frequency of usage and burnout: the moderating role of training adequacy and self-efficacy. *Journal of Computers in Human Behavior, 16 (2),* 575-590.

SALANOVA, M., GRAU, R., LLORENS, S., & SCHAUFELI, W.B. (2001). Exposición a las tecnologías de la información, burnout y engagement: el rol modulador de la autoeficia profesional [Exposure to Information Technology, Burnout and

Engagement: the moderating role of professional self-efficacy]. *Revista de Psicología Social Aplicada, 11*(1), 69-90.

SALANOVA, M., LLORENS, S., PEIRÓ, J.M., & SCHAUFELI, W.B. (2004c). Positive emotions and self-efficacy: The mediating role of Job Engagement. *Submitted for publication.*

SALANOVA, M., MARTÍNEZ, I., CIFRE, E., & SCHAUFELI, W.B. (July, 2002a). Flow at work: A Confirmatory Factor Analysis. *25th International Conference on Applied Psychology*. Singapure.

SALANOVA, M., PEIRÓ, J.M., & SCHAUFELI, W. (2002b). Self-efficacy Specificity and Burnout among information Technology Workers: An extension of the Job Demands-Control Model. *European Journal of Work and Organizational Psychology, 11*(1), 1-25.

SALANOVA, M., SCHAUFELI, W.B., LLORENS, S., PEIRÓ, J.M., & GRAU, R. (2000b). Desde el 'burnout' al 'engamement': una nueva perspectiva' [From burnout to engagement: A new perspective]. *Revista de Psicología del Trabajo y de las Organizaciones, 16*, 117-134.

SAMPSON, R., RAUDENBUSH, S., & EARLS, F. (1997). Neighbourhood and violent crime: A multi-level study of collective efficacy. *Science, 277,* 918-924.

SCHAUBROECK, J., & MERRIT, D. (1997). Divergent effects of job control on coping with work stressors: The key role of self-efficacy. *Academy of Management Journal, 40,* 738-754.

SCHAUBROECK, J., LAM, S.S.K., & XIE, J.L. (2000). Collective efficacy versus self-efficacy in coping responses to stressors and control: A cross-cultural study. *Journal of Applied Psychology, 4,* 512-525.

SCHAUFELI, W.B. & BAKKER, A.B. (2004). Job demands, job resources and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior, 25,* 293-315.

SCHAUFELI, W.B. & BUUNK B.P. (1996). Professional burnout. In M. J. Schabracq, J. A. M., Winnubst & C. L. Cooper (Eds.), *Handbook of work and health psychology* (pp. 311-346). Chichester: John Wiley.

SCHAUFELI, W.B. & BUUNK, B.P. (2003). Burnout: An Overview of 25 Years of Research and Theorizing. In M.J. Schabracq, J.A.M. Winnbust, & C.L. Cooper (eds.), *The Handbook of Work and Health Psychology* (pp. 383-425). John Wiley & Sons, Ltd.

SCHAUFELI, W.B. & ENZMANN, D. (1998). *The burnout companion to study and research: A critical analysis*. London, UK: Taylor and Francis.

SCHAUFELI, W.B. & VAN DIERENDONCK, D. (2000). *Maslach Burnout Inventory: Nederlandse Versie* [Maslach Burnout Inventory: Dutch Version]. Lisse, The Netherlands: Swets and Zeitlinger.

SCHAUFELI, W.B. (1999). Evaluación de riesgos psicosociales y prevención del estrés laboral: algunas experiencias holandesas. [Psychosocial Risk Assessment and Work Stress Prevention: Some Dutch Experiences]. *Revista de Psicología del Trabajo y de las Organizaciones, 15*(2), 147-171.

SCHAUFELI, W.B., GONZÁLEZ-ROMÀ, V., PEIRÓ, J.M., GEURTS, S., & TOMÀS, I. (2004). Withdrawal and Burnout in Health Care: on the Mediating Role of Inequity. *In press.*

SCHAUFELI, W.B., KEIJSERS, G.J., & REIS-MIRANDA, D. (1995a). Burnout, technology use and ICU-performance. In S.L. Sauter & L.R. Murphy (eds.), Organizational risk factors for job stress (pp. 259-271). Washington, DC: APA Books.

SCHAUFELI, W.B., LEITER, M.P., & KALIMO, R. (1995b, September). The Maslach Burnout Inventory-General Survey: A self-report questionnaire to assess burnout at the workplace. In M.P Leiter, *Extending the Burnout Construct: Reflecting Changing Career Paths*. Symposium, APA/NIOSH conference, Work, Stress and Health ´95: Creating a Healthier Workplace. Washington, D.C.

SCHAUFELI, W.B., LEITER, M.P., MASLACH, C., & JACKSON, S.E. (1996). Maslach Burnout Inventory - General Survey. In C. Maslach, S.E. Jackson, & M.P. Leiter (Eds.), *The Maslach Burnout Inventory-Test Manual* (3rd ed.). Palo Alto, CA: Consulting Psychologists Press.

SCHAUFELI, W.B., MARTÍNEZ, I.M., MARQUES-PINTO, A., SALANOVA, M., & BAKKER, A. (2002a). Burnout and Engagement in University Students: A Cross-National Study and Francis. *Journal of Cross-Cultural Psychology, 33(5)*, 464-481.

SCHAUFELI, W.B., MASLACH, C., & MAREK, T. (1993). *Professional Burnout: Recent Developments in Theory and Research.* Washington, DC: Taylor & Francis.

SCHAUFELI, W.B., SALANOVA, M., GONZÁLEZ-ROMÁ, V., & BAKKER, A.B. (2002b). The measurement of burnout and engagement: A confirmatory factor analytic approach. *Journal of Happiness Studies, 3*, 71-92.

SCHAUFELI, W.B., TARIS, T.W., LE BLANC, P.M., PEETERS, M., BAKKER, A.B., & DE JONGE, J. (2001). Maakt arbeid gezond? Op zoek naar de bevlogen werkenemer [Does work make healthy?. In search of the engaged worker]. *De Psycholoog, 36*, 422-428.

SCHOLZ, U., GUTIÉRREZ-DOÑA, B., SUD, S., & SCHWARZER, R. (2002). Is perceived self-efficacy a universal construct? Psychometric findings from 25 countries. *European Journal of Psychological Assessment, 18,* 242-251.

SCHUTTE, N., TOPPINNEN, S., KALIMO, R., & SCHAUFELI, W.B. (2000). The factorial validity of the Maslach Burnout Inventory – General Survey across occupational groups and nations. *Journal of Occupational and Organizational Psychology 73,* 53-66.

SCHWARZER, R. (1999). *General Perceived Self-efficacy in 14 cultures.* http://www.yorku.ca/faculty/academic/schwarze/worldl4.htm.

SCHWARZER, R., HAHN, A., & JERUSALEM, M. (1993). Negative effect in East German migrants: Longitudinal effects on unemployment and social support. *Anxiety, Stress and Coping, 6,* 57-69.

SELIGMAN, M.E.P. & CSIKSZENTMIHALYI, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*, 5-14.

SETHI, R. (2000). New product quality and product development teams. *Journal of Marketing, 64(*2), 1-14.

SHELDON, K.M. & KING, L. (2001). Why positive psychology is necessary. *American Psychologist, 56*, 216-217.

SHIROM, A. (1989). Burnout in Work Organizations. In C.L. Cooper & I. Robertson (eds.), *International review of Industrial and Organizational Psychology* (pp. 25-48), Chichester: Wiley & Sons.

SIEGRIST, J. (1996). Adverse health effects of high effort-low reward condition. *Journal of Occupational Health Psychology, 1,* 27-41.

SMITH, P.B., DUGAN, S., & TROMPENAARS, F. (1996). National culture and values of organizational employees: A dimensional analysis across 43 nations. *Journal of Cross-Cultural Psychology, 27,* 231-264.

SMITH, P.B., FISCHER, R., & SALE, N. (2001). Cross-cultural Industrial/Organizational Psychology. In C.L. Cooper & I.T. Robertson (eds.), *International Review of Industrial and Organisational Psychology* (vol. 6, pp. 147-193). Chichester: John Wiley & Sons, Ltd.

SNYDER, C.R. & LOPEZ, S.L. (2002). The future of Positive Psychology. A Declaration of Independence. In C.R. Snyder & S. Lopez (eds.), *The Handbook of Positive Psychology* (pp. 751-767). Oxford: Oxford University Press.

STATISTIC NETHERLANDS (2003). www.cbs.nl

SVENSON, O. & MAULE, A.J. (1993). *Time pressure and stress in human judgement and decision making.* New York: Plenum.

SYMON, G. (2000). Information and communication technologies and the network organization: A critical analysis. *Journal of Occupational and Organizational Psychology, 73,* 389-414.

TARIS, T.W., SCHREURS, P.J.G., & SCHAUFELI, W.B. (1999). Construct validity of the Maslach Burnout Inventory-general Survey: A two-sample examination of its factor structure and correlates. *Work & Stress, 13*, 223-237.

TARIS, T.W., SCHREURS, P.J.G., & VAN IERSEL VAN SILFHOUT, I.J. (2001). Job stress, job strain, and psychological withdrawal among Dutch university staff: Towards a dual process model for the effects of occupational stress. *Work & Stress, 15(4)*, 283-296.

TETT, R. & MEYER, J. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: Path analyses based on meta-analytic findings.

Personnel Psychology, 46, 259-293.

TIERNEY, P. & FARMER, S.M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal, 45,* 1137-1148.

TODMAN, J. & MONAGHAN, E. (1994). Qualitative differences in computer experience, computer anxiety and students' use of computers: A path model. *Computers in Human Behavior, 10*(4), 529-539.

TURNER, N., BARLING, J., & ZACHARATOS, A. (2002). Positive Psychology at Work. In C.R. Snyder & S. Lopez (eds.), *The Handbook of Positive Psychology* (pp. 715-728). Oxford: Oxford University Press.

VAN DE VEN, A.M. & FERRY, D.L. (1980). *Measuring and assessing organizations*. New York: Wiley and Sons.

VAN DIERENDONCK, D., SCHAUFELI, W.B., & BUUNK, B.P. (1998). The Evaluation of an Individual Burnout Intervention Program: The Role of Inequity and Social Support. *Journal of Applied Psychology, 83*(3), 392-407.

VAN MUIJEN, J.J., KOPMAN, P., DE WITTE, K., DE COCK, G., SUSANJ, Z., LEMOINE, F., BOURANTES, D., PAPALEXANDRIS, N., BRANYICSKI, I., SPALTRO, E., JESUINO, J., GONZALEVS DAS NEVES, J., PITARIU, H., KONRAD, E., PEIRÓ, J., GONZÁLEZ-ROMÁ, V., & TURNIPSEED, D. (1999). Organizational Culture: The FOCUS questionnaire. *European Journal of Work and Organziational Psychology, 8,* 551-568.

VAN VELDHOVEN, M. & MEIJMAN, T. (1994). *Het meten van psychosociale arbeidsbelasting met een vragenlijst: de Vragenlijst Beleving en Beoordeling van de Arbeid (VVBA).* [Measurement of psychosocial job demands with a questionnaire: The questionnaire experience and evaluation of work (VBBA)]. Amsterdam: NIA.

VAN YPEREN, N.W. (1998). Informational support, equity and burnout: The moderating effect of self-efficacy*. Journal of Occupational and Organizational Psychology, 71,* 29-33.

WALL, T.D., CORBET, J.M., CLEGG, C.W., JACKSON, P.R., & MARTIN, R. (1990). Advanced manufacturing technology and work design. Towards a theoretical framework. *Journal of Organizational Behavior, 11,* 201-219.

WARR, P. (1987). *Work, unemployment and mental health*. Oxford: Oxford University Press.

WARR, P. (1990). The measurement of well-being and other aspects of mental health. *Journal of Occupational Psychology, 63,* 193-210.

WEIL, M.M. & ROSEN, L.D. (1997). *Technostress: Coping with technology @work, @home, @play*. New York: John Wiley and Sons.

WRIGHT, T.A. (2003). Positive organizational behavior: an idea whose time has truly come. *Journal of Organizational Behavior, 24,* 437-442.

YANG, C. & CARAYON, P. (1995). Effect of job demans and social support on worker-stress: a study of VDT users. *Behaviour and Information Technology, 14,* 32-40.

YUKL, G.A., MALONE, M.P., HAYSLIP, B., & PAMIN, T.A. (1976). The effects of time pressure and issue settlement order on integrative bargaining. *Sociometry, 39,* 277-281.

ZAPF, D., DORMANN, C., & FRESE, M. (1996). Longitudinal studies in organizational stress research: A review of the literature with reference to methodological issues. *Journal of Occupational Health Psychology, 1,* 145-169.

ZAPF, D., ISIC, A., BECHTOLDT, M., & BLAU, P. (2003). What is typical for call centre jobs? Job characteristics, and service interactions in different call centres. *European Journal of Work and Organizational Psychology, 12*(4), 305-310.

ZAPF, D., SEIFERT, C., SCHMUTTE, B., MARTINI, H., & HOLZ, M. (2001). Emotion work and job stressors and their effects on burnout. *Psychology and health, 16*(5), 527-545.

ZIESSLER, M.U. & NATTKEMPER, D. (2001). Learning of event sequences is based on response-effect learning: Further evidence from a serial reaction task. *Journal of Experimental Psychology: Learning, Memory, & Cognition, 27*(3), 595-613.

ZIJLSTRA, F.R.H. (1993). *Efficiency in work behaviour: A design approach for modern tools.* Delft: Delft University Press.

ZIJLSTRA, F.R.H., ROE, R.A., LEONORA, A.B., & KREDIET, I. (1999). Temporal factors in mental work: Effects of interrupted activities. *Journal of Occupational and Organizational Psychology, 72*, 163-185.

ZURRIAGA, R., RAMOS, J., GONZÁLEZ-ROMÁ, V., ESPEJO, B., & ZORNOZA, A. (2000). Efecto de las caracteristicas del puesto de trabajo sobre la satisfaccion el compromiso y el absentismo en organizaciones sanitarias [Effects of job characteristics on job satisfaction, organizational commitment and absenteeism in health care organisations]. *Revista de Psicología Social Aplicada, 10*(3), 85-98.

Spanish Summary

Spanish Summary

El objetivo general de esta tesis ha sido poner a prueba una ampliación del modelo de Demandas-Recursos (Demerouti, Bakker, Nachreiner, y Schaufeli, 2001a) en usuarios de Tecnología de la Información y la Comunicación (TIC), integrando tanto las aproximaciones negativas (en términos de burnout) como positivas (en términos de engagement) del bienestar psicológico de los empleados y una consecuencia organizacional: el compromiso organizacional. Para conseguir este objetivo se han seguido una serie de pasos. En primer lugar, y para realizar una validación transcultural, este modelo ha sido puesto a prueba simultáneamente con empleados que utilizan tecnologías pertenecientes a dos países Europeos: España y Holanda. Para ello, se han llevado a cabo análisis factorials confirmatorios, modelos de ecuaciones estructurales, así como análisis multigrupo. En segundo lugar, y dada la relevancia de la Psicología Positiva y de los recursos personales (las creencias de eficacia) como variables intervinientes en el proceso de estrés, se han puesto a prueba modelos de espirales positivos de recursos en un estudio longitudinal de laboratorio con usuarios de TICs. Se espera que la percepción de recursos laborales incremente los niveles de creencias de eficacia, que a su vez incrementarán los niveles de engagement; a su vez, estos niveles de engagement generarán mayores percepciones de recursos laborales, generando así un círculo positivo. Finalmente, se ha realizado un paso más y se ha puesto a prueba el papel de la eficacia colectiva percibida en usuarios de TICs como variable interviniente en un proceso de estrés motivacional de trabajo en grupo. En este caso, se pusieron a prueba efectos de interacción entre demandas laborales, bienestar colectivo y desempeño de la tarea.

Las contribuciones de la tesis son las siguientes: (1) la inclusión de *tecno*-estresores específicos en puestos de trabajo con TICs, dado que la mayoría de los estudios sobre burnout se han focalizado en profesiones de ayuda; (2) estudio simultáneo de aspectos mentales negativos y positivos del bienestar psicológico (burnout y engagement), así como la relación entre ellos; (3) para llevar a cabo una validación transcultural de la estructura y la relación entre burnout-engagement, se han estudiado simultáneamente trabajadores de TICs pertenecientes a organizaciones españolas y holandesas; (4) se ha includo el papel de las creencias de eficacia como responsables de la generación de espirales positivas de recursos; y finalmente, (5) se ha considerado el papel de las creencias de eficacia colectiva percibida para explicar los efectos sobre el bienestar psicológico colectivo y el desempeño de la tarea en el trabajo en grupo.

La presente tesis se desarrolló a través de cinco estudios empíricos. Los principales resultados se resumen a continuación.

En el ***estudio 1*** (ver capítulo 2), la estructura factorial del `burnout' y de su opuesto: el `engagement' se ha puesto a prueba en empleados españoles y holandeses que utilizan TICs en sus puestos de trabajo. Concretamente, el principal objetivo de este capítulo era confirmar la estructura factorial de los instrumentos *Maslach Burnout Inventory-General Survey* (MBI-GS; Schaufeli, Leiter, Maslach, y Jackson, 1996) y del *Utrech Work Engagement Scale* (UWES; Schaufeli, Salanova, González-Romà, y Bakker, 2002b) en empleados que trabajan con TICs. Además, se ha examinado la existencia de diferencias transculturales en las propiedades psicométricas de estos instrumentos comparando los datos de empleados de España y Holanda. Este estudio también ha contribuido al debate actual sobre la relación entre burnout y engagement, investigando la estructura

factorial de primer orden del burnout y el engagement en ambos países. En este caso, intentamos dar respuesta a tres cuestiones de investigación: (a) ¿Es la estructura tri-factorial básica del burnout la más adecuada en España y Holanda?, (b) ¿Es la estructura tri-factorial básica del engagement la más adecuada en ambas muestras? y (c) ¿Cómo están relacionados el burnout y el engagement en ambos países?

Respecto a la primera cuestión, los resultados han mostrado que el burnout está compuesto por tres dimensiones independientes pero relacionadas: agotamiento, cinismo y eficacia profesional. Estos resultados coinciden con la investigación tradicional sobre el tema realizada en diferentes muestras (Bakker, Demerouti, y Schaufeli, 2002; Leiter y Schaufeli, 1996; Taris, Schreus, y Schaufeli, 1999) y específicamente en usuarios de TICs (Salanova, Schaufeli, Llorens, Peiró, y Grau, 2000b; Schaufeli *et al.,* 2002b). Esta estructura tri-factorial ha sido equivalente en España y Holanda, lo que da evidencia a la validez transcultural del instrumento MBI-GS. De acuerdo con esto, la respuesta a la primera cuestión es afirmativa: los resultados confirman la invarianza de la estructura del burnout en empleados españoles y holandeses que trabajan con TICs. A pesar de que la estructura del burnout fue equivalente en los dos países, el presente estudio mostró algunas diferencias menores entre España y Holanda. Así, algunas correlaciones y pesos factoriales (particularmente en las dimensiones de agotamiento y eficacia profesional) fueron diferentes en los dos países. Diferencias similares se obtuvieron en un estudio transcultural sobre el burnout y el engagement en una muestra de estudiantes universitarios de Portugal, Holanda y España (Schaufeli, Martínez, Marques-Pinto, Salanova, y Bakker, 2002a), así como en una muestra de usuarios de TICs (Salanova *et al.,* 2000b). Parece ser que,

aunque la estructura tri-factorial del burnout ajusta bien en los dos países, la contribución de los valores de la escala y la relación entre ellas son diferentes entre España y Holanda.

La pregunta 2 hacía referencia a la estructura del opuesto al burnout: el engagement. Los resultados a la cuestión "*¿Es la estructura tri-factorial básica del engagement la más adecuada en ambas muestras?* han mostrado que, tal y como se esperaba, el engagement está compuesto en ambos países por tres escalas independientes pero relacionadas: vigor, dedicación y absorción. Resultados similares se han obtenido en estudios previos en diferentes muestras (Grau, Llorens, Burriel, Salanova, y Agut, 2004; Schaufeli y Bakker, 2004), así como en usuarios de TICs (Llorens, Salanova, y Cifre, 2001; Salanova *et al.,* 2000b; Schaufeli *et al.,* 2002b). A pesar de las altas correlaciones que se han obtenido entre las tres dimensiones, el engagement se concibe como un concepto tri-dimensional tanto en España como en Holanda. Así, aquellos trabajadores altamente dedicados con su trabajo, normalmente también pierden la noción del tiempo, y se sienten absortos en sus actividades laborales. Además, los trabajadores con engagement experimentan también energía y se sienten vigorosos y fuertes. Aunque la estructura del engagement ha sido invariante en los dos países, algunos pesos factoriales (sobretodo en la escala de dedicación) y las correlaciones entre vigor-absorción y dedicación-absorción han sido diferentes entre España y Holanda. A pesar de que los valores de las escalas y su relación fueron distintos en esos dos países Europeos, la respuesta a esta segunda cuestión es también afirmativa: los resultados han corroborado la estructura tri-factorial del engagement medido mediante el instrumento UWES tanto en España como en Holanda.

La relación entre burnout y engagement ha sido analizada en la tercera cuestión: *¿Cómo están relacionados el burnout y el engagement en ambos países?* En este caso, estábamos interesados en estudiar si el burnout y el engagement pueden considerarse polos opuestos del mismo continuo (Maslach y Leiter, 1997), o dos constructos psicológicos diferentes pero correlacionados (Schaufeli y Bakker, 2004). Nuestros resultados confirman que el burnout y el engagement son dos estados mentales independientes pero negativamente relacionados tanto en España como en Holanda. De acuerdo con Schaufeli and Bakker (2004), esta relación entre burnout y engagement puede ser entendida si consideramos que podrían formar parte de una taxonomía más comprehensiva que incluye dos dimensiones independientes de `energía´ e `identificación´. De este modo, burnout y engagement se considerarían opuestos, especialmente agotamiento-vigor, que hacen referencia a la dimensión de *energía*, y cinismo-dedicación que se refieren a la dimensión de *identificación*. A pesar de que el burnout y engagement son estados mentales independientes, y negativamente relacionados, no son estados mutuamente excluyentes. Este resultado significa que un empleado puede sentirse emocionalmente agotado una vez por semana debido a su trabajo, pero esto no necesariamente impide que ese mismo empleado se sienta lleno de energía durante la misma semana (ver Schaufeli y Bakker, 2004).

El caso de la eficacia profesional y la absorción es diferente, dado que no se consideran opuestos directos. Ambas dimensiones constiutyen aspectos conceptualmente diferentes que no representan los puntos opuestos de un mismo continuo (Lee y Asforth, 1996; Maslach, 1993). Diferentes estudios muestran que la eficacia profesional juega un papel diferente al representado por el agotamiento y el cinismo en el burnout,

que se consideran la esencia y el corazón del burnout (Green, Walkey, y Taylor, 1991; Leiter, 1992; Maslach, Schaufeli, y Leiter, 2001). La eficacia profesional se percibe como una característica de personalidad cercana a la autoeficacia o a la competencia y por tanto más cercana al afecto positivo (Cordes y Dougherty, 1993; Cherniss, 1993). De hecho, una "crisis de eficacia" constituye un factor crítico en el desarrollo del burnout (Cherniss, 1980; Leiter, 1992; Salanova, Peiró, y Schaufeli, 2002b), mientras que un "inyección de eficacia" provoca lo opuesto: el engagement (Salanova, 2003; Salanova, Bresó, y Schaufeli, 2004a). El mismo problema sucede con la absorción, la cuál se consideró una dimensión del engagement después de 30 entrevistas realizadas en profundidad (Schaufeli, Taris, Le Blanc, Peeters, Bakker, y de Jonge, 2001). Además, la absorción es un término cercano al concepto de "flow": un estado de experiencia óptima que se caracteriza por atención focalizada, mente clara, unión mente-cuerpo, concentración, control, pérdida de auto-consciencia, distorsión del tiempo y disfrute intrínseco (Csikszentmihalyi, 2000). Sin embargo, el flow es un concepto mucho más complejo que incluye muchos aspectos y se refiere a experiencias de corta duración, frente al estado mental más persistente que caracteriza a la absorción.

Basándonos en resultados previos, se ha puesto a prueba si los modelos que incluyen sólo el `corazón´ del burnout y del engagement son más adecuados que los modelos tradicionales en los que se consideran las tres dimensiones. Nuestros resultados sugieren que en la relación entre burnout y engagement, el mejor modelo es aquel que incluye *sólo* el corazón del burnout (agotamiento y el cinismo) y el corazón del engagement (vigor y dedicación). Estos resultados coinciden con estudios empíricos previos obtenidos en muestras de profesores de instituto (García,

Llorens, Salanova, y Cifre, 2004; Llorens, García, Salanova, y Cifre, 2003a) y en trabajadores del sector turístico (Grau *et al.,* 2004). Además, en nuestro estudio esta estructura fue replicada en los empleados españoles y holandeses. A pesar de que la estructura fue la misma en ambos países, en el caso de Holanda fue necesaria una correlación negativa entre cinismo y dedicación, los cuáles representarían los dos polos opuestos de la dimensión de *energía*. Por tanto, la respuesta a esta tercera pregunta es que el burnout y el engagement se consideran dos constructos independientes pero relacionados negativamente, que pueden se medidos mediante instrumentos específicos. Además, y en contra de las perspectivas tradicionales que asumen que el burnout y el engagement se componen de tres dimensiones "opuestas" (por ejemplo, Maslach y Leiter, 1997), *sólo* el corazón del burnout (agotamiento y cinismo) y el corazón del engagement (vigor y dedicación) han sido identificados como como las dimensiones centrales del burnout y el engagement. Estos resultados coinciden con los obtenidos por investigaciones anteriores llevadas a cabo en diferentes muestras (de Rijk, Le Blanc, Schaufeli, y deJonge, 1998; Green *et al.,* 1991; Llorens *et al.,* 2003a; Schaufeli y Bakker, 2004).

El *estudio 2* se ha centrado en eplorar la estructura de las demandas y los recursos laborales específicos de los empleados de TICs en España y Holanda. En el capítulo 3, las características del puesto denominadas `demandas' y `recursos' se confirmaron en trabajadores de TICs españoles y holandeses utilizando análisis factoriales confirmatorios con análisis multigrupo. La cuestión de investigación relacionada con esta sección fue la siguiente: *¿Cómo se relacionan las demandas y los recursos laborales en ambos países?.* Los resultados han mostrado que, tal y como se esperaba, las características del trabajo en este contexto de tecnología pueden

categorizarse en dos factores principales: `demandas' (que incluye sobrecarga cuantitativa y emocional) y `recursos' laborales (incluyendo control del puesto, apoyo social y feedback sobre el desempeño). Aunque se ha utilizado un número limitado de características del puesto, nuestros resultados apoyan la premisa básica del modelo de Demandas-Recursos (Bakker, Demerouti, de Boer, y Schaufeli, 2003b; Demerouti, Bakker, Nachreiner, y Schaufeli, 2001a): independientemente del tipo de trabajo, las características del puesto pueden categorizarse en `demandas' y `recursos' laborales. Tanto en España como en Holanda, la sobrecarga emocional y el apoyo social mostraron los pesos factoriales más elevados. Esto podría implicar que esas características del puesto contribuyen substancialmente al porcentaje de varianza explicada en los factores de `demandas' y `recursos', respectivamente. Al igual que en estudios previos (Bakker, Demerouti, y Schaufeli, 2003a; Bakker, Euwema, y Demerouti, 2004a; Demerouti *et al.,* 2001a) nuestros resultados también sugieren que las demandas y los recursos están negativamente relacionados en ambos países. Esto implica la existencia de un desajuste entre ellos, que podría generar consecuencias negativas en el bienestar. Según el modelo de Demandas-Recursos, la presencia de demandas específicas y la ausencia de recursos específicos predice el burnout, que a su vez provocará diferentes consecuencias negativas, como por ejemplo, menos compromiso con la organización (Demerouti *et al.,* 2001a).

A pesar de que la estructura de las características del puesto ha sido invariante en los dos países, la prueba de equivalencia realizada mostró que algunos pesos factoriales (esto es, los pesos de la sobrecarga emocional, apoyo social y feedback) y algunas correlaciones (entre sobrecarga emocional y apoyo social) fueron diferentes en España y

Holanda. Por todo lo expuesto, podemos decir que la respuesta a esta tercera cuestión es que, tal y como se propone en el modelo de Demandas-Recursos (Demerouti *et al.,* 2001a), las condiciones de trabajo en contextos de TICS pueden dividirse en dos categorías generales, denominadas demandas y recursos, tanto en España como en Holanda. Sin embargo, se observaron algunas diferencias menores entre los dos países.

Basándonos en los resultados de los estudios previos, el **estudio 3** ha puesto a prueba el modelo de Demandas-Recursos utilizando análisis de ecuaciones estructurales. En este caso, se incluyeron simultáneamente, aproximaciones tanto negativas (burnout) como positivas (engagement) del bienestar psicológico de los empleados y el compromiso organizacional como resultado (ver capítulo 4). Para validar el modelo a nivel transcultural, dicho modelo se puso a prueba utilizando análisis multigrupo en dos países: España y Holanda. Este estudio planteaba dos cuestiones de investigación: (a) ¿Cómo se relacionan las demandas y recursos laborales con el burnout y el engagement en ambos países?, y (b) ¿Cómo se relacionan el burnout y el engagement con el compromiso organizacional en ambos países? De acuerdo con la primera pregunta, observamos una relación directa desde las demandas laborales al corazón del burnout y desde los recursos laborales al corazón del engagement. Aquellos usuarios de TICs con sobrecarga cuantitativa y sobrecarga emocional se sentían más agotados y más cínicos en el trabajo. Por el contrario, aquellos empleados con más recursos en términos de control del puesto, apoyo social y feedback sobre el desempeño, se sentían más vigorosos y más dedicados en el trabajo. Además, se encontraron otras relaciones no esperadas entre demandas-recursos y burnout-engagement.

Así pues, las demandas laborales predicen principalmente el burnout, pero también puden disminuir los niveles de engagement en el trabajo. A pesar de que este efecto fue débil y sólo se encontró en la muestra española, otras investigaciones también han encontrado esta relación (Bakker *et al.,* 2003b; Salanova, Cifre, Grau, Llorens, y Martínez, 2003). Por otra parte, los recursos laborales han sido los principales predictores del engagement, pero también han tenido un impacto importante en la reducción del burnout en los dos países. De acuerdo con esto, aquellos usuarios de TICs que percibían altos recursos laborales en el trabajo, no sólo se sintieron más vigorosos y dedicados en el trabajo, sino también menos agotados y cínicos, tanto en España como en Holanda. Este resultado sugiere que los recursos laborales podrían directamente amortiguar el proceso de erosion. Lo que ha sido también obtenido en diferentes investigaciones (Bakker *et al.,* 2003b; Lee y Asforth, 1996; Schaufeli y Bakker, 2004).

En cuanto a la relación entre burnout-engagement y compromiso organizacional (*cuestión 2)*, los resultados mostraron, tal y como se esperaba, una relación negativa entre burnout y compromiso organizacional y una relación positiva entre engagement y compromiso. Esto significa que aquellos usuarios de TICs más agotados y cínicos se sentían menos comprometidos con la organización a la que pertenecían. Este resultado va en la línea de los obtenidos en investigaciones anteriores (Bakker *et al.,* 2003a; Salanova *et al.,* 2000b; Schaufeli y Buunk, 1996; Schaufeli, González-Romá, Peiró, Geurts, y Tomás, 2004). Por otro lado, aquellos empleados más vigorosos y dedicados se sentían más comprometidos con la organización (Baumeister y Leary, 1995; Meyer y Allen, 1991; Schaufeli y Bakker, 2004). Por último, es interesante señalar

que el compromiso organizacional también puede verse afectado directamente por las demandas y los recursos. La presencia de recursos laborales generaba mayores niveles de compromiso organizacional en ambos países. La investigación muestra que cuanto más positivas sean las percepciones del usuario de TICs sobre las características del puesto (Ej., más control y más feedback), mayores niveles de compromiso organizacional mostrará, tal y como señalan otras investigaciones (Mathieu y Zajac, 1990; Zurriaga, Ramos, González-Romá, Espejo, y Zornoza, 2000). En esta línea, Van Dierendonck, Schaufeli, y Buunk (1998) en una muestra compuesta por 149 profesionales de cuidado directo a pacientes encontraron que aquellos que recibían un bajo nivel de apoyo por parte de colegas y de supervisores, tenían más intenciones de abandonar la organización, puesto que se veían abocados a restaurar el sentido de equilibrio expandiendo sus horizontes fuera de la organización. Por el contrario, en aquellos empleados con altos niveles de apoyo, las intenciones de abandono disminuían.

Por tanto, podemos decir que a pesar de la existencia de algunas diferencias de medida entre los dos países, los principales postulados del modelo de Demandas-Recursos se han confirmado en usuarios de TICs pertenecientes a España y Holanda. Estos resultados ilustran la validez transcultural del modelo de Demandas-Recursos. Al mismo tiempo, ha permitido ampliar resultados previos obtenidos con este modelo, incluyendo no sólo estados psicológicos negativos (burnout) sino también estados psicológicos positivos (engagement) en una perspectiva transcultural. Independientemente del tipo de ocupación, dos tipos de características del trabajo (en términos de demandas y recursos laborales) han corroborado la existencia de un proceso psicosocial dual del bienestar

psicosocial: (a) el proceso negativo de erosión, en el que las demandas laborales están principalmente relacionadas de forma negativa con el compromiso organizacional a través del burnout; y (b) el proceso motivacional que se genera por la presencia de recursos laborales adecuados; estos son los predictores más importantes del compromiso organizacional a través de su impacto sobre el engagement. Sin embargo, un modelo alternativo que incluye también efectos directos de las demandas-recursos laborales sobre el compromiso organizacional, ajusta mejor a los datos. Por tanto, el burnout y el engagement no actúan como mediadores totales en el modelo, sino como mediadores parciales. Además, en ambos países los recursos también podrían favorecer el compromiso con la organización mediante su influencia amortiguando el burnout. A pesar de las similitudes entre las muestras española y holandesa, existen diferencias en algunos pesos factoriales. Además, la relación no esperada entre demandas laborales y engagement, y el efecto directo de las demandas sobre el compromiso organizacional, sólo fueron significativos en los empleados de la muestra española.

A pesar de las diferencias encontradas podemos observar resultados importantes en ambos países: (1) es posible combinar aproximaciones negativas y positivas del bienestar psicológico simultáneamente en un mismo modelo, (2) burnout y engagement juegan roles similares en diferentes procesos, (3) el burnout juega un papel de mediador parcial en el proceso de erosión, que es principalmente desencadenado por altos niveles de demandas y que producirá una reducción en los niveles de compromiso organizacional, (4) el engagement también juega un papel de mediador parcial en el proceso motivacional, el cual es originado por la presencia de recursos adecuados y que conducirá a un incremento del

compromiso con la organización, (5) el proceso positivo (recursos-engagement-compromiso organizacional) fue más fuerte y más relevante que el negativo (demandas-burnout-compromiso organizacional).

Nuestros resultados aportan apoyo empírico en el marco de la Psicología Positiva para explicar el bienestar psicológico en el trabajo. Esta aproximación positiva es vista como una perspectiva complementaria a aquella basada en problemas humanos (Seligman y Csikszentmihalyi, 2000). Snyder y López (2000) señalan que la Psicología Positiva constituye un nuevo paradigma que debe ser permitido para establecer y mantener el funcionamiento óptimo y la satisfacción a lo largo del tiempo. De acuerdo con la *Teoría de la Ampliación y la Construcción* propuesta por Fredrickson (2002; *Broaden-and-Build Theory*), las emociones positivas amplían los repertorios de pensamiento-acción de las personas, que a su vez, construyen recursos personales resistentes, que finalmente transforman a las personas en individuos más creativos y sanos. Dada la relevancia de la Psicología Positiva, actualmente se está prestando gran atención para garantizar una buena vida laboral para los trabajadores y las organizaciones. Recientemente, Luthans (2002a, 2002b) ha definido la investigación de la Conducta Organizacional Positiva (Positive Organisational Behaviour, POB) como *"el estudio y la aplicación de recursos humanos orientados positivamente y capacidades psicológicas que pueden ser medidas, desarrolladas y dirigidas de manera eficaz para mejorar el desempeño en el contexto de trabajo actual"* (Luthans, 2003, p. 179). De manera similar, Salanova, Llorens, Peiró, y Schaufeli (2004c) han proporcionado evidencia empírica sobre la Psicología Ocupacional Positiva (POP) en diferentes ocupaciones y estudiantes que trabajan en grupos. Este estudio muestra que las emociones positivas facilitan el engagement,

que a su vez, incrementan las creencias de eficacia. Wright (2003) ha argumentado que la misión de la Psicología Ocupacional Positiva debe también incluir la felicidad y la salud de los empleados como objetivos viables por ellos mismos, que a su vez mejoran el desempeño en el contexto laboral. De acuerdo con esto, términos tales como afectividad positiva, engagement, fortalezas y capacidades psicológicas para el desarrollo y mejora del desempeño, van a recibir atención por sí mismos (Luthans, 2001, 2002a, 2002b, 2003).

Debido a la relevancia de esta aproximación positiva, decidimos llevar a cabo un estudio de campo. En este caso, no se utilizaron empleados sino estudiantes en un contexto de laboratorio. En el *estudio 4*, usamos un diseño longitudinal con dos momentos de recogida de datos en una muestra de 110 usuarios de tecnología que trabajaban en grupos utilizando chat-internet (ver capítulo 5). Estábamos interesados en conocer la relación entre los recursos de la tarea (control de tiempos y control de métodos), las creencias de eficacia y el corazón del engagement (vigor y dedicación). En este estudio, se utilizaron análisis más complejos incluyendo relaciones causales, inversas y recíprocas entre las variables para poner a prueba la espiral positiva de recursos, eficacia y engagement. Las cuestiones de investigación fueron las siguientes: (a) ¿Los recursos personales median la relación entre los recursos laborales y el engagement en el trabajo? y (b) ¿el engagement incrementa los niveles de recursos personales y laborales?. Por lo que se refiere a la primera pregunta, la repuesta ha sido afirmativa. Los resultados de los modelos de ecuaciones estructurales han mostrado que los recursos de la tarea tienen un efecto positivo sobre las creencias de eficacia, que a su vez muestran un efecto positive sobre el engagement tres semanas después. De acuerdo con esto, aquellos estudiantes que

utilizaron chat-internet y que percibían más recursos para completar la tarea, fueron los que se sintieron más eficaces en la realización de la tarea, lo que a su vez incrementó sus niveles de engagement tres semanas después. Según la Teoría Social Cognitiva desarrollada por Bandura (1997), la percepción de control anticipa la experiencia de éxito con la tarea y, como consecuencia, los niveles de eficacia incrementan. Además, esta percepción de eficacia en la realización de la tarea incrementa los niveles de energía y persistencia a la hora de afrontar las demandas (vigor) y satisface las necesidades personales y la identificación con la tarea (dedicación). Existe evidencia empírica de que las creencia de eficacia *"regulan los estados emocionales proporcionando cursos de acción efectivos para transformar el ambiente de manera que alteren su potencial emocional"* (Bandura, 2002, p. 137). Las creencias de eficacia son un mecanismo auto-motivador: las personas perciben sus propias competencias y, como consecuencia establecen sus objetivos, que llevarán a invertir esfuerzo y persistencia a lo largo del tiempo para afrontar los obstáculos (Bandura, 2001; Garrido, 2000). Según el *proceso motivacional* implícito en el modelo de Demandas-Recursos (Bakker *et al.,* 2003b; Demerouti *et al.,* 2001a), la presencia de recursos adecuados estimula la motivación en forma de engagement y otros resultados positivos tales como las creencias de eficacia y el compromiso con la organización (Llorens *et al.,* 2003a; Schaufeli y Bakker, 2004).

En cuanto a la segunda cuestión de investigación, las creencias de eficacia jugaron un papel mediador entre el engagement y los recursos de la tarea. Aquellos estudiantes con altos niveles de engagement se sentían más eficaces realizando la tarea, lo cual generaba en ellos la percepción de poseer más recursos relacionados con la tarea en un futuro. Al igual que en

estudios previos, el engagement actúa como un "motor motivacional" derivado de altos niveles de eficacia (Salanova, Bresó, y Schaufeli, 2004a). El engagement sólo incrementa los recursos de la tarea vía los recursos personales (esto es, las creencias de eficacia). Esto es, el vigor y la dedicación se consideran también una fuente de eficacia a lo largo del tiempo. Nuestro estudio corrobora el poder de los estados emocionales como fuente de eficacia. De acuerdo con la Teoría Social Cognitiva, las personas confían en sus estados somáticos y emocionales a la hora de juzgar sus capacidades. Las personas interpretan sus reacciones de estrés y tensiones como signos de ineficacia, mientras que los estados emocionales positivos (en nuestro estudio el engagement) se interpretan como signos de eficacia. En aquellas circunstancias que implican un estado mental positivo (Ej., el engagement) las personas pueden auto-percibirse como más eficaces en la realización de las tareas, que a su vez, pueden generar mayores percepciones de recursos de la tarea. Además, nuestros resultados coinciden con la Teoría de la Ampliación y la Construcción de emociones positivas (*The Broaden-and-Build Theory*; Fredrickson, 2001). De acuerdo con esta teoría, la experiencia de emociones positivas amplía momentáneamente los repertorios de pensamiento-acción de las personas, que a su vez, permitirán la construcción de recursos personales más resistentes (esto es, autoeficacia), los cuáles funcionan como reservas para controlar amenazas futuras.

Por otra parte, los resultados del estudio empírico 4 implican que ninguno de los constructos incluidos en el estudio pueden considerarse como sólo la causa o sólo la consecuencia, generando así una espiral de `ganancias' de los recursos, creencias de eficacia y engagement. Estos resultados coinciden con el modelo recíproco de Bandura (1997) sobre las

creencias de autoeficacia. Así, nuestro estudio ha mostrado que a lo largo del tiempo, los recursos de la tarea incrementan las creencias de eficacia, que a su vez incrementarán los niveles de engagement. Además, el engagement también es capaz de generar mayores niveles de eficacia en un futuro, que a su vez incrementará la percepción de más recursos de la tarea. Así, se ha encontrado evidencia a favor del rol mediador de las creencias de eficacia en la espiral de recursos: los recursos de la tarea predijeron los niveles de engagement posteriores y estos predijeron los recursos de la tarea posteriores a través de las creencias de eficacia. Estas relaciones recíprocas a corto plazo son consistentes con las "espirales de ganancias" propuestas por Hobfoll (1989, 2001, 2002). De acuerdo con la teoría de la Conservación de Recursos (COR), los recursos son motivadores en sí mismos. A través de los recursos las personas mantienen, protegen y expanden sus recursos para evitar la posibilidad de pérdidas futuras y consecuentemente desarrollan las creencias de eficacia (Bandura, 1997) y el bienestar positivo (Ej., engagement) (Antonowski, 1987; Ryan y Frederick 1997), generando un círculo positivo encontrado en estudios previos (Fredrickson, 2002; Llorens *et al.,* 2003a; Salanova *et al.,* 2004a). Estos resultados también están en la línea de la Teoría de las Características del Puesto (Hackman y Oldham, 1980), que muestra cómo la presencia de recursos está unido a estados psicológicos y otras consecuencias positivas. Concretamente, los resultados van en la línea de los modelos de "espirales de ganancias" de la eficacia que han sido previamente obtenidos en muestras de estudiantes (Salanova *et al.,* 2004a) y profesores de instituto (Llorens *et al.,* 2003a). Estas espirales positivas muestran que los recursos generan más niveles de creencias de eficacia en el presente, que a su vez llevará a mayores niveles de engagement en el

futuro, situación que generará más recursos relacionados con la tarea, y así sucesivamente.

En resumen, nuestros resultados confirman los *modelos de espirales de ganancias* entre los recursos de la tarea, creencias de eficacia y engagement en un estudio de campo desarrollado en un contexto de laboratorio, utilizando un diseño longitudinal. Un resultado importante es la confirmación del importante rol mediador que juegan las creencias de eficacia que recientemente ha sido obtenido en estudios anteriores (Salanova *et al.*, 2004a). Además, estos resultados proporcionan evidencia a favor de los beneficios de las creencias de eficacia en diferentes contextos, tales como el desempeño académico (Salanova, 2003; Salanova *et al*, 2004a; Schaufeli *et al.,* 2002a), estrés laboral en usuarios de TICs (Salanova, Grau, Llorens, y Schaufeli, 2001), y comportamiento proactivo (Salanova, Carrero, Pinazo, y Schaufeli, 2004b).

Dada la relevancia de las creencias de eficacia colectivas en la investigación actual, en el capítulo 6 describimos el ***estudio 5*** que consiste en un experimento de laboratorio con un diseño longitudinal. Este estudio corroboró la relevancia de las creencias de eficacia como variables intervinientes en un proceso motivacional en el trabajo en grupo. En este estudio, se utilizaron MANOVAs para poner a prueba los efectos de interacción entre demandas y eficacia colectiva sobre el bienestar colectivo y el desempeño del grupo. En cuanto al bienestar subjetivo, se han planteado las siguientes cuestiones: (1) ¿la eficacia colectiva percibida modera la relación entre el sistema de comunicación del grupo (chat vs. cara-a-cara) y el bienestar colectivo (ansiedad y engagement)?, (2) ¿la eficacia colectiva percibida modera la relación entre a presión temporal (presión vs. no presión temporal) y el bienestar colectivo (ansiedad y

engagement)?, y (3) ¿la eficacia colectiva percibida modera la relación entre el sistema de comunicación del grupo x la presión temporal sobre el bienestar colectivo (ansiedad y engagement)? Por lo que se refiere al *desempeño de la tarea*, nos planteamos las siguientes cuestiones: (4) ¿la eficacia colectiva percibida modera la relación entre el sistema de comunicación del grupo (chat vs. cara-a-cara) y el desempeño de la tarea?, (5) ¿la eficacia colectiva percibida modera la relación entre la presión temporal (presión vs. no presión temporal) y el desempeño de la tarea? Y (6) ¿la eficacia colectiva percibida modera la relación entre el sistema de comunicación del grupo x la presión temporal sobre el desempeño del grupo?

Los resultados han confirmado el rol moderador de la eficacia colectiva percibida entre el sistema de comunicación grupal utilizado (chat vs. cara-a-cara) y la presión temporal sobre el bienestar subjetivo colectivo (esto es, ansiedad y engagement) y el desempeño de la tarea, obtenido en estudios previos (Martínez *et al.,* 2003). Concretamente, altos niveles de eficacia colectiva percibida amortiguaron los efectos negativos del uso de chat y de la presión temporal sobre el bienestar colectivo y el desempeño de la tarea. Este resultado confirma la premisa básica de la Teoría Social Cognitiva (Bandura, 1997), puesto que la confianza colectiva en la eficacia futura del grupo determina los niveles de bienestar colectivo y el desempeño de la tarea. Sin embargo, los efectos sobre el bienestar subjetivo fueron diferentes en función de la naturaleza de la dimensión del bienestar subjetivo considerada. Por lo que se refiere a la dimensión negativa (ansiedad colectiva), encontramos un efecto de interacción de la presión temporal y de la eficacia percibida colectiva, pero no encontramos efectos sobre el engagement colectivo. Por otro lado, sólo se encontró un

efecto de interacción a tres-vías entre el sistema de comunicación de grupo, presión temporal y eficacia colectiva percibida sobre las dimensiones positivas del bienestar subjetivo (engagement colectivo). Además, en los grupos electrónicos que trabajaban bajo presión, la eficacia colectiva percibida amortiguaba los efectos de la presión temporal sobre el vigor y la dedicación colectiva. Sin embargo, no se encontró ningún efecto de interacción significativo con la absorción colectiva (ver Schaufeli *et al.,* 2002b). Además, el capítulo 6 confirma los efectos perjudiciales de la presión temporal sobre el desempeño del grupo. Aquellos grupos que trabajan bajo presión temporal, desempeñaron peor sus tareas comparados con aquellos grupos que trabajaban sin presión temporal (ver Davis, 1969; Karau y Kelly, 1992; Kelly y McGrath, 1985; Yukl, Malone, Hayslip, y Pamin, 1976). Sin embargo, los grupos que trabajaban con chat y bajo presión tuvieron un desempeño peor y se sintieron peor que los grupos cara-a-cara, pero *sólo* cuando se sentían menos eficaces colectivamente. Por otro lado, aquellos grupos con mejor desempeño cuando trabajaban bajo presión, fueron los de cara-a-cara sintiéndose altamente eficaces. Una de las principales conclusiones de este estudio es que la introducción de un sistema de comunicación grupal nuevo podría tener efectos perjudiciales sobre la ansiedad colectiva y el desempeño de la tarea, especialmente cuando los grupos funcionan bajo presión temporal con bajos niveles de eficacia colectiva percibida. De forma similar al estudio 5, creencias de eficacia fuertes (en este caso un fuerte sentido de eficacia colectiva) juega un rol fundamental entre las demandas y el bienestar del grupo y el desempeño de la tarea, tal y como señalan otros autores (Bandura, 1993; Gibson, 1995; Hodges y Carron, 1992). Así, las creencias de eficacia a nivel grupal pueden amortiguar el estrés ocupacional

proporcionando a los miembros del grupo apoyo social necesario para, por ejemplo, afrontar un nuevo sistema tecnológico y/o cuando trabajan bajo presión temporal (Cohen y Wills, 1985; Gore, 1987). Además, la eficacia colectiva percibida podría tener también un efecto amortiguador proporcionando a los miembros del grupo los recursos necesarios para reducir las demandas (Beehr, 1995; Jex y Bliese, 1999). Finamente, un fuerte sentimiento de eficacia colectiva percibida podría facilitar el bienestar colectivo y el desempeño del grupo (Jex y Bliese, 1999; Schaubroeck, Lam, y Xie, 2000).

Implicaciones teóricas y prácticas

Los resultados de la presente tesis tienen implicaciones teóricas y prácticas para las organizaciones. Por lo que al burnout y al engagement se refiere, el presente estudio corrobora y amplía a usuarios de TICs y a diferentes países (España y Holanda) la estructura tri-factorial del burnout y del engagement medidos mediante los instrumentos MBI-GS y UWES, respectivamente. En segundo lugar, las altas correlaciones obtenidas entre las tres dimensiones del engagement revelan la posibilidad de utilizar sólo una única escala para evaluar el engagement o bien reducir los ítems del instrumento UWES en la práctica profesional. En este sentido, sería útil considerar las tres dimensiones del engagement para explicar las características del constructo a nivel teórico, pero finalmente una única escala podría ser utilizada en la práctica real. Una de las mayores implicaciones de esta tesis ha sido considerar la relación entre burnout y engagement en términos de las dimensiones denominadas "corazón", cuando los dos constructos se estudian juntos. Estos resultados proporcionan mayor evidencia a favor de que la absorción y la eficacia

profesional parece que juegan un rol diferente cuando se comparan con el vigor y la dedicación, que son las escalas opuestas del corazón del burnout: agotamiento y cinismo, respectivamente tal y como señalan otros autores (Green *et al.,* 1991; Schaufeli y Bakker, 2004). La coincidencia entre los resultados obtenidos en los dos países (España y Holanda) en contextos de TICs sugiere que los resultados obtenidos son robustos y pueden generalizarse en otras muestras y en otros países diferentes.

Otra contribución importante es la evidencia empírica para la ampliación del modelo de Demandas-Recursos (Bakker, Demerouti, Taris, Schaufeli, y Schreus, 2003c; Demerouti *et al.,* 2001a) que incluye no sólo el burnout, sino también una aproximación positiva en una muestra específica de usuarios de TICs. Debido a que este estudio es transcultural, los resultados proporcionan evidencia para el modelo de Demandas-Recursos en ambos países (España y Holanda) a pesar de que existen ciertas diferencias entre ellos. De forma general, nuestros resultados sugieren que las características del puesto pueden dividirse en dos categorías generales: demandas y recursos laborales. Además, los procesos de erosión y el de motivación también han sido corroborados. Podemos decir que el compromiso organizacional es el resultado de ese proceso dual-básico. Los resultados sugieren que para prevenir o para reducir el burnout y, como consecuencia incrementar los niveles de compromiso organizacional, las demandas laborales específicas (Ej., sobrecarga cuantitativa, y emocional) deben ser reducidas y los recursos adecuados deben ser proporcionados. Por otra parte, para incrementar los niveles de engagement, que a su vez incrementarán los niveles de compromiso con la organización, debe favorecerse la presencia de recursos laborales adecuados. Un resultado importante obtenido en ambas muestras es el papel fundamental de la

aproximación positiva (esto es, el proceso motivacional) en el proceso de bienestar psicológico (Seligman y Csikszentmihalyi, 2000). La relevancia de esta aproximación positiva incluyendo las creencias de eficacia como variables intervinientes, ha sido puesta a prueba en un estudio llevado a cabo en un laboratorio con un diseño longitudinal. Teóricamente, los resultados han señalado la relevancia de los modelos de "espirales de ganancias" (*Gain Spiral Models*) (Hobfoll, 2001) encontrado en estudios previos (Llorens *et al.,* 2003a; Salanova, 2003; Salanova *et al*., 2004a): los recursos de la tarea, creencias de eficacia y engagement mostraron relaciones recíprocas a lo largo del tiempo. A nivel práctico, los resultados enfatizan la importancia de proporcionar buenos recursos, los cuáles favorecerán el incremento de las creencias de eficacia y el engagement, que a su vez, también incrementarán las creencias de eficacia, que cierran la espiral favoreciendo la percepción de más recursos relacionados con la tarea. Aunque la eficacia y el engagement han sido tradicionalmente considerados como resultados (*outcome*), nuestro estudio longitudinal muestra que ambos pueden considerarse como causa *y* como consecuencia en la espiral de ganancias.

Por lo que se refiere a la eficacia colectiva, nuestros resultados también ilustran la validez de la eficacia colectiva percibida como una variable moderadora y confirma su orientación "futura" tal y como se ha formulado en la Teoría Social Cognitiva de Bandura (1999). Además, nuestros resultados podrían ampliar el Modelo de Cambio formulado por Hollingshead, McGrath, y O'Connor (1993) teniendo en cuenta la influencia de otras variables (presión temporal y eficacia colectiva percibida) en la relación entre TICs sobre los resultados del grupo. Aunque se esperaba que durante los primeros encuentros los grupos electrónicos tuvieran un

desempeño más pobre comparado con los grupos cara-a-cara (por el efecto de novedad la tecnología), no se observaron diferencias significativas en el bienestar subjetivo y en el desempeño de la tarea entre grupos electrónicos y los de cara-a-cara. Sólo se encontraron diferencias entre los grupos electrónicos y cara-a-cara en el bienestar subjetivo y en el desempeño, cuando se tuvieron en cuenta más variables en el modelo: esto es, presión temporal y eficacia colectiva percibida. Además, la presión temporal fue especialmente un obstáculo para el desempeño de los grupos electrónicos cuando los grupos compartían creencias colectivas negativas sobre ellos. La presión temporal podría no ser sólo una demanda importante, sino también un reto para aquellos grupos que se sienten altamente eficaces. Sin embargo, nuestros resultados también pueden ilustrar un escenario positivo (incrementar la eficacia colectiva percibida) puesto que van en la línea de amortiguar los efectos negativos de la presión temporal, especialmente cuando se implementan nuevos sistemas de comunicación de grupo en el lugar de trabajo. Esto sugiere que las organizaciones que planeen implementar nuevos sistemas de comunicación de grupo deben utilizar estrategias para incrementar la eficacia colectiva percibida *antes* de la implantación de tales tecnologías.

Limitaciones

A pesar de la contribución de los resultados presentados en esta tesis, existen algunas limitaciones que deben mencionarse. Una de las limitaciones es que los datos fueron obtenidos mediante medidas de autoinforme, por lo que los resultados podrían estar contaminados por la varianza del método común. Sería interesante complementar estas medidas con otras más objetivas, tales como la observación (cf. Bakker, Demerouti,

y Euwema, 2004b). Aunque estos métodos podrían ser una alternativa, sufren de otros problemas que deben ser controlados, tales como los sesgos de los observadores, el efecto halo y los estereotipos (De Jonge, Van Breukelen, Landeweerd, y Nijhuis, 1999). Otra limitación es que el diseño de la investigación en los estudios 1, 2, y 3 fue transversal. Esto implica que las relaciones obtenidas entre las variables deben ser interpretadas con precaución y no pueden hacerse inferencias de tipo causal. Sin embargo, los estudios 4 y 5 fueron longitudinales, pero en este caso los participantes no fueron empleados `reales' en organizaciones `reales', sino estudiantes. Como consecuencia, los resultados de los estudios 4 y 5 no podrían generalizarse al universo de empleados y puestos. Otra limitación es que, a pesar de que los constructos psicológicos en España y Holanda fueron idénticos, las escalas utilizadas para evaluar demandas, recursos y compromiso organizacional no fueron exactamente los mismos.

Investigación futura

Los resultados obtenidos en la presente tesis sugieren la necesidad de continuar con el estudio de la estructura factorial del burnout y del engagement y la relación entre ellos desde una perspectiva transcultural. De acuerdo con la estructura del engagement, se necesitan más estudios para examinar el proceso de desarrollo de las dimensiones del engagement, de la misma manera que se ha estudiado con el burnout (Lee y Ashforth, 1996; Schaufeli y Enzmann, 1998). Se necesitan más análisis para corroborar los modelos "corazón" del burnout y del engagement en otras muestras y en otros países e investigar su relación con otros aspectos del trabajo (demandas y recursos laborales) y con algunas consecuencias

(Ej., absentismo, compromiso y satisfacción con el puesto). Esta investigación proporcionará información relevante sobre si las escalas del engagement ("opuesto" al burnout) siguen modelos similares con similares correlatos pero con signos opuestos. En términos generales esto nos permitirá optimizar el engagement en el puesto de trabajo y, como consecuencia, prevenir el síndrome de burnout. La evidencia para la relación negativa obtenida entre demandas y recursos sugiere que en futuros estudios se estudie el papel de los recursos como amortiguadores del impacto de diferentes demandas laborales en el proceso de estrés (Kahn y Byosiere, 1992). Esto implicaría el estudio del efecto de interacción entre altas demandas y bajos recursos que son responsables del proceso de erosión (burnout) así como del efecto de interacción entre altas/bajas demandas y altos recursos en el proceso de motivación (engagement) (Bakker *et al.*, 2004b).

Además, se necesitan estudios futuros que clarifiquen el papel de la carga mental en los trabajadores que trabajan con `datos'. Aunque la carga mental ha sido tradicionalmente considerada como una demanda laboral, investigaciones recientes sobre estrés en contextos de tecnología no la han considerado como tal (Bakker *et al.,* 2003a). Es cierto que el uso de la tecnología implica un esfuerzo mental. Los altos niveles de atención y concentración requeridos pueden provocar fatiga mental (Salanova, Cifre, y Martín, 1999; Wall, Corbet, Clegg, Jackson, y Martin, 1990). De acuerdo con Lorist, Klein, Nieuwenhuis, de Jonge, Mulder, y Meijman (2000) la fatiga mental genera consecuencias negativas (por ejemplo, un deterioro en el desempeño) puesto que se produce un decremento en los procesos de control cognitivo implicado en la planificación y en la preparación de actividades. Consecuencias negativas similares del esfuerzo mental sobre el

estrés y la reducción del bienestar han sido también señaladas por Zijlstra (1993). Sin embargo, Llorens y Salanova (2000) en un estudio sobre 140 empleados que trabajaban con TICs mostraron que a mayores niveles de demandas mentales se producían niveles más elevados de engagement y eficacia profesional y más bajos niveles de cinismo. Resultados similares se encontraron por Zijlstra, Roe, Leonora, y Krediet (1999) en un experimento llevado a cabo con oficinistas holandeses y rusos. En este estudio, los empleados holandeses respondían más favorablemente a las interrupciones, su estado emocional mejoraba y su esfuerzo se reducía. Sin embargo, con los empleados rusos se obtuvieron resultados opuestos. Según estos autores, la razón de esta divergencia en los resultados podría explicarse teniendo en cuenta las diferencias en cuanto a experiencias previas, destrezas y expectativas de los empleados. De este modo, podemos decir que los empleados *acostumbrados* a trabajar con altos niveles de carga mental interpretan este trabajo mental como normal. Como consecuencia, la sobrecarga mental podría percibirse como un reto, más que como un estresor. Así, las demandas mentales pueden producir un incremento de los sentimientos positivos y una reducción del esfuerzo.

Por otro lado, el modelo de Demandas-Recursos validado a nivel transcultural en esta tesis necesita ponerse a prueba mediante estudios longitudinales con al menos tres momentos de recogida de datos. De este modo, puede investigarse si las demandas y los recursos laborales en Tiempo 1 predicen el burnout y el engagement en Tiempo 2, y si el burnout y el engagement predicen el compromiso organizacional en Tiempo 3. Por lo que se refiere al burnout, se han llevado a cabo pocos estudios longitudinales respecto a cuáles son sus antecedentes y sus consecuencias (Schaufeli y Enzmann, 1998, p. 93-98). Si los estudios

longitudinales sobre el burnout son pocos, menos son los estudios longitudinales basados en la aproximación psicológica positiva (por ejemplo, el engagement). En futuros estudios debe examinarse un amplio rango de demandas y recursos laborales y poner a prueba el modelo incluyendo variables mediadoras (como por ejemplo, las creencias de eficacia) entre las condiciones de trabajo, burnout, engagement y compromiso organizaciona con diseños longitudinales. De acuerdo con Bandura (1997) las creencias de eficacia son un recurso personal muy importante para afrontar las demandas del puesto. De esta manera, aquellos con bajos niveles de eficacia muestran estrés debido a que perciben que las demandas de la tarea exceden sus capacidades percibidas, mientras que aquellos que creen en su eficacia, son capaces de hacer frente a elevados niveles de sobrecarga en el trabajo (Jex y Bliese, 1999). De acuerdo con Cherniss (1980) la falta de confianza en la propia competencia es un factor crítico en el desarrollo del burnout, mientras que altos niveles de eficacia conducen a un incremento en los niveles de engagement (Salanova *et al.,* 2001, 2004a).

Centrándonos en la aproximación positiva, nuestros resultados sugieren la necesidad de continuar con la investigación longitudinal sobre los modelos espirales de ganancias con muestras ocupacionales `reales' y en diferentes países, y con otros tipos de sistemas de comunicación. Además, será interesante utilizar un estudio longitudinal con tres momentos de recogida de datos que permitirá una interpretación más rigurosa de causalidad y de reciprocidad (Burisch, 2002; Rogosa, Brandt, y Zimowski, 1982). Finalmente, estudios futuros deberían incluir medidas colectivas (por ejemplo, engagement colectivo, eficacia colectiva) utilizando una metodología multi-nivel.

Conclusiones Finales

El objetivo de la presente tesis ha sido poner a prueba una ampliación del modelo de Demandas-Recursos (Demerouti *et al.,* 2001a) integrando tanto aproximaciones negativas del bienestar psicológico (burnout) como positivas (engagement) y una consecuencia organizacional (compromiso organizacional) en empleados que trabajan con `datos'. Para validar este modelo a nivel transcultural, dicho modelo fue puesto a prueba simultáneamente con empleados que trabajaban con TICs pertenecientes a dos países Europeos: España y Holanda. Para ello, se utilizaron análisis factorials confirmatorios, modelos de ecuaciones estructurales así como análisis multigrupo. Además, no sólo se utilizaron estudios transversales, sino también longitudinales. Dada la relevancia de la Psicología Ocupacionales Positiva (POP), se analizaron simultáneamente constructos positivos tales como recursos del puesto, recursos personales (tales como las creencias de eficacia) y el engagement. Estas variables positivas resultaron elementos relevantes en la generación de espirales positivas entre recursos de la tarea, creencias de eficacia y engagement a lo largo del tiempo. Sin embargo, en este caso la muestra estuvo compuesta por estudiantes en un contexto de laboraltorio y no por trabajadores "reales" en organizaciones "reales". Finalmente, dada la tendencia actual sobre el estudio de medidas colectivas de las creencias de eficacia, el papel de la eficacia colectiva percibida sobre el bienestar colectivo y el desempeño de la tarea también se estudió en usuarios de TICs que trabajan en grupo.

En conclusión, la introducción de TICs en el contexto laboral es imparable. Los cambios en la tecnología pueden tener consecuencias positivas para las organizaciones, puesto que favorece la supervivencia y competitividad empresarial en el mundo. A pesar de esos beneficios, ciertos

problemas técnicos, sociales y personales pueden tener consecuencias para los usuarios de TICs y para las organizaciones. La tecnología es neutral y no produce efectos negativos ni positivos *per se*. Nuestros resultados sugieren que la dirección de los efectos tecnológicos depende de la percepción de demandas y recursos (a través del proceso de erosión y motivación) y el efecto de los recursos personales tales como las creencias de eficacia. Para evitar riesgos y efectos psicosociales negativos de los cambios tecnológicos (*tecnoestrés*) en la vida organizacional, es fundamental garantizar una buena prevención y evaluación para recudir las demandas laborales e incrementar los recursos laborales y personales. Por otro lado, la introducción de TICs en el trabajo también puede convertirse en una fuente de engagement cuando se dispone de recursos del puesto adecuados y cuando los empleados disponen de altos niveles de eficacia para afrontar las demandas generadas por la tecnología. De hecho, existe evidencia de que los usuarios de TICs que disponen de recursos adecuados incrementarán su propia capacidad para realizar el trabajo, lo que hace que se sientan más vigorosos y más dedicados al trabajo a lo largo del tiempo. Además, aquellos que muestran altos niveles de engagement, son los que percibirán más recursos laborales en un futuro. Estos resultados proporcionan evidencia sobre la importancia de las creencias de eficacia en la teoría y en la investigación para optimizar y promover la salud de los trabajadores. Basándonos en el nuevo foco de la Psicología Positiva, la optimización del bienestar en la vida de los trabajadores facilitando la aparición del engagement y experiencias óptimas en el trabajo se ha convertidon en aspectos cruciales. La Psicología Ocupacionale Positiva (POP) es vista como una excitante aproximación en la investigación psicosocial future, así como en la filosofía de intervención y optimización en

las organizaciones. De este modo, *"el foco en el trabajo saludable y positivo es posible"* (Turner, Barling, y Zacharatos, 2002, p. 52) y además *"es una gran promesa"* (Fredrickson, 2002, p. 763). Sólo tenemos que creer que *"podemos".*