

**Exploring the Power of Self-efficacy at Work:  
Some Empirical Studies from the Social Cognitive  
Perspective**

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## **Chapter 1: Introduction**

The general purpose of the current thesis is to do an in-depth study of efficacy beliefs, employee well-being and performance, using the *Social Cognitive Theory (SCT)* of Albert Bandura (1997) as the main theoretical framework. This theory assumes that human beings adapt to the aspects they like in their environment, while they try to change the aspects they find undesirable. Another theoretical model considered in this thesis is the *Job Demands-Resources Model (JD-R)* (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Schaufeli & Bakker, 2004) which recognizes the uniqueness of each work environment; i.e., the specific organizational and job characteristics that are mainly responsible for employee well-being.

Based mainly on these theoretical frameworks, the general objectives of the current thesis are: 1) To extend the *JD-R Model* by including personal resources (i.e. self-efficacy) in predicting work-related well-being (i.e., burnout and engagement); 2) To design and validate a specific self-efficacy scale by following the recommendations of the *SCT*; 3) To test whether self-efficacy predicts work engagement and performance through job and personal resources; 4) To gain insight into the psychological mechanisms (i.e., motivational power of efficacy beliefs) that explain how transformational leadership predicts extra-role performance; 5) To understand the different perceptions about the psycho-social causes and consequences of accidents in the construction industry; 6) To examine the consequences of high levels of self-efficacy (i.e., overconfidence) and whether their positive or negative consequences depend on the type of activity being performed (i.e. learning, innovative and risky activities).

*The Social Cognitive Theory and Self-efficacy: The power of believing that you can...*

The *Social Cognitive Theory* derives from the *Social Learning Theory (SLT)* proposed by Miller and Dollard in 1941. This theory posits that if humans are motivated to learn a particular behavior, they will learn through clear observations and by imitating these observed actions (Miller & Dollard, 1941). Bandura (2008) has expanded upon and theorized the propositions of social learning. This expansion has resulted in the development of the *SCT*, which is applied in many different areas such as Work and Organizational Psychology. Bandura proposed that learning is not as simple as the *SLT* postulates and that multiple determinants influence behavior. Moreover, people can exercise influence over what they do, and they do their acts intentionally, which is human agency. The exercise of human agency raises the issue of freedom and determinism. Humans are not just reactive to external inputs in a preprogrammed robotic way. Rather, human agency operates within an interdependent causal structure, which involves triadic reciprocal causation among behavior, personal factors and the environment (Bandura, 1997; 2008).

The basic assumptions of the *SCT* are that: 1) human functioning is the product of the interaction among personal factors, behaviors and environment, and 2) efficacy beliefs are the basis of human agency that influences one's motivation to engage in specific positive behaviors related to high performance. In this way, efficacy beliefs are of great importance since they were missing elements in previous theoretical approaches.

The *SCT* defines *self-efficacy* as “beliefs in one's capacities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997,

p.3). Later, the *SCT* extended the conception of human agency to collective agency. *Perceived collective efficacy* is “a group’s shared belief in its conjoint capabilities to organize and to execute the courses of action required to produce given levels of attainments” (Bandura, 1997, p. 477). Perceived collective efficacy is not simply the sum of the individual efficacy beliefs, but an emergent group-level property governed by similar regulating proprieties, such as self-efficacy.

The *SCT* (Bandura, 1989; 1997; 2001a) postulates that the beliefs people have about themselves are key elements in the exercise of control and personal agency in which people are both products and producers of their own environments (Pajares, 1996). The *SCT* assumes that key personal resources are efficacy beliefs, which not only help to understand people’s behavior, but also the antecedents and consequences of these behaviors. Given the centrality of efficacy beliefs in people’s lives, being able to understand and measure them is crucial to predict human behavior. Efficacy beliefs influence behavior through goals and aspirations, outcome expectations, affective states, and the perceptions of impediments and opportunities in the social environment. In this way, efficacy beliefs influence people’s thinking (optimistically or pessimistically in self-enhancing or self-debilitating ways), the courses of action people choose to pursue, the goals and commitment they set for themselves, how much effort they put in their activities, the outcome they expect their efforts to produce, their resilience to adversity, the quality of their emotional life, how much stress and depression they experience, as well as all the choices they make in their life. Thus, people with high efficacy beliefs perceive troubles as challenges, are highly committed to the activities they carry out, invest more time and effort in their daily activities, think strategically to resolve difficulties, recover easily from failure, feel they are in control of the majority of

stressors and, furthermore, feel they are less vulnerable to stress and depression (Bandura, 1997, 2008). These concepts have led to many researchers to conclude that, in general, high levels of self-efficacy relate to positive and desired results (see Salanova, Schaufeli, Xanthopoulou, & Bakker, 2009 and Stanjovic & Luthans, 1998 for reviews), but other points of view exist. Even the *SCT* (Bandura, 1997) points out that an exaggerated sense of personal efficacy could “blind” a person when he/she faces some difficulties or risks, thus leading to negative effects.

According to Bandura (1997), self-efficacy can develop through four fundamental sources: (1) mastery experiences: past experiences of success or command, (2) vicarious experience by observing the successes and failures of others, (3) verbal persuasion, and (4) physiological states or emotional activation. Thus, the combination of these four sources produces self-efficacy perceptions through cognitive (i.e. imagining goals, predicting difficulties), motivational (i.e., anticipating outcomes, planning goals), affective (i.e., coping with stressing situations, controlling negative thoughts) and selection processes (i.e., approaching or avoiding concrete situations).

Bandura (2001) also affirms that efficacy beliefs differ in generality, strength and level. People may judge themselves efficacious across a wide range of activity domains, or only in certain domains of functioning. Generality can vary across types of activities, the modalities that express capabilities (behavioral, cognitive or affective), situational variations and the types of individuals toward whom behavior is directed. Assessment linked to activity domains, situational contexts and social aspects reveals the patterning and degree of generality of people’s beliefs in their efficacy. Therefore, Bandura (2001b, 2006) defends the specificity of efficacy beliefs in accordance with the domain of functioning. For this reason, there has been much criticism of the use of



general and non specific self-efficacy scales. He argued that it is futile to measure self-efficacy with a general scale because items of tests based on the general efficacy are not relevant enough for the domain under study.

Efficacy beliefs also vary in strength. Weak efficacy beliefs relate easily to unpleasant experiences, whereas people who have a tenacious belief in their capabilities will persevere in their efforts despite innumerable difficulties and obstacles. Adversity does not easily dissuade them. Thus, the stronger the personal efficacy, the greater perseverance and the more likelihood of a successful performance of the chosen activity. Finally, people designate efficacy beliefs in terms of level; that is, the number of activities that individuals judge themselves capable of performing above a selected cut-off value of efficacy strength.

Briefly, efficacy beliefs have effects on people's ways of thinking, feeling and acting. The motivational effect of self-efficacy influences decisions (selective effects), effort and persistence (motivational effects) through self-regulatory mechanisms, but these mechanisms depend on the environment. In this sense, previous empirical studies generally support that efficacy may designate the way individuals perceive their environment.

If we apply the *SCT* to Work and Organizational Psychology, we may consider efficacy beliefs to be a component of a dynamic interaction of personal factors (self-efficacy), the environment (job and organizational demands and resources) and work-related well-being (burnout and work engagement). Thus, self-efficacy would designate the way that employees perceive the job demands and resources available at their workplace. In fact, efficacy beliefs have been included in a recent expansion

(Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007) of the *JD-R Model* (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Schaufeli & Bakker, 2004).

#### *The Job Demands-Resources Model*

The *JD-R*, (Demerouti et al., 2001), explains that the employee's work conditions can be categorized into "job demands" and "job resources", which are specific for each occupation and that relate in different ways to positive and negative outcomes. *Job demands* are those physical, social or organizational aspects of the job that require sustained physical and/or psychological effort (cognitive or emotional) and which, therefore, associate with physiological and/or psychological costs. Although these demands are not necessarily negative, they become job stressors when they require an effort and/or certain costs that produce negative effects: depression, anxiety or burnout (Schaufeli & Bakker, 2004).

*Job resources* are those physical, psychological, social and organizational aspects of the work that reduce associated demands and costs. In addition, they are functional in the attainment of occupational goals, and stimulate growth and personal development (Schaufeli & Bakker, 2004). With regard to the relationship between demand-resources and psychological well-being, the imbalance that employees perceive between job demands-resources affects their work-related well-being which may develop into burnout, defined as "a prolonged response to chronic emotional and interpersonal stressors on the job, and is defined by the three dimensions of exhaustion, cynicism and professional inefficacy" (Maslach, Schaufeli, & Leiter, 2001, p. 397).

Later, Schaufeli and Bakker's *Dual Process Model* (2004) extended the *JD-R Model*. These researchers consider not only negative but also positive outcomes regarding job demands and resources. Their *Dual Model's* prediction is that while job

demands relate to burnout, job resources relate to work engagement. As such, job resources initiate a motivational process which may lead to work engagement and positive organizational outcomes, including enhanced performance (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004).

Work engagement is defined as “a motivational and positive state of mind related to work that is characterized by vigor, dedication and absorption” (Schaufeli, Salanova, González-Romá, & Bakker, 2002, p. 74). As regards the analytical level of the motivational process of the *JD-R*, several studies have gone into the effect of job resources on work engagement and positive organizational outcomes, such as organizational commitment or high job performance (Bakker & Demerouti, 2007; Ryan & Frederick, 1997; Salanova, Agut & Peiró, 2005; Schaufeli & Bakker, 2004). However, little is known about the psychological mechanisms that underlie this motivational process, such as the motivational power of self-efficacy and its contextual antecedents, for instance, transformational leadership. This thesis considers transformational leadership an important source of self-efficacy based on the vicarious experience and the role model represented by the leader.

#### *Transformational leadership*

Transformational leadership is generally defined in terms of the leader's behaviors and its effects on followers (Dvir & Shamir, 2003). Idealized influence, inspirational motivation, intellectual stimulation and individualized consideration characterize a transformational leader. *Idealized influence* reflects the extent to which leaders choose to do what is right rather than what is simple or expedient. *Inspirational motivation* relates not only to how leaders challenge employees to do their very best, but to how they convince both employees and work groups that they can perform beyond

expectations. *Intellectual stimulation* consists in encouraging employees to think for themselves, challenging cherished assumptions about the way in which work takes place, and thinking about old problems in new ways. *Individualized consideration* reflects how leaders care for the work-related development of their employees by promoting social support.

In this way, the elements of transformational leadership have the potential to affect employees' perceptions (Zohar & Tenne-Gazit, 2008). Regarding the relationship between transformational leadership and efficacy beliefs, some authors (Kirkpatrick & Locke, 1996; Shamir, House, & Arthur, 1993) affirm that transformational leaders enhance followers' efficacy beliefs by emphasizing positive visions, communicating high performance expectations and adequate feedback, and expressing confidence in followers' abilities to contribute to the mission and goals of their organization. Thus, a transformational leader can increase followers' efficacy through modeling and verbal persuasion, which are two of the major sources of self-efficacy (Walumbwa, Avolio, & Zhu, 2008). Unfortunately, research so far has mainly focused on outcomes of efficacy beliefs. As a result, little is known about the antecedents of self-efficacy, i.e. transformational leadership, that may also influence organizational outcomes such as job performance.

### *Performance*

In industrial-organizational psychology, work-related performance is one of the most focal variables to which efficacy beliefs relate (Judge, Jackson, Shaw, Scott, & Rich, 2007). Meta-analytic evidence suggests that efficacy beliefs relate rather strongly to performance (see Stanjkovic & Luthans, 1998, for a review). Moreover, research has consistently revealed that transformational leadership also positively relates to work-

related outcomes (Dumdum, Lowe, & Avolio, 2002; Fuller, Patterson, Hester, & Stringer, 1996; Lowe, Kroeck, & Sivasubramaniam, 1996). However, the question about the main underlying processes and psychological mechanisms by which transformational leaders exert their influence on followers' performance has been less studied (Kark, Shamir, & Chen, 2003).

Specifically, extra-role performance is an important indicator of the consequences of transformational leadership. The behaviors of those employees that do not form part of their formal job requirements and cannot be prescribed or required in advance for a given job, define extra-role performance (Bateman & Organ, 1983). Another term for extra-role performance is organizational citizenship behavior (OCB), defined as "individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system and that in the aggregate promotes the effective functioning of the organization" (Organ, 1988, p. 4). Specifically, "these behaviors contribute to the maintenance and enhancement of the social and psychological context that supports task performance" (Organ, 1997, p. 91). It does not refer to formal expectations of the job, but contributes to the evaluation of the overall job performance.

Transformational leadership has been associated with excellent performance in both correlational (Howell & Hall-Merenda, 1999) and quasi-experimental research (Barling, Kelloway, & Weber, 1996). Research of the latter type found that the effect of transformational leadership on performance is indirect and that different attitudes, such as employee morale, mediate it. Walumbwa, Avolio, and Zhu, (2008) revealed that efficacy beliefs partially mediate the positive effect of transformational leadership on performance. Moreover, Williams (1994) showed that transformational leaders display

extra-role behaviors on subordinates, such as altruism, conscientiousness, sportsmanship, courtesy, etc.; that is to say, extra-role performance.

Regarding the relationship between work engagement and extra-role performance, Salanova, Agut, and Peiró (2005) showed that levels of work engagement also relate to employee extra-role performance. This study showed that the higher the work engagement, the better the extra-role performance of service employees as assessed by their customers which, in turn, increase customer loyalty. Interestingly, Demerouti and Bakker (2006) concluded that negative indicators of well-being, such as burnout, do not show strong negative relationships with performance as one would expect, but positive indicators of well-being, such as work engagement, seem to relate more strongly with performance than negative ones.

Accordingly, Xanthopoulou, Bakker, Heuven, Demerouti, and Schaufeli (2008) found that work engagement mediates the relationship between self-efficacy and (in-role and extra-role) performance. Specifically, work engagement partially mediates the relationship between self-efficacy and in-role performance, whereas work engagement fully mediates the relationship between self-efficacy and extra-role performance. Moreover, Borman, and Motowidlo (1997) showed that engaged employees are more likely to perform activities that are not part of their formal role requirements (i.e., extra-role performance), but nevertheless promote organizational effectiveness. Seeley (2007) also found a positive and significant correlation between engagement and extra-role performance, understood as organizational citizenship behavior. To conclude, there are many studies that link the main variables included in this thesis with job performance and extra-role performance.

If we take past research into account, the innovativeness and uniqueness of this thesis lies in the fact that we have taken one step forward by testing the predicting role of self-efficacy on job performance through job and personal resources and, by examining a work contextual variable that provides extra-role performance through efficacy beliefs and work engagement, namely transformational leadership.

### **A deeper overview of the current thesis: specific research aims**

The thesis presents six empirical studies and has six main general objectives:

The first objective is to extend the *JD-R Model* (Demerouti et al., 2001) by including personal resources (i.e. self-efficacy) in the prediction of work-related well-being (i.e. burnout and engagement). **Chapter 1** covers both the erosion (job demands – burnout) and the motivational (resources – engagement) processes of the *JD-R* (Schaufeli & Bakker, 2004), by including self-efficacy. The sample comprises 274 teachers from 23 Spanish secondary schools.

The second objective of the current thesis is to show the procedure that has been carried out to design and validate a specific self-efficacy scale by following the recommendations of the *SCT*. Bandura (2001b, 2006) criticized the use of general and non specific self-efficacy scales. He argued that it is futile to measure self-efficacy with a general scale because items of the tests based on general efficacy are not relevant enough for the domain under study. Self-efficacy scales must adapt to a particular domain of interest and reflect an exhaustive study of the chosen domain. We must identify what is important for each item so that the results provide information about self-efficacy only in our particular domain. **Chapter 3** rigorously explains how to

design and validate a specific self-efficacy scale for construction workers following Bandura's recommendations. By combining the Critical Incident Technique (Flanagan, 1954) with a qualitative content analysis, we identified the main obstacles perceived by construction workers, which served as a basis to develop the scale items. We validated the scale in a sample composed of 265 construction workers. This scale is used in the next chapter, to measure construction workers' self-efficacy levels.

The third objective is to test whether self-efficacy predicts work engagement and performance through job and personal resources. Thus, **Chapter 4** tests the motivational process of the *JD-R Model* and extends the model by including self-efficacy as an antecedent of the whole process. Specifically, we are interested in the motivational process of the *JD-R Model* by examining whether self-efficacy predicts work engagement and job performance through job and personal resources. Several studies have focused on how job or personal resources relate with work engagement (Hakanen, Bakker, & Schaufeli, 2006; Mauno, Kinnunen, & Ruokolainen, 2007; Salanova, Agut, & Peiró, 2005; Schaufeli & Salanova, 2007), but few studies (Bakker & Demerouti, 2008; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007) have taken into account both kinds of resources and the predicting role of self-efficacy. A total of 228 Spanish construction workers composed the study sample and attended a semi-structured interview.

The fourth objective is to gain insight into the psychological mechanisms that underlie how transformational leadership predicts extra-role performance. **Chapter 5** goes one step forward and attempts to gain insight into these mechanisms (i.e., motivational power of efficacy beliefs) which underlie how transformational leadership predicts extra-role performance (as assessed by supervisors). We conducted this study



with a sample of 280 nurses from different health services from a large hospital in Lisbon where I, personally, had a placement to do a European thesis.

The fifth objective is to test the different perceptions of the psycho-social causes and consequences of accidents in the construction industry. Thus, **Chapter 6** attempts to examine these perceptions by using a qualitative methodology for the data analyses. We did a category-type analysis of the contents derived from a focus group formed by heterogeneous members, all of whom were experts on topics related to the psychosocial factors in the construction sector. We also used the data obtained from 7 individual interviews carried out with experts from the construction sector. The results show a consensus exists about the causes of occupational accidents; overconfidence and physical risks perceived as a challenge rather than as a danger are the main causes of many accidents. This qualitative study partly inspired the preparation of the next chapter because all the participants in the current study noted that overconfidence in the construction sector (this is a risky setting) relates with negative consequences. So we wondered about this and started a new study about this topic of overconfidence in risky settings in an attempt to test whether the same occurs in other activity settings such as learning and innovation performances.

The sixth objective of this thesis is to learn the consequences of high levels of self-efficacy (i.e., overconfidence) and to examine whether the consequences of efficacy beliefs depend on the type of activity being performed (i.e., learning, innovative and risky activities). Thus, the objective of **Chapter 7** is to analyze the role of efficacy beliefs (self-efficacy, collective efficacy) in predicting learning, innovative and risky performances using the *SCT* as the theoretical framework. Past research suggests that high levels of self-efficacy associate with positive aspects. However, it seems that high

self-efficacy in the earlier stages of the learning processes, relates to low performance over time. However there is no research available in occupational risky settings, which require safety-related responses. Moreover, Bandura noted (personal communication, Stanford, October 2005) that efficacy beliefs have a different impact on both the activities that involve risks and those that imply creative/innovative behaviors. For these reasons we compared the effects of high levels of efficacy beliefs on the three activity settings: learning, innovative and risky. The *SCT* theory assumes that self-efficacy perceptions influence one's motivation to engage in specific positive behaviors such as high performance. This study suggests that this influence depends on the type of activity being performed. We conducted 3 studies in 3 different settings: a two-wave field longitudinal study among 527 undergraduate students (learning setting), a three-wave laboratory longitudinal study among 165 university students performing innovative group tasks (innovative setting), and a field study among 228 construction workers (risky setting).

Finally, **Chapter 8** summarizes the findings of the previous studies and discusses the theoretical, methodological and practical implications. Moreover, we identified some limitations of the research presented in the thesis and we make suggestions for future research.

This thesis combines quantitative and qualitative methodology, cross-sectional and longitudinal studies of both field and laboratory kind using six different samples from different occupational fields, while part of the hypotheses were tested in different countries, which adds to the generalizability of the findings.

## **Chapter 2**

# **Extension of the Job Demands-Resources Model in the Prediction of Burnout and Engagement among Teachers over time<sup>12</sup>.**

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<sup>1</sup> This chapter is based on the article Lorente, L., Salanova, M., Martínez, I. & Schaufeli, W.B. (2008) Extension of the Job Demands-Resources model in the prediction of burnout and engagement among teachers over time. *Psicothema*, 20, 354-360.

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**Summary**

Our objective was to extend the *Job Demand-Resources Model (JD-R)* (Schaufeli & Bakker, 2004) by including personal resources (self-efficacy), job demands and job resources to predict burnout (exhaustion, cynicism and depersonalization) and work engagement (vigor and dedication). The sample comprised of 274 teachers from 23 secondary schools of the Valencian Community (Spain). Hierarchical multiple regression analyses, using a two waves longitudinal design with a one-year time lag, showed that the significant relationships between: 1) quantitative overload and role ambiguity with exhaustion, and 2) role ambiguity with cynicism, vigor and dedication, disappear when controlling by the baseline level at T1. Self-efficacy at T1 significantly predicted burnout (cynicism) and engagement (vigor and dedication) at T2, but not when controlling for baseline levels of burnout and engagement at T1. Practical implications and directions of future research are discussed.

## **Introduction**

Teaching has been considered a high-stress occupation (Gold & Roth, 1993), and is an internationally recognized problem. For example, the new Spanish “Statutory Law of Quality of Education” (LOCE, 2002), considers the necessity to modify the way to proceed (Álvarez, Castro, Field-Mon, & Álvarez-Martino, 2005). This law has meant an increase of job demands of teachers because they must have competences that exceed the didactic and pedagogic competences that teachers have fundamentally obtained. Sometimes, this situation generates a high degree of displeasure because teachers do not perceive enough resources to face new demands.

This study focuses on the psychological well-being of teachers and aims to examine the main demands and resources of teachers’ work and how these relate to their levels of well-being (burnout and engagement).

### *Job demands and resources*

The *JD-R Model* (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Schaufeli & Bakker, 2004), proposes that employees’ work conditions can be categorized into demands and resources. They relate in different ways to positive and negative outcomes, and can be typical of specific occupations.

Job demands are physical, psychological, social or organizational aspects of work that require a physical and/or psychological effort (cognitive or emotional), and are associated with certain physiological and/or psychological costs. Although these demands are not necessarily negative, they become job stressors when they require an effort and/or they require certain costs that produce negative effects: depression, anxiety or burnout (Schaufeli & Bakker, 2004). Based on previous research (Llorens, García-Renedo, & Salanova, 2005; Salanova, Llorens, & García-Renedo, 2003; Salanova,

Martínez, & Lorente, 2005), this study includes the main job demands of teaching occupations: quantitative overload, mental and emotional demands, role stress (role ambiguity and role conflict).

Conversely, job resources relate to social, psychological, physical and organizational aspects that reduce the associated demands and costs. Additionally, they are functional in the attainment of job goals and stimulate personal growth and development (Schaufeli & Bakker, 2004). Also, based on previous research (Llorens, García-Renedo, & Salanova, 2005; Salanova, Llorens, & García-Renedo, 2003; Salanova, Martínez, & Lorente, 2005), we included the main job resources of teaching occupations namely job autonomy and social support climate.

With regard to the relationship between demands-resources and psychological well-being, Maslach, Jackson, and Leiter (1996) hypothesized that the presence of specific demands and the absence of specific resources predict burnout, leading to negative results like job rotation, absenteeism and reduction of organizational commitment.

Schaufeli and Bakker's extension of the *JD-R* (2004) considers negative and positive results. This model predicts that while job demands are related to burnout, job resources are related to engagement.

#### *Personal resources*

The main aim of our study is to extend the *JD-R* (Schaufeli & Bakker, 2004) by including personal resources. That is, aspects of the self generally associated with resiliency and which refer to the individual sense of one's ability to control and impact the environment successfully (Hobfoll, Jonson, Ennis, & Jackson, 2003). These authors

define personal resources as people's mental characteristics which reduce the negative impact of demands on psychological well-being.

Diverse studies have emphasized that personal resources remarkably influence psychological well-being (Cummins & Nistico, 2002). Likewise, Xanthopoulou, Bakker, Demerouti, & Schaufeli (2007) recently reveal that personal resources play a significant role in the *JD-R* since they explain variance in exhaustion and work engagement together with job demands and job resources. Conversely, personal resources allow individuals to address and confront external/internal demands in stressful situations (Durán, Extremera, King, Fernandez-Berrocá, & Montalbán, 2006).

This, along with the *JD-R* prediction, is the reason we include personal resources in our study, which enrich and extend the model.

We have considered self-efficacy as the main personal resources because the recent psychosocial research has shown the strong power of the efficacy beliefs in different domains, for example like mechanism of facing in situations of occupational stress (Salanova, Bresó, & Schaufeli, 2005; Schmitz, 2000).

Bandura (1997, p.3), defines perceived self-efficacy as "beliefs in one's capacities to organize and execute the courses of action required to produce given attainments". Bandura (1989; 2001) emphasizes that personal resources may function either as moderators or as mediators in the relationship between environmental factors and organizational outcomes, or they may even determine the way people comprehend the environment, formulate it and react to it (Judge, Locke, & Durham, 1997). Thus personal resources may either moderate the effect of demands on negative outcomes or they may be activated by available job resources, leading to positive outcomes (work engagement), (Hobfoll & Shirom, 2001).

*Teachers' well-being*

The imbalance that teachers perceive between job demands-resources affects their psychological well-being at work, which may lead to burnout. Burnout has been defined as “a prolonged response to chronic emotional and interpersonal stressors on the job, and is defined by the three dimensions of exhaustion, cynicism and professional inefficacy” (Maslach, Schaufeli, & Leiter, 2001, p. 397).

Emotional exhaustion refers to the depletion or draining of emotional resources, possibly caused by interpersonal demands. Cynicism reflects an indifferent or distant attitude toward one's work, and lack of professional efficacy encompasses both social and nonsocial aspects of occupational accomplishment.

Empirical studies show that exhaustion and cynicism constitute the so-called “core of burnout” (CoB) (Green, Walkey, & Taylor, 1991). However, recent studies confirm a tri-factorial structure included in the CoB, exhaustion, cynicism, and depersonalization (Salanova, Llorens, García, Burriel, Bresó, & Schaufeli, 2005). Cynicism and depersonalization are manifestations of “mental distancing” regarding the broader context of the job itself (cynicism), and toward the people one works with (depersonalization).

Moreover, previous studies also reveal that professional efficacy does not act as a dimension of burnout itself, rather as a leading cause of it (García, Llorens, Cifre, & Salanova, 2006). Based on these proposals, we only use variables that form the CoB.

As previously shown, job resources relate to engagement (Xanthopoulou, et al., 2007), defined as a motivational and positive construct related to work that is characterized by vigor, dedication and absorption (Schaufeli, Salanova, González-Romá & Bakker, 2002).



Vigor is characterized by high levels of energy displayed at work and dedication by high levels of meaning of work. Enthusiasm and challenge relate to the work one does, while absorption refers to complete concentration and happiness at work when “time flies”.

Although traditionally considered the three dimensions of engagement, empirical studies demonstrated that the core of engagement is formed by vigor and dedication (Schaufeli et al., 2002), and that absorption is possibly a consequence of engagement.

Regarding the relationship between demands and resources and psycho-social well-being, previous studies on predictions of how demands and resources influence psycho-social well-being, have not controlled the baseline levels of previous psycho-social well-being (burnout and engagement at T1 in our study). The fact that the levels of demands and resources in teaching work at the beginning of the academic year (T1) influence how teachers feel when the course finishes (T2) will also depend on how teachers feel at the beginning of the course. Demands and resources are expected to vary at the beginning and at the end of the course simply because demands accumulate and resources are reduced during the initial and the final weeks of the academic year. The idea is that at the beginning of the academic year, demands and resources will predict levels of burnout and engagement at the end of the academic year. However, it is important to know whether demands and resources predict well-being at T2.

According to previous research, our objectives are (1) to study how teachers’ demands and resources predict psychological well-being over time, and (2) whether this prediction is still significant when controlling by baseline levels of well-being at T1.

Based on these objectives, we hypothesized two general predictions:

*Hypothesis 1:* Job demands will positively predict burnout (exhaustion, cynicism and depersonalization) and negatively predict engagement (vigor and dedication). The more demands, the more burnout and the less engagement.

*Hypothesis 2:* Resources (job and personal) will negatively predict burnout (exhaustion, cynicism and depersonalization) and positively predict engagement (vigor and dedication). The more resources, the less burnout and the more engagement.

This study offers three innovations: it is an extension of the *JD-R* as it considers personal resources besides job resources; well-being is considered negatively (burnout) and positively (engagement); it has a longitudinal design with two waves of data collection when controlling by baseline levels of well-being at T1.

## **Method**

### *Participants and Procedure*

A follow-up study with two waves was performed among Spanish secondary school teachers. At the beginning of the academic year, a letter was sent to 50 secondary schools explaining the research objective. Self-report questionnaires, with scales measuring the main variables of this study plus other scales related to psychological well-being, were distributed among 600 secondary teachers at these schools and were posted back to the university. In total, 484 respondents from 34 schools returned the questionnaire at T1 at the beginning of the academic year (81% response rate). Eight months later at the end of the academic year (T2), identical questionnaires were distributed among the same schools. After deleting missing cases, 274 teachers (57% women, 43% men) from 23 schools had completed both questionnaires. Their scores were used in longitudinal analyses (T1-T2). Thus, 57%

of the teachers participated at both T1 and T2. The mean sample age was 40 years ( $SD = 7.01$ ).

To test whether drop-outs differed from the panel group, we compared the T1 background variables of both groups [i.e. age, gender, type of school (private vs. public) and teaching experience], and also burnout and engagement dimensions (exhaustion, depersonalization, cynicism, vigor and dedication). Results from ANOVAs and Chi-square analyses showed no significant inter-group differences. We concluded that the panel group did not differ from drop-outs in both terms of background variables, and burnout and engagement dimensions.

### *Variables*

Five groups of variables were considered: job demands, job resources, personal resources, burnout and engagement. Cronbach's  $\alpha$  appears in Table 1, showing that all variables had an alpha coefficient higher than .70 (Nunnally & Bernstein, 1994), and the most demanding criterion .80 (Henson, 2001). There was only an exception of depersonalization at T1 ( $\alpha = .63$ ) and T2 ( $\alpha = .64$ ).

#### *Job Demands*

Quantitative overload was measured with the questionnaire of Beehr, Walsh, and Taber (1976), which includes 3 items (item example: "*I have too much work to be able to do it absolutely well*").

Mental and emotional demands were measured with the questionnaire of Van Veldhoven and Meijman (1994), with 6- and 7-item scales, respectively (item example of mental overload: "*My work requires that I am continuously thinking about what I have to do*"; item example of emotional overload: "*I must confront subjects in my work that affect me personally*").

Role ambiguity and conflict were measured using the scales of Rizzo, House, and Lirtzman (1970) with 6 and 8 items, respectively (item example: “*I clearly know what my responsibilities are (reverse)*”; item example of role conflict is: “*I do what is acceptable for some people but not for others*”).

#### *Job resources*

Autonomy was measured using the questionnaire of Jackson, Wall, Martin, and Davis (1993) formed by 5 items (item example: “*I can decide what tasks I will do everyday*”).

We used the climate scale of questionnaire FOCUS (Van Muijen et al., 1999) to measure support climate, with 3 items (item example “*People help mutually to finish the work correctly*”).

#### *Personal resources*

Self-efficacy was measured with an adapted and specific version for the work context, of the generalized self-efficacy scale (Schwarzer, Schmitz, & Daytner, 1999). Items were reworded to work specific situation. Item example: “*I will be able to solve difficult problems at my work if I try*”.

#### *Burnout*

Burnout dimensions were measured using different versions of the MBI. Thus, exhaustion and cynicism were measured using the Spanish version of the MBI-GS (Schaufeli et al., 2002) using 5 and 4 items, respectively (item example: “*I am emotionally exhausted by my work*”. Item example: “*I have lost interest in my work since I began this job*”).

We used the scale of the MBI-HSS of Maslach, Jackson, and Leiter (1996) formed by 5 items to measure depersonalization (item example: “*I really don't mind*

*what will happen to some people who I must work for in my work*”). These scales of burnout have been validated by Salanova et al., (2005).

### *Engagement*

The vigor and dedication dimensions were measured using the Spanish adaptation of the Utrecht Work Engagement Scale (UWES) (Schaufeli et al., 2002) formed by 3 items each. (Item example: “*In my work, I feel bursting with energy*”, with an item example like: “*My work is challenging*”).

All questionnaire items were answered using a 7-value Lickert scale, ranging from 0 (never/nothing) to 6 (always, everyday) excepting to self-efficacy scale, witch was scored on a four-point scale.

### *Data analyses*

To achieve our objectives, descriptive analyses and internal consistence were performed for each scale. Correlations of all variables were done at T1, T2, and relating T1 to T2. A T-test was carried out to verify possible significant differences between both times. An ANOVA verified whether drop-outs could be due to levels of teachers’ well-being. Finally, hierarchical multiple regression analyses were done using the method of successive steps (Cohen & Cohen, 1983). Independent variables were introduced into the equation in 5 successive steps (Aiken & West, 1991). In the first step (1), age and gender were introduced as control variables since some previous studies found differences in the levels of well-being based on age/gender. For example, Maslach, Schaufeli, and Leiter (2001) found the level of burnout of younger employees to be higher than those aged over 30 or 40, and that males often score higher on cynicism. Regarding engagement, Salanova and Schaufeli (2004) affirm that older people and men present higher levels of engagement. The remaining steps were: step 2,

job demands; step 3, job resources; step 4, personal resources; step 5, the possible effect of the baseline level of burnout and engagement dimensions at T1.

## Results

### *Descriptive analyses*

See Table 2.1 for the descriptive analyses of the different scales at T1 and T2 with their reliability (Cronbach's alpha). The T-test shows that mental demands decreased significantly throughout the academic year and that role ambiguity significantly increased. Support climate also shows significant differences, and decrease at the end of the academic year. Regarding well-being, levels of burnout increased throughout the academic year while levels of engagement decreased. Only exhaustion presented significant differences between T1 and T2 when teachers felt more exhausted at the end of the academic year (T2).

Table 2.1

*Means (M), Standard deviations (SD), internal consistencies (Cronbach's  $\alpha$ ) and T- test of the study variables (N=274)*

VARIABLES	T1			T2			T1-T2	
	M	SD	$\alpha$	M	SD	$\alpha$	t	p
Quantitative overload	2.66	0.67	.93	2.58	1.44	.91	1.11	n.s.
Mental demands	4.07	0.95	.82	3.98	0.86	.82	1.96	.05
Emotional demands	3.98	1.09	.85	3.94	1.02	.85	.97	n.s.
Role ambiguity	1.64	0.78	.82	1.72	0.82	.83	-2.15	.05
Role conflict	2.54	1.17	.82	2.5	1.15	.84	.66	n.s.
Autonomy	4.24	1.18	.91	4.11	1.18	.93	1.68	n.s.
Support climate	3.70	1.06	.86	3.54	1.06	.86	2.81	.005
Self-efficacy	3.93	0.87	.92	4.02	0.81	.94	-1.81	n.s.
Exhaustion	2.11	1.06	.87	2.21	1.18	.81	-2.25	.05
Depersonalization	1.07	0.82	.63	1.06	0.75	.64	.55	n.s.
Cynicism	1.71	1.16	.83	1.75	1.23	.85	-.81	n.s.
Vigor	4.12	0.93	.83	4.06	0.93	.85	1.47	n.s.
Dedication	3.88	1.13	.90	3.86	1.10	.89	-.60	n.s.

With regard inter-correlations, most were significant and as expected. Demands positively and significantly correlated with burnout, and negatively correlated with engagement. Resources negatively and significantly correlated with burnout, and positively correlated with engagement.

### *Regression analyses*

The results show an increase of variance explained in the successive steps. This shows the importance of step 5, the baseline level of well-being in T1, to evaluate the unique effect of job demands and resources on well-being at T2.

The results in Table 2.2 refer to the exhaustion variable. We see that when the level of exhaustion in T1 is introduced into step 5, the significant prediction of quantitative overload disappear.

Table 2.2  
*Hierarchic regression analyses for the demands and resources at T1 predicting exhaustion at T2 (N=274)*

Variables in T1	<i>B</i>	Error <i>B</i>	$R^2$	$\Delta R^2$	$\beta$
Step 1					
Gender	.60	.14	.64	.08***	.25***
Step 2					
Gender	.58	.12			.24***
Quantitative overload	.21	.04			.30***
Role ambiguity	.28	.08	.31	.19***	.18*
Step 3					
Gender	.57	.12			.24***
Quantitative overload	.21	.04	.31	.25	.30***
Step 4					
Gender	.51	.12			.21***
Quantitative overload	.20	.04	.33	.03**	.29***
Step 5					
Gender	.27	.09			.11*
Exhaustion	.73	.05	.61	.01***	.66***

With regard to the predictors of cynicism (Table 2.3), we can see that the most predicting variable is self-efficacy, but this effect disappear when controlling by baseline levels of cynicism at T1.

Table 2.3  
*Hierarchic regression analyses for the demands and resources at T1 predicting cynicism at T (N=274)*

Variables in T1	B	Error B	R <sup>2</sup>	ΔR <sup>2</sup>	β
Step 1					
Age	.20	.09			.13*
Gender	.38	.15	.03	.08*	.15*
Step 2					
Age	.20	.08			.13*
Gender	.41	.14			.16*
Role ambiguity	.38	.09	.22	.02***	.24***
Step 3					
Age	.18	.08			.12*
Gender	.41	.14			.16**
Role ambiguity	.43	.10	.23	.03	.27***
Step 4					
Gender	.31	.14			.12*
Role ambiguity	.32	.10			.20**
Autonomy	.13	.06			.13*
Self-efficacy	-.32	.08	.27	.03***	-.23***
Step 5					
Gender	.26	.11			.10*
Role ambiguity	.18	.08			.11*
Cynicism	.63	.05	.53	.02***	.60***

Regarding to depersonalization, Table 2.4 shows that there are no significant predictors excepting to the levels of depersonalization at T1 which are introduced in step 5.

Table 2.4  
*Hierarchic regression analyses for the demands and resources at T1 predicting depersonalization at T2 (N=274)*

Variables in T1	B	Error B	R <sup>2</sup>	ΔR <sup>2</sup>	β
Step 1			.005		
Step 2					
Role conflict	.10	.05	.10	.02 ***	.15*
Step 3					
Role conflict	.11	.05	.11	.04	.17*
Step 4					
Role conflict	.11	.05	.11	.03	.16*
Step 5					
Depersonalization	.53	.05	.38	.02***	.58***

Next, the same analyses were done but the engagement dimensions were introduced as dependent variables.



Step 5 in table 2.5, shows the importance of the previous levels of vigor measured at T1 since all the previous significant predictors (role ambiguity and self-efficacy) disappear at this step.

Table 2.5  
*Hierarchic regression analyses for the demands and resources at T1 predicting vigor at T2 (n= 274)*

Variables in T1	<i>B</i>	Error <i>B</i>	$R^2$	$\Delta R^2$	$\beta$
Step 1			.007		
Step 2					
Role ambiguity	-.46	.07	.15	.02***	-.39***
Step 3					
Role ambiguity	-.42	.08	.16	.03	-.36***
Step 4					
Role ambiguity	-.34	.08			-.29***
Self-efficacy	.23	.07	.19	.03**	.21**
Step 5					
Vigor	.58	.05	.44	.02***	.58***

Finally, Table 2.6 shows the analyses for dedication. We can observe the same, since the previous significant predictors disappear when controlling by baseline levels of dedication at T1, excepting role ambiguity.

Table 2.6  
*Hierarchic regression analyses for the demands and resources at T1 predicting dedication at T2 (n=274)*

Variables in T1	<i>B</i>	Error <i>B</i>	$R^2$	$\Delta R^2$	$\beta$
Step 1					
Age	-.30	.08	.05	.01**	-.22***
Step 2					
Age	-.31	.07			-.23***
Gender	-.34	.12			-.15**
Role ambiguity	-.46	.06	.27	.21***	-.46***
Step 3					
Age	-.03	.00			-.28***
Gender	-.32	.11			-.16**
Role ambiguity	-.62	.08	.24	.02	-.44***
Step 4					
Age	-.28	.07			-.20***
Role ambiguity	-.49	.09			-.35***
Self-efficacy	.33	.07	.30	.03***	.26***
Step 5					
Role ambiguity	-.22	.08			-.16**
Dedication	.54	.05	.49	.02***	.55***

## Discussion

The objective of this study was to extend the *JD-R* (Schaufeli & Bakker, 2004) in its prediction of burnout and engagement. For this, we included self-efficacy as personal resource and a more complex dimension of ‘mental distance’ as a component of burnout. Generally, we conclude that the results confirm Hypotheses 1 and 2 since job demands, and job and personal resources, are significant predictors of burnout and engagement in the expected direction.

It is important to discuss the role of gender in this study, mainly because women showed higher levels of exhaustion and cynicism compared to men, possibly because women are more vulnerable to the impact of perceived demands than men (Roxburgh, 1996). This would be an interesting consideration when planning promotional health programs based on gender differences. However, this result is not congruent with most studies on burnout, although it is certain that women score more than men in the exhaustion dimension, men usually gain higher scores in the cynicism dimension (Maslach, Schaufeli, & Leiter, 2001). Perhaps this finding is related to the sector under study, secondary education teachers, and it is necessary to verify these results in future studies.

To conclude, it is necessary to know the baseline levels of these variables at T1 to know the unique contribution of specific job demands and resources to predict burnout and engagement over time. These results show that future levels of burnout and engagement are predicted by the burnout and engagement presented at the beginning of the academic year, which could give rise to the creation of negative (burnout) or positive (engagement) vicious spirals. This possible future scenario leads us to consider the importance of assessing psycho-social factors from longitudinal approaches used to

make suitable risks assessments at work, and to optimize psycho-social health and psychological well-being at work.

Other findings of this study are also important. We noticed in the successive regression analyses that most job demands and resources studied were important predictors of burnout and engagement in teachers, except one, mental demands, which is not a good significant predictor of burnout or engagement at T2. Furthermore, we found in the intercorrelation matrix that mental demands at T1 are positively and significantly correlated with vigor at T2. So, the more mental overload at T1, the more vigor at T2. This can be related to the so-called *challenge demands* (Lepine, Podsakoff, & Lepine, 2005) defined as the demand with the potential to promote benefits or personal profits, causing positive emotions and an active style of coping. Thus teachers perceive mental demands like challenges, which improve their psychological well-being over time, although this significant relationship disappears in the regression analyses.

We found that self-efficacy has a significant prediction of cynicism, vigor and dedication, but it disappears when controlling by baseline levels of burnout and engagement at T1. This again demonstrates the importance of considering these baseline levels, as already discussed.

We believe that the current findings are an important contribution to explain how burnout and engagement change over time. However, given these tentative results, and especially since this is the first study that considers the baseline levels of burnout and engagement in longitudinal designs, future studies should be contemplated not only on job demands/resources and personal resources, but also on the baseline levels of burnout and engagement for controlling purposes to replicate these findings. It could be interesting to consider personal demands and predictors of burnout and engagement. For example, personality traits like perfectionism and emotional instability, goal settings

and levels of expectations, could be relevant personal demands to be studied in future research on this intriguing topic.

### **Appendix: Further results**

Although this study has been already published in *Psicothema* (impact factor = 1.08) (Lorente, Salanova, Martínez, & Schaufeli, 2008), we decided to carry out further data analyses as an important complement of the current chapter by using equation modeling techniques (SEM)<sup>3</sup>. Doing these data analyses, we can control the impact of the stability results on the longitudinal effects in the model. Similarly than in other studies in the present thesis, I have focused in the motivational process of the *JD-R* Model. Consequently, I expect that personal (i.e., self-efficacy) and job resources (i.e., autonomy and social support climate) will be reciprocally related with work engagement (i.e., vigor and dedication) over the time. So far, we expect that T1 personal resources influences positively on T2 job resources and T2 engagement and that T1 job resources influences on T2 self-efficacy as well as T1 engagement influences on T2 job resources and self-efficacy in a reciprocal way, by a *reciprocal gain cycle*.

Different competitive models were tested: (1) the *Stability Model* (M1) without cross-lagged structural paths, but with temporal stabilities and synchronous correlations, (2) the *Causality Model* (M2), which includes additional cross-lagged structural paths from T1 self-efficacy to T2 job resources and to T2 engagement, as well as from T1 job resources to T2 engagement; (3) the *Reversed Causation Model* (M3) which includes additional cross-lagged structural paths from T1 engagement to T2 job resources and to T2 self-efficacy, as well as from T1 job resources to T2 self-efficacy; and (3) the *Reciprocal Model* (M4), which includes reciprocal relationships between self-efficacy, job resources and engagement and thus including all paths of M2 and M3.

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<sup>3</sup> These analyses have been included thanks to the fruitful feedback provided by the external thesis reviewer Despoina Xanthopoulou.

We allowed the measurement errors of the corresponding indicators of T1 and T2 to covary over time (Pitts, West, & Tein, 1996).

Results show that the fit of the *reciprocal model* (M4) proved to be significantly superior to that of the stability model (M1), the causality model (M2), and the reversed causality model (M3). This means that M4, which includes cross-lagged *reciprocal* relationships between self-efficacy beliefs, job resources and engagement over time, displayed the best fit to the data.

Table 2.7

Models fit.

Model	$\chi^2$	df	RMSEA	RMR	CFI	TLI	$\Delta\chi^2$	df
M1. Stability	163.47	43	.10	.19	.91	.87		
M2. Causality	127.36	41	.08	.14	.94	.90	M2-M1= 36.01	2 ***
M3. Reversed	127.07	41	.08	.16	.94	.90	M3-M2= 0.28	0
M4. Reciprocal	64.81	39	.04	.09	.98	.97	M4-M3=62.26	2***

Notes:  $\chi^2$ =Chi-square; df=degrees of freedom; RMSEA=Root Mean Square Error of Approximation; RMR= Root-Mean-square Residual Index CFI=Comparative Fit Index; TLI=Tucker-Lewis Index

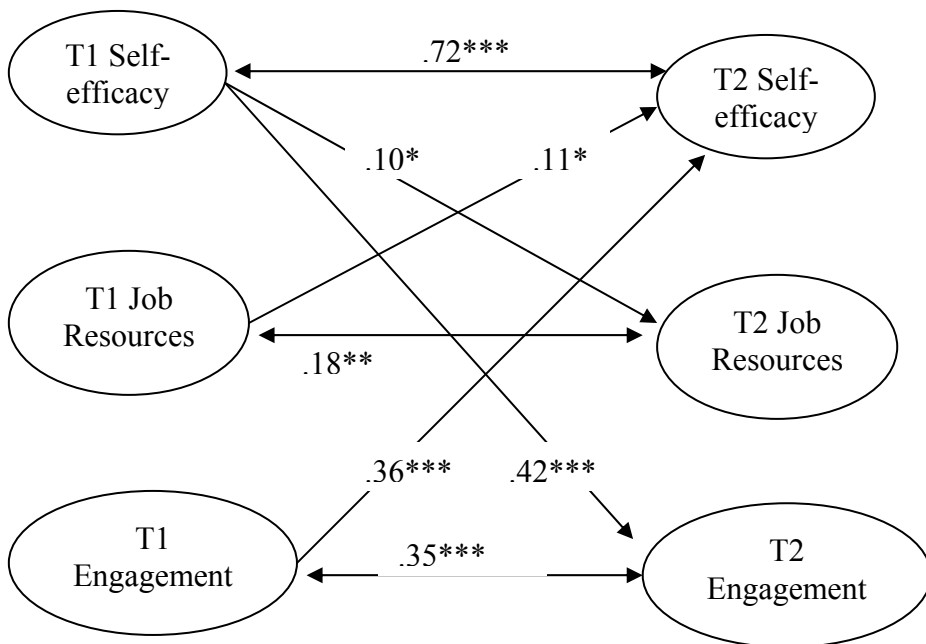


Figure 2.1 . Job and personal resources over time. SEM analyses.

Note: Only the cross-lagged and stability effects are shows in this figure.

The results of SEM confirm in part our hypotheses. As expected T1 self-efficacy has a positive influence on T2 job resources and T2 work engagement. Moreover, T2 self-efficacy is influenced by T1 job resources and T1 work engagement following a reciprocal model.

The reciprocal relationship over time between self-efficacy and job resources, support the *Conservation of Resources* (COR) theory (Hobfoll, 1989). The basic tenet of COR theory is that people are seen as motivated to obtain, retain, foster and protect those things (resources) that they value. Those who possess more resources are more capable of resource gain.

Additionally we carried out ANOVA's analyses in order to examine if there were significant differences in variables, throughout the academic year, but there were not significant differences between T1 and T2. According to Lindsley, Brass, and Thomas (1995), for a gain spiral to exist, three conditions should be met: (1) normal and reversed causation (also known as a reciprocal relationship); (2) an increment in levels of variables over time, and (3) it is necessary to study spirals in longitudinal research with at least three waves to test the tendency (up-, down or stability) over time. Furthermore, we cannot speak about a gain spiral but a *reciprocal gain cycle* between self-efficacy and job resources and between self-efficacy and work engagement has been found. The idea of reciprocal gain cycles is consistent with the cyclic relationship between psychological states that positively relate to each other over time (Salanova, Llorens, & Schaufeli, in press; Salanova, Schaufeli, Xanthopoulou, & Bakker, 2009).

## **Chapter 3**

# **Developing a Job-related Self-efficacy Scale among Construction Workers**



**Summary**

The objective of this study is to show the procedure for develop and validate a job self-efficacy scale for construction workers, following the recommendations of Bandura's *Social Cognitive Theory*. An adaptation of the *Critical Incidents Technique* was applied using interviews with 37 construction workers, who occupied different jobs. By using the *Critical Incident Technique* in combination with qualitative content analysis, the main obstacles perceived by construction workers were identified. Based on this information we formulated 7 specific job self-efficacy items that referred to the workers' perceived effectiveness to overcome obstacles. This scale was included in a broader study to assess psychosocial factors among the construction sector. Semi-structured interviews were held with a total of 265 construction workers. The sample was randomly divided into; (1) a sub-sample (n=128) in which an exploratory factor analysis was carried out that resulted into one-factor of job self-efficacy; (2) a sub-sample (n=137) in which a confirmatory factor analysis was carried out that confirmed this one-factor model. The predictive and convergent validity of the scale were examined. This scale enabled us to obtain information about job-related self-efficacy among construction workers, which is a key construct to not only understand workers' safety behaviour in the construction industry, but also the possible antecedents and consequences of it (i.e., negligence or occupational accidents).

## Introduction

Research has shown the importance of psychosocial factors in the prevention of occupational accidents. For example, some qualitative studies of accidents have mentioned work pressure, communication/coordination, and social climates as key organizational factors that influence safety performance (Dawson, 1991; Hofmann, Jacobs, & Landy, 1995; Hurst, Bellamy, Geyer, & Astley, 1991; Pidgeon, 1991; Wagenaar & Groeneweg, 1987; Weick, 1990, 1993; Wright, 1986). If we focus on the construction industry, the *European Agency for Health and Safety at Work* (2008) affirms that the construction sector has one of the worst occupational safety and health records in Europe. The *International Work Organization (IWO)* (2008), also presented new data which show that 60,000 fatal accidents take place every year in the construction industry worldwide. This is the equivalent to one death every 10 minutes.

In the province of Castellón (Spain) alone, where the study was carried out, there were a total of 2,978 accidents in the construction industry in 2007 (Spanish Ministry of Work, 2008). Moreover, the *6th National Survey of Working Conditions* (2007) showed that workers in general, perceive that psychosocial and/or ergonomic aspects, such as negligence, overconfidence or lack of attention (45%), rushing at work (19%), and tiredness or fatigue (17%) are the main psychosocial causes of their work accidents.

Thus, workers perceive these psycho-social aspects to be the causes of accidents rather than the lack of information about risks in the workplace, or the lack of safety measures. In a similar vein, the *4th European Working Conditions Survey* (2005) also indicated that the most reported symptoms among construction workers are backache and muscular pains, followed by fatigue and stress (22%). These data highlight the importance of psychosocial risks in the construction industry.

To prevent these psycho-social risks, construction workers have some job resources available in their workplace that may buffer the negative impact of job demands on health and organizational effectiveness. This assumption has been derived from the *Job Demands - Resources Model*, (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), which proposes that the employee's specific work conditions can be categorized into "job demands" and "job resources", and that these relate differently to positive and negative outcomes. Job demands are those physical, social or organizational aspects of the job that require sustained physical or mental effort and are, therefore, associated with certain physiological and psychological costs. Job resources refer to those physical, psychological, social or organizational aspects of the job that may be: functional in achieving work goals, may reduce job demands and the associated physiological and psychological costs and stimulate personal growth and development (Demerouti et al., 2001, p.501). Therefore, it is necessary to have some resources available in the workplace to face job demands and psychosocial risks.

#### *Job and personal resources*

Some studies have indicated that job control, autonomy in decision-making, social support from workmates and supervisors, teamwork, the safety climate within the organization and feedback, are the main job resources in construction work (Clarke, 2000; Goldenhar, Williams, & Swanson, 2003; Salanova, Gracia, & Lorente, 2007). Nonetheless, there are other personal resources that can also act as buffers of stress, prevent accidents, and enhance quality and performance at work. In that sense, Bakker and Demerouti (2008) have expanded the *JD-R Model* by proposing the assumption that job resources are related to personal resources (i.e., optimism, self-efficacy, resilience and self-esteem); and personal resources are capable of mobilizing job resources and enhance work engagement, and better performance and organizational outcomes.

Moreover, personal resources may determine the way workers perceive existing job demands and available job resources which, in turn, may have an effect on their levels of well-being (e.g., if you feel emotionally competent, probably you will not perceive having to work with clients as a threat and you will be engaged at work), (Hobfoll, Jonson, Ennis, & Jackson, 2003). This assumption is congruent with the *Social Cognitive Theory (SCT)* (Bandura, 1989,1997,2001a), which postulates that the beliefs that people have about themselves are key elements in the exercise of control and personal agency. As such, individuals are viewed as both products and procedures of their own environments (Pajares, 1996). Thus, the *SCT* assumes that the key personal resource to understand workers' behaviour, as well as the antecedents and consequences of this behaviour, is self-efficacy. This has been supported by many studies, such as Salanova, Gracia, and Lorente (2007). Thus, it is proposed that the most influential personal resource for construction workers are efficacy beliefs. Bandura defines self-efficacy as "*beliefs in one's capacities to organize and execute the courses of action required to produce given attainments*" (Bandura, 1997, p.3). Given the centrality of efficacy beliefs in people's lives, a sound assessment of this factor is crucial to understand and predict human behavior. As previously mentioned, perceived efficacy plays a key role in human functioning because it affects behavior through goals and aspirations, outcome expectations, affective proclivities, and the perception of impediments and opportunities in the social environment (Bandura, 1995, 1997). Thus, when efficacy levels are high and individuals believe they can control their environment effectively, job demands are more likely to be perceived as challenging, and job resources are probably perceived as abundant. Consequently, individuals are more likely to be engaged in their tasks and to perform well (Salanova, Schaufeli, Xanthopoulou, & Bakker, 2009).

Briefly, there is strong empirical evidence that job resources buffer the negative impact of psycho-social risks. However, personal resources are capable of mobilizing these job resources, and self-efficacy has been demonstrated to be the strongest personal resource in human functioning. Research has shown that personal resources, specifically self-efficacy, play a predicting role in the perception of job demands and resources. Self-efficacy is the key to understand how workers perceive some organizational factors.

### *Efficacy Beliefs*

Research has shown the power of efficacy beliefs in different domains, for example, as a mechanism to face situations of occupational stress. For instance, it has been found that self-efficacy may act as a buffer in the presence of work stressors so that their negative impact is reduced (Grau, Salanova, & Peiró, 2000; Salanova, Peiró, & Schaufeli, 2002). Workers with higher levels of self-efficacy will not perceive demands as threats, but as opportunities to overcome and develop their skills; they will strive to obtain good results, and achievements will be interpreted as a result of their own effort (Bandura, 2002).

### *Measuring Self-efficacy*

Perceived self-efficacy refers to people's beliefs in their capabilities to produce desired outcomes (Bandura, 1997). People differ in the areas in which they develop their efficacy and the levels at which they develop it, even within their given pursuits. Thus, the efficacy beliefs system is not a global trait, but a differentiated set of self-beliefs linked to distinct realms of functioning.

Bandura (2001b) criticized the use of general and non specific self-efficacy scales. He argued that it is futile to measure self-efficacy with a general scale because items of the tests based on general efficacy have not enough relevance for the domain that is

being studied. Self-efficacy scales must be adapted to our particular domain of interest and reflect an exhaustive study of our chosen domain. We must identify what is important for each item so that the results provide information about self-efficacy only in our particular domain. In relation to this, some previous research provided robust results, thus supporting the need to use specific self-efficacy measures in relation to specific domains (Bandura, 1997; Salanova, et al., 2002).

Self-efficacy scales must be tailored to activity domains and assess the multifaceted ways in which efficacy beliefs operate within the selected activity domain. The scales must be linked to factors which, indeed, determine the quality of functioning in the domain of interest. In our case, the domain is the construction industry. Thus, our objective was to design a specific self-efficacy scale for the construction industry. To achieve our objective, we followed the recommendations of the *Social Cognitive Theory* of Bandura (2001b, 2006). Therefore, the main aims of this study were to develop a specific scale for measuring self-efficacy for construction workers and to validate this scale. The procedure could be used for other researchers to construct another self-efficacy scale in other domains.

## **Method**

The methodology used has been divided into two phases: 1) a preliminary study which identified the main obstacles that construction workers face in their day-to-day work, in order to develop the specific items of the self-efficacy scale, and 2) the validation of the scale using exploratory and confirmatory factor analyses.

## Preliminary study: Developing a self-efficacy scale

*Participants and Procedure*

As Bandura (2001b) recommended, the scale to measure self-efficacy was developed using an adaptation of the *Critical Incident Technique* (Flanagan 1954), combined with qualitative content analysis. The *Critical Incident Technique* focuses on eliciting incidents that either hindered or facilitated previous job performance. The first step was to produce a semi-structured interview guide to help interviewees. This guide includes two key aspects: general data about the job and analysis of the obstacles at work. The second step was the selection of a sample formed by 37 construction workers, who worked in seven different companies. They occupied different jobs: bricklayers (63%), plasterers (10%), machinists (8%), electricians (8%). All of them were Spanish men whose age ranged from 17 to 45. The mean age of the sample was 31 years old ( $SD=8.22$ ). All of them worked in urban constructions and belonged to small- and medium-sized companies. The third step was the interviews, where the participants were asked to think about past situations when their job performance was below par, and then to recall conditions and factors that were present at that time. For instance: “*I could not do my job well because I didn’t know how to use the tool properly*”. Thus, the principal obstacles that construction workers encountered in their day-to-day work were compiled.

In the fourth step, the “content analyses” (qualitative method) of the obtained information, was performed. This information was obtained anonymously and its analysis were done using all the comments made with a system which included three judges who were experts in psychosocial issues. Their task was to categorize the comments by grouping those which were related. This categorization was done by two judges while the third intervened in cases where there was no agreement. Later, judges

chose those critical incidents that were more frequent in the responses of workers (see Table 3.1). Finally, the last step consisted in designing the self-efficacy scale using the groups of obstacles which were related. For instance, all the obstacles related with co-workers were compiled in one item.

### *Results*

As we said before, using an adaptation of the *Critical Incident Technique* of Flanagan and the ‘content analyses’, a total of 28 critical incidents were defined as technical obstacles, and 17 were related to social obstacles. Most of the technical obstacles related to the lack of indispensable material for work because it was not available or because it was defective. However, the obstacle which was observed more frequently, was related to work organization (i.e., a social obstacle). Most workers affirmed that they could not do their work due to time-related pressure and the quantitative overload as a result of other people's delays or poor communication between the different enterprises in the same workplace.



Table 3.1

*Technical and social obstacles (n=37).*

Critical incidents related to technical obstacles	Frequency
Appearance of unexpected situations or difficult problems (lack of suitable safety measures, lack of material, machinery breakdown, etc.)	20
Physical training conditions (rain, noise, disease...)	8
Total Technical Obstacles	28
Critical incidents related to social obstacles	Frequency
Poorly adapted information (poor communication with the boss, contradictory information, etc).	2
Poor work organization (quantitative overload, time- related pressure caused by other people's delays, etc.)	12
Absenteeism or lack of support from workmates	3
Total Social Obstacles	17

On the basis of these results, (all obstacles), we developed the items that would compose the self-efficacy scale. A total of 7 items were developed, which referred to the workers' perceived effectiveness to overcome each obstacle they encountered (e.g. "*I can do my work although I change tasks frequently*"). (See Appendix 1).

All the items scored on a 7-point rating scale which ranged from (0) "I cannot do this at all" to (6) "I am totally convinced I can do this".

## Validation of the self-efficacy scale

### *Participants and Procedure*

First of all, the research team contacted key informants. These were occupational risk prevention technicians, occupational risk prevention coordinators, trade union representatives, foremen, representatives from medical insurance companies within the construction sector, *Associations of Construction Employers*, and also the *University-Company Foundation (FUE)*. The research team is specialized in psychosocial health at work and in providing advanced services for the diagnosis and assessment of psychosocial risks in the workplace. During these first contacts, the study objectives and methodology were explained to all the participants. Finally, ten companies agreed to participate in this study.

In order to validate the new self-efficacy scale, it was included in the *RED-CONS interview guide* designed by the research team, which was used to evaluate the psychosocial factors in the construction industry. This interview guide measures job demands, job and personal resources and emotions at the workplace. This questionnaire was handed out to 265 employees (100% men) from the 10 small- and medium-sized construction companies. Their ages ranged from 16 to 64 years old. The mean sample age was 39.62 years old ( $SD=11.89$ ). Of all the employees, 41 were foreigners but they understood Spanish perfectly, and 120 had a temporary contract.

The employees answered the questionnaire during their breaks either at the beginning or the end of their work shift, and usually in the workplace.

### *Results*

To validate the scale, internal consistency (Cronbach's alpha) and descriptive analyses were carried out to study the psychometric characteristics of the scale, as well as the correlations between the different scale items. Table 3.2 shows the means,

standard deviations and intercorrelations of the 7 scale items. With regard to intercorrelations, they were all high, significant and positive, as expected. Internal consistency was  $\alpha = .82$ , which met the criterion of .80 (Henson, 2001). Moreover, the Kolmogorov-Smirnov test showed the normality of the data.

Table 3.2

*Means (M), Standard Deviation (SD), and Intercorrelations (N=265)*

	M	SD	Item-total correlations	1	2	3	4	5	6	7
Self-efficacy 1	4.56	1.31	.70**	1						
Self-efficacy 2	4.52	1.33	.69**	.61**	1					
Self-efficacy 3	3.38	1.79	.69**	.44**	.43**	1				
Self-efficacy 4	3.84	1.80	.70**	.45**	.39**	.38**	1			
Self-efficacy 5	3.74	1.83	.73**	.36**	.38**	.41**	.45**	1		
Self-efficacy 6	4.17	1.66	.72**	.44**	.35**	.39**	.40**	.50**	1	
Self-efficacy 7	4.03	1.73	.65**	.31**	.38**	.30**	.32**	.38**	.44**	1

### *Factor Analyses*

In order to determine the factor structure of the questionnaire, first the sample was randomly split in two parts. With one half of the sample (128 construction workers), an exploratory factor analysis was done to know if the scale was composed of only a single factor using the SPSS program. Oblimin rotation showed that the scale was composed by one factor which accounted for 49.5% of the variance. Thus all the items indicate a single factor, which confirms the consistency of the scale.

Table 3.3

Principal axis analyses with Oblimin rotation for 7-items (n=128).

	Factor
I must solve difficult problems	.75
Unexpected situations appear	.73
I don't feel well physically (headache, backache, etc.)	.69
My companions work with delays	.69
I have to rush to finish	.71
I frequently change tasks	.71
My workmates don't help me	.65

Next, with the other half of the sample (137 construction workers), a confirmatory factor analysis was done using the AMOS computer program (Arbuckle, 1997), and this confirmed the single factor, as Figure 3.1 shows.

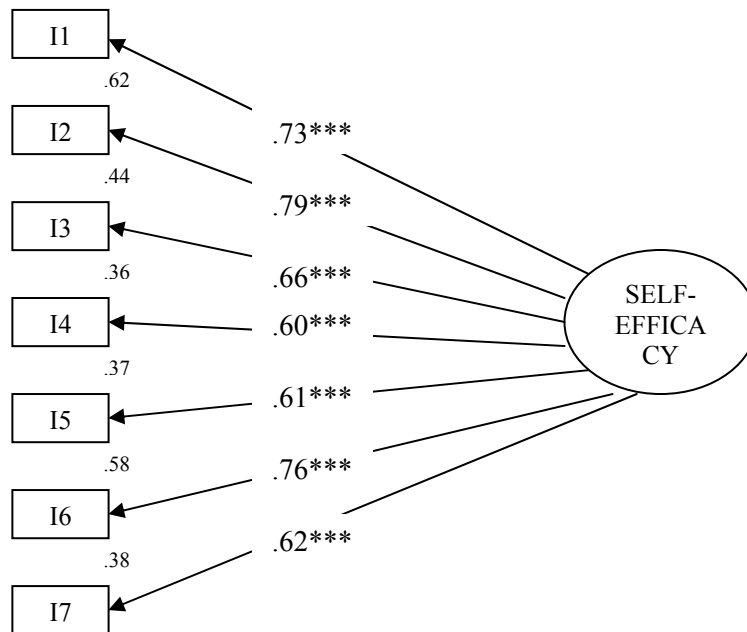


Figure 3.1. Confirmatory factor analyses.

The AMOS analyses used the traditional chi-square value, the goodness-of-fit index (GFI) and the root mean square error of approximation (RMSEA). As a rule of

thumb,  $GFI \geq .90$  and  $RMSEA \leq .08$  indicate a reasonable fit of the model to the data (Browne & Cudeck, 1989). In addition, we examined the Tucker-Lewis Index (TLI), the incremental fit index (IFI) and the comparative fit index (CFI), as recommended by Marsh, Balla, and Hau (1996). These fit indexes should have values of .90, or higher (Hoyle, 1995). Results showed that the data fit the model satisfactorily, thus confirming that the scale was composed of one factor. ( $\chi^2_{(13, n=137)} = 16.82$ ;  $GFI = .98$ ;  $RMSEA = .048$ ;  $IFI = .98$ ;  $CFI = .98$ ).

#### *Scale Validity*

When a new instrument is developed, it is important to focus on its construct (convergent) and predictive validity. The convergent validity (Campbell & Fiske, 1959) refers to whether measures appear to be measuring the same construct. It was investigated by correlating the scale with a self-constructed collective efficacy scale (Cronbach's  $\alpha = .89$ ), where all the data were used ( $N=265$ ). The results indicated that the scales correlate positively and significantly ( $r = .64, p < .001$ ).

Predictive validity refers to the degree to which a measure predicts a particular behaviour or outcome (Pedhazur & Schmelkin, 1991). It was determined by examining its relationship with organizational commitment and job satisfaction, where a unique, significant and positive relationship was expected. The model fitted the data ( $\chi^2_{(27, N=265)} = 64.75$ ;  $GFI = .93$ ;  $RMSEA = .073$ ;  $IFI = .93$ ,  $CFI = .93$ ). The results showed that self-efficacy was related with organizational commitment since the relationship between self-efficacy and satisfaction was not significant.

#### *Differential Analyses*

An ANOVA (analysis of variance) was included to check whether the socio-demographic variables related to levels of self-efficacy. Nevertheless, there were no significant differences in self-efficacy in terms of some sociodemographic variables

such as age, academic degree, work experience and type of contract, unlike some studies which indicate other contexts. The ANOVA revealed significant differences according to nationality ( $F=1.62$ ;  $p < .02$ ), where Spanish workers presented higher levels of self-efficacy ( $M = 4.06$ ) than foreign workers ( $M = 3.90$ ).

## Conclusions

The method carried out to construct a new scale for measuring self-efficacy among construction workers has been shown. By using an adaptation of the *Critical Incident Technique* (Flanagan 1954), the main obstacles that these workers encounter in their daily work were identified. The ‘content analysis’ of such obstacles enabled to construct a scale that measured specific self-efficacy for the construction industry. The scale was developed on the basis of the *Social Cognitive Theory*, so the scale was supported by a robust theory. Moreover, Cronbach’s alpha confirms that the scale was internally consistent.

An exploratory factor analysis on the one half of the sample to confirm that the scale was composed by a single factor. Moreover, a confirmatory factor analysis with the other half of the sample confirmed the good fit of this factor to the data. The ANOVA enabled us to verify that there were significant differences in self-efficacy according to nationality, where Spanish workers presented higher levels of self-efficacy than foreign workers. This could be due to the workers’ experience since Spanish workers had perhaps been working in this company longer and had acquired more mastery experiences at work. Nonetheless, no significant differences were noted in terms of other socio-demographic variables such as age, academic degree and work experience, unlike some studies which indicate other contexts. For example, with regard

to academic education, some research works have shown that the more academic level, the more levels of efficacy beliefs (Hoy & Woolfolk, 1993).

Positive Psychology is a recent trend in psychology that studies the strengths and virtues which enable individuals and communities to thrive. Thus, is a comprehensive approach that does not restrict itself to workers malfunctioning, but includes positive aspects such as work well-being (see Seligman & Csikszentmihalyi, 2000). Therefore, from the Positive Psychology viewpoint, applying intervention techniques to increase self-efficacy values makes sense because it aims to promote the factor that allows individuals and organizations to thrive, and healthy employees are those who present higher levels of self-efficacy (Schaufeli & Salanova, 2008). It would be most positive to apply intervention with a view to increasing self-efficacy beliefs among construction workers.

It is important to improve self-efficacy beliefs because people with high self-efficacy perceive demanding situation as challenges, are highly committed to the activities they carry out, invest a lot of time and effort in their activities, think strategically to solve difficulties, recover easily from failure or difficulty, feel they are in control of a majority of stressors, and also feel they are less vulnerable to stress and depression (Bandura, 1997). All these characteristics help them to become better professionals. In addition, this effect will also reduce certain labour psychosocial risks, which would be most positive with a view to reducing the rate of occupational accidents in the construction industry. Therefore, interventions seek increased efficacy beliefs in order to improve well-being at work and job performance. However, these interventions should be specific to each work setting. If it were possible to find the optimum point of efficacy in each case, it would avoid the negative consequences of overconfidence (Vancouver, Thompson, Tischner, & Putka, 2002).

*Main contributions*

The main practical contribution of this work is a work method to develop a specific self-efficacy scale for construction workers. With this method, a short reliable scale has been developed. The procedure could be used by other researchers to construct other self-efficacy scales in other work domains. A review about self-efficacy within the *Social Cognitive Theory* has been done. Furthermore, a proposal on how to measure an important variable has been put forward because self-efficacy is a key construct to not only understand workers' behaviour, but also the antecedents and consequences of this behaviour. This is important for the construction industry because construction workers' efficacy beliefs could be related with safety behavior. In fact, Lund and Aarø (2004) affirm that behavioural intentions are regarded as products of attitudes, social influences and self-efficacy. In that sense, future research should be done to examine these relationships among self-efficacy, behavioural safety intentions, and negligence and occupational accidents. Therefore, this scale for measuring self-efficacy will allow researchers to analyze the directionality, causes and effects between these variables.

*Limitations and future research*

The main limitations would be attributed to the sample itself. A sample of convenience was used that included all the workers of the ten construction companies that participated in the study. This method is possibly not the most effective in sample.

As far as the validity of the scale is concerned, our scale fulfils content validity once we had completed an exhaustive study on self-efficacy in a specific context: the construction industry. Construct (convergent) and predictive validity is equally important when developing a new instrument.

To examine the convergent validity of the self-efficacy scale, it would have been more convenient to correlate this scale with another general self-efficacy scale but, in



this case, it goes against the *Social Cognitive Theory*, which criticized the use of general and non specific self-efficacy scales (Bandura, 2001). Bandura argued that it is futile to measure self-efficacy with a general scale because items of tests based on the general efficacy have not enough relevance for the domain that is being studied. For this reason, general self-efficacy in this sample was not measured. To examine the convergent validity of the self-efficacy scale, we correlated it with the scale of collective efficacy, and a positive and significant correlation was found.

Predictive validity was determined by examining its relationship with organizational commitment and satisfaction. The results show that self-efficacy is related with organizational commitment.

Future research could also validate this method and this scale in other companies or cultures with a view to verifying whether the scale is reliable. The use of specific self-efficacy scales would also prove most interesting to develop a comparative study of several industries in order to compare levels of self-efficacy. Indeed, it would allow the analysis of the possible correlations between self-efficacy and accident records in accordance with the type of industry.

### **Final note**

The procedure carried out to develop the scale has been seen to be effective since the self-efficacy scale has proved reliable. This self-efficacy scale enabled us to obtain information about job-related self-efficacy among construction workers because it is a key construct to not only understand workers' safety behavior in the construction industry, but also the antecedents and consequences of this behaviour (i.e., negligence or occupational accidents).

Appendix: *Self-efficacy scale.*

*Next the situations that can be found in your day-to-day construction work are described. For each situation, select to what extent they enable you to do your work well by choosing a value from 0 to 6:*

0	1	2	3	4	5	6
<b>Cannot do this at all</b>			<b>I can do this quite well or I am certain I can do this</b>			<b>I am totally convinced I can do this</b>

I can do my work although:

- |  |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|
| 1. I must solve difficult problems                         | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. Unexpected situations appear                            | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 3. I don't feel well physically (headache, backache, etc.) | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. My companions work with delays                          | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 5. I have to rush to finish                                | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 6. I frequently change tasks                               | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 7. My workmates don't help me                              | 0 | 1 | 2 | 3 | 4 | 5 | 6 |

**Chapter 4**  
**How Self-efficacy predicts Work Engagement and**  
**Performance among Construction Workers: A Social**  
**Cognitive Perspective.**

## Summary

The main objective of this study is to test whether self-efficacy predicts work engagement and performance through job and personal resources. Following the predictions of Albert Bandura's *Social Cognitive Theory* and the *Job-Demands Resources Model*, we expect the relationship between self-efficacy and performance will be fully mediated by resources and work engagement. A total of 228 Spanish construction workers attended a semi-structured interview and filled out a questionnaire with the main study variables. Structural equation modeling supports the research model; that is, self-efficacy relates positively with resources (i.e., mental and emotional competences, job control and supervisor social support) which, in turn, lead to work engagement and performance. Furthermore, the results also show a direct relationship between self-efficacy and performance. This study emphasizes the role that self-efficacy plays in the prediction of positive processes like work engagement and performance. Theoretical and practical implications of the study are discussed from the *Social Cognitive Theory* perspective.

## **Introduction**

Traditionally, research on risk prevention in the construction industry has focused on the study of the physical, technical and managerial aspects. The *European Agency for Safety and Health at Work* (2008) states that the construction sector has one of the worst occupational safety and health records in Europe. In 2007, the *IWO* (International Work Organization) also revealed new data which show that 60.000 fatal accidents take place every year in the construction industry. This is equivalent to one death every 10 minutes. Therefore, construction is one of the sectors most seriously affected by occupational accidents. Moreover, the *6th Spanish National Survey of Work Conditions* (2007) indicates that workers perceive the psychosocial and/or ergonomic aspects, such as negligence, overconfidence or lack of attention (45%), rushing work (19%), and tiredness or fatigue (17%), as the main causes of their work accidents. In addition, the *4th European Working Conditions Survey* (2005) shows that the physical symptoms that most construction workers report are backache and muscular pains, followed by fatigue and stress (22%) which are also psychosocial factors.

It seems that psychosocial risks are a serious treat for the construction industry. So this study focuses on the specific relationship among the different psychosocial factors in construction work. In that sense, the *Social Cognitive Theory* (SCT, Bandura, 1989, 2001) predicts that self-efficacy affects the way workers perceive the available resources in the workplace. Self-efficacy also plays a motivational role because the higher self-efficacy, the more effort people invest in activities and the more persistent people are when facing obstacles and difficulties.

### *The predicting role of self-efficacy on well-being and performance*

Psychosocial research has supported the strong influence of efficacy beliefs on different domains as a mechanism to face situations of occupational stress (Grau,

Salanova, & Peiró, 2001; Salanova, Peiró, & Schaufeli, 2002). These processes of human agency (efficacy beliefs as both a buffer of stress and as a predictor of well-being), are framed within the *Social and Cognitive Theory* (SCT) (Bandura, (1997; 2001). Self-efficacy is defined as “beliefs in one’s capacities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p.3). Some works have postulated that self-efficacy can act as a buffer in the presence of stressors in such a way that they have a less negative impact on the individual (Grau et al., 2001). Moreover, self-efficacy may also imply that job demands have a positive impact on work-related well-being. Thus, people with higher levels of self-efficacy will not perceive demands as threats, but as opportunities to develop their skills and challenges to overcome. They will strive to obtain good results and will interpret achievements as a result of their own efforts (Bandura, 2001). Success not only increases positive evaluations of self-efficacy, but also influences well-being and job performance.

In the present study, we analyze self-efficacy as the main personal resource for construction workers to be able to face stressors (e.g., lack of resources) in their daily work. As mentioned earlier, levels of efficacy beliefs that employees experience influence their perceptions of job and personal resources. Namely, when efficacy beliefs are high and individuals believe that they can control their environment effectively, they are more likely to perceive job and other personal resources as abundant. Consequently, individuals are more likely to engage in their tasks and perform well (Salanova, Schaufeli, Xanthopoulou, & Bakker, 2009). For these reasons, this study includes self-efficacy as a predictor of job and personal resources because it affects the way people perceive their own competences and the environment. For example, a person who presents high self-efficacy in group work will perceive himself/herself as being more emotionally competent than others with low self-efficacy.

Finally, this study focuses on the role that self-efficacy plays in the *Job Demands-Resources Model* (“JD-R”) (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), and specifically on the proposed positive motivational process. We are interested in examining whether self-efficacy beliefs predict work engagement and job performance through job and personal resources. Several studies have focused on the way that job and personal resources relate with work engagement, but very few studies have taken into account both kind of resources and the predicting role of self-efficacy.

*The motivational process of work engagement in the Job-Demands Resources Model*

The *JD-R Model* (Demerouti, et al., 2001), supports the categorization of employees’ work conditions into “job demands” and “job resources”, and explain how these relate differently to positive and negative outcomes. Expanding the *JD-R Model*, Schaufeli and Bakker (2004) proposed two processes: (1) an energetic process of overtaxing and wearing out, in which high job demands exhaust employees’ energy backup; (2) a motivational process which links job resources via engagement with positive organizational outcomes (e.g., less turnover intention, high job performance). In the motivational process, job resources play a critical role as antecedents of work engagement. Job resources are those physical, psychological, social and organizational aspects of the work that reduce associated demands and costs. In addition, they are functional in the attainment of occupational goals, and they stimulate growth and personal development (Schaufeli & Bakker, 2004). As such, job resources initiate a motivational process that may lead to work engagement and positive organizational outcomes, including enhanced performance (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004).

Work engagement is “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” (Schaufeli, Salanova, González-

Romá, & Bakker, 2002, p.74). High levels of energy and mental resilience, the willingness to invest effort, and persistence even in the face of difficulties characterize vigor. A sense of significance, enthusiasm, inspiration, pride, and challenge characterize dedication. Finally, being fully concentrated and deeply engrossed in one's work whereby time passes quickly and one has difficulties with detaching oneself from work characterize absorption. Recent evidence, however, suggests that absorption plays a slightly different role and may perhaps be a consequence of engagement rather than a constituting component (Salanova, Llorens, Martinez, Cifre, & Schaufeli, 2003). Accordingly, we have excluded absorption from the present study.

This study focuses on the motivational process of the *JD-R Model*, that is, the availability of job resources leads to work engagement by fostering goal accomplishment (Schaufeli & Bakker, 2004). Job resources may have both intrinsic and extrinsic motivational potential, leading employees to meet their goals, and to become more committed and engaged in their job. This premise is consistent with traditional motivational approaches such as the *Job Characteristics Theory* (Hackman & Oldham, 1980) and the *Self-determination Theory* (Ryan & Deci, 2000).

According to the *JD-R Model*, particular job resources, such as skill variety, control, and feedback, have motivating potential and indirectly predict positive outcomes, like work engagement, through the activation of positive psychological states. In this way, Mauno, Kinnunen, and Ruokolainen's (2007) longitudinal study found that job resources (above all, job control) predict work engagement better than job demands. By boosting work engagement, job resources initiate far-reaching motivational processes that extend beyond employee well-being. Studies by Schaufeli and Bakker (2004) showed that job resources have a positive impact on various indicators of organizational commitment through work engagement. In another study



conducted among Finnish teachers, several job resources, such as job control, supervisor support, access to information, and good organizational climate, positively associate with work engagement (Hakanen, Bakker, & Schaufeli, 2006). In addition, Salanova, Agut, and Peiró (2005) found that work engagement mediates the impact of organizational resources on both performance and customer loyalty. Other authors also discovered positive and reciprocal cross-lagged associations between job resources and work engagement (Hakanen, Perhoniemi, & Toppinen-Tanner, 2008).

Some studies have indicated that job control, autonomy in decision-making, supervisor social support, social relationships, and teamwork, are the main job resources that benefit workers (Clarke, 2000; Goldenhar; Ryan & Frederick, 1997; Williams & Swanson, 2003). In this study, we examine job control and supervisor social support because they proved to be the most important job resources in past research, and also in specific studies about job resources in the construction sector (Salanova, Gracia, & Lorente, 2007).

Regarding personal resources, research shows their positive relationships with work engagement. For example, in their study among female school principals, Bakker, Gierveld, and Van Rijswijk (2006) found that those with the most personal resources obtain the highest scores for work engagement. Moreover, a recent extension of the *JD-R Model* included personal resources that supplement job resources, such as self-efficacy, optimism and self-esteem. For example, Bakker and Demerouti (2008) proposed that job and personal resources have unique effects on work engagement. Furthermore, a study among flight attendants (Xanthopoulou, Bakker, Heuven, Demerouti, & Schaufeli, 2008) showed that work engagement mediates the relationship between self-efficacy and (in-role and extra-role) performance. Finally in a study with 714 Dutch employees of an electrical engineering and electronics company,

Xanthopoulou, Bakker, Demerouti and Schaufeli (2007) showed that personal resources, such as self-efficacy, positively relate with work engagement through job resources; that is, personal resources influence the perception of job resources.

Therefore, resources (i.e., personal and job resources) predict engagement in a positive way; this is the reason why Bakker and Demerouti (2008) named them “the drivers of work engagement”. There is convincing empirical evidence that job and personal resources, because of their extrinsic and intrinsic motivational potential, are the most important predictors of work engagement. Therefore, high levels of resources lead to engaged workforces. In turn, engaged employees report higher levels of well-being and exhibit better performance (see Bakker for a review, in press).

Therefore, it seems clear that job and personal resources predict engagement but, what is the underlying psychological mechanism that explains this relationship? Bandura's *SCT* (1997) is a rich theoretical framework to explain the psychological mechanism of this link. Accordingly employees with high efficacy beliefs will perceive more job and personal resources at work and in turn will experience higher work engagement. In this study, we included job control and supervisor social support as the main job resources and mental and emotional competences and self-efficacy as the main personal resources. However, we considered and treated the personal resources in the research model differently. From a socio-cognitive perspective, levels of efficacy beliefs that employees experience influence their perceptions of job demands and resources, and efficacy beliefs also influence the way that workers perceive other personal resources, such as mental and emotional competences. Therefore we centered on self-efficacy as the main personal resource for workers. Thus, self-efficacy influences the perception of both job and personal resources and acts as the main driver of both work engagement and performance.

*Collective performance*

Given its relevance for organizations, the area of work and organizational psychology, has undertaken studies on performance. Furthermore, some research has studied the link between job performance and psychosocial constructs, such as work engagement. For example, Salanova, Agut, and Peiró (2005) showed that levels of work engagement of contact employees working in hotels and restaurants relate to employee performance, as perceived by customers. Harter, Schmidt, and Hayes (2002) also studied how levels of employee engagement weakly but positively relate to business-unit performance. Recently, Schaufeli, Taris, and Van Rhenen (2008) found that work engagement positively relate to in-role performance. In their review study about employee well-being and job performance, Demerouti and Bakker (2008) concluded that negative indicators of well-being do not show such strong relationships with performance as expected. However, positive indicators of well-being like work engagement seemed to show a stronger relationship with performance than negative ones. Finally, similar results in the arena of study engagement and performance link study engagement with students' better performance over time (Salanova, Schaufeli, Martínez, & Bresó, 2009). In short, it appears that these studies corroborate that engagement positively relates to performance.

Regarding the relationship between self-efficacy and performance, several studies have found a positive and significant relationship in different pursuits. For example, Stajkovic and Luthans (1998) in their seminal meta-analysis found that self-efficacy positive and strongly relates to work-related outcomes such as job performance. More recently, Jawahar, Meurs, Ferris, and Hochwarter (2008) found that self-efficacy not only relates more strongly to task performance than to contextual performance, but that it is also a better predictor of task performance than political skills. As mentioned

earlier, Xanthopoulou et al. (2008) discovered that work engagement mediates the relationship between self-efficacy and (in-role and extra-role) performance. Finally, other authors found this positive relationship between self-efficacy and performance in settings like academic performance (Carmona, Buunk, Disjkstra, & Peiró, 2008; Elias & MacDonald, 2007).

In this study, we included collective performance in order to cover the relationship of the variables in the research model in a specific occupational context, i.e., the construction industry because, as far as we know, no studies into this matter are available. Moreover, we also included collective performance (as assessed by workers in each working group) and not individual performance, because teamwork rather than individual work is usual in this occupational sector. In fact, what construction managements desire the most is that work teams perform well.

Therefore, by basing this study on the *SCT* predictions, and by also considering the motivational process of the *JD-R Model*, we introduced self-efficacy as the predicting variable of this process. Specifically, we hypothesize (see Figure 4.1) a mediating model where the relationship between self-efficacy and performance is fully mediated by resources and work engagement.

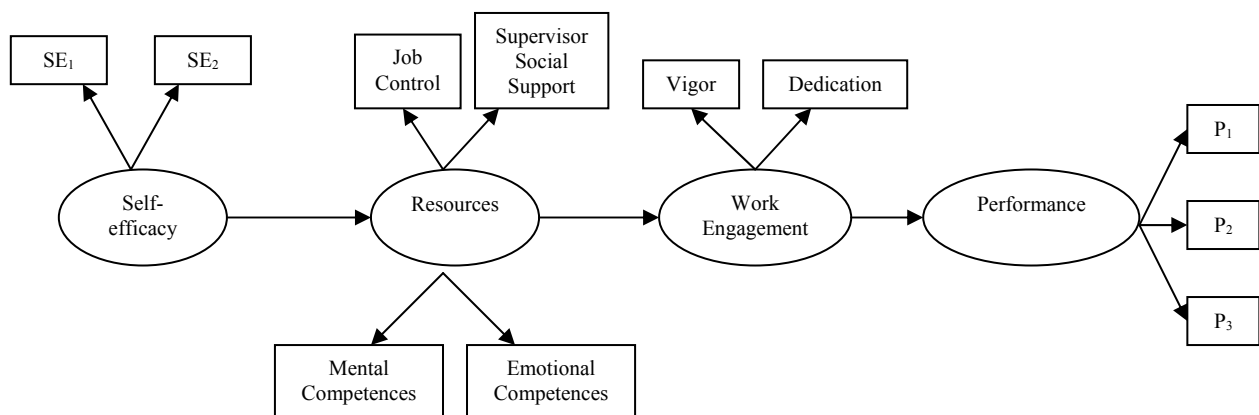


Figure 4.1. The research model.

## **Method**

### *Participants and procedure*

First, the research team contacted several key informants in the construction sector, and invited them to participate in either in-depth interviews or a focus group. The intention of both the interviews and focus group was to study the influence of self-efficacy on the perception of job demands and job resources, and its relationship with performance and occupational accidents in the construction sector. During these first contacts, the participants received an explanation of the study objectives. Fifteen people participated in the focus group: 5 employers, 1 occupational risk prevention officer, 1 technician on prevention of labor risks, 2 trade union representatives, 1 representative from a medical insurance company, and 5 experts in Occupational Health Psychology. Moreover, we interviewed other people related with the construction industry: 2 occupational risk prevention technicians, 1 occupational risk prevention coordinator, 2 foremen and 2 site managers. Of the 16 companies contacted to participate in the study, 10 participated in the study.

An interview guide was designed to assess the work conditions and psychosocial factors in the construction industry. We also used a questionnaire with the study variables, which we handed out to each employee during the face-to-face interview. Finally, 228 employees (100% men) from 10 different Spanish small- and medium-sized construction companies filled in the questionnaire using a semi-structured interview. Ages ranged from 16 to 64 years (mean= 39.62, s.d. = 11.89). 41 of the employees were foreigners (18%), and 86 had a temporary contract. We had to use semi-structured interviews given the characteristics of the sample (i.e., low level of education where 34% had not completed primary school education, and immigrants who might have had problems with the specific meaning of the items). Confidentiality

was guaranteed. Employees answered the interview during their breaks either at the beginning or the end of their work shift, and usually in the workplace.

### *Variables*

Four groups of variables were considered: self-efficacy, resources, work engagement and performance. Cronbach's  $\alpha$  are showed in Table 1, and all the variables had an alpha coefficient higher than .70 (Nunnally & Bernstein, 1994), and even self-efficacy gets the most demanding criterion of .80 (Henson, 2001).

*Self-efficacy* was assessed with a validated 7-item constructed scale (Lorente, Salanova, & Martínez, 2009) which is specific for the construction industry, and we followed the recommendations of Albert Bandura (2001). An example of a self-efficacy item is: "*I can do my work well, although my co-workers work with delays*".

*Resources.* *Job control* and *supervisor social support* were included as job resources. They were measured using a composite item for job control and two items for supervisor social support (an example item of job control is: "*In my work, I have sufficient autonomy to decide when to start the task and finish it, as well as the order in which I do my tasks*"). An example item of supervisor social support is: "*My boss highlights people's achievements*". We measured mental and emotional competences by using an item for each one (i.e., mental competence: "*In my work, I am able to watch and remember many things at once*"; and emotional competence: "*In my work, I am capable of objectively and directly tackling problems with the people I work with*").

*Work Engagement.* *Vigor* and *dedication* dimensions of work engagement were measured using the Spanish version of the Utrecht Work Engagement Scale (UWES) (Schaufeli et al., 2002), which has 3 items for each dimension (examples of items: "*In my work, I feel full of energy*", and: "*My work is challenging*").

*Performance* was assessed with three items based on Goodman and Svyantek (1999), but we reworded them for collective performance instead of individual performance. One example is: “*My work team achieves the objectives of the job*”. As this variable is collective, we checked the within-group agreement before starting the data analyses because it is important to match the level of analysis between the study variables (Chan, 1998; Kozlowski & Klein, 2000; Rousseau, 1985). It is also important to note that collective performance is a group construct and not an individual construct.

All the questionnaire items were answered using a 7-item Likert scale ranging from 0 (never/nothing) to 6 (always, everyday).

#### *Data analyses*

Firstly, and as mentioned above, we tested the within-group agreements of collective performance (Chan, 1998; Kozlowski, & Klein, 2000; Rousseau, 1985) by computing  $r_{wg}$  using the Agree program (James, Demaree, & Wolf, 1993). Although several alternative operationalizations of construct agreement exist (e.g., the standard deviation by Klein, Conn, Smith, & Sorra, 2001; and Schneider, Salvaggio, & Subirats, 2002),  $r_{wg}$  is the most frequently used measure (Bliese, 2000).  $R_{wg}$  values indicate whether the referent-shift consensus on collective performance judgments exists. High mean  $r_{wg}$  values indicate consensus or agreement between the group members, which suggests the sharing of individual perceptions (see Arthur, Bells, & Edwards, 2007).

Secondly, we performed descriptive analyses and internal consistence for each scale and the correlations of all variables. The recommendations of Podsakoff, MacKenzie, Lee, and Podsakoff (2003) were considered in order to test for the common method variance bias. Thus, the Harman’s single factor test with Confirmatory Factor Analyses (CFA; e.g., Iverson & Maguire, 2000) was used for the variables. Results reveal a significant inferior fit of the model with one single factor [ $\Delta \chi^2 = 253.12$ ,  $p$

< .001] as compared to the model with four latent factors (i.e., self-efficacy, resources, engagement and performance). Hence, one single factor cannot account for the variance in the data, therefore we cannot consider common method variance in this dataset to be a serious deficiency.

Finally, we applied the Structural Equation Modeling (SEM) methods, as implemented by AMOS 16.0 (Arbuckle, 2005), to test the research model (see Figure 1). 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 model was evaluated using absolute and relative indices. The absolute goodness-of-fit indices calculated were: 1) the  $\chi^2$  goodness-of-fit statistic; 2) the Root Mean Square Error of Approximation (RMSEA); 3) the Goodness-of-Fit Index (GFI); and 4) the Adjusted Goodness-of-Fit Index (AGFI) (Jöreskog & Sörbom, 1986). Since the  $\chi^2$  – test is sensitive to sample size, is strongly recommended the calculation of relative goodness-of-fit indices (Bentler, 1990). The following relative goodness-of-fit indices were calculated: 1) Incremental Fit Index (IFI); 2) Comparative Fit Index (CFI) (Marsh, Balla, & Hau, 1996). Since the distribution of the GFI and the AGFI is unknown, no statistical test or critical value is available (Jöreskog & Sörbon, 1986). Values near .08 for RMSEA are considered to indicate an acceptable model fit, as a rule of thumb, and those smaller than .08 are considered to indicate a good model fit (Cudeck & Browne, 1993). Finally, the relative fit indices values greater than .90 are considered to indicate a good fit (Hoyle, 1995).

Self-efficacy, resources, work engagement and performance are latent variables in the structural model. Specifically, self-efficacy has two indicators, i.e., 3 and 4 items of the scale. Resources have four indicators, i.e., job control, supervisor social support, mental and emotional competences, whereas work engagement has two, i.e., vigor and



dedication. Finally, performance has three indicators represented by all the items (3) that compose the scale.

## **Results**

### *Preliminary analyses*

As self-efficacy is a personal resource in the research model, and mental and emotional competences have been included as personal resources as well, a Confirmatory Factor Analyses was performed in order to ensure that all these resources were different. The recommendations of Podsakoff, MacKenzie, Lee, and Podsakoff (2003) were considered. Thus, the Harman's single factor test with Confirmatory Factor Analyses (CFA; e.g., Iverson & Maguire, 2000) was used for the variables. Results reveal a significant inferior fit of the model with one single factor [ $\Delta \chi^2 = 29.9$ ,  $p < .01$ ] as compared to the model with two latent factors (i.e., self-efficacy, and mental and emotional resources). Therefore, we can conclude that, according to *SCT*, self-efficacy and mental and emotional resources are different psychosocial constructs.

### *Within-group agreement*

All the groups reached an agreement except for one group made up of four people. The average  $r_{wg}$  value for the referent-shift consensus of the judgments of collective performance was .80. These results suggest that we should only remove one group of the 45 groups that comprised the sample because 44 groups reached an agreement. Furthermore, we removed this group from the sample and we carried out all the subsequent analyses without this group, that is, with 224 construction workers.

### *Descriptive analyses*

The means, standard deviations, intercorrelations and internal consistences (Cronbach's  $\alpha$ ) of each variable were calculated. As mentioned before, all the  $\alpha$  values

met the criterion of .70 (Nunally & Berstein, 1994), and self-efficacy scale also met the most stringent criterion of .80 (Henson, 2001).

Table 4.1

*Means (M), Standard deviations (SD), internal consistencies (Cronbach's  $\alpha$ ) of the study variables (n=224)*

	M	SD	$\alpha$	1	2	3	4	5	6	7	8
1 Self-efficacy	4.05	1.17	.81	1							
2 Job Control	3.21	2.20	-	.33	1						
3 Supervisor social support	4.03	1.61	.40**	.11	.14*	1					
4 Mental comp.	4.92	1.30	-	.23**	.31**	.12	1				
5 Emot. Comp.	4.49	1.73	-	.15**	.25**	.23**	.40**	1			
6 Vigor	4.81	0.94	.72	.20**	.10	.10	.32**	.14*	1		
7 Dedication	4.51	1.10	.70	.12	.14**	.20**	.30**	.17**	.47**	1	
8 Performance	4.99	0.90	.73	.26**	.02	.13	.20**	.08	.22**	.14*	1

As expected, the intercorrelations between the dimensions of the same construct (i.e., engagement) were significant and positive. Table 1 also shows the correlation matrix among the variables used. Self-efficacy significantly and positively correlated with mental competences, with vigor, but not with dedication, and strongly and positively related with performance. Resources, in general, correlated positively with work engagement and, finally, the engagement dimensions (vigor and dedication) also positively and significantly correlated with performance.

#### *Hypothesis testing*

According to Baron and Kenny (1986) and Judd and Kenny (1981), when a mediational model involves latent constructs, structural equation modeling provides the basic data analysis strategy. In accordance with the four basic steps to establish the mediation effects proposed by these authors, and in order to test the hypothesis, our

research model (M1) was fitted to the data, as Figure 4.2 depicts. The results in Table 4.2 show that the research model fitted the data, and that all the fit indices met the criteria ( $\chi^2_{(40, n=224)} = 67.97$ ; RMSEA= .05; GFI= .94; AGFI= .91; CFI= .94; IFI= .93). All the path coefficients were significant except the path from self-efficacy to engagement that did not meet the criteria of 1.96 ( $t = .05$ ). These results indicate that resources fully mediates the relationship between self-efficacy and engagement. All four steps described by Baron and Kenny (1986) and Judd and Kenny (1981) were met.

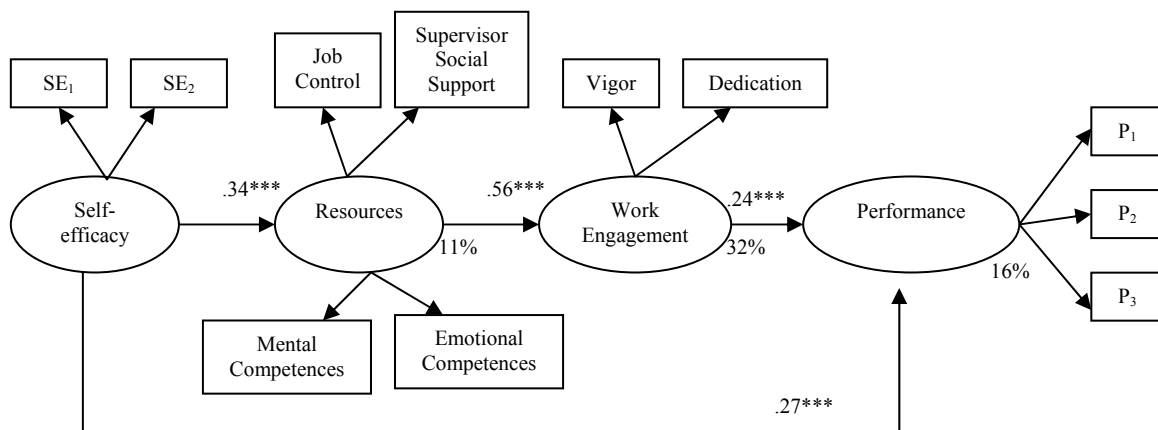


Figure 4. 2. The research model with standardized paths coefficients \*\*\*  $p < .001$ .

In order to test whether the impact of self-efficacy and resources on performance was mediated by work engagement, additional analyses were carried out (Peiró, González-Romá, Ripoll & Gracia, 2001). First, direct paths from self-efficacy and resources to collective performance were added to the initial model (M1), and this new model (M2) was fitted to the data. The model fitted the data ( $\chi^2_{(39, n=224)} = 60.16$ , RMSEA= .05; GFI= .95; AGFI= .92; CFI= .95; IFI= .95), but a new parameter estimated between self-efficacy and performance was statistically significant. Also, the

difference between the chi-square statistics associated with M2 and M1 was statistically significant.

Secondly, the value of parameters estimating the impact of engagement on performance of the research model (M1) was fixed to the value presented by this parameter (unstandardized coefficient) of the M1, and a new alternative model was fitted to the data (M3). The model fitted the data with all fit indices meeting the criteria ( $\chi^2_{(41, n=224)} = 69.94$ ; RMSEA= .05; GFI= .94; AGFI= .91; CFI= .93; IFI= .93), and the difference between the chi-square statistics associated with M3 and M2 was statistically significant, but fit indexes shown that M2 fitted better the data. Thus, the influence of resources on performance is fully mediated by work engagement, but the influence of self-efficacy on performance is partially mediated by resources and work engagement, because there is a direct relationship between self-efficacy and performance.

Table 4.2

*Models fit.*

Model	$\chi^2$	df	RMSEA	GFI	AGFI	CFI	IFI	$\Delta\chi^2$	$\Delta df$
M1.	67.97	40	.05	.94	.91	.94	.93		
M2.	60.16	39	.05	.95	.92	.95	.95	M2-M1= 7.8	1***
M3.	69.94	41	.05	.94	.91	.93	.93	M3-M2= 9.7	2**

Notes:  $\chi^2$ =Chi-square; df=degrees of freedom; RMSEA=Root Mean Square Error of Approximation; GFI= Goodness-of-fit Index; AGFI= Adjusted Goodness-of-fit index CFI=Comparative Fit Index; IFI=Incremental fit index  
M1= research model, M2= direct paths from self-efficacy and resources to collective performance, and M3= new alternative model.

Moreover, we did Sobel tests to know whether a mediator variable significantly carried the influence of an independent variable to a dependent variable; i.e., whether the indirect effect of the independent variable on the dependent variable through the mediator variable was, or was not, statistically significant. The results show that the effect of self-efficacy on engagement through resources was significant (Sobel test =

2.80,  $p < .001$ ), and that resources on performance through work engagement was also significant (Sobel test = 2.37,  $p < .05$ ).

These results partially confirmed our hypothesis since we found a full mediation of resources between self-efficacy and work engagement, along with a full mediation of work engagement between resources and performance, but we noted a direct, positive and significant relationship between self-efficacy and performance ( $\beta = 0.26$ ,  $p < .001$ ). This indicates that resources and work engagement partially mediates the relationship between self-efficacy and performance. So far, the more the self-efficacy, the better performance, both directly and mediated by resources and work engagement. The model explained the 16% of the variance of performance, the 32% of work engagement and the 11% of resources.

## **Discussion**

The main objective of this study was to test whether self-efficacy predicts work engagement and performance through job and personal resources. Following the predictions of Bandura's (1997) *Social Cognitive Theory*, we expected that resources and work engagement fully mediate the relationship between self-efficacy and performance. The results confirm that self-efficacy has a positive effect on job and personal resources (i.e., job control, supervisor social support, mental and emotional competences), thus initiating the motivational process of the *JD-R Model*. Moreover, we found a direct relationship from self-efficacy to performance. In fact, work engagement and self-efficacy accounted for 16% of the variance of performance. Thus, self-efficacy predicts engagement by means of available job resources and perceived workers' mental and emotional competences. Self-efficacy positively relates with resources which, in turn, lead to engagement. Therefore, resources fully mediate the relationship between

self-efficacy and engagement. These relationships also agree with the *Job Characteristics Theory* (Hackman & Oldham, 1980) and the *Self-Determination Theory* (Ryan & Deci, 2000), which state that job characteristics have a motivating potential and indirectly predict positive outcomes.

Work engagement has a positive relationship with performance, which agrees with the *SCT* (Bandura, 2001), and coincides with the *JD-R Model*. Specifically, the finding that resources predict performance via work engagement agrees with the motivational process of the expanded *JD-R Model* (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). Therefore, this process was confirmed in this study as well in a sample of construction workers.

Briefly, the relationships found partially corroborate our hypothesis since the perception of resources and work engagement partially, but not fully, mediates the relationship between self-efficacy and performance. Therefore, this relationship is explained not only by how workers perceive the available job resources, but also by their perceived competences and the levels of engagement at work.

#### *Main contributions*

The results of this study empirically support the robustness of the motivational process of the *JD-R Model* by supporting the fully mediating role of work engagement between resources and performance. Furthermore, we extended this motivational process because we tested the predicting role of one main personal resource, i.e., self-efficacy.

Our results agree with some research works which show how positive personal and environmental factors increase not only engagement, but in turn, they also enhance specific positive behaviors, such as performance (Salanova, Agut, & Peiró, 2005). From a Positive Psychology perspective, this study stresses the importance of enhancing the

levels of self-efficacy at work to improve levels of work engagement and performance. Specifically, researchers may apply these results to the construction industry, for example, to improve safety performance by enhancing employees' levels of efficacy beliefs, which could contribute to reduce high accident rates.

#### *Limitations and future research*

Perhaps the most relevant limitation of this study lies in the fact that we used a subjective measure as the indicator of performance, although the different companies participating in our study did not use any objective measure of workers' performance. Therefore, it was not possible to collect such a measure. Moreover, using the same score many times for different participants blow-up our results, and this could be other limitation. However, the high level of agreement among the workers in the same work group, in terms of the measure of collective performance, is one strength of this study as we used an agreement inter-subjective measure as a dependent variable instead of only an individual subjective measure.

Another possible limitation of the study concerns the kind of information analyzed since all the measures were self-reports. However, following the recommendations of Podsakoff et al. (2003), we used Harman's single-factor test and the results reveal that common method variance is not a serious deficiency in this dataset.

Finally, a sample of convenience was used. However, we believe that working with a sample of 228 construction workers is quite an achievement given the difficulty of collecting data because, as previously mentioned, we had to do a face-to-face interview with each worker.

Future research could study the influence that efficacy beliefs have on how construction workers' perceive job demands and other job resources, and to also study

the relationship between efficacy beliefs and other variables, like burnout or health variables, to examine their effects on performance. Furthermore, it would be very interesting to identify the most effective sources of self-efficacy in each setting which, in our case, is the construction industry, as they would prove most useful to design interventions aimed to increase these workers' efficacy beliefs and, in turn, to improve their levels of engagement and job performance.

Finally, future studies could also test these relationships by means of longitudinal designs that would allow the analysis of the reciprocal relationships between the study variables.

### **Final note**

The significance of the present study lies in the fact that the predicting role of self-efficacy in the motivational process of the *JD-R Model* has been shown, based on the predictions of Bandura's (1997) *SCT*. This study emphasizes the crucial role that self-efficacy plays in determining how people perceive resources by determining levels of work engagement and, hence, their performance.



## **Chapter 5**

### **Transformational Leadership and Extra-Role Performance: The Mediating Role of Self-Efficacy and Work Engagement.**

**Summary**

Within the framework of the *Social Cognitive Theory* by Bandura (1997, 2001), the current study aims to gain insight into the psychological mechanisms (i.e. motivational power of self-efficacy) that explain how transformational leadership predicts employee extra-role performance (as assessed by supervisors). The sample comprises 280 nurses from different health services and their 17 supervisors. Structural equation modelling analyses were consistent with a mediation model in which transformational leadership predicted extra-role performance through self-efficacy and work engagement. Moreover a direct relationship between transformational leadership and work engagement was found. Therefore, transformational leadership style influences levels of self-efficacy and work engagement, which in turn, positively predict extra-role performance. Finally, theoretical and practical implications are discussed together with limitations and suggestions for future research.

## **Introduction**

Public health nurses face patients who normally have health troubles as part of their day-to-day work. For this reason, extra-role performance is crucial for providing a good health service. Apart from having to cope with job demands that are present in other occupational settings (i.e., time-related pressures, overload, teamwork, role conflict, routine, etc.), they have additional job demands, like feeling responsible for human lives. Consequently, it is likely to experience emotional strain. However, nurses have not experienced emotional strain for performing well; quite opposite, and more importantly, they feel motivated, engaged and self-efficacious doing their work.

According to the *Social and Cognitive Theory* (SCT) of Albert Bandura (1997, 2001), human functioning is the product of the interaction among personal factors, behavior and environment. Moreover, self-efficacy is the basis of agency and influences one's motivation to engage in specific positive behaviors related to high performance. Accordingly, employees' behavior (e.g., extra-role performance) would be the result of a combination of personal resources (e.g., efficacy beliefs), contextual resources (e.g., job and organizational characteristics) and well-being (e.g., work engagement). This study focuses on self-efficacy as the main personal resource which influences extra-role performance through work engagement. This study also aims to identify the main contextual resource that influences self-efficacy according to two of the four sources of self-efficacy postulated by Bandura (1997), i.e., vicarious experiences and verbal persuasion. We have taken transformational leadership as the main contextual resource with sufficient power to influence employees' self-efficacy and work engagement which in turn, positively predict extra-role performance.

*Efficacy beliefs as a strong personal resource at work*

The *SCT* (1997, 2001) defines self-efficacy as “beliefs in one’s capacities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p.3). The beliefs that people have about themselves are key elements in the exercise of control and personal agency, and in which individuals are viewed as both, products and procedures of their own environments (Pajares, 1996). The *SCT* assumes that self-efficacy is the key personal resource to understand people’s behavior and to know what the antecedents and consequences of this behavior actually are.

Given the centrality of self-efficacy in people’s lives, its study is crucial to understand and predict human behavior because it affects behavior through goals and aspirations, outcome expectations, affective proclivities and the perception of impediments and opportunities in the social environment (Bandura, 1997). In this way, self-efficacy influence people’s thinking (erratically or strategically, optimistically or pessimistically). Efficacy beliefs also influence the courses of action that people choose to pursue, the goals and commitment they set for themselves, how much effort they invest in their activities, the outcome they expect their efforts to produce, their resilience to adversity, the quality of their emotional life, how much stress and depression they experience, and all the choices they make in their life. Thus, people with high self-efficacy perceive troubles as challenges, are highly committed to the activities they carry out, invest more time and effort in their daily activities, think strategically to solve difficulties, recover easily from failure, feel they are in control of the majority of stressors, and also feel they are less vulnerable to stress and depression (Bandura, 1997).

Following the *SCT* (Bandura, 1997), this study considers self-efficacy to be the main personal resource able to predict work engagement and, in turn, extra-role performance. Work engagement is defined as a motivational and positive construct

related to work, characterized by vigor, dedication and absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002). High levels of energy and mental resilience, the willingness to invest effort, and persistence even in the face of difficulties, characterize vigor. A sense of significance, enthusiasm, inspiration, pride, and challenge, characterize dedication. Finally, being fully concentrated and deeply engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work, characterize absorption. Recent evidence, however, suggests that absorption plays a slightly different role and might perhaps be considered a consequence of work engagement rather than a constituting component (Salanova, Llorens, Martínez, Cifre, & Schaufeli, 2003). Accordingly, we have excluded absorption from the present study.

According to Bandura (1997), four fundamental sources may generate efficacy beliefs : (1) mastery experiences: past experiences of success or command, (2) vicarious experience by observing the successes and failures of others, i.e. a role model, (3) verbal persuasion, and (4) physiological states or emotional activation. Mastery experiences refer to previous success in similar tasks. Then the better people's successes in the past, the more self-efficacious they will be when facing future tasks. Vicarious experiences are when a person observes what another is able to do and realizes the consequences of his/her behavior. This person uses this information to build his/her own efficacy beliefs. For example, the leader can be a role model for the employee since the employee can learn from the leader's experience. The strength of this vicarious learning process depends not only on the similarities and the power of influence between the observed (role model) and the observer, but also on the kind of task observed. Verbal persuasion refers to a person building his/her self-efficacy as a result of the positive-negative feedback received from his/her leader, director, colleagues, etc. Finally, the psychological emotions that people experience when they must face a certain task,

provides information related to their levels of self-efficacy. For example, feeling anxious about performing a task offers information about low levels of self-efficacy to accomplish this task (Bandura, 1989; Pajares, 1996). Thus, the combination of these four sources produces self-efficacy perceptions about a specific domain through the cognitive process (i.e., imagining goals, predicting difficulties), motivational processes (i.e., anticipating outcomes, planning goals), the affective process (i.e., coping with stressful situations, controlling negative thoughts) and the selection process (i.e., approaching or avoiding specific situations). This study considers transformational leadership as a work contextual characteristic that influences employees' efficacy beliefs mainly through vicarious experiences and verbal persuasion.

#### *Transformational leadership*

Unlike the transactional leader who practices contingent reinforcement of followers, the transformational leader influences, inspires, intellectually stimulates, and is individually considerate of them. *Idealized influence* reflects the extent to which leaders choose to do what is right rather than what is simple or expedient. *Inspirational motivation* occurs when leaders challenge employees to do their very best, and convince both employees and work groups that they can perform beyond expectations. *Intellectual stimulation* consists of encouraging employees to think for themselves, to challenge cherished assumptions about the way in which work takes place, and to think about old problems in new ways. *Individualized consideration* refers to leaders caring for the work-related development of their employees and promoting social support.

In this way, the elements of transformational leadership have the potential to affect employees' perceptions (Zohar & Tenne-Gazit, 2008), including efficacy beliefs. Therefore, a transformational leader will foster closer relationships with subordinates, since there is less distance between them despite "power" and individualized

consideration of members' needs and capabilities (Bass, 1990). Both mutual trust and openness and the richness of verbal communication and bi-directional feedback between leaders and members sustain this relationship (House & Shamir, 1993; Klaus & Bass, 1982). Such leaders create more opportunities for sharing and clarifying perceptions (Kozlowski & Doherty, 1989), and offer a better articulation of task cues (Kirkpatrick & Locke, 1996), all of which should provide group members with better information to assess what to prioritize, value and support by promoting the development of their self-efficacy.

Regarding the relationship between transformational leadership and efficacy beliefs, past research (Kirkpatrick & Locke, 1996; Shamir, House, & Arthur, 1993) has shown that transformational leaders enhance followers' perception of self-efficacy by emphasizing positive visions, communicating high performance expectations and adequate feedback, and expressing confidence in followers' abilities to contribute to the their organization's mission and goals. Thus, a transformational leader can increase followers' self-efficacy through verbal persuasion and also acting as a model for them (role modeling), which are two major sources of self-efficacy (Walumbwa, Avolio, & Zhu, 2008). Unfortunately, such research is scarce because that which has been conducted mainly focused on outcomes of efficacy beliefs. Therefore, less is known about the variables able to act as antecedents of them. We believe that in order to obtain more in-depth learning about the role of self-efficacy in organizations, it is important to examine not only how it affects organizational outcomes, but also how other variables, such as leadership style, affect it. Along these lines, both the theory of transformational leadership (Bass, 1985; Shamir et al., 1993) and empirical studies (Walumbwa, Wang, Lawler, & Shi, 2004) suggest that efficacy beliefs would mediate the relationship between transformational leadership and work-related attitudes and behaviors. To

pursue this suggestion, Walumbwa, Lawler, Avolio, Wang, and Shi (2005) investigated the role of both collective efficacy and self-efficacy, and their results revealed that collective efficacy partially mediated the contribution of transformational leadership to organizational commitment and job satisfaction.

This study aims to examine and to extend previous research about how transformational leadership is a key antecedent or a source of self-efficacy (Walumbwa et al., 2008) which, in turn, lead to positive outcomes such as work engagement and extra-role performance. Moreover, this study assumes that a transformational leader may lead to followers' perception of more personal resources (self-efficacy), which positively influence levels of work engagement (Turner, Barling, & Zacharatos, 2002). This occurs because leaders increase followers' awareness of the mission toward which they are working, thereby creating a situation where followers feel excited and interested in common goals. This link may exist because leaders' behavior is likely to provoke emotional responses in subordinates which have implications for their well-being and work motivation (Druskat, 1994).

However, this research goes one step further and, while previous studies have shown the influence of the transformational leader on efficacy beliefs and work engagement, this study seeks to analyze how transformational leadership predicts extra-role performance and, also through self-efficacy and work engagement.

#### *Extra-role performance*

Research has consistently revealed that transformational leadership positively relates to work-related outcomes (Dumdum, Lowe, & Avolio, 2002; Fuller, Patterson, Hester, & Stringer, 1996; Lowe, Kroeck, & Sivasubramaniam, 1996). However, fewer studies have been conducted on the underlying processes and mechanisms by which



transformational leaders exert their influence on followers' performance (Kark, Shamir, & Chen, 2003).

Both correlational (Howell & Hall-Merenda, 1999) and quasi-experimental research (Barling, Kelloway, & Weber, 1996) have associated transformational leadership with high performance. It was hypothesized that the effect of transformational leadership on performance is indirect, and that different aspects of employee morale mediate it. In that sense, Walumbwa et al., (2008) revealed that the interaction of efficacy beliefs partially mediates the effect of transformational leadership on performance. Chan (2008) also found direct effects of the three components of paternalistic leadership behaviors on followers' performance. Using a sample of 178 scout leader-member dyads collected in a voluntary organization, he found that perceived supervisory support primarily mediates the relationship between benevolent leadership and followers' performance, while self-efficacy primarily mediates the relationship between moral leadership and followers' performance. Moreover, Williams (1994) showed that transformational leaders display more extra-role behaviors in subordinates, such as altruism, conscientiousness, sportsmanship, or courtesy; that is to say, extra-role behaviours.

As regards the relationship between work engagement and extra-role performance, Salanova, Agut, and Peiró (2005) showed that levels of work engagement of contact employees working in hotels and restaurants relate to employee extra-role performance, as perceived by customers. Demerouti and Bakker (2006) concluded that positive indicators of well-being (i.e., work engagement) seem to reveal a stronger relationship to extra-role performance than negative indicators (i.e., job burnout). Accordingly, Xanthopoulou, Heuven, Demerouti, and Schaufeli (2008) found that work engagement mediates the relationship between self-efficacy and (in-role and extra-role)

performance. Moreover, Borman and Motowidlo (1997) showed that engaged employees are more likely to perform activities that are not part of their formal role requirements, but which nevertheless promote organizational effectiveness (i.e., extra-role performance). Seeley (2007) also discovered a positive and significant correlation between work engagement and extra-role performance, understood as organizational citizenship behavior (OCBs).

It is important to note that extra-role performance is also termed organizational citizenship behavior (OCBs), that is defined as “individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system and that in the aggregate promotes the effective functioning of the organization” (Organ, 1988, p.4). Specifically, “these behaviors contribute to the maintenance and enhancement of the social and psychological context that supports task performance” (Organ, 1997, p. 91). Extra-role behaviors do not refer to formal expectations of the job, but they contribute to the evaluation of overall professional performance. Moreover, as many of the tasks performed by nurses are very complex, the quality assurance depends heavily on the accumulation of experience and expertise, and the interaction and integration among different specialists. Therefore, it is essential that health policy makers and administrators understand the importance of OCBs and attempt to attract and retain those employees capable of exhibiting such behaviours (Bolon, 1997). In the current study, we included extra-role performance, as assessed by supervisors, as an outcome variable.

To summarize, we expect transformational leadership to predict extra-role performance of nurses (as assessed by supervisors) through self-efficacy and work engagement. Figure 5.1 graphically displays our research model and includes the full

mediation of self-efficacy and work engagement between transformational leadership and extra-role performance.

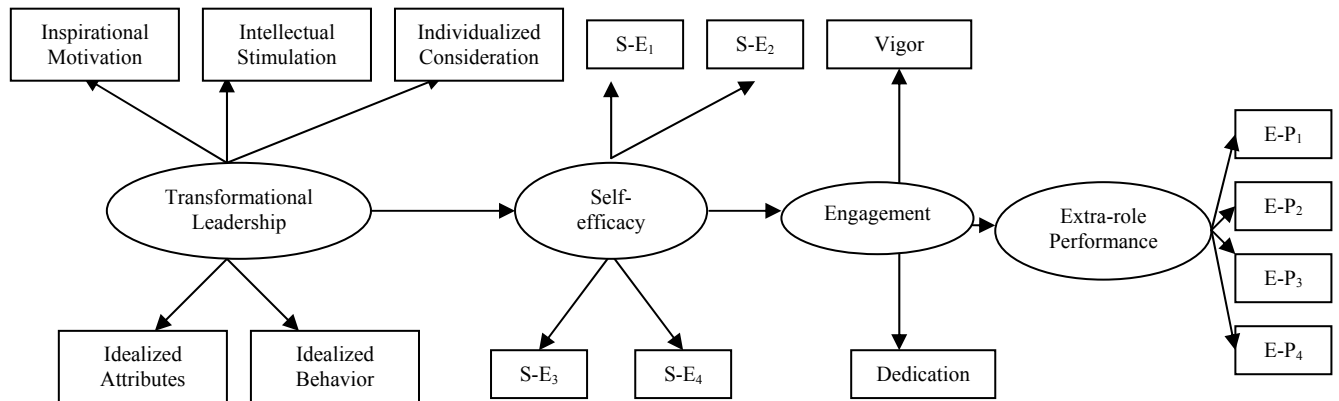


Figure 5.1. The research model.

Notes: E-P<sub>1</sub>, E-P<sub>2</sub>, E-P<sub>3</sub> and E-P<sub>4</sub>=Four items that compose the extra-role performance scale.

S-E<sub>1</sub>, S-E<sub>2</sub>, S-E<sub>3</sub> and S-E<sub>4</sub>=Four items that compose the self-efficacy scale.

## Method

### *Participants and Procedure*

The participants in our study were employees in a large Portuguese hospital (N=364 nurses). We distributed self-report questionnaires with scales measuring the main variables of this study among nurses who belonged to the different health services (i.e., Nephrology (76,5%), Radiotherapy (100%), Vascular Surgery (73,3%), Accidents and Emergency (55,8%), Ambulatory (90%), Medicine 1C (95,8%), Obstetrics (92,6%), Medicine 2B (95,8%), Neurology (89,5%), Infectious Diseases (100%), Psychiatry (66,7%), Oncology (100%), Medicine 1B (95,8%), Intensive Care Unit (100%), Palliative Medicine (100%), HRED (75%), and Pediatrics (100%)). The research procedure involved several steps. After seeking permission from the hospital's Board of Directors, we asked permission from the supervisors (i.e. charge nurses) of each service. Then a researcher met with several groups of supervisors to explain the purpose and

requirements of the study. Researchers committed to send a detailed report of the results of each health service in order to motivate their participation. All 17 supervisors agreed to participate in our study and we gave them two kinds of questionnaires, one for him/herself to complete and one for each subordinate nurse. We included a matched code number on both the subordinate and the supervisor questionnaires. Next, the supervisors handed out the questionnaires to their corresponding subordinates and gave each respondent a sealable envelope in which to enclose the completed survey. Finally, the researcher returned to the hospital after 15 days to collect the surveys. All the respondents had sealed the completed questionnaires in the envelopes before returning them.

Moreover, we asked each supervisor to evaluate the extra-role performance of each of his/her subordinates. We wrote the subordinate's name on the supervisor's questionnaire so that the supervisor could focus on the subordinate he/she was evaluating. After completing the survey, we asked the supervisors to cut out the subordinates' names so that the subordinate's identity was anonymous, even if someone happened to see the completed survey. We also assured complete confidentiality of all the participants' responses. Lastly, we emphasized that participation in the study was voluntary.

After eliminating incomplete questionnaires, a total of 280 sets of supervisor-subordinate questionnaire dyads remained and constituted the sample for our study (76.9 % of the total nurses of the hospital), 79% were women with a mean age of 34 years (SD = 11.1). The final sample was representative (i.e., error margin < 0.01 and 90% reliability).

### *Variables*

*Transformational Leadership.* We used the four Transformational Leadership dimensions from the *Multifactor Leadership Questionnaire* (Bass, 1985; Bass & Avolio, 1990). We measured *Inspirational motivation* with a four-item scale (item example: “*My supervisor speaks so optimistically about the future*”). We measured *Individualized consideration* using a four-item scale (item example: “*My supervisor believes that each worker has different needs, skills and aspirations*”). We measured *Intellectual stimulation* using another scale composed of four items (item example: “*My supervisor suggests new ways to perform the tasks*”). Finally, to measure *idealized influence*, Bass and Avolio (1990) suggested two sub-dimensions: *idealized attributes*, which we measured with a four-item scale (item example: “*My supervisor conveys a sense of power and confidence*”); and *idealized behavior* measured by another four-item scale (item example: “*My supervisor speaks about his/her most important values and beliefs*”). Participants answered the questionnaire items using a 5-value Likert scale, ranging from 0 (never) to 4 (always). Table 1 presents the alpha coefficients of each scale.

*Self-efficacy.* We measured self-efficacy using self-constructed scale composed of four items, (items examples: “*I can do my work although I must solve difficult problems*”). Subjects answered the questionnaire items using a 7-value Likert scale, ranging from 0 (never) to 6 (always).

We measured the *vigor* and *dedication* dimensions of *Work Engagement* using the Utrecht Work Engagement Scale (UWES, Schaufeli & Salanova, 2007) formed by 6 and 5 items, respectively (Items examples: “*In my work, I feel I have plenty of energy*” and “*My work is challenging*”). Subjects answered the questionnaire items using a 7-value Likert scale, ranging from 0 (never/nothing) to 6 (always, everyday).

*Extra-role performance.* We measured this variable with four items of the questionnaire on citizenship behavior by Morrison (1994) which the supervisors answered. We also asked the supervisors to indicate the frequency with which each nurse displays certain extra-role behaviors at the hospital. (Item example: “*The employee thinks about what is best for the hospital*”). The supervisors answered this scale using a 5-value Likert scale, ranging from 1 (never) to 5 (always).

## **Results**

### *Descriptive analyses*

Firstly we conducted descriptive analyses and the internal consistency of the scales, as well as inter-correlations of all the variables. Given the use of self-reports in this study, we considered the recommendations of Podsakoff, MacKenzie, Lee, and Podsakoff (2003) in order to test for the common method variance bias. Thus, we applied Harman’s single-factor test with Confirmatory Factor Analyses (CFA; e.g., Iverson & Maguire, 2000) for the study variables. The results reveal a significant inferior fit of the single-factor model [ $\Delta \chi^2 = 153, p < 0.001$ ] compared to the model with four latent factors (i.e., transformational leadership, efficacy beliefs, work engagement and extra-role performance). Hence, one single factor cannot account for the variance in the data. Consequently, we cannot consider the common method variance to be a serious deficiency in this dataset.

Table 5.1 presents the descriptive analyses of the different scales with their reliability (Cronbach’s  $\alpha$ ). Table 1 shows that all variables had an alpha coefficient higher than .70 (Nunnally & Bernstein, 1994), and we even observed the most demanding criterion, .80 (Henson, 2001), for all the variables except idealized attributes and behavior. As expected, all the intercorrelations were positive and significant. The

transformational leadership dimensions positively interrelated (mean  $r = .76$ ) and positively related to the engagement dimensions (mean  $r = .18$ ). Idealized attributes and inspirational motivation also revealed a positive and significant relationship with self-efficacy (mean  $r = .15$ ). Self-efficacy positively related to the engagement dimensions (mean  $r = .33$ ). Finally, extra-role performance positively and significantly correlated with idealized behavior ( $r = .20$ ) and vigor ( $r = .12$ ).

Table 5.1

*Means (M), Standard deviations (SD), internal consistencies (Cronbach's  $\alpha$ ) and intercorrelations of the study variables (N=280)*

	<u>M</u>	<u>SD</u>	(1)	(2)	(3)	(4)	(5)	(6)	(8)	(9)	(10)
1. Inspirational motivation	2.61	.75	.84								
2. Indiv. consideration	2.53	.79	.72**	.83							
3. Intellectual stimulation	2.52	.69	.73**	.82**	.80						
4. Idealized attributes	2.55	.70	.74**	.74**	.82**	.72					
5. Idealized behavior	2.59	.70	.73**	.74**	.78**	.81**	.73				
6. Self-efficacy	4.29	.94	.18**	.07	.09	.13*	.09†	.91			
7. Vigor	4.27	.95	.21**	.15**	.20**	.18**	.15**	.39**	.80		
8. Dedication	4.81	.96	.21**	.21**	.24**	.14*	.13*	.27**	.70**	.84	
9. Extra-role performance	3.31	.91	.05	.10†	.09	.08	.20**	.05	.12*	.07	.88

Note. Correlations diagonal; \*\* $p < .01$ . ; \* $p < .05$  ; † $p < .10$

### *Hypothesis testing*

We used structural equation modelling (SEM) methods, as implemented by AMOS 16.0 (Arbuckle, 2005), to test the research model (see Figure 1). We also used maximum likelihood estimation methods, and the input for each analysis was the covariance matrix of the items. We evaluated the goodness-of-fit of the model using absolute and relative indices. The absolute goodness-of-fit indices calculated were: 1) the  $\chi^2$  goodness-of-fit statistic; 2) the Root Mean Square Error of Approximation (RMSEA). Since the  $\chi^2$  – test is sensitive to sample size; it is strongly recommend the calculation of relative goodness-of-fit indices (Bentler, 1990). We also calculated the following relative goodness-of-fit indices: 1) Comparative Fit Index (CFI) (Marsh, Balla, & Hau, 1996); 2) Root-Mean-square Residual Index (RMR) and 3) also the so-

called Tucker-Lewis Index (TLI). Values near .08 for RMSEA are considered to indicate an acceptable model fit, as a rule of thumb, and those smaller than .08 are considered to indicate a good model fit (Cudeck & Browne, 1993). Values lower than .05 of RMR indicate a good model fit; finally, the relative fit indices values greater than .90 are considered to indicate a good fit (Hoyle, 1995).

Transformational leadership, self-efficacy, work engagement and extra-role performance are represented as latent variables in the structural model. Specifically, transformational leadership has five indicators, i.e., inspirational motivation, individual consideration, intellectual stimulation, idealized attributes and idealized behavior. Self-efficacy has four indicators corresponding to the items that compose the scale. Work engagement has two indicators, i.e., vigor and dedication. Finally, extra-role performance has four indicators that all the four items composing the scale represent.

According to Baron and Kenny (1986) and to Judd and Kenny (1981), when a mediation model involves latent constructs, SEM provides the basic data analysis strategy. In accordance with the four basic steps to establish the mediation effects proposed by these authors, and in order to test the hypothesis, our research model (M1) fitted the data, as Figure 5.2 depicts. The results presented in Table 5.2 show that the research model fits the data and that all the fit indices met the criteria ( $\chi^2_{(86, N=280)} = 153.45$ ; RMSEA= .053; RMR= .03; CFI= .97; TLI= .97). We observed a fulfillment of the first three steps described by Baron and Kenny (1986) and by Judd and Kenny (1981), since all path coefficients were significant. Therefore these results show that self-efficacy partially mediated the relationship between transformational leadership and work engagement.



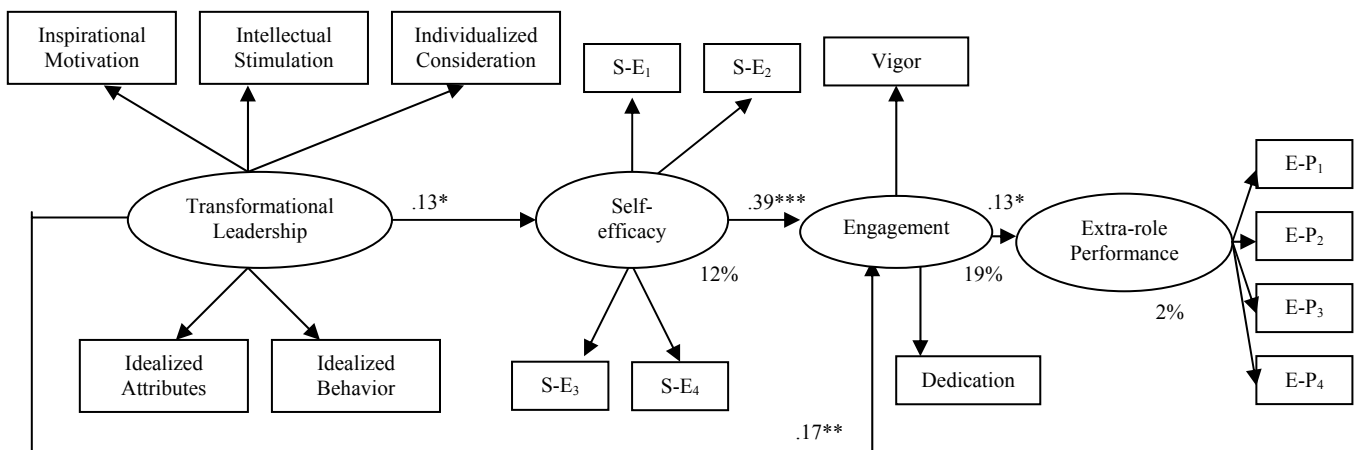


Figure 5.2. The research model with standardized paths coefficients \*\*\* $p < .001$ . \* $p < .05$ .

Notes: E-P<sub>1</sub>, E-P<sub>2</sub>, E-P<sub>3</sub> and E-P<sub>4</sub>=Four items that compose the extra-role performance scale.

S-E<sub>1</sub>, S-E<sub>2</sub>, S-E<sub>3</sub> and S-E<sub>4</sub>=Four items that compose the self-efficacy scale.

In order to test whether work engagement mediates the impact of transformational leadership and self-efficacy on extra-role performance, we carried out additional analyses (Peiró, González-Romá, Ripoll & Gracia, 2001). First, we added the direct paths from transformational leadership and self-efficacy to extra-role performance to the initial model (M1). This new model (M2) fitted the data ( $\chi^2_{(84, N=280)} = 151.07$ ; RMSEA= .05; RMR= .02; CFI= .97; TLI= .97), and none of the new parameter estimates was statistically significant. Therefore, a full mediation exists.

Second, we fixed the value of the parameters estimating the impact of work engagement on the extra-role performance of the research model (M1) to the value presented by this parameter (unstandardized coefficient) of the M1, and we fitted a new alternative model to the data (M3). The model fitted the data, and all the fit indices met the criteria ( $\chi^2_{(86, N=280)} = 155.45$ ; RMSEA= .05; RMR= .03; CFI= .97; TLI= .97). The difference between the chi-square statistics associated with M3 and M2 was not

statistically significant. Thus, engagement fully mediated the influence of transformational leadership and self-efficacy on extra-role performance.

Table 5.2

*Model fit*

Model	$\chi^2$	df	RMSEA	RMR	CFI	TLI	$\Delta\chi^2$	df
M1.	153.45	86	.053	.038	.97	.97		
M2.	151.07	84	.053	.029	.97	.97	M2-M1= 2.3	2 n.s.
M3.	153.45	86	.053	.037	.97	.97	M3-M2= 2.3	2 n.s.

Notes:  $\chi^2$  =Chi-square; df=degrees of freedom; RMSEA=Root Mean Square Error of Approximation; RMR= Root-Mean-square

Residual Index CFI=Comparative Fit Index; TLI=Tucker-Lewis Index

M1= research model, M2= direct paths from transformational leadership and self-efficacy to extra-role performance, and M3= new alternative model

In short, the data support our hypothesis since self-efficacy partially mediated the relationship between transformational leadership and work engagement, and work engagement fully mediated the relationship between transformational leadership and self-efficacy, with extra-role performance.

## **Discussion**

The objective of the current study was to gain insight into the psychological mechanisms (i.e., motivational power of self-efficacy) that underlie how transformational leadership predicts employee extra-role performance (as assessed by supervisors). The sample comprised 280 nurses from the different health services and their 17 supervisors from one hospital. We carried out SEM to verify our hypothesis. The data largely supported our hypothesis since the results obtained confirmed a mediation model in which transformational leadership predicts extra-role performance through self-efficacy and work engagement. Moreover, a direct relationship between transformational leadership and work engagement was found.

*Theoretical findings*

A positive and significant relationship between transformational leadership and self-efficacy was found. This study clearly demonstrates that transformational leadership dimensions may increase employees' self-efficacy. This agrees with the suggestions of Walumbwa et al., (2008) who noted that a transformational leader may enhance followers' self-efficacy through vicarious experience (role modeling) and verbal persuasion, which are two of the major sources of self-efficacy according to the *SCT*.

Next, we also analyzed whether transformational leadership impacted work engagement by influencing self-efficacy. Although previous research had studied the relationship between transformational leadership and well-being (Druskat, 1994), our results confirm that self-efficacy partially mediate this relationship. This study goes one step further by testing one contextual variable which predicts self-efficacy (i.e., transformational leadership). Specifically, this study shows how the transformational leader dimensions (i.e., inspirational motivation, individualized consideration, intellectual stimulation, idealized attributes and idealized behavior) predict self-efficacy but also the levels of employees' work engagement (i.e., vigor and dedication). Our results agree with those of Turner et al. (2002) who suggested that transformational leadership has the potential to contribute considerably to individual well-being (in our study, work engagement). The added value of the current study is that it shows that the relationship is partially mediated by the impact of leaders' behavior on followers' self-efficacy.

Moreover, we included extra-role performance in our model as assessed by supervisors. Although it is important to note the difficulty of obtaining an individual measure of extra-role performance of each nurse, it is recommended for assessing the

extra-role performance of employees more precisely. The results show that work engagement positively relates to the extra-role performance of nurses. Moreover, work engagement fully mediates the relationship between transformational leadership, self-efficacy and extra-role performance. Furthermore, these relationships agree with Williams (1994) who showed that transformational leaders display more extra-role behaviors from followers. Finally, the recent article by Avolio, Walumbwa and Weber (2009) shows that more research is needed to examine the mediators and moderators that would help to explain how leaders influence outcomes. In this sense, our study shows that some of these mediators are self-efficacy and work engagement.

#### *Limitations of the study*

The main limitation of this study is the use of self-reports, which means that the common method variance could bias the results. However, following the recommendations of Podsakoff et al. (2003), results of the Harman's single-factor test revealed that we cannot consider the common method variance to be a serious deficiency in this dataset. Moreover, we used nurses' extra-role performance assessed by their supervisors, which is also a strong characteristic of the study.

Another possible limitation would be to use a sample of convenience. It is possible that this method is not the most effective in sample collection, and that random sampling is preferable. However, given the difficulty of obtaining this kind of sample for measuring individual extra-role performance by others (i.e. supervisors), we obtained a representative sample of participants with a relatively high participation rate.

#### *Practical Implications and Avenues for Future Research*

Our results agree with research about how positive personal and environmental factors increase work engagement which, in turn, increase specific positive behaviors (Salanova et al., 2005). However, this study assumes an innovation because a job

contextual variable that provides extra-role performance through self-efficacy and work engagement has been found, this is transformational leadership.

From a Positive Psychology perspective (Seligman & Csikszentmihalyi, 2000), this study stresses the importance of enhancing the levels of transformational leadership in order to improve employees' levels of self-efficacy and work engagement and finally, positive results as extra-role performance. Specifically, we may apply these results to hospital staff. One positive option may be to train supervisor nurses (supervisors) in practices related with transformational leadership in order to improve nurses' efficacy beliefs and work engagement and, in turn, their extra-role performance, since extra-role performance is highly valued in professionals working with patients. In this way, it would be very interesting to develop transformational leadership training protocols.

Future research may test our hypotheses in other occupational settings in order to test the invariance of the proposed model. This would allow us to explore whether or not the relationships observed in this study are due to unique aspects of the organization. Moreover, we could also verify the role of the leader in this kind of population (nurses) and in others. Finally, future longitudinal studies could also test these relationships with a view to analyzing the causal effects among the study variables.

### **Final Note**

The present study expands the *Social Cognitive Theory* as it seeks a contextual variable which is able to drive self-efficacy: transformational leadership. The relevance of a transformational leader to enhance both employees' self-efficacy through its dimensions and work engagement and, finally, extra-role performance has been shown.

## **Chapter 6**

### **The Relationship between Overconfidence and Occupational Accidents among Construction Workers: a Qualitative Study.**

## **Summary**

The objective of this study is to know the different perceptions about the psychosocial causes and consequences of accidents in the construction industry, such as overconfidence. Using a qualitative methodology for the data analyses, a category-type analysis of the contents was done, derived from a focus group and from 7 individual interviews with experts from the construction industry. Results show a consensus about causes of occupational accidents: overconfidence and physical risks perceived as a challenge rather than a danger, are the main causes of many accidents. Thus, these conceptions can become the keys for future accident prevention in the construction industry.

## Introduction

The construction industry is one of the motors of economic growth, and it is characterized by low labour costs, high precariousness, low qualified workers and a large number of immigrants. Since the publication of the *Occupational Risk Prevention Act* (1995) a decade ago, almost 1.9 million minor accidents, around 28,000 serious ones and more than 2,700 fatal accidents have occurred in this sector alone (CSI-CSIF, 2006). For this reason, we affirm that this sector is that which accumulates a greater number of industrial accidents, particularly mortal accidents. Specifically in Spain, 23% of deaths at work take place in this sector. The latest data of the Ministry of Work indicate that globally, occupational accidents diminish, but an intolerable number of accidents still take place in the construction sector. In 2006, a total of 255,636 accidents took place, of which 252,368 were minor, 2,969 were serious and 299 were fatal.

The *IWO* (International Work Organisation) has also mentioned new data which show that 60,000 fatal accidents take place every year in the construction industry. This is equivalent to one death every 10 minutes. Therefore, this sector is one of the most afflicted with occupational accidents.

These data demonstrate that while some sectors have been able to curb the increase of occupational accidents and even lower it, the structure of the construction industry itself, the practice of chain subcontracting (successive subcontracts worsens the quality of employment) and high working rotas all make the implementation of prevention measures very difficult.

The *5th National Survey of Work Conditions* organised by the *Spanish National Institute of Safety and Hygiene at Work* (INSHT) in 2003, contributes some revealing



data: 25% of tasks do not have an incident book available, which is a fundamental and compulsory preventive mechanism. Moreover, in approximately one third of small-size companies, the people who work in preventive actions are not specialised or specifically trained for that task.

In Spain, occupational accidents in the construction industry cause a financial burden of around 12,000 million euros a year. This places Spain at the top of the list of countries as far as the number of accidents registered is concerned, which amount to 250,000 a year (*Agencias/EP, 2005*).

Therefore, both the characteristics and occupational accidents of the construction industry make it an object of increasing interest for professionals and researchers alike whose objective is to improve the knowledge of this fatality rate, and consequently, to reduce the negative impact that it has at the social and economical level. In addition to occupational accidents, quasi-accidents are also considered in the present work. Quasi-accidents are defined by any situation which might have led to an accident, irrespectively of whether the accident had occurred or not (*Goldenhar, William, & Swanson, 2003*).

Traditionally, research referred to risk prevention in the construction industry has been limited to the study of physical, technical and management aspects. Nevertheless, the research being presently undertaken shows the importance of psycho-social factors in safety, and confirm that only intervention at either a technological level or of management strategies does not lower the rate of occupational accidents. In fact, the 5th National Survey of Work Conditions shows that what the workers perceive as the main causes of their accidents are indeed psycho-social and/or ergonomic aspects, such as negligence, overconfidence or habit (38.0%), and forced unnatural body postures (27.4%). Therefore, workers perceive these aspects to be the causes of

accidents rather than the lack of information about risks in the workplace or the lack of safety measures.

*Perception of demands and resources at work*

In order to confront these psycho-social dangers, there may be a series of job resources available for workers that buffer the negative impact of job demands on occupational health and organizational efficacy.

The *Job Demands and Resources Model* (“JD-R”), (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), explains that employee’s work conditions can be categorized into “demands” and “resources”, and that these relate in different ways to positive and negative outcomes which can be typical of specific occupations.

Job demands are understood as those physical, psychological, social or organizational aspects of work that require a physical and/or psychological effort (cognitive or emotional), and are associated with certain physiological and/or psychological costs. Although these demands are not necessarily negative, they may become stressors when they require an effort and/or they require certain costs that produce negative responses (Schaufeli & Bakker, 2004). For this reason, it is interesting to analyze those aspects of work that can be considered demands because they may create tension at work and affect health and safety (Karasek & Theorell, 1990; Gillena, Baltzb, Gassel, Kirschd, & Vaccaro, 2002; Goldenhar, William, & Swanson, 2003). In the present study, we focus on physical risks as the main demand of the workers in this sector.

As mentioned previously, the tasks to be done have diverse resources to confront job demands, that is, those physical, psychological, social and organizational aspects of the work that reduce the associated demands and costs. In addition, they are functional

in the attainment of occupational goals, and stimulate growth and personal development (Schaufeli & Bakker, 2004).

Research has indicated that the main job resources that would be beneficial for construction workers are the following: autonomy in decision-making, social support, a climate of safety in the company in which safety training is included (Clarke, 2000; Goldenhar, Williams, & Swanson, 2003). But personal resources also exist and they can buffer stress and benefit accident prevention. These personal resources are: efficacy beliefs, competences, the positive perception of psycho-social risks and attitudes toward occupational safety.

#### *Efficacy beliefs and overconfidence*

According to Bandura (1997, p.3), self-efficacy is defined as the “beliefs in one’s capabilities to organize and execute the course of action required to produce given attainments”. People’s beliefs in their efficacy have diverse effects: they influence the election of both the conducts that individuals will engage in and the resources of action that they will do. People embark on tasks which they feel competent with and they avoid those they do not.

Additionally, these beliefs influence the amount of effort that people invest in an activity, how much they persist when they come across obstacles, how they endure and adapt to adverse situations, how much stress and depression they experience when they have to confront job demands, and the level of profit that they obtain. Thus, people undertake safe conducts when they feel able to plan and execute this conduct satisfactorily, and when they also think that exerting this conduct will entail the desired result.

The *Social and Cognitive Theory* (SCT) (Bandura, 1997) affirms that self-efficacy is related to positive results. But, what happens when self-efficacy is

excessively elevated, that is, when a person presents an excess of confidence (overconfidence)? Will this overconfidence also be related with positive results, or, can it be related to risk behavior which can lead to accidents?

Within the *SCT*, we can indicate that people with high levels of self-efficacy tend to interpret demands more like challenges than threats (Bandura, 1999, 2001). For this reason, an overconfident person can interpret demands erroneously and may not confront them correctly, and this situation could lead to occupational accidents. For example, an overconfident worker can think that he/she can jump the hollow of the lift easily, and perceives this action as a challenge instead of a threat. This is the reason why the worker attempts the jump, and could consequently lead to a serious accident.

The present study attempts to study the influence of overconfidence on the perception of job demands and resources, and its relationship with occupational accidents in the construction industry. These relationships can be observed graphically in Figure 6.1.

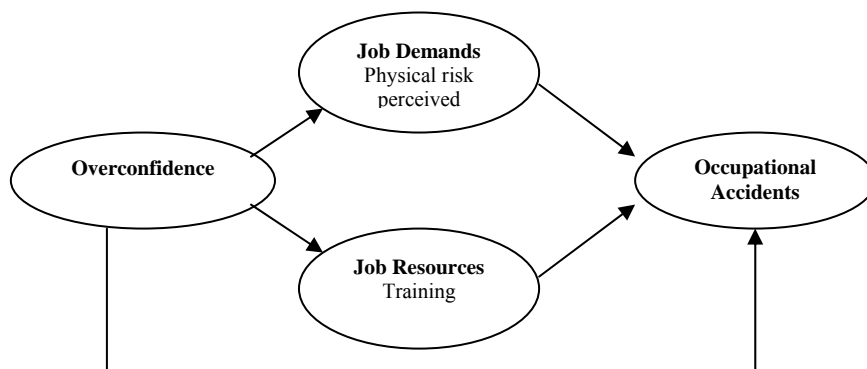


Figure 6.1: Relationships between the study variables.

## Method

### *Procedure and participants*

The study comprises five phases. The first two phases were preparatory and we contacted participants and compiled information about the construction sector. A focus group was carried out in the third phase. Data were analyzed and conclusions were drawn in the last two phases.

- During the first stage, the members of the focus group were summoned. We contacted the key informants in the construction sector, and collaborated with the associations of Construction Employers and also with the *University-Company Foundation* (FUE). In these first contacts, the study objectives and methodology were explained to all the participants. The five companies contacted were of great interest and they offered to participate. Criteria were established by means of consultations with experts and by undertaking a bibliographical review.
- In the second phase, interview guidelines to hold the focus group were elaborated, taking into account the bibliographical review and the research objectives.
- The focus group was held in the third phase, during which a moderator guided the conversation and introduced the subjects of interest for the present study. This moderator was a member of the research team with training and experience as an interviewer. The debate lasted over two hours and was recorded with an

audio system (with previous consent of the participants which guaranteed confidentiality).

On the other hand, seven people (experts from the sector) were interviewed. These interviews were carried out by expert interviewers at workplace. The questions asked may be seen in Annex I.

- In the fourth phase, a transcription of the content of both the focus group and the interviews was performed, which was subsequently analyzed. Content analysis is a technique to study the communication in which the systematization, objectivity and the quantitative measurement of content were sought. The objective was to analyze messages to reach the meanings, the concepts and the symbols that are understood by the participants (Bryman, 1998). Data examination was performed by means of codification: the elements of verbal speech were detected and indicated, and then grouped into analysis categories (general procedure of qualitative analysis).

- Finally, results were presented and the conclusions were drawn.

Fifteen people participated in the focus group: five employers, an occupational risk prevention officer, prevention of labour risks, two trade union representatives, a representative from a medical insurance company, the secretary of a construction association and the five experts in Psychology of Work and Organizations. Interviewed people were: two occupational risk prevention technicians, an occupational risk prevention coordinator, two foremen and two site managers.

### *Variables*

The aspects covered in the interview guidelines were the following: general characteristics of the sector, the worker's labour profile, accidents (causes,

consequences and prevention), psycho-social damages (causes, consequences and prevention) and future challenges.

#### *Data analyses*

The recorded content corresponding to both the focus group session and the interviews was transcribed and then analyzed.

A first analysis was done by categorizing the data obtained. This consisted in selecting all the comments referring to the concepts of “confidence” and “occupational accidents” that appeared in the transcription. The investigator’s “memo” or explanation was identified, and we attempted to relate the comments to others or to some theoretical concept (Goulding, 2002). The study of all the comments gave rise to one first category, “nodes”, which are related groups of comments. A second analysis of the nodes produced new subcategories. Finally, the final category gave rise to general macrocategories containing the other comments and which explain the relationships established between them. The categories identified were as follows: overconfidence, job demands, job resources and occupational accidents.

The study of the relationships between these categories allows conclusions to be drawn about the information provided by the participants.

### **Results**

The most significant relationships found between the established categories of the content are shown below:

#### *Overconfidence*

This category concerns perceptions about the role of overconfidence on occupational accidents. Furthermore, a series of antecedents or causes of this excess of confidence has been identified, which emphasizes the participants’ interest in the

concept and their concern for its consequences. All the participants considered that overconfidence is one of the main risk factors.

We now go on to present the subcategories that define the possible causes of this overconfidence:

- a) Culture. In general, culture is considered one of the main causes of overconfidence since no general preventive culture exists in some countries (i.e. in Spain). Like an example, one of the focus group participants literally commented: *“In North American films, you see when a person is about to make a hole in the wall at home, he or she puts on gloves, safety goggles.... That is, an image is presented in which they resort to safety because they learn this from a very young age. Here in Spain, this culture does not exist”*. Workers are not aware of applying safety measures because they do not learn this at school. In addition, we live in a society that approves risk.
- b) Experience. The longer people work in the construction sector, the more confident they are. Confidence is good, but not in excess. They perceive a false belief that they are immune to accidents because *“they have always done the same things all their lives and nothing has ever happened to them”*.

On the other hand, we found two other relationships:

- a) Overconfidence and risk perception. Overconfidence influences how workers perceive their job demands. In this case, the way in which they perceive physical risks, perceiving them more as a challenge than as a threat or danger. *“The law states that employers must provide the necessary means for workers to carry out their work in*



*total safety. This we do, and for this reason, I do not think that failure lies in the employer, but in the worker who thinks that there is no risk... ”.* This information corroborates with the results found in a study (Salanova, Gracia, & Lorente, 2007) about construction workers in which 27% of the people interviewed affirmed that they frequently take risks in their job, and only 8% affirmed that it was probable that they would have an accident during the following year. This can be related with overconfidence, since they trust that nothing will happen to them. Thus, they do not perceive any danger at work. This lack of risk perception involves negligence that can lead to accidents and/or quasi-accidents.

- b) Overconfidence and quasi accident or accident. On the other hand, overconfidence could be related with occupational accidents; even though the workers perceive that their work is dangerous, they do not apply the appropriate safety measures (they believe nothing is going to happen to them), which can also lead to an accident or quasi-accident. *“I think that even though companies try to apply safety measures and involve the workers in these measures, the workers do not fulfil these measures because they feel safe anyway”.*

*Job demands: physical risks*

In this second category, perceptions referring to job demands were compiled. Many of the construction sector demands have been identified: team work, a high work rate, routine, coordination... Yet the most remarkable demand in our study would be that referring to physical risks.

In addition there is the following relationship:

- a) Risk perception and occupational accidents. The fact that workers do not perceive the real risk that they take in their job often means they do not apply safety measures and they therefore develop dangerous behaviours. Thus, they can even jeopardize their own safety and that of their fellow workers. *“What I see in my work is a total lack of concern regarding the safety of my workmates...”*.

*Resources: training*

In this third category, perceptions of job resources were collected. An overall consensus existed among the focus group members regarding the main resource that they arrange in the construction sector: to face the demands related to physical risks. This resource is training in occupational hazard risks. We need to emphasize that certain discrepancies appeared at this point, especially between the trade union representatives and the employers. These will be explained in the Discussion section.

We can emphasize two relationships in relation to this training:

- a) Overconfidence and training. Those workers who display overconfidence do not perceive the utility of training. *“The training that we provide them is not displayed on any worksite, it does not influence workers enough, it does not interest them...”*.
- b) Training and occupational accidents. The workers do not take full advantage of the training offered to them, they are unaware of the safety regulations which can lead to dangerous conducts, and therefore to accidents and quasi-accidents. *“When people go to a training course, they do not pay attention. They feel they are wasting time. Therefore, they do not apply the things they learn in their workplace because they have not learned...”*.

*Occupational accidents*

Our intention in this final category is to identify the causes or antecedents of accidents and quasi-accidents. Previously we covered the variables related to occupational accidents (overconfidence, job demands and resources). In this section, we believe it is recommendable to classify the causes as follows:

- a) Internal causes for the worker. To emphasize the non-use or incorrect use of individual protective equipment, *“the equipment available in the construction sector is totally uncomfortable or troublesome, which is the reason why workers have taken them off as soon as you turn your back ...”*. With regard the lack of conditioning as far as the importance of risk prevention and the application of safety measures are concerned: *“I deduce that the main failure lies in the worker’s mental preparation. The employer can do nothing if the worker automatically does not believe what you tell him or her as far as safety is concerned”*. Other important aspects are the emotional state and the level of stress of the workers which can lead to confusion and negligence: *“Quite often, the cause of accidents is confusion that arises from concerns regarding social matters: money problems, children...”*. Finally, comments were heard that many workers in this sector consume alcohol and take drugs during their working hours. *“Once I told a worker off because he was smoking marijuana and he told me that some of his other workmates drank beer at lunchtime. What could I do? I cannot dismiss them all...”*.
- b) External causes affecting the worker. Certain aspects can cause accidents that do not depend on the worker. The following aspects

have been identified: high rates of work, subcontracting, casual employment, mobility within the sector and the non-elucidation of the causes of those accidents which had occurred previously.

One subject matter that the focus group did not go into deeply is the consequences of occupational accidents. Nonetheless, it is remarkable that the only matter that came to the fore was the economic consequences for the company and for society in general “*By avoiding an accident, you are avoiding a pointless cost on society*”.

## **Discussion**

The main objective of this study was to gain a qualitative knowledge of causes of accidents and by dealing with those psycho-social factors that can cause occupational accidents, such as overconfidence. Using a qualitative methodology for the data analyses, a category-type analysis was done of the contents derived from a focus group and from 7 individual interviews with experts from the construction industry. Analyzing the content of both the focus group and the interviews has allowed us to qualitatively confirm the relationships previously established (Figure 1).

This model identified four categories: overconfidence, job demands, job resources and occupational accidents. Firstly, it is possible to conclude that overconfidence presents a relationship with occupational accidents, and that this relationship can be mediated by how the workers perceive job demands and resources. As previously mentioned, overconfident workers perceive physical risks as a challenge rather than a danger. In addition, they do not take full advantage of the only resource they have to face these demands (i.e., training on occupational hazard risk prevention). There is a consensus that the employers do not fulfil the objectives they wish to achieve

through the training they provide their workers. On the one hand, employers affirmed that workers are not motivated to training as they are not interested. On the other hand, the trade union representatives affirmed that workers are not interested because this training is normally organized outside the working schedule which leads to demotivation, and this training is generic and always of the same kind which means that workers perceive they will not learn something new. As a possible solution to this problem, it was discussed the possibility of a membership card being provided to workers which records which courses each worker has attended so that they do not have to attend one course twice, which often happens when workers switch from one company to another.

Apart from this measure, other intervention strategies that could be carried out to avoid the high indices of occupational accidents were discussed during the session. Some such strategies are: advertising campaigns, include a subject about preventive measures at schools, a worker's membership card which specifies the training courses the worker has attended and his/her labour category, sanctions directed to the worker and not always to the employer, the creation of formative protocols for each job and each labour category, training incentives and the possibility of measuring workers' productivity by considering their performance in safety procedures.

To sum up, a great deal remains to be done to prevent accidents in this characteristic occupational sector. In agreement with Glendon, Stanton, and Harrison, (1994), the aspects that contribute to successful occupational safety are: (1) commitment on behalf of the management, (2) communication, (3) occupational stability and group relationships, (4) control of a work climate, (5) safety training, (6) and the usual safety behaviour.

Therefore, these variables are those that require greater attention to create a strong and positive safety climate among workers which helps prevent accidents. On the other hand, it is necessary for workers to simultaneously develop a suitable perception of occupational risks in their jobs to develop, in turn, positive attitudes toward safety and occupational health. Let us emphasize that this does not mean that people purposely seek accidents, but simply that accidents are sometimes due to negligent conducts caused by distraction, lack of concentration, etc. Therefore on numerous occasions, accidents are not due to deficiencies in safety or hygiene, but are attributed to psychosocial and ergonomic subjects such as bad habits, an attitude of overconfidence and habits that encompass these accidents. In the construction industry alone, this negligence, overconfidence, etc., are the first perceived causes of accidents, which surpass the overall average number by 42.2%.

One of the limitations of this study is that the contents of one focus group and of seven interviews have been analyzed solely, since the new cases neither contribute new information nor forced a conceptual reframing, reaching the conceptual saturation (Glaser & Strauss, 1967).

In the future, therefore, we will attempt to extend this study with other focus groups in which workers may also participate, and we will include more interviews with key informants of the sector in question. Finally, future studies would be focused on the antecedents of accidents to clarify the causes and to develop effective intervention strategies.

Annex 1: *Questions included in the interviews with key informants from the construction sector.*

- 1.- On the basis of your experience, what type of accidents are more frequent in the construction sector?
- 2.- In your opinion, which do you think are the main causes of these accidents?
- 3.- What consequences do you think can lead to an excess of confidence in the workers of this sector? (in this question, overconfidence is not stated as one of the causes)
- 4.- Do you think that workers perceive the real risk in their daily work?
- 5.- Are you aware of the risk that you take in your work?
- 6.- Which do you think that are the main job demands in this sector?
- 7.- What resources are available to face job demands?
- 8.- What do you think about the training that workers receive?

## **Chapter 7**

### **The *Dark* and *Bright* Sides of Self-Efficacy in predicting Learning, Innovative and Risky Performances**



## Summary

With Bandura's *Social Cognitive Theory* as a theoretical framework, this study analyzes the role of efficacy beliefs (self-efficacy, collective efficacy) in predicting learning, innovative and risky performances. This theory assumes that self-efficacy perceptions influence motivation to engage in specific positive behaviors, i.e., high performance, and that this influence depends on the type of activity being performed. Specifically, we hypothesize that high levels of efficacy beliefs in learning and innovative activities have positive consequences (i.e., better academic and innovative performance, respectively); whereas high levels of efficacy beliefs in risky activities have negative consequences (i.e., less safety performance). Three studies were conducted in three different settings: a two-wave field longitudinal study among 527 undergraduate students (learning setting), a three-wave lab longitudinal study among 165 university students performing innovative group tasks (innovative setting), and a field study among 228 construction workers (risky setting). As expected, high levels of efficacy beliefs have different (positive or negative) consequences on performance depending on the activity. Unexpectedly, we found no time X self-efficacy interaction effect over time in learning and innovative settings. Finally, we discuss the theoretical and practical implications within the *Social Cognitive Theory* framework.

## Introduction

This study focuses on the predictions of the *Social Cognitive Theory (SCT)* of Albert Bandura. Basically, the SCT assumes that: 1) the human functioning is the product of the interaction between personal factors; behavior and environment, and 2) efficacy beliefs are the basis of personal and collective agency and influence one's motivation to engage in specific positive behaviors related to high performance. Thus, it seems that efficacy beliefs predict human behavior in different settings (Bandura, 1997, 2001). The research question underlying this study is whether this influence is always positive, i.e., the higher the self-efficacy, the better the performance of the behavior. This research takes a step forward and attempts to analyze how high levels of efficacy beliefs may have negative or positive consequences on behaviors depending on the type of activity performed, i.e., learning, innovative or risky activities. We describe the findings of three studies. The first is a longitudinal study among undergraduate students (learning setting), the second is a three-way lab longitudinal study on groups working on innovative tasks (innovative setting), and the third is a field study of construction workers who display risky behaviors (risky setting).

*Efficacy beliefs: The power of believe that you can do it...*

The *SCT* (1997) defines self-efficacy as “beliefs in one's capacities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p.3). Later, the *SCT* extended the conception of human agency to collective agency, defined as people's shared beliefs in their collective power to produce desired outcomes which is not simply the sum of the individual efficacy beliefs, but an emergent group-level property governed by similar regulating proprieties as self-efficacy (Bandura, 2001). Moreover, one definition of perceived collective efficacy is “a

group's shared belief in its conjoint capabilities to organize and to execute the courses of action required to produce given levels of attainments" (Bandura, 1997, p.477).

According to Bandura (1997), four fundamental sources may generate these beliefs: (1) mastery experiences: past experiences of success or command, (2) vicarious experience by observing the successes and failures of others, (3) verbal persuasion, and (4) physiological states or emotional activation. Mastery experiences refer to previous success in similar tasks, then the better success in the past, the more self-efficacious to face similar future tasks. Vicarious experiences occur when a person observes what another is able to do. Then he/she realizes the consequences of this behavior and he/she uses this information to build his/her own self-efficacy beliefs. The strength of this vicarious learning process depends not only on the power of influence between the observed (model) and the observer, but also on the similarities between the observed task and the future task. Verbal persuasion refers to a person building his/her self-efficacy as a result of the positive-negative feedback received from his/her leader, director, colleagues, etc. Finally, the psychological emotions that people experience when they must face certain tasks provide information related to their self-efficacy. For example, psychological states such as anxiety, stress or fatigue, influence people's cognitions negatively because they are signs of either incompetence or possible defeat (Bandura, 1986; Pajares, 1996).

Thus, the combination of these four sources produces several self-efficacy perceptions through cognitive (i.e., imagining goals, predicting difficulties), motivational (i.e., anticipating outcomes, planning goals), affective (i.e., coping with stressing situations, controlling negative thoughts) and selection (i.e., approaching or avoiding concrete situations) processes. Given the centrality of efficacy beliefs in people's life, it is crucial to understand and predict human behavior. Perceived efficacy

plays a key role in human functioning because it affects behavior through goals and aspirations, outcome expectations, affective proclivities and the perception of impediments and opportunities in the social environment (Bandura, 1995, 1997). By following the *SCT*, self-efficacy becomes a key construct to understand people's behavior and to know the antecedents and consequences of this behavior.

Bandura (2001) also affirms that efficacy beliefs differ in generality, strength and level. People may judge themselves as efficacious across a wide range of activity domains or only in certain domains of functioning. Generality can vary across types of activities, the modalities which express capabilities (behavioral, cognitive or affective), situational variations and the types of individuals the behavior addresses. Assessment linked to activity domains, situational contexts and social aspects reveals the degree of generality of people's beliefs in their efficacy. Therefore, Bandura (2001) defends the specificity of efficacy beliefs in accordance with the domain of functioning. The *SCT* treats the efficacy belief system not as an omnibus trait, but as differentiated self-beliefs that are specific of different areas of functioning (Bandura, 2008). For this reason, there has been criticism of use of general and non specific self-efficacy scales. He argued that it is futile to measure self-efficacy with a general scale because test items based on general efficacy are not relevant enough for the domain under study. It is necessary to adapt self-efficacy scales to the particular setting of interest and to reflect an exhaustive study of our chosen domain. Researchers must identify what is important for each item so that the results provide information about self-efficacy in only the particular domain of interest.

As noted above, efficacy beliefs vary in strength. Unpleasant experiences easily negate weak efficacy beliefs, whereas people who have tenacious beliefs in their capabilities will persevere in their efforts despite any difficulties and obstacles as

adversity does not easily dissuade them. Thus, the stronger the sense of personal efficacy, the greater the perseverance and the higher the likelihood that people will successfully perform the chosen activity. Moreover, we may also designate efficacy beliefs in terms of levels, that is, the number of activities individuals judge themselves capable of performing above a selected cut-off value of efficacy strength.

Finally, efficacy beliefs influence people's way of thinking (erratic or strategic, optimistic or pessimistic, in self-enhancing or self-debilitating ways). Additionally, efficacy beliefs influence the courses of action that people choose to pursue, the goals and commitment they set themselves, how much effort they put in their activities, the outcome they expect their efforts to produce, their resilience to adversity, the quality of their emotional life, how much stress and depression they experience, and all the choices they make in their life. Thus, people with high self-efficacy perceive troubles as challenges, are highly committed to the activities they carry out, invest more time and effort in their daily activities, think strategically to resolve difficulties, recover easily from failure, feel they are in control of the majority of stressors and also feel less vulnerable to stress and depression (Bandura, 1997, 2001, 2008).

In short, efficacy beliefs have effects on people's way of thinking, acting and feelings. In that sense, efficacy relates to human behavior and, hence, to performance. Efficacy beliefs influence decisions (selective effects), effort and persistence (motivational effects) through self-regulatory mechanisms, and these mechanisms depend on the environment. Therefore, people with high levels of efficacy in the activity that they are performing, feel involved and connected with it and they feel that they are performing well. We will go on to describe this question in the following section.

*The negative and positive consequences of high self-efficacy on behavior: the power of the type of activity*

There are many studies that link self-efficacy with positive outcomes and consequences. For example, some have studied the levels of self-efficacy in patients with chronic diseases (Stanton, Reverson, & Tennen, 2007), and some findings relate the consequences of efficacy beliefs to certain desirable behaviors such as taking medications correctly, eating healthily, or doing physical exercise (Leventhal, Weinman, Leventhal, & Phillips, 2008). Other studies have linked efficacy beliefs positively to academic performance (Brian, 2001; Salanova, Schaufeli, Martínez, & Bresó, 2009) and self-regulatory efficacy to both school grades and the likelihood of remaining at high school (Caprara, et al., 2008). Other studies have focused on how efficacy beliefs relate to high competence and satisfaction with the use of computers (Beas & Salanova, 2006; Hung-Pin, 2006), and even the positive relationship between self-efficacy and self-esteem in unemployed and employed women (Azar & Vasudevan, 2006).

Research on Work and Organizational Psychology has linked high levels of efficacy beliefs with intrinsic motivation (i.e., work engagement) and psychological well-being, at both individual and organizational levels. To date, Latham (2005) found positive relationships among self-efficacy, motivation, commitment and job performance. Xanthopoulou, Bakker, Heuven, Demerouti, and Schaufeli (2008) and Xanthopoulou, Bakker, Demerouti, and Schaufeli (2009) revealed that work engagement mediates the relationship between self-efficacy and (in-role and extra-role) performance. Thus, decades of empirical research has generated a large number of studies that demonstrate positive relationships between job self-efficacy and different motivational and behavioral outcomes in several settings (Stanjovic & Luthans, 1998).

The reason is because when efficacy levels are high and individuals believe that they can control their environment effectively, there is more likelihood that people perceive job demands as challenging, and that job and other personal resources are abundant. Consequently, individuals are more likely to engage in their tasks and to perform well (Salanova, Schaufeli, Xanthopoulou, & Bakker, 2009).

All the previous studies conclude that high levels of efficacy beliefs relate to positive and desired results, such as good academic or work performance, positive attitudes and satisfaction. But the question is: does this mean that the consequences of high levels of self-efficacy are always desirable? That is, if the relationship between efficacy beliefs and performance is always positive (i.e., the more self-efficacy, the better the behavior and performance), could these consequences not be desirable or negative under certain conditions?

In relation to this, some studies conducted in the eighties and nineties, show negative consequences of self-efficacy on performance. For example, Salomon (1984) found that high levels of efficacy beliefs encourage greater investment of effort and greater cognitive learning, but only when subjects perceive the task as difficult. However, when people perceive the task to be easy, they invest less effort and learning is lower. Stone (1994) discovered that high self-efficacy leads to overconfidence in one's abilities. Instead of high self-efficacy individuals contributing more of their resources toward the task, they contribute less. These participants are both less attentive and effortful than their low self-efficacy counterparts. Finally, Whyte, Saks, and Hook (1997) postulated that self-efficacy may act as a source of inappropriate persistence; that is, the individual who has been successful in the past in those domains in which he/she displays high self-efficacy may not persist long enough, and even develop overconfidence. This goes against Bandura's *SCT* and other studies which show that

efficacy beliefs associate with persistence, commitment, satisfaction in actions and motivation, as noted above.

Recently, Vancouver, Thomson, and Williams (2001) also criticized these results that endorse the *SCT* because their results call into question the positive relationship between self-efficacy and performance. They conclude that high self-efficacy creates relaxation and reduces future performance. In their longitudinal study with students, they find a significant and negative relationship between self-efficacy and the subsequent performance (at the intra-person level). That is, the more self-efficacy toward exams, the worse the performance in later examinations. It seems that at least in contexts of learning new tasks, a high level of self-efficacy has an influence on whether a person invests few resources (less effort to learn new things) and, accordingly, offers lower performance later. In addition, these relationships are only at the intra-person level (intra changes over time), but not between individuals (groups with high or low efficacy without considering time), where high self-efficacy positively relates with better performance.

However, Bandura and Locke (2003) presented a large body of evidence which verifies that perceived self-efficacy and personal goals enhance motivation and performance, thus contradicting Vancouver's findings. Furthermore, Vancouver and colleagues (i.e., Vancouver & Kendall, 2006; Vancouver, Thompson, Tischner, & Putka, 2002) subsequently found more findings to support that self-efficacy may have negative consequences on behavior. For example, Vancouver et al., (2002) conducted two studies which show that by manipulating self-efficacy in an analytic game, it negatively relates to performance in the next trial. Furthermore the results of the other study show that self-efficacy leads to overconfidence and, hence, increases the likelihood of committing logic errors during the game. Vancouver and Kendall (2006)



carried out another study in which self-efficacy also negatively relates to motivation and exams performance at the intra-person level of analysis despite a significant positive relationship with performance at the between-persons level. The authors explain that they base their results on the control theory. They affirm that when self-efficacy is relatively high, we may expect individuals to use fewer resources (e.g., spending less time studying) because their discrepancy between the desired level of preparedness and the perception of preparedness is smaller compared to when their self-efficacy is lower. So self-efficacy is likely to play a negative role in resources allocation which may adversely affect performance.

In addition, Yeo and Neal (2006) found similar relationships between self-efficacy and performance on tasks that involve learning, and they indicate that the positive relationships between self-efficacy and performance are due to an error of analysis in the study. That is, they base their results on cross-sectional studies and only take into account effects between groups. Yet these negative effects of efficacy beliefs are evident in longitudinal studies where we observe *intra* changes *over* time. In relation to this, in Caprara et al.'s (2008) longitudinal study with Italian students, the perceived efficacy for self-regulated learning presents a progressive decline over time; however, the lower the decline in self-regulatory efficacy, the higher the high school grades and the greater the likelihood of remaining at high school.

Therefore, although discrepancies exist in the interpretation of the results of some previous studies, all of them refer to high levels of efficacy. But, to what extent can we talk about positive consequences of high efficacy? When and in what situations do these levels of efficacy become an excess of efficacy or overconfidence? Bandura (1997) showed how an optimistic view raises the aspirations and maintains motivation, allowing people to take greater advantage of their talent, thereby contributing to

psychological well-being and personal achievements. This indicates that an optimistic assessment of one's self-efficacy relates to positive results, but not an overly optimistic assessment as an exaggerated sense of personal efficacy can “blind” a person when he/she faces some difficulties or risks, thus having negative effects. So, Bandura (1997) hypothesizes that people take risks and face challenges because they believe they are capable of coping with the situation. Hence, people with high self-efficacy may be less likely to fear failure and are more likely to take reckless risks (Kontos, 2004).

In that sense Llewellyn, Sanchez, Asghar, and Jones (2008) found in their study among climbers that climbers take calculated additional risks and they attempt harder climbs when they feel confident in their abilities and feel high self-efficacy. So far, it appears that high self-efficacy could predict more risky behaviors. In relation to this, Bandura noted (personal communication, Stanford, October 2005) that efficacy beliefs have a different impact on performances that involve risks and activities than those which involve innovative behaviors and actions. In the former, consequences of high self-efficacy may have negative consequences (less safety performance). With the latter however, high self-efficacy may have positive consequences (i.e., more innovative performance).

The current study tests these predictions and hypothesizes that high levels of self-efficacy may not only become overconfidence, but also relates to negative consequences depending on the type of activity being performed. To our knowledge, no research has compared learning settings and innovative settings which demand creative or innovative outcomes as well as risky settings requiring responses to safety. On the one hand, therefore, this study investigates whether the consequences of efficacy beliefs depends on the type of activity being performed (i.e., learning, innovative and risky activities) and, on the other hand, whether there are significant differences between high

and low self-efficacious people over time in learning and innovative behaviors. Specifically, we expect:

*Hypothesis 1:* Significant differences between students with high and low levels of self-efficacy in future academic performance, where students with higher levels of self-efficacy report higher levels of academic performance than students with lower levels of self-efficacy.

*Hypothesis 2:* An interaction effect of time X self-efficacy on future academic performance (intra-level changes). The performance of participants with higher levels of self-efficacy decrease over time compared with participants with previous lower of self-efficacy.

*Hypothesis 3:* Significant differences between participants and groups with high and low levels of efficacy beliefs (i.e., self-efficacy and perceived collective efficacy) in future innovative performance, where those participants and groups with higher levels of efficacy beliefs report more innovative behaviors than participants and groups with lower levels of efficacy beliefs.

*Hypothesis 4:* An interaction effect of time X efficacy beliefs on future innovative behavior (intra-level changes). The innovative behaviors of participants and groups with higher levels of efficacy beliefs decrease over time compared with participants and groups with previous lower levels of efficacy beliefs.

*Hypothesis 5:* Significant differences between construction workers with high and low levels of self-efficacy in safety performance, where workers with higher levels of self-efficacy report less safety performance than workers with lower levels of self-efficacy.

Below, we describe the three studies conducted in order to achieve our objectives and to test our hypotheses.

## Study 1: A learning setting

### Method

#### *Participants and Procedure*

We formed a stratified sample of 867 students from around the 6,000 undergraduate students of a Spanish University based on the number of students of its three faculties. The final study sample comprises 527 students; 67% are female and 33% are male. Participants major in social and behavioral sciences (40%), chemistry and engineering (33%), and law (27%). All the study programs take four years to complete, including one-year follow-up GPA (Grade Point Average) scores. Therefore, only the students from the first (33.2%), second (42.9%) and third years (23.9%) participated in the research. The mean age of the sample is 22 years and 6 months (SD = 2.6; ranging from 18 to 43 years). PhD students handed out questionnaires before a class started, and participation was voluntary. Originally, 867 students completed the questionnaire, but 340 students did not indicate their identification numbers, so it was not possible to obtain their GPA scores. We did not include these students in the analyses presented herein, therefore the final longitudinal sample includes 527 university students.

#### *Variables*

We specifically operationalized the *self-efficacy* construct in this study as academic self-efficacy, and we measured it with 5 items of the Spanish version of Midgley et al.'s (2000) scale which reflects specific student beliefs in their future capacities to produce accurate levels of academic performance ( $\alpha = .83$ ). One example item is: “*I will be able to do the more complicated work in class if I try hard enough*”. We asked students to indicate the extent to which they agree with each sentence on a seven-point rating scale (0 = never, 6 = everyday).

*Performance* was measured as academic performance with the students' GPA of the previous semester (i.e., previous performance) and of the following semester (i.e., future performance). We obtained students' GPA from university records. In the Spanish grading system, GPA scores range from 5 (low) to 10 (high).

## Results

### *Descriptive analyses*

We calculated the means, standard deviations, internal consistencies (Cronbach's  $\alpha$ ) and inter-correlations of each variable. As seen in Table 7.1, the  $\alpha$  value for academic self-efficacy meets the criterion of .80 (Henson, 2001). Moreover, the correlation between self-efficacy and past and future academic performance is significant and positive, i.e., the more self-efficacy, the better the (past and future) performance.

Table 7.1

*Means (M), standard deviations (SD), internal consistencies (Cronbach's  $\alpha$ ) and correlations of the study 1 variables (N=527)*

	M	SD	$\alpha$	1	2
1 Past academic performance	6.58	.74	-		
2 Academic self-efficacy	4.08	1.07	.83	.15***	
3 Future academic performance	6.60	.66	-	.75***	.14**

### *Testing hypotheses*

We conducted a MANOVA repeated measures analysis to check whether significant differences exist in academic performance *between* subjects with high and low levels of self-efficacy as well as *intra* individual differences over time. First, we selected those participants with the lowest and the highest levels of self-efficacy in order to compare both groups. We chose the +/-1SD criteria to select subjects with higher and lower levels. We created a dichotomous variable (high and low self-efficacy)

that serves as a factor for the repeated measures test, and academic performance measured at both time points, which acts as the dependent variable.

The results of the MANOVA repeated measures tests reveal significant differences *between* subjects ( $F = 6.32$ ;  $p < .01$ ) with low and high efficacy beliefs. Those with higher levels of self-efficacy present better academic performance at T2 than those with lower levels, thus confirming Hypothesis 1. However, the interaction effect of time X self-efficacy beliefs on performance is not significant (*intra*-individual changes over time), which does not support Hypothesis 2.

### Study 2: An innovative setting

#### **Method**

##### *Participants and Procedure*

Study 2 is a three-way longitudinal laboratory study in which 165 undergraduate university students participated. The sample comprises 84% females and 16% males. They study Psychology (70%) and Management and Business Administration (30%). Participation in the experiment was voluntary.

First, we randomly divided all the participants into different working groups composed of four or five people. When each group arrived at the social psychology laboratory, a researcher explained to them the tasks they should perform and gave them instructions about the study. The study comprises three tasks. The first was to design “the University’s cultural week”. Each individual had to suggest five activities individually. Later they brought together all the activities. Finally, they decided the five most innovative activities from among all the individual proposals. When they finished task 1, they completed a questionnaire with the study variables (Time 1 -

T1). The second activity was to distribute the activities over one week and to design an original timetable for the different activities chosen in task 1. Then, they completed another questionnaire (Time 2 - T2). Finally, the third task was to design an original poster announcing the University's cultural week. We explained to them that the innovation and creativity of the poster were the most appreciated points. When they had finished task 3, they completed another questionnaire with the study variables (Time 3 - T3).

### *Variables*

*Efficacy beliefs (i.e., self-efficacy and perceived collective efficacy)*: In this study we took into account both individual and collective levels of efficacy beliefs. We measured self-efficacy at the individual level, and perceived collective efficacy at the group level with a self-constructed scale of five items, each of which is specific for innovative settings. One example of a self-efficacy ( $\alpha = .90$ ) item is: "*I'm sure I can think and propose creative ideas*"; and an example of perceived collective efficacy ( $\alpha = .93$ ) item is: "*My group can find original solutions*". We used a 10-item Likert scale ranging from 0 (I/My group cannot do this at all) to 10 (I am totally convinced I/my group can do this) to answer the items.

*Performance* was measured as innovative performance at both the individual and collective levels with a self-constructed scale formed by three items each. Example items are: "*I'm satisfied with my inputs because they have been innovative*" (Self-efficacy,  $\alpha = .78$ ), and "*My group has taken new initiatives*" (Collective efficacy,  $\alpha = .83$ ). We used a 7-item Likert frequency scale, ranging from 0 (nothing/never) to 6 (always), to answer the items.

## Results

### *Preliminary data analyses*

Before starting the data analyses, we checked the within-group agreement in collective efficacy and collective behavior because it is important to match the level of analysis between the variables being studied (Chan, 1998; Kozlowski & Klein, 2000; Rousseau, 1985). It is also important to note that collective efficacy beliefs and collective behavior are group constructs rather than individual constructs. Therefore, we tested within-group agreement of both innovative collective efficacy and innovative collective performance by computing  $r_{wg}$  using the Agree program (James, Demaree, & Wolf, 1993). Although several alternative operationalizations of construct agreement exist (e.g., the standard deviation by Klein, Conn, Smith, & Sorra, 2001 and Schneider, Salvaggio, & Subirats, 2002),  $r_{wg}$  is the most frequently used measure (Bliese, 2000).  $R_{wg}$  values indicate whether the referent-shift consensus on collective efficacy and collective behavior judgments exists. High mean  $r_{wg}$  values indicate consensus or agreement between the group members, which suggests the sharing of these individual perceptions (see Arthur, Bells, & Edwards, 2007).

All the groups reached a within-team agreement in both collective efficacy beliefs and collective behavior. The average  $r_{wg}$  value of the referent-shift consensus of the collective efficacy judgments is .77, while the average  $r_{wg}$  of collective behavior is .91. These results suggest that we should not eliminate any of these groups because of the agreement reached in both the collective variables.

### *Descriptive analyses*

Given the high correlations among the variables, we considered the recommendations of Podsakoff, Mackenzie, Lee and Podsakoff (2003) to test for the common method variance bias. Thus, we applied Harman's single-factor test with



Confirmatory Factor Analyses (CFA; e.g., Iverson & Maguire, 2000) for the variables. The results reveal a significant inferior fit of the model with one single factor [ $\Delta \chi^2 = 539.38, p < 0.001$ ], as compared to the model with four latent factors (the two variables measured at both the individual and collective levels). Hence, one single factor cannot account for the variance in the data. Consequently, we cannot consider the common method variance to be a serious deficiency in this dataset.

Then we calculated the means, standard deviations, internal consistencies (Cronbach's  $\alpha$ ) and inter-correlations of each variable. As Table 7.2 shows, all the  $\alpha$  values meet the criterion of .70 (Nunally & Bernstein, 1994), and the most stringent criterion of .80 (Henson, 2001). We checked whether group size (i.e., with four or five members each group) influences either collective efficacy or innovative behavior. The ANOVA test results show no significant differences in terms of group size (i.e., four or five members to each group). Moreover, the correlation between efficacy beliefs and innovative performance is positive in both cases.

Table 7.2

*Means (M), standard deviations (SD), internal consistencies (Cronbach's  $\alpha$ ) and correlations of the Study 2 variables (N=165)*

	M	SD	$\alpha$	1	2	3
1 Innovative performance self-efficacy	6.62	1.70	.90			
2 Innovative performance collective efficacy	4.21	1.00	.93	.38**		
3 Individual innovative performance	6.87	1.72	.78	.76**	.37**	
4 Collective innovative performance	4.47	.93	.83	.40**	.70**	.45**

### *Testing hypotheses*

We conducted a MANOVA repeated measures analysis to check whether there are significant differences in innovative behaviors between subjects with high/low efficacy

beliefs and intra-individual differences among the three time points (T1, T2 and T3). We performed this analysis at both the individual and collective levels. As in Study 1, we first selected those subjects with the lowest and highest levels of efficacy beliefs to compare both groups. We followed the same procedure with perceived collective efficacy by splitting the same subjects into two categories: high and low levels of perceived collective efficacy. We chose the  $\pm 1SD$  criteria to select subjects with high and low levels of efficacy beliefs. We created a dichotomous variable (high or low self-efficacy) that serves as a factor for the repeated measures test, and we took the innovative behavior measured at the three time points to be the dependent variable. We followed the same procedure at the collective level.

The results of MANOVA repeated measures tests reveal significant differences *between* participants ( $F = 19.82; p < .001$ ) and groups ( $F = 28.09; p < .001$ ) with high and low efficacy beliefs. Those with high levels of efficacy beliefs display more innovative behaviors than those with low levels at the three time points, thus confirming Hypothesis 3. However, the interaction effect of time X efficacy beliefs on innovative performance is not significant (*intra* individual changes over time), and does not support Hypothesis 4.

### Study 3: A risky setting

#### **Method**

##### *Participants and Procedure*

The third study is a field study in the construction industry. We chose this sector because it presents more risks. In fact, the European Agency for Health and Safety at Work (2008) affirms that the construction sector has one of the worst occupational

safety and health records in Europe. The IWO (International Work Organization) has also presented new data that show that 60,000 fatal accidents take place in the construction industry every year.

Therefore, our research team firstly contacted the key informants in the construction industry and different Construction Employers Associations. During these first contacts, we explained the study objectives and methodology to nineteen construction companies. Finally, ten companies participated in the study. Moreover, we used an interview guide designed by the research team to assess the work conditions in the construction industry. The guide included open questions as well as a questionnaire with the study variables, which we handed out during the face-to-face interview with each construction worker. A total of 228 employees (100% men) from ten different Spanish construction companies received the questionnaire. Ages ranged from 16 to 64 years old (mean age= 39.62, SD = 11.89); 18% were foreigners and 35% had a temporary contract.

Given the characteristics of the sample (i.e., low level of education where 34% had not completed primary education), and immigrants who might have problems with the language), we used 30-minute semi-structured interviews. Two researchers helped the interviewees with any difficulties, including the content of the questions. We guaranteed confidentiality. The employees answered the interview during their breaks at the beginning or at the end of their work shift, and usually in the workplace.

### *Variables*

We specifically operationalized the *self-efficacy* construct in this study as risky performance self-efficacy and we measured it with a self-constructed scale formed by five items which is specific for both the construction industry and the safety at work domain ( $\alpha = .83$ ). We designed the scale following Albert Bandura's recommendations

(2001). One example of an item is: “*I can do my work well, although I don’t use the protective equipment correctly*”. We used a 7-item Likert scale, ranging from 0 (cannot do this at all) to 6 (I am totally convinced I can do this), to answer the items.

*Performance* was measured in this study as safety performance with a self-constructed scale formed by three items ( $\alpha = .72$ ). One example of an item is: “*I fulfill the security rules and instructions*”. We used a seven-item Likert frequency scale, ranging from 0 (nothing) to 6 (always) to answer the items.

## **Results**

### *Descriptive analyses*

We considered the recommendations of Podsakoff et al., (2003) to test the common method variance. We used Harman’s single-factor test with Confirmatory Factor Analyses (CFA; e.g., Iverson & Maguire, 2000) for the variables. The results reveal a significant inferior fit of the model with one single factor [Delta  $\chi^2 = 110.9$ ,  $p < 0.001$ ] when compared to the model with two latent factors (i.e., self-efficacy and safety performance). Hence, one single factor cannot account for the variance in the data. Consequently, we may not consider the common method variance to be a serious deficiency in this dataset.

We calculated the means, standard deviations, internal consistencies (Cronbach’s  $\alpha$ ) and inter-correlations of each variable (see Table 7.3). All the  $\alpha$  values meet the criterion of .70 (Nunnally & Bernstein, 1994), and the self-efficacy scale also meets the more stringent criterion of .80 (Henson, 2001). The correlation between self-efficacy and safety performance is negative and significant.

Table 7.3

Means (*M*), standard deviations (*SD*), internal consistencies (Cronbach's *α*) and correlations of the study 3 variables (*N*=228)

	M	SD	α	1
1 Risk performance self-efficacy	2.99	1.60	.83	
2 Safety performance	4.84	1.07	.72	-.13*

### Testing hypothesis

Finally, we performed an ANOVA to test whether there are significant differences in safety performance in terms of the self-efficacy levels. As in Studies 1 and 2, we selected the first participants with high and low levels of self-efficacy from the data set using the  $\pm 1SD$  criteria. High and low self-efficacy is the factor used for the ANOVA test, and safety performance is the dependent variable. The ANOVA test results show significant differences between high and low self-efficacy groups in safety performance ( $F = 3.13; p < .05$ ). The construction workers who display the highest levels of self-efficacy present less safety performance (i.e., more risky behaviours) than those with the lowest levels of self-efficacy. These results confirm Hypothesis 5 where we expected significant differences *between* high and low self-efficacious construction workers in safety performance. Construction workers with high levels of self-efficacy present less safety performance than workers with low levels of self-efficacy.

### Discussion

Using Bandura's *SCT* as the theoretical framework, the objective of this study was to analyze the different role that efficacy beliefs (i.e. self-efficacy and collective efficacy) play in the prediction of learning, innovative and risky performances. The *SCT* assumes self-efficacy perceptions to influence motivation and engagement in specific

positive behaviors such as high performance. The results from the current study suggest that this influence depends on the type of activity being performed. More specifically, we hypothesize that high levels of efficacy beliefs in learning and innovative activities have positive consequences (i.e. better academic and innovative performances respectively), whereas high levels of efficacy beliefs in risky activities have negative consequences (i.e. less safety performance).

To test our hypotheses, we developed three different studies in three different settings: learning, innovative and risky settings. The results confirm Hypothesis 1, that is, the higher the self-efficacy in the learning setting, the higher the academic performance. They also confirmed Hypothesis 3, that is, the higher the efficacy beliefs in the innovative setting (i.e., self-efficacy and perceived collective efficacy), the more innovative performances at both the individual and collective levels. Furthermore in these two settings, high efficacy beliefs relate to positive consequences, i.e., better academic and innovative performances respectively. Finally, the results confirm Hypothesis 5, that is, the higher self-efficacy in the risky setting, the less safety performance, which relates to negative consequences, i.e., more unsafe behaviors. However, regarding *intra*-individual changes over time, we find no time X self-efficacy interaction effect over time in either academic performance or innovative performances. These results do not confirm Hypotheses 2 and 4.

### *Theoretical findings*

The most relevant theoretical implication of the current study is empirical evidence of the consequences of high self-efficacy not always being beneficial or positive for individual and groups, rather they depend on the type of activity performed. From the beginning, this study has focused on the predictions of Albert Bandura's *SCT*, which affirms that human functioning is the product of the interaction between personal

factors, and behavior and environment, and that efficacy beliefs are the basis of personal and collective agency and influence one's motivation to engage in specific positive behaviors related to high performance. However, this study goes one step further by questioning whether this influence is always positive. The results show that the answer is "*it depends*". That is, efficacy beliefs do not always relate to specific positive performances, but depend on the type of activity being performed.

In the learning and innovative settings for example, the most desired behaviors are high academic performance and innovative performance. In these settings, the results confirm that having high levels of efficacy beliefs relates more with academic performance and innovative performance, but the most desired behavior in the risky setting is safety performance. The results also show that having high levels of efficacy for performing well (even assuming risky behaviors) relates to less safety performance. Moreover, these undesired behaviors may also have future negative outcomes, i.e., occupational accidents.

Therefore we could talk about "overconfidence" in some environments due to negative results (i.e. risky settings). Similarly, Powers (1991) argued that when performance levels are ambiguous (which could be the case of safety performance), self-efficacy inflates perceived performance levels which decrease efforts, and maybe also safety performance. This may relate with the idea which postulates that feeling confident about enacting performance and believing that enacting such behavior will result in better outcomes can motivate people to set realistic goals (Bandura, 1995). Yet, perhaps feeling "overconfidence" can motivate people to set unrealistic goals. For this reason, overconfident people present less safety performance or inappropriate behaviors, as Whyte, Saks and Hook (1997) indicate. It may even relate with how overconfident people perceive risks at work. Indeed, overconfident people may possibly

perceive risks as less dangerous; consequently their responses to a given threat are the minimum. On the other hand however, we could also talk about the costs of underconfidence in some settings (i.e. low performance in learning and innovative settings), as Bandura noted (Bandura & Locke, 2003).

Moreover in the learning setting, the results show that no *intra*-individual changes take place over time. These results nor agree with Vancouver and colleagues, who noted that efficacy beliefs in training or learning contexts have negative effects on learning performance (Vancouver, Kendall, 2006; Vancouver, Thompson, & Williams, 2001). They affirm that high self-efficacy creates relaxation and reduces future performance, but only at the *intra*-person level (*intra* changes over time) because self-efficacy plays a practical and adaptive role, as well as a negative role in resource allocation. In a way, our results support the evidence presented by Bandura and Locke (2003) and show that efficacy beliefs predict the behavioral functioning between individuals at different levels of perceived self-efficacy. Although our results do not corroborate changes in individuals' functioning at different levels of efficacy over time, they support the *SCT* in such a way that higher self-efficacious people's performance does not lower over time.

Finally, high levels of efficacy beliefs (i.e., self-efficacy and perceived collective efficacy) in innovative settings are "always" desirable. Bandura (1997) strongly suggests that self-efficacy is essential for innovative productivity. Furthermore, high efficacy beliefs in innovative settings are highly desirable because, nowadays, creativity and innovation are two highly valued characteristics by organizations in the current competitive world. In this study, we find significant differences in innovative performances *between* individuals and groups, but no *intra* individual differences over



time. Therefore, having high innovative self-efficacy does not predict less innovative performance over time.

Briefly, this study is congruent with the *SCT* but also adds new information about the role of efficacy beliefs in different settings. To our knowledge, the current study is the first to examine the association between self-efficacy and different performances by comparing three different settings (i.e., learning, innovative and risky settings). Moreover, almost all the studies conducted have focused on risky settings in risk sports but not in occupational risk settings, such as the construction industry. Furthermore, we use domains with specific measures of self-efficacy in learning, innovative and risky performance by following the *SCT*'s recommendations.

#### *Practical implications*

The results of this study show the importance of establishing an optimum level of efficacy in accordance with the setting where people perform the given activity (avoiding overconfidence and under-confidence). There are interventions that seek to increase efficacy beliefs to improve performance, but this study shows that these interventions should be specific to each setting. If it is possible to find the optimum point of efficacy in each case, it would avoid the negative consequences of overconfidence. In addition, we agree with the recommendation of Llewellyn et al. (2008) which affirms that researchers should not assume psychological or behavioral homogeneity within risk-taking populations.

#### *Limitations and future research*

The most relevant limitations in this study relate to the kind of information analyzed since some measures are self-reports. One considered limitation is the use of this kind of measure because many other factors may influence it. However, by following the recommendations of Podsakoff et al., (2003), we used Harman's single-

factor test, and the results reveal that we cannot consider the common method variance to be a serious deficiency in this dataset.

For further research, we could include other settings to verify our hypotheses, as well as other populations like fire-fighters (risky setting) or designers (innovative setting). It would be interesting to analyze whether the consequences of efficacy beliefs on behavior continues to be positive or negative depending on the setting where subjects perform the activity, but using longitudinal designs. This would prove useful to find the optimum efficacy point, as previously mentioned. Moreover, future studies could analyze the effect time X self-efficacy, but with longer time intervals to explore intra differences over time.

### **Final Note**

The *SCT* background has tested the power of the relationship between efficacy beliefs and human performance in different settings. The results suggest that promoting self-efficacy is effective but depends on the setting in which subjects perform the activity in question. This is a serious challenge for research: to identify those settings in which self-efficacy can become overconfidence in order to prevent it, and settings in which self-efficacy should be enhance.

## **Chapter 8: General Discussion**

The purpose of the current thesis was to conduct an in-depth study of efficacy beliefs, employee well-being and performance using the *Social and Cognitive Theory (SCT)* of Albert Bandura as the main theoretical framework. Moreover, we also considered the *Job Demands-Resources Model (JD-R)* as a theoretical framework of some specific studies. The 6 objectives raised through the 6 studies composing this thesis have been generally met.

The first objective was to extend the *Job Demand-Resources Model (JD-R)* (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Schaufeli & Bakker, 2004) by including personal resources (self-efficacy) for the prediction of work-related well-being (i.e., burnout and engagement). The second objective was to design and validate a specific self-efficacy scale following the recommendations of the *SCT*. Our third objective was to test whether self-efficacy predicts work engagement and performance through job and personal resources. The fourth objective was to gain insight into the psychological mechanisms (i.e., motivational power of efficacy beliefs) that explain how transformational leadership predicts extra-role performance. The fifth was to examine the different perceptions about the psycho-social causes and consequences of accidents in the construction industry. Finally, the sixth objective was to gain in-depth knowledge regarding the consequences of high levels of self-efficacy (i.e., overconfidence), and to examine whether their positive or negative consequences depend on the type of activity being performed (i.e., learning, innovative and risky activities).

**Summary of main findings**

In order to achieve the first objective, the first empirical study (**Chapter 2** of this thesis) extends the *JD-R Model* (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Schaufeli & Bakker, 2004) by including personal resources (self-efficacy) in the model to predict work-related well-being, that is, burnout (exhaustion, cynicism, depersonalization) and engagement (vigor and dedication). Hierarchical multiple regression analyses, of a two-wave field longitudinal design with a 1-year time lag, showed significant relationships between: 1) quantitative overload and role ambiguity with exhaustion, and 2) role ambiguity with cynicism, vigor and dedication disappear when controlling by the baseline level at T1 (Time 1). Self-efficacy at T1 significantly predicts cynicism and engagement (both vigor and dedication) at T2 (Time 2), but not when controlling by baseline levels of cynicism and engagement at T1. So, it is necessary to know the baseline levels of these variables at T1 in order to know the unique contribution of specific job demands and resources to predict burnout and engagement over time. These results show that previous levels of burnout and engagement predict future levels of burnout and engagement. The current findings are an important contribution to explain how burnout and engagement change over time. This study offers three innovations or strengths: it is an extension of the *JD-R Model* as it considers personal resources besides job resources; well-being comes over as being negative (burnout) and positive (engagement); furthermore, it is of a longitudinal design with two waves of data collection when controlling by baseline levels of well-being at T1.

The second study (**Chapter 3**) shows the procedure carried out to develop and validate a specific self-efficacy scale for construction workers following the recommendations of Albert Bandura's *SCT*. By combining the Critical Incident

Technique (Flanagan, 1954) with a qualitative content analysis, we identified the main obstacles that construction workers perceive in their daily work. Based on this information, we developed a specific 7-item job self-efficacy scale which we validated by using exploratory and confirmatory factor analyses. This scale enabled us to obtain information about job-related self-efficacy among construction workers, which is a key construct to not only understand workers' safety behaviour in the construction industry, but to also know more about the consequences of self-efficacy (i.e., negligence or occupational accidents). For these reasons, we have used this scale in the next study to measure specific efficacy beliefs among construction workers.

The third study (**Chapter 4**) examines whether self-efficacy predicts work engagement and performance through job and personal resources. Structural equation modeling supported the research model; that is, the predicting role that self-efficacy plays in the perception of personal and job resources (i.e., mental and emotional competences, job control and supervisor social support) which, in turn, leads to work engagement and performance. The results also showed a direct relationship between self-efficacy and performance. This study emphasizes the role that self-efficacy plays in the prediction of positive processes that explain work engagement and performance.

The fourth study (**Chapter 5**) attempts to gain insight into the psychological mechanisms (i.e., motivational power of self-efficacy) that underlie the relationship between transformational leadership and extra-role performance (as assessed by supervisors). Structural equation modeling analyses were consistent with a mediation model in which transformational leadership predicts extra-role performance through self-efficacy and work engagement. In other words, transformational leadership influences the levels of efficacy beliefs (i.e., self-efficacy and collective efficacy) and work engagement which, in turn, positively predict extra-role performance. The current

study expands the *SCT* since it finds a contextual variable that is able to drive efficacy beliefs: transformational leadership. It shows the relevance of a transformational leader to enhance employees' self-efficacy through its dimensions, work engagement and, finally, extra-role performance.

By using a qualitative methodology for the data analyses, the fifth study (**Chapter 6**) shows a consensus exists about the causes of occupational accidents, this being that overconfidence and physical risks perceived as a challenge rather than as a danger are the main causes of many accidents. These results partly inspired the preparation of the next chapter because all the participants noted that overconfidence in the construction sector (this is a risky setting) seems to relate with negative consequences, such as occupational accidents.

In this way, the sixth study (**Chapter 7**) attempts to know the consequences of high levels of self-efficacy (i.e., overconfidence) in different settings and to examine whether efficacy beliefs consequences depend on the type of activity being performed (i.e., learning, innovative and risky activities). The *SCT* assumes that efficacy perceptions influence motivation to engage in specific positive behaviors such as high performance, but our results suggested that this influence depends on the type of activity being performed. We conducted three studies in which we compared three different settings (i.e. learning, innovative and risky settings). The results showed that high levels of efficacy beliefs have different consequences (i.e., negative or positive) on performance depending on the activity setting. In the learning setting, the more self-efficacy, the higher the academic performance, whereas the more efficacy beliefs in the innovative setting, the greater the creative behavior at both the individual and collective levels. Furthermore the high efficacy beliefs in these two settings relate with positive consequences, i.e., better academic and innovative performance. Finally in the risky

setting, the more self-efficacy, the less safety performance, related to negative consequences (i.e., more unsafe behaviors). We also examined *intra*-individual changes over time in the learning and innovative settings. However, no significant differences on either academic performance or innovative behaviours were found over time.

In short, what can we conclude from all these findings? First of all, we extended the *JD-R Model* by including personal resources (i.e., self-efficacy) besides job resources and we confirmed the predicting role of efficacy beliefs in the motivational process of the *JD-R Model*, being the main personal resource able to influence how employees perceive job resources and other personal resources (mental and emotional competences), as well as the predictive value of job performance. Additionally, we identified transformational leadership as the main contextual variable that is able to increase self-efficacy through its dimensions. Finally we extended the information about the role of efficacy beliefs in different settings: high levels of efficacy beliefs are desirable in settings such as learning and innovative settings, while high levels of efficacy beliefs can become overconfidence and have negative consequences in risky settings. Therefore, these last findings extend the *Social Cognitive Theory*.

### **Theoretical findings**

The main theoretical findings of the current thesis are the following:

#### *(1) Burnout and engagement over time*

The results of the first study showed that the burnout and engagement presented at the beginning predict future levels of burnout and engagement. In fact, self-efficacy at T1 significantly predicts burnout (cynicism) and engagement (vigor and dedication) at T2, but not when controlling by baseline levels of burnout and engagement at T1. The



current findings are an important contribution to explain how burnout and engagement change over time.

*(2) The predicting power of efficacy beliefs*

As noted above, the current thesis tried to extend *the JD-R Model* by including efficacy beliefs such as personal resources and by examining whether self-efficacy plays a predicting role in the motivational process of the model. Previous research had expanded the *JD-R Model* by including personal resources such as self-efficacy, optimism, resilience and self-esteem (Bakker & Demerouti, 2008; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007). It seems clear that job and personal resources predict work engagement. However, our results showed the underlying psychological mechanism that explains this relationship: self-efficacy not only influence how workers perceive the job resources that are available, but also how they perceive their own mental and emotional competences and, thus, influence the levels of engagement at work.

Albert Bandura's *SCT* explains the psychological mechanism of this link. From a socio-cognitive perspective, the levels of efficacy beliefs that employees experience actually influence their perceptions of job demands and resources, and efficacy beliefs also influence the way that workers perceive other personal resources. For this reason, we centered on self-efficacy as the main personal resource for workers by treating the other personal resources differently. As expected, the results confirm that self-efficacy plays a predicting role in the perception of job and personal resources (i.e., job control, supervisor social support, mental and emotional competences) in the motivational process of the *JD-R Model*; this is a mediating model where resources and work engagement partially mediate the relationship between self-efficacy and performance. So far, the more the self-efficacy, the better the performance, but this relationship is

partially mediated by resources and work engagement, since we found a direct relationship between self-efficacy and performance. Figure 8.1 graphically presents this model.

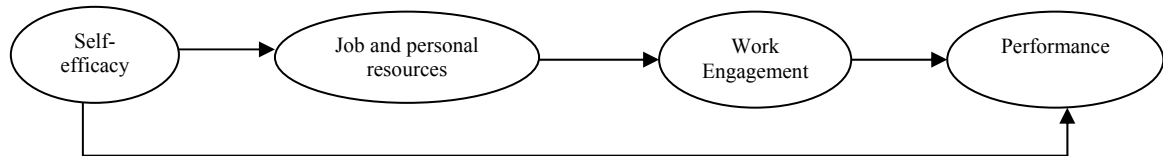


Figure 8.1. The expanded Job Demands-Resources Model.

This last relationship between self-efficacy and performance agrees with the research conducted on how positive personal and environmental factors increase not only engagement, but in turn also increase specific positive behaviors, such as performance (Salanova, Agut, & Peiró, 2005). So, the perception of resources and work engagement partially, but not fully, mediates the relationship between self-efficacy and performance. These results corroborate the findings of Xanthopoulou, Bakker, Heuven, Demmerouti and Schaufeli (2008) who found that work engagement partially mediates the relationship between self-efficacy and in-role performance, whereas work engagement fully mediates the relationship between self-efficacy and extra-role performance (as we found in Chapter 5).

The specific finding that resources predict performance via work engagement also agrees with the *JD-R Model* (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004), especially in terms of the model's assumption that work engagement mediates the relationship between job resources and performance (i.e., the motivational process). This thesis empirically supports this process, thus showing its robustness. However, we extended this motivational process to test the predicting role of one main personal

resource, i.e., self-efficacy. Moreover, our results support the social cognitive point of view since employees will perceive more available job and other personal resources at work and they will enhance work engagement in accordance with employees' efficacy beliefs. Thus, self-efficacy influences the perception of both job and personal resources and acts as the main driver of both work engagement and job performance. High self-efficacious employees perceive more job resources, but they also perceive themselves as being more competent to afford job demands, and feel vigorous and dedicated to be able to achieve their work goals and to display better job performance.

Briefly, the results based on the predictions of Bandura's *SCT* support the predicting role of self-efficacy in the motivational process of the *JD-R Model*. This thesis emphasizes the crucial role that self-efficacy plays in determining how people perceive job and other personal resources by determining levels of work engagement and, hence, their job performance.

### *(3) Transformational leadership as an antecedent of efficacy beliefs*

One other main objective of this thesis was to examine the psychological mechanisms (i.e., motivational power of efficacy beliefs) that underlie how transformational leadership predicts extra-role performance. In this sense, we found a mediation model in which transformational leadership predicts extra-role performance through self-efficacy and work engagement. Figure 8.2 graphically presents this model.

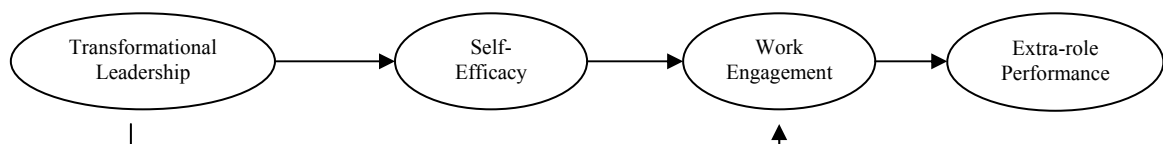


Figure 8.2: The model in which transformational leadership predicts extra-role performance through self-efficacy and work engagement.

The results clearly demonstrated that transformational leadership enhances levels of self-efficacy and work engagement, which in turn increases the levels of extra-role performance. Furthermore, transformational leaders may increase self-efficacy through its dimensions (i.e. idealized influence, inspirational motivation, intellectual stimulation and individualized consideration). Walumbwa, Avolio, and Zhu (2008) noted that a transformational leader can increase followers' self-efficacy through vicarious experience (role modeling) and verbal persuasion, which are two of the major sources of self-efficacy according to the *SCT*, and our results confirm these authors' suggestions. So, a transformational leader is able to enhance efficacy beliefs of his/her employees by acting as a model for them. It is clear that this vicarious learning process depends on the similarities and the power of influence between the observed (role model) and the observer, and that it also depends on the kind of task observed. But a good transformational leader is able to use his/her influence in order to develop the desirable behavior in his/her subordinates. Moreover, verbal persuasion refers to a person building his/her self-efficacy as a result of the positive-negative feedback received from his/her leader, director, colleagues, etc. Furthermore, a transformational leader is characterized by providing adequate bidirectional feedback to subordinates, communicating with them directly, and taking into account their interests, needs and capabilities.

Secondly, we also analyzed whether transformational leadership impacted work engagement by influencing self-efficacy. Previous research has studied the relationship between transformational leadership and well-being (Druskat, 1994), but our results confirm that self-efficacy partially mediate this relationship. These results agree with Turner, Barling and Zacharatos (2002) who suggested that transformational leadership

has the potential to contribute considerably to individual well-being (in our study, work engagement). However, we directly examined the possibility of the impact of leaders' behavior on followers' self-efficacy mediating this relationship.

Finally in their recent article, Avolio, Walumbwa, and Weber (2009) saw that more work is needed to examine the mediators and moderators that would help to explain how leaders influence outcomes. Therefore, this thesis shows that some of these mediators are self-efficacy and work engagement.

Our results highlight the power of the leadership style since a transformational leadership is able to influence and enhance efficacy beliefs in their subordinates. So, once again, our results agree with the research done about how positive personal and environmental factors increase work engagement and, in turn, increase specific positive behaviors (Salanova, Agut & Peiró, 2005). Moreover, this thesis offers innovation because we found a contextual variable that provides extra-role performance through self-efficacy and work engagement: transformational leadership.

In short, the current thesis expands the *SCT* because it presents transformational leadership as a contextual variable that is able to drive efficacy beliefs. The relevance of a transformational leader has been shown as this leader enhances not only efficacy beliefs of workers through its dimensions, but also work engagement and, finally, extra-role performance.

#### *(4) The Dark and Bright Sides of Self-efficacy*

This thesis also attempts to gain information about the role of efficacy beliefs in different settings by examining whether efficacy beliefs influence performance, and whether their consequences are positive or negative, in accordance with the type of activity being performed. Past research suggests that high levels of self-efficacy offer positive aspects. However, it seems that settings in the earlier stages of learning relate to

low performance. But no research in other settings is available, for instance, in occupational risky settings, where responses are meant to be safety-related. Moreover, Bandura noted (personal communication, Stanford, October 2005) that efficacy beliefs have a different impact on both activities that involve risks and those that imply innovative behaviors. For these reasons, we compared three activity settings: learning, innovative and risky. The results showed that the more self-efficacy in the learning setting, the greater the academic performance, while the more efficacy beliefs in the innovative setting, the more innovative performance at both the individual and collective levels. However we noted that the more self-efficacy in the risky setting, the less safety performance. So high efficacy beliefs in learning and innovative settings relate with positive consequences, (i.e., better academic and innovative performance), whereas high efficacy beliefs in risky settings relate to negative consequences, (i.e., more unsafe behaviors).

These results provide empirical evidence that the consequences of high efficacy beliefs are not always positive for individual and groups, rather they depend on the type of activity performed. The *SCT* affirms that human functioning is the product of the interaction among personal factors, behavior and environment, and that efficacy beliefs are the basis of personal and collective agency and can influence one's motivation to engage in specific positive behaviors related to high performance. Nonetheless, we took one step forward by questioning whether this influence is always positive. The results show that "*it depends*". That is, efficacy beliefs do not always relate with specific positive behaviors, but depend on the type of activity being performed.

For example, the most desired behaviors in the learning and innovative settings are high academic and innovative performance, respectively. In these settings, the obtained results confirm that having high levels of efficacy beliefs relates with higher

academic and innovative performance, while the most desired behavior in the risky setting is safety performance. The results also showed that having high levels of efficacy for performing in risky settings relates to less safety behaviors (i.e., low safety performance). Moreover, these undesirable behaviors could also have future negative outcomes as occupational accidents.

In this sense, we can talk about “overconfidence” in some environments (i.e., risky settings) since high levels of efficacy beliefs relate to negative results. In this sense, Powers (1991) argued that when performance levels are ambiguous (which could be the case of safety performance), self-efficacy inflates perceived performance levels which decrease efforts, and possibly safety behavior. Moreover, this may relate with an idea which postulates that feeling confident about enacting performance and believing that enacting such a behavior will result in better outcomes can motivate people to set realistic goals (Bandura, 1995). Yet feeling “overconfidence” may lead to people setting unrealistic goals; for this reason, overconfident people show less safety behaviors, or inappropriate behaviors as Whyte, Saks and Hook indicated (1997). It may even relate with how overconfident people perceive risks at work. Perhaps overconfident people perceive risks as challenges and not threats and, consequently, their responses to a given risks are more dangerous.

To summarize, our results are congruent with the *SCT* but also extend the information about the role that efficacy beliefs play in different settings. To our knowledge, the current study is the first to examine the association between self-efficacy and performance by comparing three different settings (learning, innovative and risky). In the *SCT* background, this thesis tests the power of the relationship that efficacy beliefs have with human behaviors in different settings. The results suggest that promoting self-efficacy can be effective, but depends on the setting in which the activity

takes place. To identify those settings in which self-efficacy can become overconfidence is a huge challenge for research.

### **Practical implications**

After completing all the studies, and according to the findings obtained, we can discuss several practical implications. The first practical implication is that this thesis shows the method carried out to develop and validate a specific self-efficacy scale by following the recommendations of the *Social Cognitive Theory* (Bandura, 2001b, 2006). Moreover, we have used specific measures of self-efficacy in the learning, innovative and risky settings used.

From a Positive Psychology perspective (Seligman & Csikszentmihalyi, 2000), this thesis stresses the importance of enhancing employees' levels of efficacy for several reasons. It affects the way employees perceive not only job resources, but other personal resources, such as mental and emotional competences; hence, resources predict extra-role performance via work engagement. Moreover, efficacy beliefs directly influence employees' job performance. Thus, if we wish to enhance employees' well-being and performance, we may start by enhancing levels of efficacy beliefs.

If we focus on the improvement of the efficacy beliefs of workers, almost all the interventions carried out in organizations focus on the four main sources of self-efficacy (Fletcher, 2005), these being interventions at the individual level. But this thesis has identified a contextual variable that influences employees' efficacy levels, i.e., transformational leadership. The results suggest that instead of interventions focusing on individuals, they may be put to use in training supervisors in practices related to improving levels of transformational leadership. Moreover in this way, supervisors may become good transformational leaders who are able to increase employees' efficacy



beliefs. Hence, our results suggest that increasing supervisors' transformational leadership styles will also enhance employees' engagement and extra-role performance.

However, this thesis also stresses the importance of establishing the optimum level of efficacy in accordance with the setting in which the activity takes place in order to avoid the negative consequences of overconfidence. It is well-known that interventions exist that seek to increase efficacy beliefs in order to improve employees' well-being and job performance. Nonetheless, our results show that these interventions should be specific to each setting. If we can find the optimum point of efficacy in each case, we will avoid the negative consequences of overconfidence, for example in risky settings. So, researchers should not assume psychological or behavioral homogeneity within occupational risk-taking populations as our results show that although efficacy beliefs in risky settings relate with job performance (Chapter 4), higher efficacy beliefs may also relate with lower safety performance (Chapter 7). This suggests that efficacy beliefs are also desirable in risky occupational settings but, as Bandura noted (1997), not an exaggerated sense of efficacy beliefs because it can "blind" a person when he/she faces occupational risks, which can lead to negative consequences.

### **Limitations and future research**

We should point out that the current series of studies are not without their limitations. Firstly, we mainly used self-reported data in all the studies which raises questions of a common method bias. This is a recurrent issue in research on work and organizational psychology because self-reports are considered to be influenced by many other factors such as subjective factors, well-being and individual differences. However, we used Harman's single-factor test, and the results revealed that common method variance is not a serious deficiency in our datasets.

Secondly, the sample size employed could be a limitation to generalize the results obtained in the current thesis, especially in relation to Chapter 6. However, it is a qualitative study which includes all the content extracted from the focus group and the different interviews. Moreover, the informants soon reached a consensus as all the participants reached the same conclusions. Therefore, there is no need to collect more data for the conclusions.

Future research with other occupational settings may test our hypotheses in order to verify the invariance of the models found. This would allow us to explore whether the relationships observed in this thesis are due to unique aspects of the participating organizations or not. It would be interesting to analyze whether efficacy beliefs continue to have a predicting role in the motivational process of the *JD-R Model* by influencing the way that employees perceive other personal resources, but by using other samples and by including other positive outcome variables.

Moreover, research could include other settings to analyze the positive or negative consequences of efficacy beliefs depending on the activity being performed. For example, other populations could be used, such as fire-fighters (risky setting) or designers (innovative setting), among others. It would be interesting to analyze the consequences of also undertaking longitudinal designs as they would prove useful for finding the optimum efficacy point, as we have already mentioned.

## General Summary

Building on *Social Cognitive Theory* (SCT) and the *Job Demands-Resources* (JD-R) model, the main purpose of this thesis was to examine the role of self-efficacy in explaining employee well-being and performance. The empirical studies of the thesis expand both *SCT* and the *JD-R* model in various ways. The findings support the motivational power of self-efficacy, recognize transformational leadership as an initiator of the motivational process of the *JD-R* model, and provide qualitative and quantitative evidence regarding the positive, as well as the negative outcomes of high levels of self-efficacy (i.e. overconfidence). From a theoretical point of view, the most important contributions of this thesis are: 1) the development and validation of a new self-efficacy scale, tailor-made for construction workers; 2) the examination of the role of the leader in initiating employees' self-efficacy beliefs, work engagement and performance; 3) the qualitative analysis of the "dark side" of self-efficacy with regard to risks and accidents, and 5) the examination of the conditions (i.e. type of activity) under which high levels of self-efficacy may have detrimental effects for employees.

The thesis does not restrict to empirical findings that stem from cross-sectional studies and self-reports only. Rather, Chapters 2 and 7 present results of longitudinal studies, while Chapter 5 incorporates other-ratings of performance. Additionally, the present thesis combines both quantitative and qualitative methodologies. Finally, the thesis examines different occupations and employees from two different countries, which adds to the generalizability of the findings.

## Final note

This thesis comprises 6 empirical studies which have allowed us to meet our main objectives. They combine quantitative and qualitative methodology, cross-sectional and longitudinal studies of field and laboratory kinds with 6 different samples from 2 European countries. Several theoretical and practical implications have been provided to conduct an in-depth study of efficacy beliefs, subjective well-being and performance. The influence of efficacy beliefs on employees' perceptions of their own competences and job resources, on psychological well-being and on job performance has been showed. But, how can practitioners enhance levels of employees' efficacy beliefs? One way is to train supervisors in practices related with transformational leadership, a quality which is able to influence levels employees' self-efficacy through role modeling and verbal persuasion. Finally, if modern organizations seek engaged employees with excellent performance, employees need to feel self-efficacious. Nonetheless, we must always take into account the setting in which their activity takes place in order to avoid the negative consequences of overconfidence in, for example, risky settings.

*"If I have the belief that I can do it,  
I shall surely acquire the capacity to do it  
even if I may not have it at the beginning."  
~ Mahatma Gandhi ~*

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## **Resumen**

**(Summary in Spanish)**

Con el desarrollo de esta tesis se pretendía profundizar en el estudio de las creencias de eficacia, utilizando la *Teoría Social Cognitiva* (TSC) de Albert Bandura como marco teórico. Esta teoría asume que las personas, en un intento por alterar su entorno, se adaptan a aquellos aspectos que les gustan, mientras que al mismo tiempo tratan de modificar aquellos aspectos que encuentran indeseables, desarrollando creencias y competencias. Por otro lado, algunos de los estudios que componen la tesis se han centrado en los antecedentes y consecuencias del bienestar de los trabajadores, centrándose en las principales predicciones del Modelo *Demandas y Recursos Laborales* (D-RL) (Demerouti, Bakker, Nachreiner, y Schaufeli, 2001; Schaufeli y Bakker, 2004). Este modelo reconoce la singularidad de cada entorno laboral, es decir, las características laborales y organizacionales que son las principales responsables de su bienestar.

Por tanto, los objetivos generales son: 1) Ampliar el Modelo *D-RL*, incluyendo los recursos personales (creencias de eficacia), demandas y recursos laborales en la predicción del burnout y del engagement. 2) Diseñar y validar una escala de autoeficacia específica, siguiendo las recomendaciones de la *TSC*. 3) Probar si la autoeficacia predice engagement y desempeño laboral a través de los recursos laborales y personales. 4) Obtener información sobre los mecanismos psicológicos (poder motivacional de las creencias de eficacia), que operan en la forma en que el liderazgo transformacional predice desempeño extra rol. 5) Conocer las diferentes percepciones sobre las causas de los accidentes laborales en el sector de la construcción. 6) Profundizar en el conocimiento de las consecuencias de los altos niveles de autoeficacia (sobreconfianza), y examinar si sus consecuencias son positivas o negativas dependiendo del tipo de actividad que se está desarrollando (de aprendizaje, de innovación o de riesgo).

Para poner a prueba estos objetivos generales, se han desarrollado seis estudios empíricos. Estos estudios han combinado metodología cualitativa y cuantitativa, estudios longitudinales y transversales, de campo y de laboratorio y se han utilizado seis muestras distintas, pertenecientes a dos países europeos. Estos estudios han dado lugar a seis artículos de investigación que han sido sometidos varias revistas de impacto para su publicación.

Con el desarrollo de los citados seis estudios que componen la tesis, se han alcanzado los seis objetivos planteados. El primer objetivo era ampliar el modelo *D-RL*, incluyendo (además de demandas y recursos laborales), la autoeficacia como recurso personal, en la predicción del burnout y del engagement. Se utilizó un diseño longitudinal con dos momentos temporales de recogida de datos. La muestra estuvo compuesta por 274 profesores de secundaria. Análisis de regresión múltiple jerárquicos pusieron de manifiesto que la autoeficacia en Tiempo 1 predecía significativamente los niveles de burnout y engagement en Tiempo 2, pero esta relación desaparecía cuando se tenían en cuenta los niveles basales de burnout y engagement. Por tanto, estos resultados son importantes a la hora de explicar el desarrollo temporal del burnout y del engagement.

El segundo objetivo de la tesis era mostrar el procedimiento llevado a cabo para diseñar y validar una escala específica de creencias de eficacia, siguiendo las recomendaciones de la *TSC*. Por tanto, aplicando la *Técnica de Incidentes Críticos* de Flanagan (1954), y un análisis cualitativo del contenido, se identificaron los principales obstáculos que posteriormente permitieron desarrollar los 7 ítems que formaron la escala definitiva. Esta escala fue validada en una muestra de 265 trabajadores de la construcción y se utilizó en el estudio 3 que se explica en el capítulo 4 de esta tesis.

El tercer objetivo de la tesis era poner a prueba el rol predictor de la autoeficacia en el modelo *D-RL*, es decir, comprobar si la autoeficacia predice el engagement y el desempeño a través de los recursos laborales y personales. Para ello se utilizó una muestra de 228 trabajadores de la construcción. Modelos de ecuaciones estructurales confirmaron nuestro modelo de investigación, esto es, el rol predictor que desempeña la autoeficacia, en la percepción de recursos laborales y también personales (competencias mentales y emocionales), que a su vez influyen en el engagement y el desempeño laboral. Además también se encontró una relación directa entre autoeficacia y desempeño. Estos resultados enfatizan el papel que juega la autoeficacia en la predicción de procesos positivos en el ámbito laboral.

El cuarto objetivo de la tesis era obtener más información sobre los mecanismos psicológicos (poder motivacional de las creencias de eficacia), que operan en la forma en que el liderazgo transformacional predice el desempeño extra-rol de los trabajadores. Se utilizó una muestra de 280 enfermeros portugueses. Análisis con modelos de ecuaciones estructurales fueron consistentes con un modelo mediacional en el que el liderazgo transformacional se relaciona con desempeño extra-rol, a través de la autoeficacia y el engagement laboral. Por tanto, se puede concluir que el estilo de liderazgo transformacional influye en las creencias de eficacia de los trabajadores, que a su vez, predice positivamente los niveles de engagement y de desempeño extra-rol. Por tanto, este estudio ha permitido identificar una variable contextual (liderazgo transformacional), capaz de influir en las creencias de eficacia de los trabajadores a través del modelado y la persuasión verbal, que son dos importantes fuentes de autoeficacia (Bandura, 2001b).

El quinto objetivo de la tesis era ampliar nuestro conocimiento sobre las posibles causas de accidentes en el sector de la construcción. Para ello, utilizando una

metodología cualitativa, se analizaron las diferentes percepciones que presentaban varios expertos del sector que fueron entrevistados y que participaron en una mesa redonda en la que se trataron los temas de interés psicosocial para el desarrollo de este estudio. Los resultados mostraron un consenso absoluto entre todos los participantes sobre las principales causas de accidentes: la sobreconfianza y los riesgos percibidos más como un reto que como un peligro para la integridad física. Estos resultados inspiraron, en parte, nuestro próximo estudio, en el que se comparan varios contextos para ver si una alta autoeficacia (o sobreconfianza) se relaciona con consecuencias positivas o negativas en función de la actividad que se esté desarrollando.

Por tanto el sexto y último objetivo de la tesis era analizar si las consecuencias de unos altos niveles de autoeficacia son positivas o negativas dependiendo del tipo de actividad. Para eso se compararon tres contextos distintos, utilizando tres muestras diferentes: 527 estudiantes para el contexto de aprendizaje, 165 participantes de un estudio de laboratorio para el contexto de innovación y finalmente, 228 trabajadores de la construcción para el contexto de riesgo. Los resultados mostraron que efectivamente, las creencias de eficacia se relacionan con consecuencias positivas o negativas en función del contexto de actividad. En el contexto de aprendizaje y de innovación, altos niveles de creencias de eficacia se relacionan con consecuencias positivas (mejor desempeño académico y de innovación), mientras que en el contexto de riesgo, niveles altos de creencias de autoeficacia se relacionan con menos conductas seguras, es decir, con un bajo desempeño en seguridad, y por tanto con consecuencias negativas (negligencias y accidentes laborales). Estudios anteriores muestran que altos niveles de autoeficacia suelen relacionarse con resultados positivos pero nuestros resultados ponen de manifiesto que esta relación “depende” del contexto de actividad en el que nos encontremos.



Con el desarrollo de los seis estudios que forman la tesis, se ha ampliado el modelo *D-RL*, pues se han incluido las creencias de eficacia como recurso personal y se ha puesto de manifiesto su rol predictor en el proceso motivacional del modelo. Por tanto se ha mostrado que las creencias de eficacia son el principal recurso personal, ya que presentan poder de influencia en el desempeño laboral y en la forma en que los trabajadores perciben los recursos laborales pero también otros recursos personales como las propias competencias mentales y emocionales.

Por otro lado, el liderazgo transformacional se ha identificado como una variable contextual capaz de aumentar las creencias de eficacia de los trabajadores, así como sus niveles de bienestar y su desempeño extra-role.

Finalmente, se ha ampliado la *Teoría Social Cognitiva*, explorando y comparando el rol de las creencias de eficacia, así como sus consecuencias, en distintos contextos de actividad.

## Curriculum Vitae



Laura Lorente Prieto was born on February 20<sup>th</sup>, 1981 in Castellón (Spain). She graduated in Psychology in 2003 at Universitat Jaume I of Castellón. Then, she started a Master about Occupational Risks Prevention and later she started the PhD studies on Work and Organisational Psychology, (Inter-university program awarded a quality mention by the Spanish Ministry of Science and Education), under the supervision of Marisa Salanova and Isabel Martínez. In 2006 she was granted a scholarship from the Regional Cultural Ministry, in order to carry out her PhD. Since then she is involved in several research projects at Wont Research Team, and also teaching in the Department of Social Psychology at the Universitat Jaume I.

Her main topics of interest are related to the role of self-efficacy in several activity settings and its relationship with employees' well-being and job performance.