Revista Interamericana de Psicología Ocupacional
Volúmen 30, Número 2, diciembre de 2011, Pág. 149-160

DEVELOPING A JOB-RELATED SELF-EFFICACY SCALE AMONG CONSTRUCTION WORKERS

Laura Lorente[1]
Universidad de Valencia, Spain

Marisa Salanova and Isabel Martínez
Universitat Jaume I, Spain

Resumen

Es propósito de este estudio mostrar el procedimiento de desarrollo y validación de una escala de auto-eficacia en el trabajo con un grupo de trabajadores de la construcción, siguiendo las recomendaciones de la Teoría Social Cognitiva de Albert Bandura. Se utilizó una adaptación de la Técnica de Incidentes Críticos mediante entrevistas con 37 trabajadores de la construcción, que ocupaban diferentes cargos. Usando la Técnica de Incidentes Críticos combinada con análisis de análisis de contenidos cualitativos se identificaron los principales obstáculos percibidos por los trabajadores de la construcción. A partir de esta información se formularon 7 ítems específicos de auto-eficacia relativos a la percepción de la eficacia de los trabajadores para enfrentar obstáculos. Esta escala se incluyó en un estudio más amplio que buscaba evaluar factores psicológicos entre trabajadores del sector de la construcción. Se utilizaron entrevistas semi-estructuradas con una muestra de 265 trabajadores. La muestra se dividió aleatoriamente en 2 submuestras: (1) (n = 128) en la que se realizó un Análisis Factorial Exploratorio que arrojó la existencia de una solo factor de auto-eficacia en el trabajo. (2) (n = 137) con la que se realizó un Análisis Factorial Confirmatorio que evidenció la existencia de un modelo con el factor referido. Esta escala permite avaluar aspectos un aspecto psicológico relacionado con los comportamientos de seguridad de los trabajadores de la construcción, así también algunos de sus antecedentes y consecuencias.

Palabras clave: Evaluación, auto-eficacia, trabajador de la construcción, cuestionarios.

DESARROLLO DE UNA ESCALA PARA MEDIR AUTO-EFICACIA EN TRABAJADORES DE LA CONSTRUCCIÓN

Abstract

The object of this study is to show the procedure for developing and validating a job self-efficacy scale among construction workers, following the recommendations of Albert 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 combined with qualitative content analysis, the main obstacles perceived by

1 Correspondence should be addressed to Laura Lorente Prieto, Universidad de Valencia, Departamento de Psicología Social. Avda. Blasco Ibáñez, 21, 46010, Valencia, España. Email: Laura.Lorente-Prieto@uv.es

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. This scale enabled us to evaluate job-related self-efficacy among construction workers, which is a key construct to not only understand workers' safety behavior in the construction industry, but also the possible antecedents and consequences of it (i.e., negligence or occupational accidents).

Key words: evaluation, self-efficacy, construction workers, questionnaire.

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.

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 and Resources Model* ("JD-R"), (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), which explains that the employee's work conditions can be categorized into "demands" and "resources", and that these relate differently to positive and negative outcomes which may be typical of specific occupations.

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 reformulated the *JD-R Model* by proposing the assumption that most authors state that job resources are related to personal resources (i.e., optimism, self-efficacy, resilience and self-esteem), so that the latter are capable of mobilizing job resources and generating more 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 (Hobfoll, Jonson, Ennis, & Jackson, 2003). Furthermore, some research focus on the considerable importance of personal resources. This 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, and with which 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); so 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). 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 (Bandura, 1997).

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).

Efficacy beliefs influence the courses of action people choose to pursue, the challenges and goals they set for themselves and their commitment to them, how much effort they invest in given endeavours, the outcome they expect their efforts to produce, how long they persevere when faced with obstacles, their resilience to adversity, the quality of their emotional life, how much stress and depression they experience in coping with taxing environmental demands, the life choices they make and their accomplishments.

For all these reasons it is important to take into account the construction workers' levels of self-efficacy to understand their behaviour and their consequences (i.e., negligence and occupational accidents, as well as excellent performance at work).

Measuring Self-efficacy

Perceived self-efficacy is concerned with 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 (Bandura, 1997; Salanova, et al., 2002) provided robust results, thus supporting the need to use

specific self-efficacy measures in relation to specific domains.

In order to develop self-efficacy scales, they 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 Albert Bandura to design self-efficacy scales (Bandura, 2001b, 2006). Therefore, the main aims of this study were to describe the procedure carried out to develop a specific scale for measuring self-efficacy in 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. The interviewees were two experts in Psychology of Work and Organizations with training and experience as an interviewer. This guide serves as a support and 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 ages ranged from 17 to 45. The mean age of the sample was 31 years old (SD=8.22). All of the workers 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 they said: "*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.

From the information obtained, the 'content analyses' qualitative method was then performed as the fourth step. This information was obtained anonymously and the information analysis was done using all the comments made with a system which included three judges who were experts in psychosocial issues and in conducting this type research. 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 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

Based on 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 affirm that they cannot 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.

Thus from the previous information (all obstacles), we developed the items that would form 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 U*niversity-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 offered to participate in this study.

In order to validate the 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. It specifically 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

Table 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

(*SD*=11.89). Of all the employees, 41 were foreigners but they understood Spanish, 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 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.

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.

Table 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

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. *Principal axis analyses with Oblimin rotation for 7-items (N=265).*

	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

Later, 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 1 shows.

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 conventional cutoffs, 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 fix 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 fitted the model, thus confirming that the scale was composed of one factor. ($c^2_{(13, n=137)}$ = 16.82; GFI = .98; RMSEA = .048; IFI = .98; CFI = .98).

Scale Validity

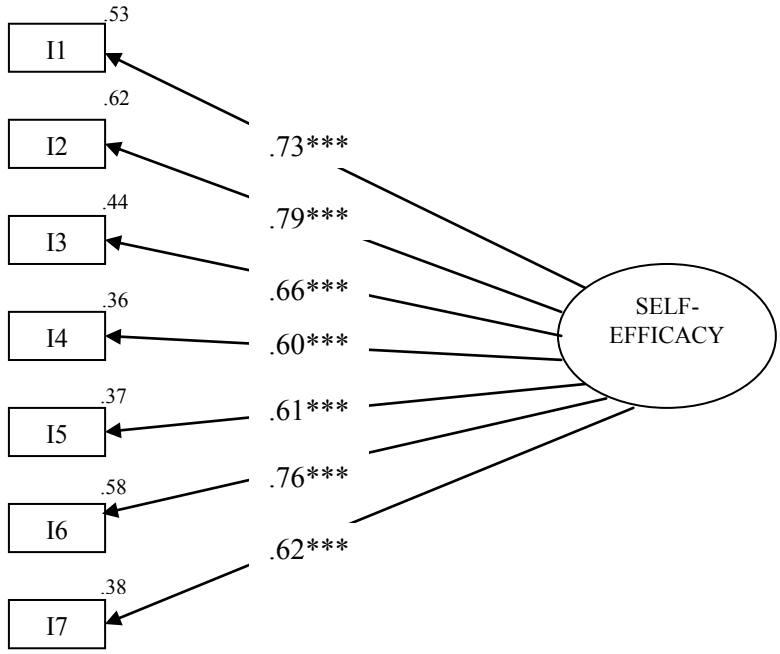
When a new instrument is developed, it is important to focus on its construct (convergent) and predictive validity. The convergent validity (Campbel & Fiske, 1959), refers to whether measures appear to be measuring the same construct. It was investigated by correlating the scale with a self-constructed 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 two outcomes which, in our case, were organizational commitment and job satisfaction, where a unique, significant and positive relationship was expected. The model fitted the data ($c^2_{(27, N=265)}$ = 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 only revealed significant differences accor-

Figure 1. *Confirmatory factor analyses*



ding 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).

DISCUSSION

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 in a certain context, in this case, the construction industry. Thus, the scale was based on the *Social Cognitive Theory*, so the scale was supported by a robust theory. Moreover, Cronbach's alpha confirms that the scale was internally consistent.

In order to determine the factor structure of the questionnaire, an exploratory factor analysis was done with one half of the sample to confirm that the scale was composed of a single factor. Moreover, a confirmatory factor analysis with the other half of the sample confirmed that this single factor indeed exists. 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 long 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).

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 reliable scale has been developed which allows information about levels of self-efficacy of construction workers to be obtained in a very short time. The procedure could be used by other researchers to construct other self-efficacy scales in other domains. A review about self-efficacy within the *Social Cognitive Theory* has been done. Furthermore, a proposal as to 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 probably due to the sample itself. A sample of convenience was used to include all the workers of the ten construction companies that participated in the study. This method is possibly not the most effective in sample collection, and another type of sampling could be used, for instance, a representative sample selection.

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 (conver-

gent) 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. So, to be able to examine the convergent validity of the self-efficacy scale, it was correlated with the scale of collective efficacy, and a positive and significant correlation was presented.

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, cities or cultures with a view to verifying whether the scale is still 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.

References

Arbuckle, J. L. (1997). *Amos Users' Guide version 4.0.* Chicago, IL: Smallwaters Corporation.

Bandura, A. (1986). *Social foundations of thought and action.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1989). Human Agency in social cognitive theory. A*merican Psychologist, 44*, 1175-1184.

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

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

Bandura, A. (2001b). *Guía para la construcción de escalas de autoeficacia*. [Guide for constructing self-efficacy scales]. Universidad de Stanford. http://www.des.emory.edu/mfp/effguideSpanish.html. Date accessed: April 6, 2006.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares, and T. Urdan, (Eds.) *Self-efficacy Beliefs of Adolescents*. Information Age. Greenwich.

Browne, M. W., & Cudeck, R., (1989). Single sample cross-validation indices for covariance structures. *Multivariate Behavioral Research, 24,* 445-455.

Campbell, D., & Fiske, D. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56*, 81-105.

Clarke, S. G. (2000). Safety culture: Underspecified and overrated? *International Journal of Management Reviews, 2*, 65-91.

Dawson S. (1991). *Manapng safety offshore. Oftore Operations Post Piper Alpha: London, 6-8 February (Paper 13)*. London: Marine Management (Holdings) Ltd.

Espluga, (2006). NTP 405: Factor humano y siniestralidad: aspectos sociales. *Nota técnica de prevención del INSHT. (Series 12,* nos. 401-435). http://www.mtas.es/insht/ntp/ntp_405.htm. Date accessed: June, 10, 2007.

European agency for Safety and Health at work (2008). *The construction sector*.

http://osha.europa.eu/en/sector/construction. Date accessed: September, 6, 2008.

Flanagan, J. C., (1954). The critical incident technique. *Psychological Bulletin, 51*, 327-358.

Goldenhar, L. M., Williams, L. J., & Swanson, N. G. (2003). Modelling relationship between job stressors and injury and near-miss outcomes for construction labourers. *Work & Stress, 17,* 218-240.

Grau, R., Salanova, M., & Peiró, J. M. (2000). Efectos moduladores de la autoeficacia en el estrés laboral [The modulator effect of self-efficacy in work-related stress]. *Apuntes de Psicología, 18*, 57-75.

Henson, R. K. (2001). Understanding internal consistency reliability estimates: A conceptual primer on coefficient alpha. *Measurement and Evaluation in Counseling and Development, 34*, 177-189.

Hobfoll, S. E., Jonson, R. J., Ennis, N., & Jackson, A. P. (2003). Resource loss, resource gain and emotional outcomes among inner city women. *Journal of Personality and Social Psychology, 84*, 632 - 643.

Hofmann, D. A., Jacobs, R., & Landy, F. L. (1995). High reliability process industries: Individual, micro, and macro organizational influences on safety performance. *Journal of Safety Research, 26,* 131-149.

Hoy, W. K., & Woolfolk, A. (1990). Socialization of student teachers. *American Educational Research Journal, 27,* 279-300.

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

Hurst, N. W., Bellamy, U., Geyer, T. A. W., & Astley, J. A. (1991). A classification scheme for pipework failures to include human and sociotechnical errors and their contribution to pipework failure frequencies. *Journal of Hazardous Materials, 26*, 159-186.

Judge, T., Locke, E., & Durham, C. (1997). The dispositional causes of job satisfaction: a core evaluations approach. *Research in Organizational Behavior, 19*, 151-188.

Lund, J., & Aarø, L. E. (2004). Accident prevention. Presentation of a model placing emphasis on human, structural and cultural factors. *Safety Science 42*, 271-324.

Marsh, H., Balla, J., & Hau, K. (1996). An evaluation of incremental fit indices: a clarification of mathematical and empirical properties. In G.A. Marcoulides & R.E: Schumacker (Eds.), *Advanced structural equation modelling issues and techniques* (pp. 315-353). Mahwah, NJ: Lawrence Erlbaum.

Ministerio de Trabajo y Asuntos Sociales (2008). *Condiciones de trabajo y relaciones laborales* [Work Conditions and Labour Relations]. http://www.mtas.es/estadisticas/bel/ANE/Ateadvertencias.htm. Date accessed: April, 28, 2008.

Pajares, F. (1996). Current directions in Self-efficacy Research. In M. Maehr & P. R. Pintrich (Eds.). *Advances in motivation and achievement,* (pp. 1-49). Greenwich, CT: JAI Press.

Pedhazur, E., & Schmelkin, L. (1991). *Measurement, design and analysis: an integrate approach*. Hillsdale, NJ: Lawrence Erlbaum.

Pidgeon, N. F. (1991). Safety culture and risk management in organizations. *Journal of Cross-Cultural Psychology, 22*, 129-140.

Salanova, M., Gracia, E., & Lorente, L. (2007). Estudio de riesgos psicosociales en trabajadores de la construcción [Study of psychosocial risks in construction workers]. *Gestión Práctica de Riesgos Laborales, 44,* 12 - 19.

Salanova, M., Peiró, J. M., & Schaufeli, W. B. (2002). Self-efficacy Specificity and Burnout among Information Technology Workers: An extension of the Job Demands-Control Model. *European Journal on Work and Organizational Psychology*, *11*, 1-25.

Salanova, M., Schaufeli, W. B., Xanthopoulou, D., & Bakker, A. (2009). The gain spiral of resources and work engagement. In A. Bakker & M. Leiter (Eds.) *Work engagement: Recent developments in theory and research*. New York: Psychology Press.

Schaufeli, W. B., & Salanova, M. (2007). Work Engagement: an emerging psychological concept and its implications for organizations. In S.W. Gilliland, D.D. Steiner & D. P. Skarlicki (Eds.), *Managing Social and Ethical Issues in Organizations*. Research in Social Issues in Management.

Schaufeli, W. B., & Salanova, M. (2008). Enhancing work engagement through the management of human resources. In K. Näswall, M. Sverke & J. Hellgren (Eds.), *The individual in the changing working life* (pp. 380-404). Cambridge: Cambrigde University Press.

Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive Psychology: an introduction. *American Psychologist, 55*, 5-14.

Vancouver, J. B., Thomson C. M., & Williams, A. A. (2001). The changing signs in the relationships among self-efficacy, personal goals and performance. *Journal of Applied Psychology, 86*, 605-620.

Wagenaar, W. A., & Groeneweg, J. (1987). Accidents at sea: Multiple causes and impossible consequences. *International Journal of Man-Machine Studies, 27*, 587-598.

Weick, K. E. (1990). The vulnerable system: Analysis of the Tenerife air disaster. *Journal of Management, 16*, 571-593.

Weick, K. E. (1993). The collapse of sensemaking in organizations: The Mann Gulch disaster. *Administrative Science Quarterly, 38,* 628-652.

Whyte, G., Saks, A., & Hook, S. (1997). When success breeds failure: the role of self-efficacy in escalating commitment to a losing course of action. *Journal of Organizational Behavior, 18*, 415-433.

Wright, C. (1986). Routine deaths: Fatal accidents in the oil industry. *Sociological Review, 4*, 265-289.

Recibido 01/08/2011
Aprobado 01/02/2012

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
Cannot do this at all			I can do this quite well or I am certain I can do this			I am totally convinced I can do this

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