

Equivalent Validity of Identification-Commitment-Inventory (HSA-ICI)

Validez del Cuestionario de Identificación y Compromiso (HSA-ICI)

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The main purpose of this study was to demonstrate the validity of the Identification-Commitment-Inventory (HSA-ICI) in two European samples (from Spain and Portugal). The ICI was proposed by Quijano and collaborators as part of the Human System Audit (HSA), a conceptual model and set of tools designed for evaluation and intervention in Human Resources Systems (HRS). The underlying factor structure of the instrument was tested with samples of Spanish ($n = 625$) and Portuguese ($n = 520$) employees - in combination and separately - working in the health care sector. Confirmatory factor analysis with a test of invariance across groups was conducted. The results show that the theoretical model fits the observed data of the general sample ($\chi^2 = 2643.12$, $P = .046$; RMSEA = .028; RMR = .041; GFI = .983; AGFI = .977; CFI = .994), replicating the results of a previous study. When the samples were analysed separately, the measurement structure presented a better fit in the Spanish sample than in the Portuguese sample. The overall difference was not large - due to being influenced at the item level by some contextual aspects - but was just sufficient to obtain statistical significance ($\chi^2_{\text{Tucker-Lewis}} = 48.23$; $df = 1$; $P < .001$). This work provides evidence supporting the use of the HSA-ICI. The implications of these results for future research are discussed.

Keywords: Organizational Commitment, Organizational Identification, Confirmatory Factor Analysis, Structural Equation Modeling, Elliptical Least Square Solution.

El objetivo principal de este estudio es validar el Cuestionario de Identificación y Compromiso (HSA-ICI) en dos muestras europeas (de España y Portugal). El ICI ha sido desarrollado por Quijano y colaboradores en el marco de la Auditoría del Sistema Humano (ASH). El ASH es un modelo conceptual que incluye un conjunto de herramientas diseñadas para la evaluación e intervención en los Sistemas de Recursos Humanos (HRS). La estructura factorial subyacente del instrumento ha sido puesta a prueba, tanto a nivel general como por separado, en una muestra de empleados del sector sanitario (españoles, $n = 625$; portugueses, $n = 520$). Se ha llevado a cabo un análisis factorial confirmatorio con pruebas de invariancia en ambos grupos. Los resultados muestran, al igual que estudios anteriores, que el modelo teórico se ajusta a los datos de la muestra global ($\chi^2 = 2643.12$, $p = 0.046$, RMSEA = 0.028, RMR = 0.041, GFI = 0.983, AGFI = 0.977; CFI = 0.994). Cuando se analizan ambas muestras por separado, la estructura de medición presenta un mejor ajuste en la muestra española que en la muestra portuguesa. Si bien la diferencia en el ajuste no es alta, resulta suficiente para obtener evidencia estadísticamente significativa ($\chi^2_{\text{Tucker-Lewis}} = 48,23$; $gl = 1$, $p < .001$). Las diferencias halladas entre los ítems pueden ser explicadas por la influencia del contexto. Este trabajo ofrece herramientas para la administración del HSA-ICI. Para finalizar, se analizan las implicaciones derivadas de los resultados obtenidos en futuras investigaciones.

Palabras Clave: Compromiso Organizacional, Identificación Organizacional, Análisis Factorial Confirmatorio, Modelos de Ecuaciones Estructurales, Solución Elíptica de Mínimos Cuadrados.

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After more than 40 years of research the distinction between the concepts of commitment and identification still requires examination, because the distinction between the concepts is still fuzzy (Edwards, 2005; Riketta, 2005). Both concepts are meant to tap into and describe very similar psychological states and attempt to better understand the link between employee-organization.

The Human System Audit Identification Commitment Inventory model (HSA-ICI) integrates organizational commitment (OC) and organizational identification (OI). It is based on a theoretical approach to understand the interplay between organizational concepts within a broader integrative model, the Human System Audit (HSA) (Quijano, 2006). The model “emerges as an integrated proposal, made from the context of Work and Organizational Psychology, for the Assessment of Intangibles, for the Assessment of Quality in models of excellence, and in general for the diagnosis of and intervention in the Human System in Organizations, as well as for research on human behavior in them” (Quijano, Navarro, Yepes, Berger, & Romeo, 2008, p. 92).

The application of the HSA allows a concrete, concept-based, valid and quality-related diagnosis of human resources and processes in organization in the line with the aim of the European Foundation for Quality Management (EFQM) (EFQM, 2000, 2010) which is dedicated to the development of organizational excellence. This diagnosis includes psychological (role conflict; role clarity; self efficacy, awareness of results: responsibility for results and perceived meaning) and psychosocial processes (leadership, shared vision, culture, participation, power and authority, conflict management and negotiation), quality of human results (climate, competences, motivation, identification and commitment, attitude to change, stress, arousal, burnout and work-life balance, job satisfaction, quality of life) and organizational effectiveness.

Specifically, the ICI model is part of those “quality of human results” and one of the most important contributions in the HSA (Quijano, 2006). It reinforces the importance of the link as a core concept to understand the relationship between employee and organization (Buchanan, 1974; O’Reilly & Chatman, 1986; Reichers, 1985). The strength of this link can be understood as a result of the psychological and psychosocial processes related to Human Resources Management Systems (HRMS). According to the ICI model OC constitutes the psychological link that employees develop towards the organization for different reasons. As an attitude it is based on beliefs, evaluation processes, feelings and behaviors. At the same time, behavior is a result of commitment and an inferential indicator of it. Following Quijano, Navarro, and Cornejo (2000) OC can be considered as a theoretical concept with four different dimensions: value,

affection, exchange and need. Value and affection compose the personal commitment; exchange and need together could be called instrumental commitment. Affective commitment refers to the affective link between employee and organization resulting from affiliation needs. When it is present, it means that there is more than a contract between the employee and organization. Value commitment is related to the recognition of common goals and values between individual and organization. Employees accept the goals and values of the organization because they are seen as congruent with their own. Instrumental commitment is related to the rewards which the individual expects from the organization. Quijano et al. (2000) distinguish between need and exchange in an attempt to differentiate better the types of link that, despite the same instrumental base, induce distinct patterns of behavior toward the organization. So, need implies a weaker link focused only on the maintenance of the job as a way of survival, because there is not another opportunity of work for the individual. Exchange is based on more or less satisfactory retributions/compensations (intrinsic or extrinsic) received from the organization. Based on the model of organizational identification proposed by Ashforth and Mael (1989), Quijano et al. (2000) define OI as a type of link with the organization. From this perspective, OI implies cognition, affection and desire, and it is composed of three dimensions: pride, categorization and cohesion. Pride implies self-esteem for being part of the group; categorization means being aware of belonging; and cohesion implies desire for continuous belonging to the organization along time. In other words: awareness of membership, self-esteem for being an organizational member and desire to stay in the organization. All these topics exceed the OI concept and complement it. Previous studies show (Quijano et al., 2000; Quijano, Yepes, Berger, Romeo, Navarro, & Gómez, 2007) that personal commitment, specifically affective commitment, and OI have a strong relationship. Specifically, value commitment is related to pride and categorization; affective commitment to general identification. The items of exchange commitment and cohesion are also integrated. In this sense Quijano et al. (2000) suggested that personal commitment and OI will interact and happen at the same time: OI leads to personal commitment and reinforcing it. Recently, empirical studies (Quijano et al., 2007) contributed to the model’s adjustment, by first conducting Exploratory Factor Analysis (EFA) and in an advanced stage applying Confirmatory Factor Analysis (CFA). The ICI model integrates OC and OI. It is based on a theoretical approach for the understanding of interplay between concepts within a broader integrative model, the Human System Audit (HSA).

Results of earlier studies by Quijano et al. (2007) and Romeo, Yepes, Berger, Guàrdia, and Castro (2010) reinforce the ICI model as part of the HSA Quality of Human Processes and Resources (QHPR). The aim of the present study is to ana-

lyze the validity of the Identification-Commitment-Inventory (HSA-ICI), in two European samples (in Spain and Portugal). Empirical testing has been seriously hampered by a lack of instruments that are valid in different countries. The most frequently studied type of measurement is construct equivalence (Caprara, Barbaranelli, Bermúdez, Maslach, & Ruch, 2000; Cheung & Rensvold, 2000; Van de Vijver & Leung, 2000) but in our case we have focused on predetermined structures equivalence.

Previous studies revealed some differences in health care employees for Spain and Portugal (Colby, 1997; Morlans, 2001; Peiró, 2007; Richards, 1997; Smith, 2001), but no considerable differences in relations with others European countries (Fischer & Mansell, 2009; Meyer, Stanley, Herscovitch, & Topolytsky, 2002). Taking these findings into account, we hope to demonstrate the equivalent validity of the integrated Identification-Commitment-Inventory (HSA-ICI) across two European samples. It will allow us to be more confident that results are applicable to a wide range of occupations, jobs and countries.

Method

Participants

Our two samples consist of 1,145 total participants: 625 subjects from a public hospital in Spain, and 520 from a public hospital in Portugal (all participating employees in Portugal are nurses and other professional assistants). Globally considered, participants were distributed as follows: 106 doctors (9.3%), 809 nurses and other professional assistants (73.6%), 217 other hospital professionals (18.9%), and 13 employees (1.1%) whose job category was not indicated. A total of 10.3% of participants (n = 118) indicated that their post was managerial. A relatively high percentage (13%) of subjects failed to respond to the role category item.

Data collection

During one month and a half, employees answered the questionnaires and sent them back to the researchers using mailboxes, in order to ensure anonymity and confidentiality. The rate of participation was around 60% in Spain and 38% in Portugal.

Instrument

The original version of the ICI questionnaire was in Spanish. The items were translated and back translated and adapted to Catalan and Portuguese languages. The objective of the translation process was to keep the instrument as near

as possible to the original, maintaining the direction of each question and the same structure presented by the authors. Therefore, a back-translation method (Carlson, 2000) and the guidelines of the International Test Commission (ICT) to obtain a linguistically equivalent instrument in Catalan and Portuguese were used: first with the collaboration of expert consultants the translation into Catalan and Portuguese was done and then it was back translated from Catalan and Portuguese into Spanish. All discrepancies were cleared up and a common version was derived.

The questionnaire used to collect the data was the HSA-ICI, a 20-item questionnaire with indicators related to commitment and identification.

According to the theoretical model underlying the questionnaire (Quijano et al., 2000), OC is a third-order factor composed of two second-order factors (as shown in Figure 1): personal commitment and instrumental commitment. Personal commitment includes two first-order factors: affective commitment and value commitment. Instrumental commitment includes exchange commitment and need commitment. Some examples of OC items are: "I feel that there is a great similarity between my personal values and those of this hospital" (i94 - value commitment); "The success of my organization is my success" (i87 - affective commitment); "An important reason why I continue working in this hospital is that I don't feel that other hospitals can offer me better compensation" (i90 - exchange commitment); "I would not recommend to any family member or friend that they should work in this hospital" (i93 - need commitment). For all items of the study, a 5-point Likert-type scale was used (1 = *Strongly disagree*; 5 = *Strongly agree*).

OI is a first-order factor composed of eight observable variables. Nevertheless its unidimensionality (Quijano et al., 2000) includes three clear conceptual components for OI: categorization: e.g. "I feel part of this hospital" (i85); proud, e.g. "I feel proud when I tell others that I work in this hospital" (i101); and cohesion, e.g. "I would like to be a member of this hospital for life" (i95). The authors also included one item related to general identification: "I identify myself with my organization" (i108). For all items of the study, a 5-point Likert-type scale was used (1 = *Strongly disagree*; 5 = *Strongly agree*).

Previous studies showed a general Cronbach's α of .941 on the original ICI scale (Romeo et al., 2010). Quijano et al. (2000) obtained the following values: value commitment (.67), affective commitment (.67), exchange commitment (.63), need commitment (.82) and identification (.93), and they showed correlations between Commitment dimensions and Identification from .50 to .83, the higher correlation being that between Identification and Affective commitment.

Figure 1. Path Diagram of Factorial Model.

Data Analysis

Confirmatory Factor Analysis (CFA) through Structural Equation Modeling (SEM) was performed. Cause of non-normal multivariate distribution (Mardia's coefficient > 3) and little asymmetry of the variables Elliptical Least Square Solution (ELS) were chosen as estimator procedure. SEM with a CFA approach was performed using EQS for Windows 6.1 version.

Results

Study of Measurement Model (CFA) using the global sample

Factorial coefficients (λ_{ij}), error variances (θ_{ϵ}^2) and the covariance between the factors (ϕ_{ij}) from CFA using the global sample were estimated using Elliptical Least Square Solution (ELS), due to the nonsymmetrical distribution of observed variables and non-normal multivariate distribution. Although the chi-square goodness-of-fit test could have been employed it was decided, given that type I error increases with sample size, to use other indicators such as the Root Mean Square Residual (RMSR; cut-off criteria RMSR < .05), Root Mean Square Error of Approximation (RMSEA; cut-off criteria RMSEA < .05), Goodness-of-Fit Index (GFI; cut-off criteria GFI > .90), Adjusted Goodness-of-Fit Index (AGFI; cut-off criteria AGFI > .90) and the Comparative Fit Index (CFI; cut-off criteria CFI > .90). As usual the model fit is verified with values near 1 and residuals near 0 (Bentler, 1990; Bentler y Bonet, 1980; Browne y Cudeck, 1993; Hu y Bentler, 1995, 1998). Results of the first study are shown in Table 2.

In addition to the residual matrix (R- Σ), the off-diagonal absolute standardized residuals are not so high (.0432). The residual values range from -.2 to .3, with 92.38% of residual values ranging from -.1 to .1. The largest standardized residual is .237.

Complementary to this, the general Cronbachs α was .91 and all the subscales shown internal validity: .87 for value commitment, .88 for affective commitment .89 for exchange commitment, .91 for need commitment and .94 for identification. All values were estimated from EQS reliability Shapiros Test, using the correction proposed by Asparouhov and Muthén (2009) in relation to exploratory structural equation models (ESEM) and computing the results through M-Plus sentences. According to the usual criteria, this coefficient of reliability is indicative of the internal consistency of the responses across the set of items (Muiz, 1992; Schumacker & Lomax, 2004).

Table 1. Factorial Coefficients for each Item and Factor Structure according to the Latent Theoretical Measurement Model. (N = 1,145).

Item Number	Estimation (λ_{ij})	Measurement Error (ϵ_i)	Coefficient of Determination (R^2)
Item85	.610*	.793	.372
Item86	.646*	.763	.417
Item87	.555*	.832	.308
Item89	.257	.967	.066
Item90	.241	.971	.058
Item91	.632*	.775	.400
Item92	.721*	.693	.519
Item94	.786*	.618	.618
Item95	.620*	.785	.384
Item97	.681*	.732	.464
Item99	.647*	.762	.419
Item101	.799*	.601	.639
Item106	.729*	.685	.531
Item107	.827*	.562	.685
Item108	.757*	.654	.572
Item110	.704*	.710	.496
Item93n	.712*	.703	.506
Item104n	.823*	.568	.677
Item88n	.469*	.883	.220
Item109n	.211	.978	.044
Second order - Values	.869*	.495	.754
Second order - Affective	.962*	.274	.925
Second order - Exchange	.989*	.145	.979
Second order - Need	.768*	.641	.589
Third order - OC	.992*	.046	.812
Third order - OI	.981*	.196	.961

*Significance $p < .001$

Another step in the model fit is the analysis of the individual parameter estimates; this means whether their value and signs are appropriate and if they are significant (Schumacker & Lomax, 2004). In a general sense, the estimated regression coefficients were positive, high and significant ($p < .001$), which shows a high correlation between the observable variables and the factors as postulated by the proposed model. Table 1 shows the estimation of each coefficient as a fixed parameter and estimation above described.

In general, Table 1 shows high values in standardized estimation (statistically different from 0), small measurement error and significant coefficient of determination. Except for the results obtained in Item89, Item90 and Item 109n (with poor coefficient of determination), all the rest of the items present a good fit to the theoretical model of measurement. As a consequence of these results, we can conclude that the theoretical model fits the observed data and that its high value of construct validity is derived from the adjusted model.

Study of Measurement Model (CFA) in each sample

The second study was used to test the factorial invariance across the Spanish and Portuguese samples. We tested a sequence of multisample, ordered measurement models as described by Bollen (1989) and Jöreskog and Sörbom (1993) using the usual techniques derived from Tucker-Lewis Index (TLI) and the Lagrange Multiplier (LM) test in order to compare both measurement models (Table 2). The TLI index is a system that compares global models and is a derivative of Bentler and Bonnet Fit Index (Bentler and Bonnet, 1980). TLI can be estimated from the Tucker-Lewis χ^2 as a result of the difference of the global χ^2 of each model under comparison divided by the χ^2 from the general model. The same situation apply with the LM test (estimated using EQS) that allows the comparison of each pair of parameters in each model under considerations (λ_{ij} for instance, in two different models). Both, TLI and ML follow the gamma distribution and can be tested using the χ^2 theoretical model. An excellent way to do this with M-Plus can be found in Kenny, Kashy, and Bolger (1998).

Table 2. Goodness of Fit Index of the Measurement Model in the General and in each Sample.

Sample	χ^2	RMSEA	RMSR	GFI	AGFI	CFI
Global (N = 1145)	2643.12 df = 1063; p = .046	.028	.041	.983	.977	.994
Spain (n = 625)	2122.11 df = 543; p = .091	.033	.049	.974	.971	.986
Portugal (n = 520)	3941.33 df = 438; p = .072	.081	.088	.899	.900	.912

Note 1. χ^2 = Chi-Square; df = Degrees of freedom; RMSEA = root mean square error of approximation; RMR = root mean square residual; GFI = goodness of fit index; AGFI = adjusted goodness of fit index; CFI = comparative fit index.

Note 2. TLI Spanish versus Portuguese models. $\chi^2_{\text{Tucker-Lewis}} = 48.23$, $df = 1$ ($p < .001$)

From these results, it seems that the measurement structure presents a much better fit in the Spanish sample than in the Portuguese sample. The global difference is not higher but is enough to obtain significant statistical evidence ($\chi^2_{\text{Tucker-Lewis}} = 48.23$; $df = 1$; $p < .001$). To get a deeper insight into the results, a particular analysis connected with the free parameter estimate (λ_{ij}) for each sample was carried out. There are some differences between the parameter solutions (both statistical analyses were carried out with elliptical estimations due to the non-normal distribution of observed variables).

Table 3 presents the items with different factorial coefficients and the result of LM contrasts between each pair of estimations. The rest of the estimation was the same in both samples and equal to the global estimation shown in Table 2 with the topic criteria.

In all cases the estimation from the Spanish sample shows a better value than from the Portuguese sample. In fact, item109n was not significant in the global analysis and now, estimated from a separate sample, results were statistically significant in the Spanish measurement model. Results allow a first conception of the factorial structure for an integrated ICI model. Differences between Spain and Portugal were found for some items that may reflect a slight sensibility to influences of contextual aspects presented in Table 3. Finally, the values derived from the correlation between latent variables were statistically significant in both samples ($\phi_{ij} = .412$ and $\phi_{ij} = .589$, respectively) assuming standardized variance to 1 and $p < .001$.

Table 3. Pairs of Comparisons between Standardized Factorial Coefficients with Statistical Significant Results in Lagrange Multiplier (LM) Test.

Item	(λ_{ij}) Spain (n = 625)	(λ_{ij}) Portugal (n = 520)	LM Test	Significance
item85	.722*	.348*	8.77	.002
item91	.745*	.421*	7.89	.001
item101	.845*	.511*	8.93	.002
item110	.779*	.538*	12.18	< .001
item109n	.389*	.201	7.43	.001

λ_{ij} = free parameter estimation for each sample; LM = Lagrange Multiplier; *Significance $p < .05$

Discussion

The purpose of this research was to demonstrate the equivalent validity of the integrated Identification-Commitment-Inventory (HSA-ICI) across two European samples. The fuzzy relationship between OC and OI has been discussed by different authors along years of research, and recent integrative models are important attempts to understand better how OC and OI interplay within the organizational context. In this sense, ICI offers researchers and consultants not only a theoretical model which integrates the concepts, but also a single tool to measure them at the same time. To test the equivalent validity the structural equation modeling assessed the goodness of the fit in samples of health care employees.

In a first step we tested the model in a general analysis. Results confirm the goodness of fit of the integrated model, which underlies the relation between commitment and identification although each one is operatively different (Edwards, 2005; Riketta, 2005). Only three exceptions with poor coefficient of determination could be found: the results obtained in Item 89 (“The members of this hospital consider working here all their lives”); in Item 90 (“An important reason why I continue working in this hospital is that I don’t feel that other hospitals can offer me better compensation”), and in Item 109n (“If another organization were to offer me a better remuneration package, I would accept their offer”). A content analysis of these items shows that Item 89 is written in third person, while the other items are in first person. Item 109n is formulated in reverse and item 90 in a negative sense, which could affect the subjects’ answers, as was shown in other studies (for example Tomás & Oliver, 1999). These results suggest that the items should be reformulated in a new version. Nevertheless, the general fit and the value of Cronbach’s α suggest a good internal consistency.

The results obtained from the residuals show a normal distribution and a mean value equal to 0. This situation corresponds to a good fit of the general measurement model and provides evidence for its construct validity. Therefore, the model equivalence should be tested in several new samples.

To get a deeper insight, we tested the models fit, separately for the Spanish and for the Portuguese sample. Item loadings were not similar across the two samples (χ^2 difference = 897.32, $df=105$, $p < .001$ in Spain χ^2 difference = 2431.12, $df=231$, $p < .0$ in Portugal).

Given the finding of an overall difference between both groups, subsequent analyses considered item-by-item comparisons across samples to identify the source of specific statistical differences between groups. The differences that were found between Spain and Portugal for five items may reflect slight sensibility to influences of contextual aspects as a latent variable that could underlie the model. The contextual differences in the health care sector in both countries (salary, social benefits, social image, turn-over rates,...), can partly explain the differences e.g. in the items about identification in the sense of categorization, pride and affective commitment seen in the ICI as related to identification between health care employees (Colby, 1997; Morlans, 2001, Peiró, 2007; Richards, 1997; Smith, 2001). These contextual differences should be analyzed in future research.

Recently the health care sector is considered, by most advanced Western societies, as the new economic engine (Peiró, 2007). However, financial resources for the health care system are insufficient to attend the growing costs. Different authors point out that this sector is characterized by conflicting requirements between economic and ethical aspects. Requirements for efficiency marked by a considerable cost-reduction and for efficacy marked by high-level patient-related

quality that must be offered in an often stressful work environment.

Different studies show the relationship between organizational commitment and individual-level outcomes (performance, turnover and absenteeism) and organizational level (organizational effectiveness) (Cohen, 1993; Randall, 1990). Therefore, the analysis of identification and commitment as carried out within the frame of the HSA is of special benefit and added value for health care organizations. It allows not only a detailed diagnosis in relation to efficacy and efficiency, but also gives a deeper insight into possible intervention measures to improve these quality-related indicators. This means an extraordinary advancement for the transparency of the health care system making it possible to benchmark health care centers independently of their size or complexity of treated pathologies.

It is foreseen to establish professional profiles for commitment and identification. Therefore, research in other sectors and different professional groups will be necessary. In general, our sample size is moderate and in future research the ICI structure should be proved with an increased sample. Nevertheless, to sum up, these results considerably clarify the nomological network of commitment and identification models and support the validity of this integrated ICI model.

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