



# Job satisfaction and organizational commitment: Test of measurement equivalence between Mexico and the United States

*Satisfacción laboral y compromiso organizacional: prueba de equivalencia de  
medición entre México y Estados Unidos*

Daniel Arturo Cernas Ortiz<sup>1,\*</sup>, Patricia Mercado Salgado<sup>1</sup>  
and Filadelfo León Cázares<sup>2</sup>

<sup>1</sup>Universidad Autónoma del Estado de México, Mexico

<sup>2</sup>Universidad de Guadalajara, Mexico

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## Abstract

The purpose of this work was to study the measurement equivalence of a job satisfaction scale and an organizational commitment scale between the Mexican culture and that of the United States. The data were collected through a self-administered questionnaire that was applied to a sample of master's degree students from both nations (Mexico = 287, United States = 273). The results indicated that the analyzed scales are not invariant between the cultures. One implication of this finding is that transcultural job satisfaction and organizational commitment studies can report invalid results regarding the direct comparison of the concepts. To avoid this, we recommend taking certain precautions in the preparation and the analysis of data.

JEL Classification: M12, C38, C83

Keywords: Measurement equivalence, Job satisfaction, Organizational commitment, National culture.

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\* Corresponding author

E-mail address: [dcernasortiz@yahoo.com.mx](mailto:dcernasortiz@yahoo.com.mx) (D. A. Cernas Ortiz)

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## Resumen

El propósito de este trabajo fue estudiar la equivalencia de medición de una escala de satisfacción laboral (Judge, Bono y Locke, 2000) y de una de compromiso organizacional (Allen y Meyer, 1990) entre la cultura mexicana y la estadounidense. Los datos se recolectaron por medio de un cuestionario auto administrado que se aplicó a una muestra no probabilística de estudiantes de maestría en ambas naciones (México = 287, Estados Unidos = 273). Los resultados indicaron que las escalas analizadas no son invariantes entre las culturas. Una implicación de este hallazgo es que los estudios transculturales de satisfacción laboral y compromiso organizacional pueden reportar resultados inválidos en cuanto a la comparación directa de los niveles de los conceptos. Para evitarlo, se recomienda tomar ciertas precauciones en la preparación y en el análisis de los datos.

Códigos JEL: M12, C38, C83

Palabras clave: Equivalencia de medición, Satisfacción laboral, Compromiso organizacional, Cultura nacional, Diferencias entre México y Estados Unidos

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## Introduction

Usually, culture is understood as the set of beliefs, standards and assumptions shared by a group of people in a specific space and time (Minkov and Hofstede, 2012). Each society develops a culture that influences the behavior and, therefore, the life of the people that comprises it. Different societies evolve through different historic trajectories (Hofstede, Hofstede and Monkov, 2010). Thus, it does not come as a surprise for there to be divergences between societies regarding the fundamental assumptions of the individuals' life and existence. For Octavio Paz (2009), Mexico and the United States are two countries condemned to exist next to each other, divided by a profound psychic difference. From a functional paradigm perspective (see Burrell and Morgan, 1979), research works with international renown, such as the studies by IBM (Hofstede et al., 2010; Minkov and Hofstede, 2012) and the GLOBE project (House, Hanges, Javidan, Dorfman and Gupta, 2004) present said differences. However, and conversely to what is publicized in mass communication media and Hollywood movies (see Coatsworth and Rico, 1989), such works also indicate that the differences between both nations are not as pronounced as to alter the meaning of a variety of concepts regarding organizations.

Nevertheless, it is often necessary to determine if the ways to measure a concept work in a similar manner in different national environments. Some evidence indicates that people from different societies do not use measurement scales the same way. For example, Smith (2004) found that, compared to people with a predominantly individualistic culture (e.g. the U.S.), citizens of countries with a collective culture (e.g. Mexico) tend to give higher scores, and use the range of options less in their answers to values related questions. Therefore, even if cultural differences do not profoundly alter the meaning of a concept, they could still significantly affect the use of the measurement scales. This possibility is critical given that the direct comparison of the levels of a concept could lack meaning when the measurement instruments are not equivalent among social groups (Hair, Black, Babin, Anderson and Tatham, 2006; Wensing, 2014).

Job satisfaction and the commitment of employees to the organizations for which they work are two organizational phenomena of great relevance in Mexico and the United States. Since the beginning of the 20<sup>th</sup> century, particularly following the studies by Hawthorne (1924 – 1932), job satisfaction has been a constant concern in several areas of science (Judge, Thoresen, Bono and Patton, 2001). More recently, though not less important, attention has been given to the analysis of organizational commitment (Porter, Steers and Mowday, 2007). In both cases, the interest to delve into such concepts has been largely due to intentions to quit and personnel turnover having been associated with creativity, absenteeism, and a big number of phenomena that affect the effectiveness of organizations (Harrison, Newman and Roth, 2006; Raina and Britt Roebuck, 2016). Given that organizational effectiveness is crucial for companies (Gazol Sánchez, 2010) in the integrated economic and competitive environment of North America, the study of both job satisfaction and organizational commitment are still relevant, and direct comparisons between nations are increasingly more informative. It is necessary to analyze the equivalence of the measurement instruments for satisfaction and commitment between Mexico and its neighboring country of the north, in order to know the reliability and pertinence of said comparisons.

In the above context, the objective of this work is to analyze the equivalence (invariance) of a job satisfaction measurement scale (Judge, Bono and Locke, 2000) and another one of organizational commitment (Allen and Meyer, 1990) between Mexico and the United States. These measurement forms are commonly utilized in research, and are therefore pertinent for the purposes presented in this document. The equivalence analysis is done with a sample of 287 and 273 administration master's degree students from Mexico and the United States, respectively.

The results of this work contribute to the literature on job satisfaction and organizational commitment in international environments. In summary, we found that the measurement scales of the analyzed concepts are not equivalent between Mexico and the United States. Furthermore, the results indicate that the meaning that Mexican participants attribute to the amount of job satisfaction and organizational commitment represented in the scales differed from that of their American counterparts.

The rest of the document is organized as follows. In the next section, we briefly address the concepts of job satisfaction and organizational commitment, as well as the ways they are measured. Next, we succinctly present the cultural differences between Mexico and the United States according to Hofstede's scheme, and explain how said differences affect the use of the satisfaction and commitment measurement scales. Subsequently, the method used in the research is detailed and the results are presented. This document ends with the discussion of the findings and the presentation of some recommendations for those investigators interested in the behaviors at, and towards, work across national borders.

## **Job satisfaction**

Job satisfaction is important due to its alleged relation to the productivity of the personnel. Locke (1969) defines this concept as the positive emotion towards work, which results from an evaluation of its characteristics. In their philosophical and social typology on organizational studies, Burrell and Morgan (1979) indicate that the benefits of the study of satisfaction

have entered the kingdom of administrative mythology. The authors argue that, since the Hawthorne studies the almost blind belief has been that job satisfaction is important because it promotes the productivity of the companies. Among industrial psychologists, there were some that even considered the relation between job satisfaction and performance as the Holy Grail of organizational studies (Landy, 1989).

However, the real relevance of the concept, as well as its relation to job performance is still debated. An influential meta-analysis carried out by Iaffaldano and Muchinsky (1985) showed that the correlation between satisfaction and performance at work is relatively low ( $r = 0.17$ ), casting doubt on the practical relevance of studying satisfaction to increase productivity. Subsequently, Judge et al. (2001) showed that the correlation between satisfaction and performance can be as high as 0.25, igniting the discussion on the importance of the concept of satisfaction.

Renewing the enthusiasm, different researchers have conscientiously delved towards the causality between satisfaction and performance. In fact, and in open opposition to the theory of planned behavior and to the models of reasoned action, it seems that satisfaction (attitude) depends more on job performance (behavior) than the other way around. Solid arguments based on the expectancy theory (Vroom's expectancy theory, 1964) support said evidences, as they indicate that high performance leads to rewards, and these in turn create satisfaction. Other works such as those by Wright and Staw (1999) still suggest that job satisfaction reflects individual happiness and satisfaction with life as characteristics inherent to personality. Although interesting, this line of research is somewhat extreme, as it implies that productivity has little to do with job satisfaction; if so, then happy people would be mostly satisfied regardless of their job results. Even with all of this, research on job satisfaction is still carried out to this day, as several studies indicate that such a concept exists, that it has meaning in western cultures, and that it could in fact have, one way or another, some sort of impact on job results (Harrison et al., 2006; Judge and Klinger, 2008).

The aforementioned concept has been measured in several ways. A great variety of existing instruments that measure job satisfaction have been documented since the end of the 1970s (see O'Connor, Peters and Gordon, 1978). Some of the most utilized scales are those that, just like the JDI (Job Descriptive Index) or the JSS (Job Satisfaction Survey), measure satisfaction in its different aspects. Nevertheless, global job satisfaction is different to the sum of satisfaction with the aspects of the same (Bowling, Hendricks and Wagner, 2008). Consequently, global measurements can be the most adequate to studied the relations of the concept being analyzed with other attitudes, such as organizational commitment (see Curry, Wakefield, Price and Mueller, 1986). One of the most utilized global measurements has been the Brayfield and Rothe index (1951), particularly its shorter versions such as the one with six items proposed by Curry et al. (1986), or the one with five items proposed by Judge et al. (2000). The evidence indicates that it is valid and reliable (especially the shortest measure) as it is commonly used in studies that address global job satisfaction (Judge and Klinger, 2008).

## **Organizational Commitment**

After satisfaction, organizational commitment is perhaps the most studied work attitude around the world. Early researches on this concept can be traced back to the postulates by

Etzioni (1961), who highlighted, from a sociological point of view, the importance and benefits of commitment towards the organizations in the post-war era. However, one of the early and most disseminated definitions of the concept was given by Porter, Mowday and Steers (1982), who conceived commitment as the relative force of the identification of the personnel, and their involvement with a particular organization. Although Porter and his colleagues have been influential in this subject, it was Allen and Meyer (1990) who launched the concept to global fame, with the postulation of their tridimensional commitment model: affective, normative and continuance. This conceptualization was, and still is, well received by researchers in the matter. However, the affective dimension alone has been re-affirmed as the most common way to study commitment. Unlike the normative and continuance dimensions, it is the only one where the organization (an abstract entity) is the internal evaluation target (attitude, *per se*) and not the (possible) abandonment of the same (a concrete behavior) (Solinger, van Olfen and Roe, 2008).

As with satisfaction, organizational commitment is a debated attitude. On the one hand, and based on theories such as planned commitment and social exchange, it is assumed that a high commitment towards the organization promotes positive behaviors (e.g. citizenship and innovation) and reduces those that are negative (e.g. work harassment and indifference) (Gill, Meyer, Lee, Shin and Yoon, 2011). However, this logic is also susceptible to operate inversely. This means that the rewards obtained for showing positive behavior can increase, and even create commitment. Research regarding the perceived organizational support would support this logic. After all, a high performance at work implies a better care of the employee by the organization, and even some degree of condescension towards him/her (Rhoades and Eisenberger, 2002). Such elevates the perceived support and this in turn increases commitment. Regardless of the causality between commitment and its antecedents, studies from different national environments have set as a point of reference that, as with job satisfaction, commitment is a concept that exists and has a meaning in several cultures (Gill et al., 2011; Meyer, Stanley, Herscovitch and Topolnysky, 2002).

Consistent with the conceptual predominance of the affective organizational commitment of Allen and Meyer (1990), the most common way to measure commitment is through the scale developed by the same authors. The original items were eight, though for brevity, these were subsequently reduced to six (Meyer, Allen and Smith, 1993). In any case, the instrument by Allen and Meyer is strongly related to the Organizational Commitment Questionnaire (OCQ) with fifteen items by Mowday, Steers and Porter (1979) and with other measurements reported in the literature on the subject (Allen and Meyer, 1996; Meyer et al., 2002). These relations provide evidence of the construct validity of the affective commitment scale just as was proven in the United States and Canada.

## **Cultural differences between Mexico and the United States**

Octavio Paz (2009) states that Mexico and the United States are two different versions of western culture. For this author, as heirs of the Spanish (Catholic) and English (Protestant) cultures, respectively, both countries exhibit different worldviews that make citizens behave differently, and even contradictorily. In this regard, Riding (1985) denoted that it is possible that nowhere else in the world two neighboring nations know and understand so little of each other as Mexico and the United States. According to Paz, and due to their differences, these

nations maintain a love/hate relationship, as both imitate and openly repudiate and vilify something about the other. The ignorance, reticence, and suspicion that surround the neighbor relationship between Mexico and the United States are complex in many senses, including in a cultural manner. However, such complexity seems to synthesize in the common reference that in Mexico, the U.S. is called “the other side” (something strange) and in the United States, Mexico is called a “backyard” (a place of secondary importance) (Coatsworth and Rico, 1989).

### **Mexico and the United States in terms of Hofstede’s dimensions**

In the IBM studies, Hofstede (1980) indicates that nations differ culturally in four dimensions: avoidance of uncertainties, masculinity, distance of power, and individualism. More recently (Hofstede et al., 2010), this range broadened to include two more dimensions: short-term orientation and indulgence. In short, the avoidance of uncertainty is the degree with which the members of a society feel anxiety and stress in the face of uncertainty and, generally, prefer the certain and concrete. Masculinity is the prevalence of values such as assertiveness, competitiveness and aggressiveness in society. Distance of power indicates the degree with which power is unequally distributed in a social group, and how said differential is accepted and expected. Individualism denotes a low group cohesion level, so that each individual looks out for themselves without being loyal to any particular group. Short-term orientation implies focusing the attention and energy in the immediate, without taking future consequences too seriously. Indulgence refers to the tendency of societies to allow the gratification of desires and pleasures related to leisure and the enjoyment of life.

Unquestionably, Hofstede’s studies have received severe criticism; among other reasons, for having conceived national culture as an entirely objective phenomenon, in addition to being simplistic when pretending to capture the complexity of the phenomenon based on a few dimensions addressed through nomothetic methods (McSweeney, 2002). However, even if Hofstede’s studies are an approximation of the complexity of the culture, they have the great advantage of presenting it with sufficient precision and parsimony to communicate to a large audience the advances that, from a functionalist approach, are done to unravel the “black box” of the national culture concept (Williamson, 2002).

In his 2010 studies, Hofstede measured and quantified six cultural dimensions through a questionnaire applied to the workers of the IBM company in 107 countries. The author and his colleagues processed the measurements to obtain a cultural dimension index. The index gives a ranking as a result. The higher the rank of a country in the index, the more prevailing is the cultural dimension among its citizens.

Mexico and the United States present differences regarding the measurements of Hofstede et al. (2010). Mexico had higher results than the United States regarding avoidance of uncertainty, distance of power, and indulgence. Although the difference is smaller, Mexico also had higher results in masculinity and short-term orientation. In turn, the United States had higher results than its neighbor in individualism. Figure 1 graphically presents these differences. The illustration shows the global cultural distance of the United States with regard to 32

countries<sup>3</sup>. As can be observed (solid line), the United States is culturally closer to other English-speaking nations (e.g. Australia and the United Kingdom) than to certain countries of eastern Europe (Greece and Russia) and the extreme eastern Asia (e.g. Singapore and Malaysia).

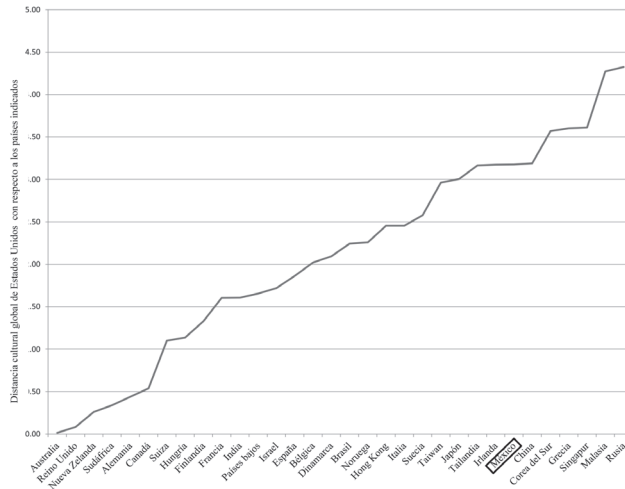


Figure 1. Cultural distance between the United States and 32 countries  
 Source: Own elaboration

Figure 2 shows the same set of countries as the previous figure (with the exception of Sweden), but now Mexico is the basis of comparison. As can be observed from the set of countries included, the closest to Mexico is Brazil—which is not surprising, as both are Latin American nations. Among the closest to Mexico there are also Greece, Russia and Spain, in addition to extreme eastern nations such as Taiwan and South Korea. Figure 2 shows that the English-speaking countries and those along the shores of the Baltic Sea are farthest to Mexico, culturally speaking.

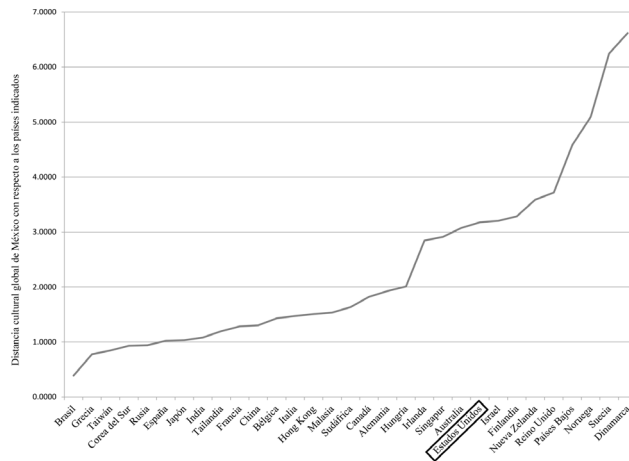
<sup>3</sup> The global tests were obtained using the formula of Kogut and Singh (1988) based on data from Hofstede et al. (2010). See Formula 1. Four dimensions were taken into account: evasion of uncertainty, masculinity, distance of power and individualism.

$$KS_{ij} = \frac{1}{n} \sum_{d=1}^n \frac{(I_i^d - I_j^d)^2}{V^d}$$

In Formula 1, KS is the cultural distance between countries j and i.  $I_x^d$  is the place of a country x in the index of the cultural dimension d, Vd is the variance of the index for dimension d, and n is the number of cultural dimensions considered in the calculation. In this document, the set of countries involved is only illustrative. Therefore, it is granted that the cultural proximity between

Figure 2. Cultural distance between Mexico and 31 countries

Source: Own elaboration



Figures 1 and 2 exhibit the cultural distance between Mexico and the United States. The distances, in turn, make us suspect that cultural differences could affect the behavior of the instruments (measurement scales) that are often utilized to measure a great variety of phenomena concerning human behavior. We should remember that said instruments are often created in the United States and applied in Mexico (and other countries) through translations, which reliability is rarely documented.

### **Influence of the culture in the validity of the research results**

According to Campbell and Stanley (1963), internal validity is understood as the absence of alternate explanations (or hypotheses) for the experimental relation between causes and effects, or for the correlation between two variables in a non-experimental study. There are multiple threats to this type of validity (see Cook, Campbell and Peracchio, 1990), each one having the potential to dwindle the credibility of the obtained results and the conclusions that could be drawn from the same. One of the most concerning threats of the non-experimental studies is the measurement error and its two components: the randomized and the systematic (Bagozzi and Yi, 1991).

The systematic error is particularly serious, since it is a direct alternative explanation for the covariance observed between two concepts. Said error is often understood as a bias (or set of biases such as the halo, social desirability, acquiescence and leniency) that alters (towards high or low scores) the responses to the answers included in a questionnaire (Fiske, 1982). When there is a high systematic error in the application of a measurement instrument, the constructs involved will exhibit a high covariation (or correlation) due to the fact that all questions were answered with similar scores regardless of their content (Bagozzi, Yi and Phillips, 1991; Podsakoff and Organ, 1986; Podsakoff, MacKenzie, Lee and Podsakoff, 2003). Needless to say, the detected relation will be spurious.



The acquiescence and leniency biases are particularly susceptible to the effect of national culture. According to Podsakoff et al. (2003), acquiescence (yes to all) refers to the propensity of the respondents to agree with the reagents of a scale regardless of its content. For its part, leniency is the individual propensity to give unduly high scores when the questionnaire refers to someone (or something) who is well-known or well-liked. Interestingly, both biases seem to imply a subconscious “want to please attitude” towards someone or something, or the evasion of a real or imaginary confrontation with that entity. Given that culture comprises beliefs, norms, and assumptions regarding the relations between individuals and social harmony (Smith, 2004), both leniency and condescension could be inclined to present themselves more in some cultures than others.

For the case of Mexico and the United States, it is possible that the satisfaction and commitment measurement scales work differently due to cultural influences. It has been documented that the acquiescence bias is more prevalent in societies with a high avoidance of uncertainty, distance of power, and collectivism (Marín, Gamba and Marín, 1992; Smith, 2004). This same cultural profile could pronounce the leniency bias. People from cultures with high avoidance of uncertainty are more prone to give high scores to the reagents of a questionnaire in order to minimize the possibility of conflict and the anxiety and uncertainty that these could generate. In societies with high collectivism and distance of power, individuals are prone to give more positive scores than they should due to the fact that it favors harmony among the group and deference towards other people with a social position that could be superior. In addition to this, when a culture is high in indulgence and short-term orientation, people tend to remember more positive than negative things when answering a survey (Hofstede et al., 2010). This effect, known as availability bias, artificially increases scores (Ruder and Bless, 2003). Given that Mexico scores higher than the United States in the majority of the aforementioned cultural dimensions, the condescension bias is higher in Mexico (Marín et al., 1992) and the leniency bias is probably higher as well. Based on these arguments, the following hypothesis is presented.

H. The job satisfaction scale by Judge et al. (2000) and the organizational commitment scale by Allen and Meyer (1990) are not equivalent between Mexico and the United States.

## Research method

A total of 583 master’s degree students participated in the study. After eliminating the incomplete answers (approximately 4%), the final sample comprised 560 observations. The data were collected at a university in central Mexico<sup>4</sup> (n = 287) and one in the southwestern United States<sup>5</sup> (273). The samples exhibit small differences, but are largely similar in terms of the demographics of the participants<sup>6</sup>. The number of women was a little higher in Mexico (55.4%

<sup>4</sup> Universidad Autónoma del Estado de México

<sup>5</sup> University of North Texas

<sup>6</sup> It is important to note that the described samples illustrate the employed population of both societies, though in this document there is no evidence of its full representativeness. However, and according to Locke (1986), there are reasons to presume it, as the employed master’s degree students show essential characteristics of the populations to which they belong. Among which are having developed an attitude towards an organization (which is obtained through work in an organization) and to be imbued in the culture of their countries (which is obtained through having lived in a country for a considerable amount of time). There is no reason to expect master’s degree students to be more or less influenced by the culture of their countries than any other worker. However, we acknowledge that the results of this study can have a limited generality. This is due to the fact that within a country there is cultural diversity and, therefore, the results obtained with a sample of a region would not be generalizable to others; Minkov and Hofstede (2012) found that both

women, 44.6% men) than in the U.S. (48.5% women, 51.5% men). Most of the participants were full-time employees (72.4% Mexico, 59.9% U.S.), though the American database had a larger amount of unemployed than its Mexican counterpart (3.8% Mexico, 14.6% United States). The average age was of 31.32 (s. d. = 5.77) years among Mexicans, and of 29.34 (s. d. = 7.24) among Americans.

The data were collected through a self-administered survey. The response rate was high, because the questionnaires were applied during class hours. Kindly, the students were offered the possibility to have the results of the research shared with them as an incentive to honestly answer the questionnaire. Mechanisms were applied in all cases to ensure the anonymity of the responses and, therefore, avoid conscious answer biases such as social desirability.

In accordance with the objectives of this work, job satisfaction and organizational commitment were measured with the aforementioned scales. In both cases, the reagents were formatted in a Likert type scale with seven points with a verbal anchor in 1 (strongly disagree) and 7 (strongly agree). The sentences "I really enjoy my job" and "I would be happy to spend the rest of my career in this organization" exemplify the satisfaction and commitment scales, respectively. The authors of the scales report internal consistency estimates of 0.89 for satisfactions and 0.87 for commitment.

For the application of the survey in Mexico, the aforementioned scales were translated into Spanish from their original versions in English. Subsequently, an external person translated, once again, the questions to their original version in English. This re-translation was compared to the English version of the scales and the discrepancies detected were corrected until the reagents were considered equivalent in both languages. A decentralized process was utilized in all cases, through which the translation was done to comparable meanings instead of literal ones.

## Analysis and Results

Table 1 shows the reliability estimates as well as some descriptive statistics. Although organizational commitment seems to have a lower internal consistency in Mexico than in the United States, the measurements exhibit acceptable reliability levels in both countries.

Table 1  
Reliability and descriptive statistics

	$\alpha$		Media		<i>t</i>	Desv. est.		Correlación	
	México	EE.UU.	México	EE.UU.		México	EE.UU.	México	EE.UU.
Satisfacción laboral	0.90	0.89	5.32	4.71	5.68***	1.24	1.34		
Compromiso organizacional	0.70	0.84	4.40	4.24	1.80	1.06	1.12	0.54***	0.59***

\*\*\* =  $p < 0.001$

Source: Own elaboration

in Mexico and the United States, the cultural differences among regions are far less than the cultural differences that, generally, exist between both countries.

Regarding satisfaction and commitment levels, Table 1 indicates that both are superior in Mexico than in the United States. The difference, however, is significant only for the case of satisfaction. Conspicuously, the fact that in Mexico measurements are higher and standard deviations are lower, makes us suspect that the Mexican respondents were more prone than the Americans to the acquiescence and leniency biases. This means that Mexican respondents tended to use more the extreme positive values in the scale than their American counterparts (thus the higher median) and use less the range of options that they were given (thus the lower standard deviation). Table 1 shows that the correlation between satisfaction and commitment is relatively high in both countries. This is consistent with the aforementioned results regarding the relations between both constructs (Harrison et al., 2006).

The hypothesis of this work indicates that the aforementioned satisfaction and commitment scales are not equivalent between the countries subject to this study. To prove this deduction, for each construct and each country, a Confirmatory Factor Analysis (CFA) was carried out in LISREL (8.8). These independent CFA show whether the job satisfaction and organizational commitment concepts exist in the considered cultures, and if the scales function properly when analyzed separately. Bagozzi et al. (1991) suggest and show that the CFA is a proper tool to detect and analyze the measurement error.

The preliminary study was reinforced with a series of measurement equivalence analyses for each construct with both samples together. According to several sources (e.g. Byrne, 1998; Hair et al., 2006), for a measurement scale to be considered equivalent between two samples, the evidence must support three types of equivalence or measurement invariance: of configuration, metrical, and scalar. This means that the analyzed construct must exist in the samples of the two cultures when the measurement instrument is simultaneously tested in them (configuration equivalence). Furthermore, the factor loads (or weights) of the reagents in the construct must be equivalent in the two samples when they are obliged to be so (metric equivalence). Finally, the intercepts of the reagents of the scale must also be equivalent in the two sets of data (scalar equivalence). Each type of equivalence needs the aforementioned as an indispensable requirement (e.g. without metric equivalence there cannot be scalar equivalence).

Although configuration equivalence is relatively easy to understand even in mathematical terms, the conceptual interpretation of metric and scalar equivalence is easier to understand than its numeric explanation. On the one hand, when the samples of two cultures are equivalent in metric terms, the respondents of both samples used the intervals between the values of the scale in a similar manner. Resorting to an analogy, if the measurement scale under analysis were a meter, this would be equivalent to the same longitude in both countries, indicating that it is a reliable measurement in the sense that it is not larger in one place than it is in another. On the other hand, when the measurement scale is equivalent in scalar terms, the respondents attributed the same meaning to the values (or scores) represented in the scale. In a measuring analogy—if not equivalent in scalar terms—while in a country a 50-cm plant could be considered as “very tall”, in another it could be considered as just “tall”. As inferred, when there is no evidence of scalar equivalence, two people from different cultures could indicate the same scores in a measurement scale even if the perceptions and meanings are different.

Table 2 shows the result of the confirmatory factor analysis for job satisfaction independently for each country. As can be observed, both in Mexico and in the United States, the CFA suggests that the covariance matrix of the original data adjusts well to the matrix of theoretical covariance, in which said data are placed in a single construct: job satisfaction (non-significant  $\chi^2$  in both

cases). Although the fit is slightly superior in Mexico (Mex.  $\chi^2 = 3.08 < \text{U.S. } \chi^2 = 5.76$ ), the CFI and the NNFI support this result in both countries ( $> 0.98$ ). The RMSEA is somewhat marginal for the indicated models (even more so in the U.S.), which is not surprising given that this indicator is not exact in models with very few degrees of freedom (df) (Kenny, Kaniskan and McCoach, 2015)<sup>7</sup>. In summary, the CFA suggests that the job satisfaction construct exists in the data of both countries and that the scale functions reasonably well in the two cultures in an independent manner.

The result of the equivalence analysis between cultures is also shown in Table 2. Regarding the configuration equivalence, the results indicate that the measurement model functions very well when the observed data are forced to load in the job satisfaction construct simultaneously in both samples (non-significant  $\chi^2$ , and CFI and NNFI  $> 0.99$ ). This finding confirms the results of the independent CFA by country. In fact, the scale works similarly in the analyzed cultures, as there is evidence of an acceptable metric equivalence in Table 2. Not only are the CFI and NNFI high in this case ( $>0.99$ ), but also the  $\Delta\chi^2$  indicator that compares the fit level of this model with the configuration one is not significant. This result suggests that there is no fit loss between the original covariance of the matrix and the theoretical one when, in addition to forcing the data to load in the satisfaction construct, the factor loads (or weights) of the reagents are also forced to be equivalent in the two samples. Apparently, the Mexican respondents and their counterparts used the intervals between the values of the satisfaction scale in a very similar manner.

Table 2  
CFA and equivalence analysis of the job satisfaction scale

Modelo / Indicador	$\chi^2$	gl	RMSEA	CFI	NNFI	$\chi^2 / \text{gl}$	$\Delta\chi^2$
AFC México (n = 287)	3.08	2	0.04	1.00	1.00	1.54	
AFC Estados Unidos (n = 273)	5.76	2	0.08	1.00	0.98	2.88	
Modelo de equivalencia de estructura factorial (equivalencia configural)	8.84	4	0.07	1.00	0.99	2.21	
Modelo de equivalencia de cargas factoriales (equivalencia métrica)	16.9*	8	0.06	1.00	0.99	2.11	8.06
Modelo de equivalencia de cargas factoriales y de interceptos de los reactivos (equivalencia escalar)	87.63***	13	0.14	0.96	0.94	6.74	70.73***

\* =  $p < 0.05$ ; \*\* =  $p < 0.01$ ; \*\*\* =  $p < 0.001$

Source: Own elaboration

<sup>7</sup> The models shown in tables 2 and 3 allow the free covariance of the error of some of the observed variables (items of the scale). This, based on the modification indexes reported by LISREL. The fits are very few and in no case violate the convergent and discriminant validity of the constructs, though they do increase the parameters freely estimated by the model and reduce the degrees of freedom. However, the degrees of freedom are very reduced, even without the increase of the freely estimated parameters. Therefore, the free of error covariance of some of the observed variables, does not significantly affect the RMSEA or any of the global fit indicators.

Unfortunately, there is no evidence of scalar equivalence in Table 2. The  $\Delta\chi^2$  indicator that compares the fit level of the scalar and the metric models is significant, with the CFI and NNFI being superior in the latter. This indicates that when the intercepts of the reagents are forced to be equivalent between the samples (in addition to forcing the reagents to load in a single construct and the factor loads to be equivalent), the fit of the model is significantly deteriorated. This finding implies that the satisfaction levels have different meanings in Mexico and in the United States. In other words, while for a Mexican a score of five could mean a very high level of satisfaction, for an American said score could represent a higher (or lower) level of the same concept.

Regarding the organizational commitment level scale, Table 3 shows the results of the independent CFA by country. As can be observed, for Mexico and the United States, the results suggest that organizational commitment exists in the analyzed data. In this case, however, the evidence is less robust than in the case of job satisfaction, given that  $\chi^2$  (Mex. = 27.87; U.S. = 32.60) is significant at the level of 0.05 in both countries and the CFI and the NNFI are slightly lower than one. Regarding RMSEA, the same precaution is indicated regarding the few degrees of freedom (df) of the model.

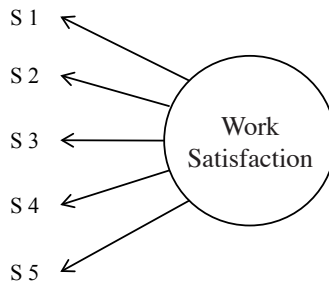


Figure 3. Measurement model of job satisfaction  
 Source: Own elaboration

Table 3  
 CFA and equivalence analysis of the organizational commitment scale

Items	Work satisfaction	
	Mexico	EE.UU.
S 1	0.79*	0.75*
S 2	0.88*	0.89*
S 3	0.90*	0.95*
S 4	0.77*	0.85*
S 5	0.66*	0.55*

\* =  $p < 0.05$

Source: Own elaboration

The result of the configuration and metric equivalence analyses of the commitment scale is also presented in Table 3. As can be observed, the configuration equivalence of the scale is acceptable given that the CFI and NNFI are high in this case. This is the case even if  $\chi^2$  is significant; which can be explained because the calculation is based on the total combined data ( $N = 560$ ) and the indicator is very sensitive to the size increase of the sample. However, and unlike job satisfaction, Table 3 does not show evidence of metric equivalence ( $\Delta\chi^2$  is significant, with  $\chi^2$ , CFI, and NNFI being superior in the configuration model). In other words, the people of Mexico and the United States seem to have used the intervals between the values of the scale in a different manner.

Regarding scalar equivalence, Table 3 indicates that the scores associated to the organizational commitment scale are also not equivalent between both countries. The aforementioned equivalence analysis gives a significant  $\Delta\chi^2$ , indicating a deterioration in the global goodness of fit indexes in the scalar model when compared to the metric model.

In summary, the evidence indicates that the job satisfaction scale is equivalent in two aspects (configuration and metric) between Mexico and the United States, and the organizational commitment scale is only equivalent in one (configuration). In other words, the results suggest that the examined constructs exist in both cultures even though people use the measurement scale in a similar manner only in the case of satisfaction. However, given that in both cases there was no evidence of scalar equivalence, the direct comparison of the levels of the constructs (medians) is inaccurate, as the amounts of job satisfaction and organizational commitment that were captured in the scores of the scales do not seem to mean the same in the Mexican and American cultures.

Based on the foregoing, the hypothesis presented is accepted. This means that the analyzed scales are not completely equivalent between the considered countries. Consequently, though the independent use of the scales in both cultures could be adequate, the direct transcultural comparison of the satisfaction and commitment levels could be tentative but not conclusive. Having said that, let us note that the difference of satisfaction levels between Mexico and the U.S. shown in Table one, though illustrative, is not reliable despite the significance level of the  $t$  statistic.

## **Discussion and conclusions**

The purpose of this work was to explore the equivalence of a job satisfaction scale and an organizational commitment scale between Mexico and the United States. To this end, we surveyed MBA students in both countries. The result of the analyses indicates that the scales are not equivalent between both nations. This finding has implications for the studies that aim to measure and compare the levels of satisfaction and commitment in an international context.

The findings shown in this document indicate that the transcultural comparison of certain phenomena can be inaccurate. Job satisfaction and organizational commitment are concepts coined in the United States. Consequently, the scales to measure them were coined there as well. This is interesting in light of the cultural studies where the theories, concepts and scientific methodologies imply the world view and beliefs and values of the societies from which they emerge (Scott and Davis, 2007). By implication, the job satisfaction and organizational commitment concepts may not exist (or at least not in the same way) in societies different to the American society. Furthermore, it is possible that the measurement scales used to empirically

address said phenomena are not equivalent in other societies even when using methods that reinforce the linguistic equivalence. In accordance with other studies (e.g. Peterson, Puia and Suess, 2003), the results of this work indicate that both job satisfaction and organizational commitment exist in Mexico and its northern neighbor. However, the results also expand this knowledge, as they show that, though the concepts do exist, the measurement scales are not equivalent between both cultures.

The lack of equivalence of the satisfaction and commitment measurement scales implies a precaution, though not necessarily a limitation, to transcultural studies. As was previously explained, when a scale does not function in the same manner through two (or more) cultures, the comparison of the levels of the concepts involved is illustrative but not reliable. However, this does not mean that transcultural studies are inappropriate or impossible. There are reliable statistical ways to remove the biases and distortions that could alter the responses of the participants (e.g. condescension and leniency). One of said methods is the one employed by Hofstede et al. (2010), whose famous studies are precisely a direct comparison of the levels of the cultural dimensions through a considerable amount of countries. It is also worth clarifying that when transcultural studies have the objective of analyzing correlations (instead of measurement differences), it is not necessary to process the data for the scores to be equivalent to similar meanings through the cultures (scalar equivalence). According to Hair et al. (2006) metric equivalence (a meter measuring the same in several countries) would be sufficient in correlational studies.

Admittedly, this study presents several limitations that restrict the generalization of the results. As with all researches that involve the translation of a scale, it is possible that the equivalence problems detected are due to translation errors. This possibility is always present even if the process has been thorough and diligent. Also, the results shown here have ecological validity problems. In other words, the differences found could be due to differences in the culture of the organizations (universities) where the data were collected, and not due to differences in the cultures of the countries. However, this possibility is moderated, given that, to a greater or lesser extent, organizational culture reflects national culture (Gerhart, 2009). In this vein, we imply that the equivalence problems of the scales herein could be due to cultural factors. However, this is presumed but not demonstrated or analyzed.

The aforementioned limitations (and others that are not mentioned at the moment) represent future research areas. For example, collecting data in different regions of both countries, as well as analyzing slightly larger samples, would help to better understand how the cultural differences between Mexico and the United States affect the use of the measurement scales and the direct comparison of the results of the scales of job satisfaction, organizational commitment, and others regarding work attitudes such as involvement and engagement. We must not forget that transnational businesspeople and executives are interested in this topic, as it is believed that attitudes towards (and in) the work significantly affect the productivity and performance of the employees.

Finally, the content of this document is a piece of information whose value lies in stressing the precautions that should be taken into consideration in the study of job satisfaction and organizational commitment in international contexts.

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