

WHO'S CONTROLLING LOCUS OF CONTROL? CROSS-CULTURAL LOC USAGE

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Rotter's Internal-External Locus of Control scale has been broadly used in both American contexts as well as in other cultures around the world. A review of the research that first transitioned this scale into other cultures shows a number of significant validity and reliability threats. Given that many more recent studies have based their validity and reliability on these earlier studies, it is important to understand the threats that existed so current research can strengthen the validity and reliability of this important scale across other cultures. Recommendations for various forms of validity and reliability are provided.

When one compares the accumulation of leadership research developed in a Euro-American context with the burgeoning global consciousness, the need for cross-cultural research quickly becomes apparent (Dyal, 1984). Not only does a greater influence of cross-cultural research assist in understanding the similarities and differences between cultures but also, perhaps more importantly, it bases application of leadership theory in culturally sensitive research (Dyal, 1984). However, simply translating an established instrument for use in another culture is insufficient if validity and reliability of the instrument within that culture has not been established. For instance, Rotter's Internal-External Locus of Control (I-E LOC) scale has shown strong validity and reliability (e.g. Goodman & Waters, 1987; Hersch & Scheibe, 1967; Zerega, Tseng, & Greever, 1976) in Euro-American contexts and researchers have extensively used it in cross-cultural research (Dyal, 1984). Unfortunately, as will be shown, too many of the initial studies presumed various degrees of validity and reliability of the scale as it had been used in its original context rather than going through the harder work of re-establishing validity and reliability in the cultural context researched. Therefore, an important step in understanding the current research validity and reliability is to go back to this earlier research and confirm its validity and reliability.

This work will identify early locus of control (LOC) studies in cross-cultural settings that contributed to an understanding of the instrument's validity and reliability in those contexts. The author identified articles through an EBSCO search using a combination of the terms Rotter, Locus of Control, reliability, validity, cross-cultural, and translation, focusing on articles up until 1999 that became foundational to later research. This search resulted in 24 articles. Four of the

articles did not provide sufficient validity or reliability information and were removed. The remaining 20 articles represented Rotter's I-E LOC scale and its use in 49 countries representing 54 distinct cultural groups.

Why should articles nearly 15 years or older be of concern for contemporary cross-cultural research on locus of control? Many studies since 2000 have often presumed the validity and reliability of this earlier research (Arslan, 2001; Beretvas, Suizzo, Durham, & Yarnell, 2008; Brice, 2012; Cannon, Doney, Mullen, & Petersen, 2010; Chan, Makino, & Isobe, 2010; Church, 2000; Gençöz, Vatan, Walker, & Lester, 2007; Goodwin, 2000; Huhmann & McQuitty, 2009; Johnson & Fullwood, 2006; Judge, Erez, Thoresen, & Bono, 2002; Judge, Van Vianen, & De Pater, 2004; Junttila & Vauras, 2009; Kung, 2003; Li-Jane & Shi-Kai, 2007; McKeever, McWhirter, & Huff, 2006; Mittal & Wieling, 2006; Montoya & Horton, 2004; Neiss, Stevenson, Legrand, Iacono, & Sedikides, 2009; Ng, Sorensen, & Eby, 2006; Palmer, Rysiew, & Koob, 2003; Pornpitakpan, 2004; Schippers & Van Lange, 2006; Sidani & Gardner, 2000; Soh, Surgenor, Touyz, & Walter, 2007; Takao, Takahashi, & Kitamura, 2009; Tsai, Miao, Seppala, Fung, & Yeung, 2007; Twenge, Liqing, & Im, 2004; Varnum, 2008; Wong, 2000; Zeyrek, Gençöz, Bergman, & Lester, 2009). To be clear, these references only indicate research published after 2000 that directly cites one of the 20 identified articles. It only includes articles from within EBSCO. This does not include research published prior to 2000 that cites these articles. It does not include third generation articles developed off of this research. All the articles, except Tyler, Dhawan, and Sinha (1988), were cited in other research. Simply put, any article that presumes the validity and reliability of the earlier cross-cultural locus of control research at any point in its theoretical foundation places its own validity and reliability at risk if that earlier research is shown to have weaknesses in its validity and reliability analysis.

Rotter developed the concept of LOC in 1966. This concept predicts the degree to which an individual believes that any possible behavior on their part determines outcomes (Furnham & Steele, 1993; Ivancevich, Konopaske, & Matteson, 2008). The theory predicts that a person with an internal locus of control (I-LOC) perceives outcomes are dependent on personal behavior or characteristics (Yukl, 2006). On the other hand, individuals with external locus of control (E-LOC) perceive outcomes are dependent on forces outside the individual (Yukl, 2006). Rotter developed a 29 item self-reported Internal-External Control scale to measure LOC (Furnham & Steele, 1993). I-LOC has been linked with many favorable psychosocial benefits (among many others, motivation, responsibility, learning – for more detail see Ivancevich et al., 2008; Spector, 1982; Welton, Adkins, Ingle, & Dixon, 1996; Yukl, 2006). E-LOC, on the other hand, has been associated with much less desirable characteristics (for instance, conformity to authority, lower emotional stability, counterproductive behavior – for more, see Ivancevich et al., 2008; Key, 2002; Trevino & Youngblood, 1990). Despite these differences, I-LOC does not necessarily lead to better performance. In tasks requiring initiative, I-LOCs are likely to perform better (Ivancevich et al., 2008). However, in tasks requiring high structure and routine, E-LOCs are likely to perform better since the structure and routine act as an external source of control over the individual (Ivancevich et al., 2008).

Validity of I-E LOC Scale in Cross-Cultural Research

The validity of an instrument in any cultural context is critical to research (Kerlinger & Lee, 2000). Without validity, neither researchers nor those seeking to learn from their research can be certain that what they measured was in fact what they believed they were measuring.

Often, validity can be broken down into three primary forms: (a) content and face validity, (b) criterion-related validity, and (c) construct validity. The latter form, construct validity, can be broken into several other forms of validity including conceptual, factorial, convergent, discriminant, and nomological. Dyal (1984) noted two primary problems in cross-cultural methodology. First is that of construct validity. Simply put, researchers must reestablish in the new culture the same degree of construct validity established in the culture of origin. Just because an instrument has shown construct validity in one culture, researchers cannot presume it has construct validity in another. The reason for this leads to the second problem in cross-cultural methodology – conceptual differences. The researcher seeking to use instruments in a culture other than the one that the validity was established in, must go through the whole process again of showing validity in the new culture in order to establish that the concept and function of the constructs being measured have not changed. This reassessment of the validity of the I-E LOC scale becomes the benchmark by which cross-cultural research using this scale can be measured.

Content and Face Validity

Content validity is the informed judgment of competent reviewers on whether items within an instrument are representative of what they are purportedly measuring (Kerlinger & Lee, 2000). Face validity, though similar, differs slightly in that it obtains feedback on whether the instrument appears to measure what it intends to measure (Kerlinger & Lee, 2000). In the cross-cultural LOC research in this study, rarely do authors provide any information regarding either face or content validity. The lone exception to this is Hojat (1982) who asked twelve Iranian specialists in the fields of psychology and measurement and ten American specialists in the fields of education and psychology to provide feedback for face and content validity, especially as it pertained to cultural bias.

Criterion-Related Validity

This form of validity seeks to compare the results of external variable data that is believed to measure or predict the variable under study (Kerlinger & Lee, 2000). The two forms of criterion-related validity are predictive and concurrent. Predictive validity, which seeks to identify predictive correlations among variables, is the most common form of criterion-related validity in leadership research (Kerlinger & Lee, 2000). Concurrent validity measures the correlation between the variable studied and other existing instruments that measure the same variable (Kerlinger & Lee, 2000).

Predictive validity was the exclusive form of criterion-related validity in the cross-cultural LOC research studied. Table 1 provides a listing of the variables shown to be significantly predictive by LOC. This listing only includes variables that were significant for all the cultures included in the particular studies. As one might expect, there are many other variables that LOC predicts either within subsets of participants or within a portion of the cultures represented in a particular study (Kanungo & Bhatnagar, 1978; Khanna & Khanna, 1979; Lester, Castromayor, & Icli, 1991; McGinnies & Ward, 1974; Parsons & Schneider, 1978; Reimanis, 1977; Reitz & Jewell, 1979).

Table 1: Predictive Variables in Cross-Cultural LOC Research

Author(s)	Country(ies) Represented	Predictive Variable(s)	Significance
Chan (1989)	China (Hong Kong)	Depression	$r=.36^{***}$
Hojat (1982)	American Iranians and Iranians	Loneliness	$R^2=.69, \beta=.10^*$
McGinnies, Nordholm, Ward, & Bhanthumnavin (1974)	Australia, New Zealand, Japan, Sweden, US	Gender	$F(1, 1528) = 21.53^{***}$
Smith, Trompenaars, & Dugan (1995)	43 Countries	Power Distance	$r=.53^*$
		Individualism	$r=.70^{****}$
		Income	$r=.53^{**}$
		Literacy	$r=.59^{***}$
		Christianity	$r=.71^{****}$
		Externality	$r=.43^*$
		Gender	$r=.51^{**}$
		Age	$r=.51^{**}$
		Conservatism	$r=.74^*$
		Harmony	$r=.73^*$

Note Predictive variables only listed when significance was obtained across all cultures studied.

* $p < .05$

** $p < .01$

*** $p < .001$

**** $p < .0001$

Conceptual and Functional Validity

Though researchers do not often list conceptual and functional validity as forms of construct validity, Scroggins, Rozell, Guo, Sebestova, and Velo (2010) noted that simply translating an instrument into another language is not sufficient to maintain construct validity. The first problem that arises is conceptualization, which they illustrated with a bicycle. Across many cultures, the conceptualization of a bicycle has near perfect alignment. A bicycle in America is the same as a bicycle in China. For items in an instrument that bridge cultures so simply, conceptualization is not a problem. However, as Scroggins et al. noted, concepts, such as leadership, have been shown to have significant differences across different cultures. Thus, researchers should test conceptual validity in any cross-cultural work. Secondly, Scroggins et al. pointed out that there is a functional validity, which can again be illustrated with bicycles. In America, bicycles are primarily seen as either recreational or as exercise equipment. However, in China, for many people, the bicycle remains a primary means of transportation. Thus, although conceptually there is validity for an instrument “measuring” bicycles between the cultures, functionally there is a lack of validity for an instrument “measuring” bicycles since the use of

bicycles is different and thus would change the perception of the variable. As they pointed out, the participant must have both a conceptual and a functional understanding of the construct being measured in order for it to have construct validity.

Only Smith, Trompenaars, and Dugan (1995) and Tyler et al. (1988) translated the instrument into other languages without a back-translation process. However, for most studies, the typical back-translation process was used (Chan, 1989; Cole, Rodriguez, & Cole, 1978; Hojat, 1982; Kanungo & Bhatnagar, 1978; McGinnies, Nordholm, Ward, & Bhanthumnavin, 1974; McGinnies & Ward, 1974; Parsons & Schneider, 1974, 1978; Reitz & Jewell, 1979; Tobacyk, 1978; Tobacyk, 1992; Zea & Tyler, 1994). This process involves translating the instrument from the language of origin to the language of research by someone whose primary language is the language of origin. Then, multiple translators whose primary language is the language of research translate the instrument back into the language of origin. Researchers discuss discrepancies between the original and the back-translated version and changes are made to the instrument in the language of research. This process in most cases will provide for conceptual validity. However, there is no research on whether there are functional validity issues that could arise from a translation of Rotter's I-E LOC scale. The only researchers to indicate that they were aware of functional validity issues were Santelli, Bernstein, Zborowski, and Bernstein (1990). They screened all their items to remove idiomatically expressed phrases and references to activities not common in the country of research. Although this did not result in the removal of any of the I-E LOC items, the process still establishes the functional validity of the I-E LOC for this study. Those researchers who did not use back-translation (Smith et al., 1995; Tyler et al., 1988) used participants fluent in English. However, even though an individual may fluently speak English, conceptual and functional discrepancies of the language may exist and thus undermine the conceptual and functional validity of the study.

Convergent and Discriminant Validity

In this form of validation, the researcher seeks to include measures that theoretically should have a high correlation with the construct (convergent) and measures that theoretically should have a low correlation with the construct (discriminant) (Kerlinger & Lee, 2000). The primary means used to measure these forms of validation is multitrait/multimethod. This method of validation requires the researcher to make sure that there is more than one trait being measured using more than one method of measurement. The theory of locus of control has developed from Rotter's original claim of unidimensionality to near total acceptance of multidimensionality (Yukl, 2006) and thus inherently has multiple traits that are being measured. Chan (1989) provided a good example of convergent validity. In addition to testing the I-E LOC scale, Chan included items from the General Health Questionnaire that included somatic symptoms, anxiety/insomnia, social dysfunction, and depression. Chan anticipated that all these measures would have a high positive correlation (meaning they correlated with E- LOC). Chan also administered the Vaillant Assessing Coping Styles Questionnaire anticipating that these measures would have a high negative correlation (meaning they correlated with the I- LOC). Due to the past behavioral research in LOC, Chan believed these measures would converge on the LOC measures adding to its validity. Unfortunately, only the Depression measures ($r=.36$, $p<.001$) correlated the way that Chan anticipated. However, this result was similar to the results found by Lester et al. (1991) who used the Zung Self-rating Depression Scale to support the correlation between E- LOC and depression. In American and Turkish students, this correlation

was found ($r=.32$ and $.38$, respectively, $p<.001$). Still, the researchers did not find this same correlation to be significant among Phillipino students. Kanungo and Bhatnagar (1978) theorized in their research that LOC would be correlated with achievement oriented behavior and found correlations with emphasizing planning ($r=-.12$, $p<.05$), personal responsibility ($r=-.14$, $p<.05$), and future orientation ($r=-.10$, $p<.05$). None of the articles analyzed used a discriminant variable to validate the study. The I-E LOC scale is forced choice while most of the other measures used in these studies were Likert scaled and so the researchers used multi-method process in these studies.

Factorial Validity

Factor analysis seeks to identify the underlying dimensions that may be within a particular construct (Kerlinger & Lee, 2000) and thus is related to convergent and discriminant validity (Brahma, 2009). Though Rotter originally designed the I-E LOC scale as a unidimensional instrument, most other research has suggested a multi-dimensional measurement (Yukl, 2006). Unfortunately, there is little agreement on what and how many those dimensions should be in the original Euro-American context that the I-E LOC scale was developed in, let alone in the cross-cultural contexts of the research within this work. Table 2 summarizes the findings of factor analysis in the articles studied. However, underscoring the importance of determining factorial validity, Parsons and Schneider (1974) found significant differences in subscale scores between countries while within-country scores showed much greater correlation. Their recommendation was to expand the dimensionality of the LOC concept so that as different cultures used the instrument there would be culture-contextual factors already validated for usage.

Table 2: Factor Analysis Results for Cross-Cultural LOC Research

Author(s)	Country(ies) Studied	Factors Identified	% Variance Accounted For
Chan (1989)	China (Hong Kong)	Personal Powerlessness General vs. Specific Powerlessness Political Powerlessness	No Variance information provided though correlation data supplied in tables
Garza & Widlak (1977)	American/Chicano	Luck/Fate Leadership/Success Academics Politics Respect	12.5% in Chicanos, 17.6% in Anglos 7.2% in Chicanos, 6.0% in Anglos 6.7% in Chicanos, 7.1% in Anglos 6.0% in Chicanos, 6.6% in Anglos 5.4% in Chicanos, 5.5% in Anglos

Smith et al. (1995)	43 Countries	Personal-Political Individual-Social Luck	No Variance information provided though correlation data supplied in tables
Tobacyk (1978)	Poland	Political Control Personal Control	14% Total Var., 41.5% Common Var. 4.7% Total Var., 14.1 Common Var.
Zea & Tyler (1994)	Colombia	Political Control Personal Control Luck/Fate Control Ideology Academic Control/ Interpersonal Control	14.2 % All, 13.8% Men, 14.3% Women 7.3% All, 8.3% Men, 7.1% Women 6.0% All, 6.3% Men, 6.1% Women 5.2% All, 5.9% Men, 5.4% Women 4.9% All, 5.3% Men 5.1% Women

Nomological Validity

This form of validation is the process whereby the researcher analyzes the hypothesized relationships between the constructs being studied for statistical significance. The simpler forms of statistical analysis include a correlation measurement of variables (Kanungo & Bhatnagar, 1978; Lester et al., 1991; Reimanis & Posen, 1980; Reitz & Jewell, 1979; Santelli et al., 1990) and a difference in means of variables (Cole et al., 1978; Parsons & Schneider, 1974; Reimanis, 1977; Tobacyk, 1992; Zea & Tyler, 1994). Analysis of variance provides a more comprehensive measurement of nomological validity as it allows for the comparison of more categorical subsets of the independent variables. Several researchers used ANOVA and MANOVA to show statistical significance in their research (Khanna & Khanna, 1979; Lester et al., 1991; McGinnies et al., 1974; McGinnies & Ward, 1974; Parsons & Schneider, 1974; Tyler et al., 1988). Multiple regression analysis provides the most comprehensive measures of statistical validation through its ability to measure multiple independent variables and their relative contributions. Four studies used this form of nomological validity (Chan, 1989; Hojat, 1982; Santelli et al., 1990; Tyler et al., 1988).

Reliability of I-E LOC Scale in Cross-Cultural Research

Once the researcher has determined through validation methods that the instrument is measuring what it hypothetically says it is measuring, it is also important to make sure that it is both dependable and consistent (Kerlinger & Lee, 2000). It is here that the researcher turns to reliability. There are primarily two forms of reliability – internal and external. Internal reliability

determines whether an instrument is consistent within itself. External reliability determines whether an instrument is consistent over multiple uses. Internal consistency estimates for the I-E LOC scale had a mean of .663 and a median of .690 with results as high as .93 and as low as -.40 (Beretvas et al., 2008). Test-retest reliability estimates ranged from .53 to .86 with a mean of .663 and a median of .640 (Beretvas et al., 2008).

Internal and External Reliability

Chan (1989) calculated the internal consistency of the items at $\alpha=.70$, however, item-total correlations ranged from .05-.45. Though this is comparable to Rotter's item-total correlations (.11-.48), it still suggests that several of the items are not correlating well with the final score (Chan, 1989). Tyler et al. (1988) calculated an internal consistency of $\alpha=.62$. The alpha in Zea and Tyler's (1994) research was .66. None of the other articles in this work reported internal consistency for the I-E LOC scale items. None of the articles in this study reported any test-retest analysis.

Discussion

The studies used for this work suggest that the transitioning of Euro-American constructs and instruments into other cultures is not a smooth one. In every form of validity and reliability, researchers could have strengthened both the validity and reliability analysis of the new instruments. As scientific study is designed to build upon previous research (Kerlinger & Lee, 2000), this is especially essential in early instrument transition from one culture to another lest later research presume the validity and reliability into its future use. Given the scattered results from the articles studied, it would appear at face value that the I-E LOC scale does in fact transition into other cultures. However, since rigorous validity and reliability methods were not followed in any of the articles (although Chan (1989) certainly is most comprehensive) any research that has built upon these articles that does not address these shortcomings carries into it the validity and reliability shortcomings.

Based on these articles, several additional methods would have assisted in strengthening the validity and reliability of the I-E LOC in cross-cultural contexts and are necessary to be established in future cross-cultural I-E LOC research. Face and content validity is critical in transitioning an instrument into another culture. Experts in the understanding and research of locus of control other than the researcher(s) ought to be involved in the process of validating that the translated measure appears to measure what it says it measures. Since researchers are often identifying predictive variables, that aspect of criterion related validity is constantly being developed. In order to strengthen criterion related validity, researchers should include concurrent validity measures with their testing. Researchers have developed a number of LOC scales with varying levels of reliability and validity. Comparing these scales with the I-E LOC in the culture of research would assist in strengthening its criterion related validity. Though researchers can approach conceptual validity through back-translation, they must still assess functional validity. Functional uses of terms in the I-E LOC scale such as luck, politics, teachers, leaders, success and idiomatic ideas such as 'getting a break' may differ from culture to culture and researchers ought to specifically address these concepts in the I-E LOC. Convergent and discriminant validity could be strengthened by focusing on developing discriminant variables against which to test the construct. Factorial validity remains a difficult topic even within the I-E LOC scale's

original culture of research (Welton et al., 1996). However, this should not stop researchers from verifying the underlying components, through either confirmatory factor analysis or principal component analysis. Especially during the transitional phase of the I-E LOC into a new culture, this should be a minimum expectation of the research. Closely related to this is the internal reliability measures of any components detected. As with the factorial validity, all research transitioning the I-E LOC into a new culture should include internal reliability estimates as a minimum expectation. Finally, it was disturbing that no research included test-retests in the articles studied. This important step in the reliability verification will assist researchers in knowing whether they have properly developed the tool for consistency over uses. In the end, the establishment of the validity and reliability of any instrument in one culture will not automatically mean that it can be transitioned into another culture. This work shows that any research based upon the early transitions of the I-E LOC into other cultures that does not address the validity and reliability recommendations given may have significant validity and reliability concerns that will need to be addressed.

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