

## Are Goal Orientation Comparisons Appropriate Between American and Korean Groups?

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This study tested for measurement invariance of VandeWalle's (1997) goal orientation instrument across Korean and American workers using multi-group confirmatory factor analysis. Across groups, learning and proving orientations were invariant, but avoiding goal orientation was partially noninvariant. Implications for goal orientation and comparisons between Korean and American respondents are discussed.

Cross-cultural research has proliferated in the fields of organizational assessment and organizational behavior in recent years. This emphasis on cross-cultural research can be attributed to expanding international business markets, which has prompted the necessity of multinational human resources management to remain competitive (Caligiuri, Phillips, Lazarova, Tarique, & Burgi, 2001; Duane, 2003). Today's fast-paced and culturally diverse business environment presents unique challenges to organizational researchers and practitioners (Ryan, Chan, Ployhart, & Slade, 1999; Triandis, Triandis, Dunnette, & Hough, 1994). These challenges include the administration of psychological and attitudinal surveys on a global scale, as well as subsequent cross-cultural comparisons (Ryan et al., 1999; Wang & Russell, 2005). To accurately interpret the results of employee surveys, researchers and practitioners must establish measurement equivalence (or invariance) for these instruments across the individuals and groups being assessed. That is, it is inappropriate to make group comparisons based on mean differences using instruments lacking measurement equivalence (Meredith, 1993; Vandenberg & Lance, 2000). Also, instruments translated into other languages must provide evidence of consistent measurement prior to being employed (Hui & Triandis, 1985; Ryan et al., 1999; Wang & Russell, 2005). Thus, there is an important need for research examining measurement equivalence of psychological instruments across cultural and linguistic boundaries. In this study, we

examine the invariance of a common measure of goal orientation across two culturally distinct samples. Specifically, our study assesses the cross-cultural measurement invariance between Korean and American samples.

### *Goal orientation*

In the past decade, goal orientation has emerged as the predominant conceptualization of achievement motivation. Dweck & Leggett (1988) define goal orientation as the broad, underlying goals that individuals pursue in achievement settings; they initially identified two goal orientations: a *learning goal orientation* to develop competence by acquiring new skills and mastering new situations, and a *performance goal orientation* to gain positive judgments and avoid negative judgments about one's competence. Subsequent research has supported partitioning the performance goal orientation into *proving* and *avoiding* dimensions (Elliot & Church, 1997; VandeWalle, 1997). The former is focused on the attainment of favorable judgments about one's competence while the latter is focused on avoiding unfavorable judgments about one's competence.

Goal orientation is one of the most commonly assessed motivational variables in applied psychology and has been employed in a wide variety of organizational settings (DeShon & Gillespie, 2005). Organizational contexts in which researchers have employed goal orientation to examine and predict learning behavior include training (Brown, 2001; Heimbeck, Frese, Sonnentag, & Keith, 2003),

job performance (Janssen & Van Yperen, 2004; Porath & Bateman, 2006; VandeWalle, Brown, Cron, & Slocum, 1999), employee attitudes (Potosky & Ramakrishna, 2002), and feedback seeking (Tuckey, Brewer, & Williamson, 2002; VandeWalle, Ganesan, Challagalla, & Brown, 2000). Researchers have also used goal orientation to understand and predict differential achievement in academic settings across cultures (Lee, Tinsley, & Bobko, 2003; Xiang, Lee, & Solmon, 1997). While few studies have specifically examined goal orientation in cross-cultural workplace settings or across two distinct workplace cultures, economic globalization reinforces the need for research examining the impacts of culture and language on the measurement of work motivation in multinational organizations and cross-cultural settings. Next, we discuss the concept of measurement invariance and the ramifications of this concept for goal orientation.

#### *Measurement Invariance*

In the context of cross-cultural assessment, an instrument displays measurement invariance if respondents from different cultures have identical scores on the latent construct, as well as identical expected raw scores at the item and scale level (Drasgow & Kanfer, 1985; Raju, Laffitte, & Byrne, 2002). Measurement invariance allows researchers to be confident that (a) the measured construct is applicable to all groups of respondents, (b) scale items are interpreted consistently among respondents across groups, (c) the item rating scales are similarly calibrated across groups, and (d) observed mean differences between groups correspond to genuine differences in the measured trait (Drasgow, 1984). While multiple methods exist to assess cross-cultural measurement invariance, the most commonly used method for multi-factor measures is multi-group confirmatory factor analysis (Raju et al., 2002; Vandenberg & Lance, 2000).

Multi-group confirmatory factor analysis (MGCFA) utilizes a series of factor analytic models fit simultaneously to two or more groups in order to determine the extent to which the psychometric properties of a measure are equivalent in the groups. Typically, the first model specifies the same general factor structure across groups, yet CFA model parameters are allowed to differ by group. This model serves as a baseline model for comparison to more restricted models to follow, and indexes the extent to which the factor model is appropriate for both groups (i.e., configural invariance; Horn & McArdle, 1992). Presuming this model fits adequately, a series of models are introduced in which parameters for like items are constrained to be equal across the groups. Typically, constraints are

first placed on the factor loadings (i.e., a test of metric invariance; Horn & McArdle, 1992). The decrement in model fit as compared to the baseline model is then evaluated. If this decrement in fit is not significant, other constraints can be placed on subsequent models, such as item intercepts, item uniqueness terms, factor variances and covariances, etc. (see Vandenberg & Lance, 2000 for a review).

#### *Purpose*

The purpose of the current study was to assess the measurement invariance of a measure of work-domain goal orientation developed by VandeWalle (1997), across Korean and American workers. Globalization trends have coincided with economic conditions and policies that have attracted sharp increases in foreign investment and multinational corporations in Asian countries, such as Korea (Bang Nam & Se Young, 2004). While studies have addressed the role of cultural values in work attitudes and behaviors across Korean and American workers (Bae & Chung, 1997; Choi, 2002), we were unable to locate any studies that have examined differences in psychometric assessments between these populations. This absence of cross-cultural psychometric research potentially questions the validity of between group comparisons for these groups (Wang & Russell, 2005), and highlights the need for studies targeting the psychometric properties of survey instruments. Therefore, the current study investigated the equivalence of VandeWalle's (1997) widely used work-domain goal orientation instrument across Korean and American samples. Previous research comparing East Asian students to American students suggests that American students more readily distinguish between learning and performance goal orientations (Lee et al., 2003). Researchers have also found that Confucian heritage cultures, such as Korea, show higher levels of proving and avoiding goal orientations compared to some Western cultures (Woodrow & Chapman, 2002). However, these studies did not examine measurement invariance of goal orientation measures across cultures. We were unable to locate any previous research assessing the invariance of this instrument across Eastern and Western societies. Thus, it is unclear whether goal orientations are conceptually equal across cultures, making mean comparisons difficult to interpret (Drasgow, 1984).

#### Methods

##### *Sample*

Participants were drawn from two different studies. The American sample consisted of 500 U.S. Army soldiers participating in a required, job-related

foreign language training program. The 500 soldiers were drawn at random from a larger sample of 1700. The soldiers participated in 19 to 25 weeks of training, depending on the difficulty level of the language to which they were assigned. The training was their only job responsibility during the 19 to 25 weeks. The language training effectiveness study consisted of pre- and post-training measurement. Goal orientation was measured prior to training.

The Korean sample consisted of 156 employees at a Korean software company. The Korean employees were participating in an English-speaking proficiency test validation study. All study participants completed a pre-validation assessment survey designed to measure relevant individual differences to be used as control variables or covariates in the study. Goal orientation was included on this questionnaire.

### Measure

*Goal orientation.* Work-domain learning, proving, and avoiding goal orientations were assessed with 13 items from an instrument developed and validated by Vandewalle (1997). A 7-point Likert-type response scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) was used for each item. The Korean-language version of the goal orientation instrument was translated as part of a larger questionnaire designed to be administered prior to English-speaking proficiency test validation study in Korea. The instrument was translated by Korean language professionals working for the American Council on the Teaching of Foreign Languages (ACTFL). The translation was verified by the company in Korea prior to administration.

*Invariance Tests.* Using the means and covariance structure (MACS) analysis framework (see Ployhart & Oswald, 2004) to assess the invariance of the work-domain goal orientation scale, a series of MGCFAs were estimated. In the first model, the three goal orientation factors were specified as latent variables using their corresponding items as indicators. In this baseline model, factor loadings, item intercepts, factor variances and factor covariances were freely estimated in the two groups. In order to achieve model identification and scaling, factor loadings and item intercepts were fixed for the first indicator for each factor. Note that this model constitutes a test of the equality of factor structure across groups (i.e., configural invariance; Horn & McArdle, 1992) such that if the model fits poorly when estimated in the two groups, invariance is said to not exist.

If the baseline model fits the data (i.e., configural invariance exists), a constrained model will be fit to the data such that the factor loadings for

like items for the two groups will be constrained to be equal. The decrement in model fit between this more constrained model and the baseline model will be evaluated using a difference in chi-square test. Should this constrained model not show a significant decrement in fit, additional tests of item error variances will be performed by constraining item error variances to be equal across like items (Ployhart & Oswald, 2004). If, however, factor loadings for the two groups are significantly different, a series of follow-up analyses will be conducted in which the factor loadings for only one item are constrained to be equal across groups. The fit of each of these models will be compared to the baseline using the difference in chi-square test based on previous recommendations (Stark, Chernyshenko, & Drasgow, in press). A subsequent test of equality of factor variances and covariances will be conducted by constraining all factor loadings (with the exception of any items found to be noninvariant), factor variances, and factor covariances across both groups. The fit of this model will be compared to a model constraining all factor loadings (except noninvariant items) to be equal across both groups.

### Results

Internal consistency coefficients, subscale intercorrelations, and descriptive statistics for Korean and American data are presented in Table 1. A baseline model was established to test the joint fit of the 13-item goal orientation scale by obtaining goodness-of-fit for a three-factor CFA model with no restrictions on the factor loading and item uniqueness matrices tested concurrently across groups. Maximum likelihood factor loadings for both Korean and American respondents from the baseline model are presented in Table 2. Goodness-of-fit indices for the baseline model (Model 1; see Table 3) indicate the three-factor structure produces a well-fitting model for both groups. To test for full metric invariance, Model 2 imposed equality constraints on all factor loadings (the  $\Lambda_x$  matrix) across the Korean and American groups. As differences in chi-square values for large samples approximate the chi-square distribution, chi-square difference ( $\Delta\chi^2$ ) tests were used in model comparisons. Comparison of Model 2 to Model 1 produced a significant decrement in fit ( $\Delta\chi^2(10) = 25.03, p < .05$ ), indicating the presence of one or more noninvariant items.

A series of subsequent models were fitted which imposed an equality constraint on only one

item factor loading per model (e.g., Item 2)<sup>1</sup>. These item-level invariance tests revealed that Items 2 through 9 were invariant (see Table 3). However, the comparison between Model 3 (Item 10 equal) and Model 1 yielded a significant decrement in fit ( $\Delta\chi^2(1) = 9.05, p < .05$ ), indicating Item 10 was not invariant across Korean and American samples. Using the same testing procedure, Item 11 and Item 12 were found to operate equivalently across Koreans and Americans. Thus, Item 10 was the only item found to not function equally across groups.

We conducted a subsequent test for equality of item error variances across Koreans and Americans. For this test, Model 4 imposed equality constraints on all factor loadings (with the exception of Item 10) and all item error variances (the  $\Theta_a$  matrix) across groups. Comparison of Model 4 to Model 2 (Item 10 free) yielded a significant chi-square difference (see Table 3), indicating one or more item error variances were not invariant across groups. Subsequent analyses revealed all item error variances were not invariant across Koreans and Americans. To test for equality of factor variances and covariances across both groups, Model 5 constrained all factor loadings (with the exception of Item 10) and factor variances and covariances to be equal. Comparison of Model 5 (Item 10 free) to Model 2 (Item 10 free) resulted in a significant chi-square difference (see Table 3), signifying factor variances and covariances were noninvariant across Koreans and Americans.

As the learning and proving goal orientation subscales displayed full metric invariance across groups, follow-up mean comparisons were conducted. Learning goal orientation differed significantly across groups,  $t(211) = 14.14, p < .01, d = 1.95$ , with American respondents displaying a higher mean orientation than Koreans. Conversely, Koreans showed a higher mean proving goal orientation,  $t(371) = 5.64, p < .01, d = .59$ , compared to American respondents.

## Discussion

The purpose of the current study was to examine the measurement invariance of the Vandewalle (1997) goal orientation measure across Korean and American workers. Using MGCFA, we found the 3-factor model of the goal orientation measure provided a good fit to the data across Korean and American respondents. Subsequent tests of the

equality of factor loadings within each subscale indicated all items for the learning and proving subscales were invariant across groups. The avoiding subscale failed to display measurement invariance for only one item (Item 10). The content of this item was “I would avoid taking on a new task if there was a chance that I would appear rather incompetent to others.” Differences in error variances were also found, indicating that items were not subject to the same amount of error across Koreans and Americans. However, requiring equality of item residual variances in testing for measurement invariance is highly stringent and not practically realistic in most situations (Byrne, 1998, 2001; Raju et al., 2002). Thus, for the Vandewalle (1997) goal orientation measure, the results provide support for measurement invariance for the learning and proving goal factors and support for partial measurement invariance for the avoiding goal factor across Korean and American workers. Given these results, any mean differences on the learning and proving goal factors between our Korean and American samples can be meaningfully interpreted.

These results have several theoretical implications. First, respondents in both groups distinguished between learning, proving, and avoiding goal orientations, viewing each as unique constructs. In line with previous findings (Lee et al., 2003), however, Korean workers did not distinguish between the learning and proving goal orientations to the same extent as the Americans. Results revealed a strong and positive correlation ( $r = 0.69$ ) between learning and proving orientations for the Korean sample. Paired with our finding of noninvariant factor variance-covariance matrices across both groups (see Table 3), this strong correlation indicates Koreans with a strong learning goal orientation tended to also display a strong proving orientation. In contrast, there was an insignificant correlation ( $r = 0.07$ ) between learning and proving orientations for the American workers. This finding may be explained by cultural differences in the perceived relationship between working hard and attaining knowledge and ability across Western societies and Eastern societies based on Confucianism (Lee et al., 2003). Whereas Americans have been shown to view effort as unrelated or negatively related to ability (Salili & Hau, 1994), East Asians appear to view ability as solely a product of hard work and effort (Stevenson & Lee, 1996). Thus, American workers may display a proving goal orientation without endorsing a learning goal orientation, while Koreans likely view these two goal orientations as distinct, but inextricably linked.

Second, Korean respondents appeared to define the avoiding goal orientation slightly

<sup>1</sup> Items 1, 6, and 13 were constrained to 1.00 for statistical identification and factor scaling purposes and thus were not subjected to item-level invariance tests.

differently than the American respondents. American workers considered the avoiding goal orientation to include both avoiding situations in which one might appear incompetent (i.e., Items 10 and 11) and concern over performing poorly in the presence of others in the workplace (i.e., Items 12 and 13). As evidenced by the unconstrained item factor loadings, Korean workers distinguished between these two concepts to a larger extent than the Americans (see Table 2). These results may be explained by the fact that Items 12 and 13 are explicitly related to a workplace context, whereas Items 10 and 11 may be interpreted more broadly to situations outside the workplace. Koreans appeared to perceive a conceptual difference between avoidance of situations in which one might appear to have low ability, across work and non-work contexts, and concern towards appearing incompetent in the workplace. This finding is consistent with previous research suggesting East Asians perceive ability to be a result of effort and experience (Lee et al., 2003; Stevenson & Lee, 1996). In this view, novel situations, or situations in which one has little experience or skill, are necessary steps towards attaining new knowledge and ability. Thus, avoidance of novel situations is likely viewed as a distinct concept from concern over one's appearance at work in East Asian cultures.

The finding of invariance for a learning goal orientation across the two samples has positive implications for cross-cultural adjustment for expatriate assignments. Specifically, Gong and Fan (2006) conducted a study with international students enrolled at an American university. They found that a learning goal orientation predicted social and academic self-efficacy, which in turn, predicted social and academic adjustment. The latter adjustment form then predicted students' cumulative grade point average. In another recent study, Wang and Takeuchi (2006) investigated the role of goal orientation for a group of predominantly North American expatriates working in China for a multinational manufacturing company. They found that a learning goal orientation had a positive relationship with adjustment to the new work, which in turn had a positive relationship with job performance. In addition, a learning goal orientation predicted positive general adjustment to the new living situation, which in turn predicted a decreased likelihood of a premature intention to withdraw from one's foreign assignment. When our findings of invariance for a learning goal orientation are considered in along with the above two studies, it appears that organizations concerned with the success of their expatriate employees should consider a

learning goal orientation as a part of their selection and training process.

#### *Limitations*

One limitation to the current study is the differing nature of occupations between the Korean and American samples. The Korean workers were employees with a private software company, while the American workers were U.S. Army Soldiers participating in required foreign language training. This disparity in occupation presents possible alternative explanations, other than cultural or language factors, to finding a lack of invariance across groups. For instance, contextual factors related to workers' occupations may have contributed to invariance across the Korean and American samples. Future research should examine the impact of contextual factors associated with one's job and organization on measurement invariance of Vandewalle's (1997) goal orientation measure across East Asian and American workers. Another limitation is the use of only one non-American comparison group. Many organizations employ workers across a large number of countries, highlighting the need for research including a wide range of cultures (Ryan et al., 1999). Finally, however unlikely it might be given the professional translation and verification of the Korean version, we cannot rule out a translation issue with Item 10 as the source of the noninvariance found for the avoiding goal orientation factor.

#### *Conclusion*

As result of technological advancements and globalization, the increasing degree of cultural diversity within organizations presents unique challenges to organizational researchers and practitioners. One challenge is performing accurate and consistent psychological assessment across employees from different culture and language backgrounds. The current study found evidence for partial measurement invariance of the Vandewalle (1997) goal orientation instrument across Korean and American workers. Results indicated cross-cultural differences in respondents' interpretation of the avoiding goal orientation. Thus, researchers and practitioners assessing goal orientations across Korean and American respondents should ensure the constructs of interest are being interpreted consistently prior to making group comparisons.

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Table 1.

*Means, Standard Deviations, Reliabilities, and Scale Intercorrelations Among the Three Subscales on the Goal Orientation Instrument for Korean and American Respondents*

Scale	Mean	SD	1	2	3
Korean					
1. Learning	5.08	1.08	(0.92)		
2. Proving	4.85	1.05	0.69*	(0.91)	
3. Avoiding	3.50	1.30	-0.36*	-0.07	(0.73)
American					
1. Learning	6.22	0.82	(0.90)		
2. Proving	4.31	1.57	0.07	(0.87)	
3. Avoiding	2.76	1.42	-0.36*	0.41*	(0.86)

*Note.* Cronbach's alpha estimates of internal consistency reliability are presented in parentheses.

\*  $p < .05$ .

Table 2.

*Maximum Likelihood Factor Loadings From Baseline Joint Fit Model<sup>a</sup>*

Item #	Goal Orientation Factor	Group	
		Korean	English
1 <sup>b</sup>	Learning	0.81	0.85
2	Learning	0.85	0.87
3	Learning	0.92	0.93
4	Learning	0.79	0.70
5	Learning	0.85	0.69
6 <sup>b</sup>	Proving	0.79	0.65
7	Proving	0.83	0.78
8	Proving	0.87	0.85
9	Proving	0.91	0.89
10	Avoiding	0.42	0.70
11	Avoiding	0.52	0.71
12	Avoiding	0.88	0.90
13 <sup>b</sup>	Avoiding	0.80	0.78

<sup>a</sup> Standardized estimates. <sup>b</sup> Constrained to 1.00 for statistical identification and factor scaling purposes.

Table 3.

*Goodness-of-Fit Statistics Related to Tests for Invariance Across Koreans and Americans<sup>a</sup>*

Model	Model type	Model Constraints	df	$\chi^2$	Comparison Model	$\Delta df$	$\Delta\chi^2$	RMSEA	NNFI	CFI
1	Baseline Joint Fit	None	124	340.88*	None			0.052	0.939	0.958
2	Full Metric Invariance	All factor loadings	134	365.91*	1	10	25.03*	0.051	0.939	0.955
3 (I2) equal	Partial Metric Invariance	All factor loadings free, I2 equal	125	342.04*	1	1	1.17	0.052	0.939	0.958
3 (I3) equal	Partial Metric Invariance	All factor loadings free, I3 equal	125	343.02*	1	1	2.14	0.052	0.939	0.958
3 (I4) equal	Partial Metric Invariance	All factor loadings free, I4 equal	125	341.09*	1	1	0.21	0.051	0.939	0.958
3 (I5) equal	Partial Metric Invariance	All factor loadings free, I5 equal	125	342.83*	1	1	1.95	0.052	0.939	0.958
3 (I7) equal	Partial Metric Invariance	All factor loadings free, I7 equal	125	342.63*	1	1	1.75	0.052	0.939	0.958
3 (I8) equal	Partial Metric Invariance	All factor loadings free, I8 equal	125	343.98*	1	1	3.10	0.052	0.939	0.958
3 (I9) equal	Partial Metric Invariance	All factor loadings free, I9 equal	125	342.11*	1	1	1.23	0.052	0.939	0.958
3 (I10) equal	Partial Metric Invariance	All factor loadings free, I10 equal	125	349.92*	1	1	9.05*	0.052	0.937	0.957
3 (I11) equal	Partial Metric Invariance	All factor loadings free, I11 equal	125	341.88*	1	1	1.00	0.052	0.939	0.958
3 (I12) equal	Partial Metric Invariance	All factor loadings free, I12 equal	125	341.44*	1	1	0.56	0.051	0.939	0.958
2 (I10 free)	Partial Metric Invariance	All factor loadings, I10 free	133	352.32*	1	9	11.44	0.050	0.942	0.958
4 (I10 free)	Equal Uniquenesses	All factor loadings, I10 free, and equal uniquenesses	146	631.01*	2 (I10 free)	13	278.68*	0.071	0.884	0.907
5 (I10 free)	Factor Variance and Covariance Invariance	All factor loadings, I10 free, equal factor variances, equal factor covariances	139	458.08*	2 (I10 free)	6	105.76*	0.059	0.92	0.939

\*  $p < .05$ *Note.* RMSEA = root-mean-square error of approximation, NNFI = non-normed fit index, CFI = comparative fit index.Korean group,  $n = 156$ English group,  $n = 500$ <sup>a</sup> Items 1, 6, and 13 constrained to 1.00