

Assessing Construct Validity of R-JDI in Korea

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This study investigated the construct validity of the R-JDI by reanalyzing Tak and Downey's(1988) data with different analyses. Two sets of analyses were conducted to address this issue. First, the confirmatory factor analysis suggested that the original five R-JDI scales were a reasonable fit to the data. A Rasch IRT analysis comparing the Korean item statistics to those from a USA sample indicated a moderate convergence between the two samples. Several items were identified where sample and / or cultural differences led to different estimates of item characteristics.

Job satisfaction has been one of the most highly researched subjects in industrial and organizational psychology(Iaffaldano & Muchinsky, 1985; Locke, 1976). Among a large number of measures, the Job Descriptive Index, JDI.(Smith, Kendall, & Hulin, 1969) has been the most frequently used measure of job satisfaction and subjected to extensive validation attempts(Robinson, Athanasiou, & Head, 1969; Vroom, 1964).

Most studies using the JDI have dealt with an English version. The limited efforts have been made to investigate the feasibility of using a translated version of the JDI in different cultures(Hulin & Mayer, 1986; Tak & Downey, 1988). Tak and Downey(1988) examined the factor structure of the JDI and the relationship between job satisfaction and a variety of background variables, using Korean workers. Tak and Downey found that the JDI scales appear to be measuring a similar set of constructs in

the Korean sample as has been found in the United States. The results of coefficients of congruence showed that each of the five dimensions of the JDI emerged at least once as a single factor over the four, five, and six factor solutions for the Korean version of the JDI. Also, scale reliabilities, scale intercorrelations, and correlations between job satisfaction and other variables were similar to findings for American workers. However, Tak and Downey failed to investigate the item characteristics of the translated individual items. Also, a confirmatory factor analysis appears to be a more powerful strategy for assessing the stability of the factor structure of the JDI in a different culture.

The purpose of the present study was to investigate and provide further evidence of the construct validity of the JDI by reanalyzing Tak and Downey's(1988) data with different analyses. Two sets of analyses were conducted to address this issue. First, a con-

firmatory factor analysis was conducted to assess the stability of the factor structure of the JDI across a different culture. This analysis represents a more appropriate method for confirming an a priori factor structure over exploratory factor analysis. Then, Item Response Theory was used to investigate the item characteristics of the translated items.

METHOD

Data were collected from 471 Korean workers and the Revised Job Descriptive Index, R-JDI (Smith, 1987) was used in the present study. Detailed information on subjects, instruments, and procedures can be found in Tak and Downey's (1988) article.

Analysis

First, LISREL VI's (Joreskog & Sorbom, 1986) maximum likelihood estimation procedure was used to assess the factor structure of the Korean version of the R-JDI. Confirmatory factor analysis was performed and a correlation matrix of the 72 R-JDI items was used for the input for this analysis. Listwise deletion of missing values reduced a total of subjects from 471 to 336. Several models were tested: an orthogonal five-factor model (factor intercorrelations were set as zero), an oblique five-factor model (factor intercorrelations were allowed to be freely estimated), a general or one-factor model (all the items measure the one underlying construct), and a null model (a model that produces no common factor, i.e., all of the items are constrained to be independent of each other). Several goodness-of-fit indices were used and reported here. First, the ratio of the chi-square to degrees of freedom was computed for each factor model (Joreskog & Sorbom, 1986). A ratio of less than 2.0 generally indicates an excellent model fit (Brooke, Russell, & Price, 1988) and also, ratios up

to 5.0 are considered a reasonable fit (Marsh & Hocevar, 1985). In addition to this ratio, the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), and root mean square residual (RMSR) are reported. Recent Monte Carlo simulations suggest that the Tucker-Lewis index (TLI: Tucker & Lewis, 1973) is useful (Marsh, Balla, & McDonaly, 1988), and therefore it is also reported here.

The item characteristics of the translated R-JDI were compared to those from a sample from the United States (USA)¹. A one parameter IRT model (Rasch, 1960) was selected as the IRT approach for analyzing the items. A program developed by Assessment Systems Corporation (1986) was used to compute the difficulty indices. As suggested by Hulin, Drasgow, and Komocar's (1982) work with different language forms, the item parameters were estimated separately for each sample (analogous to the form in Hulin's et al. work) and a correlation was computed between the two estimates. This was done for the items in each of the 5 sub-scales and the total 72 items. Since IRT approaches require dichotomously scored items, all items were rescored (after reversal of negative items) using an approach suggested by Hulin, et al. (1982, p. 829): all 0s or 1s were recoded to 0 and 3s were recoded to 1.

RESULTS

The factor structure of the Korean form of the R-JDI was analyzed via confirmatory factor analysis using LISREL VI. Table 1 presents goodness-of-fit indices for each of the models analyzed. The null model provided a poor fit, indicating that the hypothesis of zero common factors was not appropriate for the data set. The indices of the one-factor model also indicate that the model was not representation of the factor structure of the R-JDI. The five / factor models,

Table 1. Goodness-of-fit Indices for Models Tested

Model	df	X ²	X ² / df	GFI	AGFI	RMSR	TLI
Null	2556	10383.88	4.06	.311	.292	.174	—
One Factor	2484	7296.75	2.94	.495	.466	.101	.366
Orthogonal Five-factor	2484	4958.90	2.00	.685	.667	.113	.673
Oblique Five-factor	2476	4742.43	1.92	.694	.675	.071	.701

Note. GFI : goodness-of-fit index. AGFI : adjusted goodness-of-fit index. RMSR : root mean square residual. TLI : Tucker-Lewis index.

both orthogonal and oblique, provided a better fit. All the goodness-of-fit indices for the five-factor models were better than the null and one-factor models. Also, the oblique five-factor model had an improved fit to the data over the orthogonal five-factor model and the chi-square difference between the two models was significant, $X^2(8)=216.47(p<.01)$. Therefore among the models tested, the oblique five-factor model appeared to provide the better fit to the data than the other models. The GFI of .694 and TLI of .701 for the oblique five-factor model suggest that this model provides a reasonable fit to the data

Table 2 provides the maximum likelihood estimates for this oblique five-factor model. One item each from the five scales appeared to be poorly estimated from these procedures: Work, "Too much to do:" Pay, "Income provides luxuries:" Promotion, "Opportunities somewhat limited:" Supervisor, "Stubborn:" and Coworkers, "Stubborn."

Table 3 summarizes the results from the Rasch IRT analyses. The Rasch estimates produced a moderate level of convergence, $\kappa(70)=.65, p<.01$, between the Korean and USA sample estimates of the item difficulties when all 72 items were included at once. Figure 1 shows this relationship. One item("income provides luxuries") was clearly an outlier with the Korean sample providing a very large item difficulty estimate. This finding is not surprising given the general low standard of living in Korea and the

resultant lowering of expectations as to what is a "luxury". When this item was removed it had little effect on the correlation.

For the five R-JDI subscales, only one, Pay, had a significant correlation ($r(16)=.69, p<.05$) between the item difficulties from the Korean and USA samples (see Table 3). The correlations for the remaining four subscales were not significant. Five items were identified as outlier. For the Work subscale "tiring" and "frustrating" were identified as items having larger than average discrepancies, the USA sample said their job had more of both attributes when compared to the Korean sample. When these items were dropped from the set of Work items, the resultant correlation was significant, $r(14)=.58, p<.05$ (see Table 3). For the promotion subscale "fairly good chance for promotion" was identified as an outlier, the Korean sample tended to say yes to this more often than the USA sample. There is no ready explanation for this difference. When this item was removed, the correlation became significant, $r(6)=.86, p<.01$. For both the Supervisor and Coworkers subscales, the item "intelligent" was found to be very different for the two samples. Korean workers rated both their supervisors and coworkers as more intelligent. When this item was dropped from the set of Supervisor items, the resultant correlation was significant, $r(15)=.55, p<.05$. When "Intelligent" was dropped from the Coworkers subscale, the resultant correlation was marginally

Table 2. Factor Loadings(Maximum Likelihood) for the Five JDI Scales

<u>Item</u>	<u>Loading</u>	<u>Item</u>	<u>Loading</u>
<u>THE WORK YOU DO</u>		<u>YOUR SUPERVISOR</u>	
1. Fascinating	.63	1. Asks my advice	.27
2. Routine	.56	2. Hard to please	.52
3. Satisfying	.69	3. Impolite	.54
4. Boring	.70	4. Praises good work	.49
5. Good	.74	5. Tactful	.69
6. Creative	.71	6. Influential	.49
7. Respected	.51	7. Up-to-date	.47
8. Uncomfortable	.53	8. Doesn't supervise enough	.58
9. Pleasant	.72	9. Has favorites	.47
10. Useful	.71	10. Tells me where I stand	.47
11. Tiring	.65	11. Annoying	.64
12. Healthful	.40	12. Stubborn	.08
13. Challenging	.70	13. Knows job well	.48
14. Too much to do	-.02	14. Bad	.65
15. Frustrating	.50	15. Intelligent	.34
16. Simple	.53	16. Poor planner	.60
17. Repetitive	.38	17. Around when needed	.52
18. Gives a sense of accomplishment	.71	18. Lazy	.58
<u>PRESENT PAY</u>		<u>FELLOW EMPLOYEES</u>	
1. Income Adequate for normal expenses	.60	1. Stimulating	.24
2. Fair	.58	2. Boring	.58
3. Barely live on income	.50	3. Slow	.58
4. Bad	.60	4. Helpful	.55
5. Income provides lux.	.09	5. Stupid	.52
6. Insecure	.50	6. Responsible	.68
7. Less than I deserve	.59	7. Fast	.52
8. Well paid	.54	8. Intelligent	.37
9. Underpaid	.61	9. Easy to make enemies	.46
<u>OPPORTUNITIES FOR PROMOTION</u>		10. Talk too much	.49
1. Good opportunities for promotion	.66	11. Smart	.51
2. Opport. somewhat limit.	.16	12. Lazy	.58
3. Promotion on abilities	.40	13. Unpleasant	.61
4. Dead-end job	.46	14. Gossipy	.49
5. Good chance for promo.	.70	15. Active	.65
6. Unfair promotion policy	.37	16. Narrow interests	.29
7. Infrequent promotions	.49	17. Loyal	.63
8. Regular promotions	.36	18. Stubborn	.06
9. Good chance for promo.	.60		

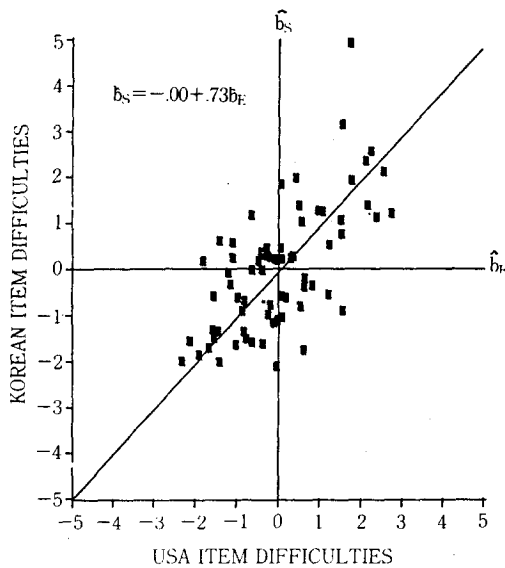


Figure 1. Regression line and scatterplot for regression of Rasch estimated item difficulties for the R-JDI for the Korean and USA samples.

significant, $r(15) = .47, p < .10$.

Item / total (adjusted for the item) correlations were computed for each of the five scales. Eight items in the Korean R-JDI had low item-total correlation (i.e., correlations less than .3). Of these eight items, 5 had been previously identified in the confirmatory factor analysis and of the three remaining, one was in the Supervisor scale ("Asks my advice") and the other two

were in the Coworkers scale ("Stimulating" and "Narrow-interest"). The problem with one item ("stubborn") appeared to be due to a failure in translation and it will be corrected for future work. The remainder of the failures were most likely due sample and/or cultural specific difficulties.

DISCUSSION

The present study shows that the R-JDI subscales appear to be measuring a similar set of constructs in the Korean sample as has been found in the United States. Confirmatory factor analysis provided evidence of a reasonable fit for the oblique five-factor model of the R-JDI, indicating that the five factors were somewhat stable when translated and used in a different language and culture. The IRT results supplied evidence for a moderate degree of item convergence between the two forms. A small number of items were identified by both the confirmatory factor analysis and the IRT analysis as operating differently in the two forms. As with previous studies (e.g. Hulin & Mayer, 1986) the question must be asked as to the origin of the differences that were found; translation procedures or cultural differences or sample differences between the United States and Korea forms.

Table 3. Summary of Relationships Between USA and Korean Item Rasch Difficulties for R-JDI Sub-Scales and Total

SCALE	ORIGINAL	REVISED	ITEM(S) DROPPED
1. The Work You Do	.36	.58**	#11 Triring #15 Frustrating
2. Present Pay	.69**	---	---
3. Opportunities for Promotion	.52	.86***	#9 Fairly good chance for promotion
4. Your Supervisor	.33	.55**	#15 Intelligent
5. Fellow Employees	.35	.47*	#8 Intelligent
6. Total R-JDI	.66***	---	---

* $p < .10$, ** $p < .05$, *** $p < .01$

In general, the Korean version of the R-JDI appears to approximate the five factors found in English speaking samples. The difficulties that were found appear to be the result of cultural and/or specific sample issues and are not unrelated to similar problems found in the English version. The use of five factors for future work with the Korean R-JDI would appear to be warranted.

The various problems identified with several items in the R-JDI would also appear to have multiple sources. A translation problem appears to be the most logical explanation for the problem with the word "Stubborn" and the item has been revised for a future form. The difficulties with the remaining problem items can most likely be attributed to either cross-cultural differences and/or sample specific issues-(subcultures). The Korean sample was a mixture of manufacturing workers and their managers. The JDI has been developed and the factor structure determined on a people from a broad spectrum of U.S. workers. In addition, the USA sample used in the IRT analysis was primarily composed of research and development staff and their support people.

Problems with items like "income provides luxuries" and "asks my advice" would seem to have their origin in difference between the Korean and U.S. cultures. Although Korea has a rapidly growing economy, the level of salary for most employees still is not sufficient to provide them "luxuries" and they are, thus, unlikely to endorse this item. Problems with items like "asks my advice" would appear to result from the authoritarian culture of Korea, which would not support supervisors asking their subordinates for advice.

Conversely, the remaining difficulties would seem to be due to sample specific problems(e.g., "opportunities somewhat limited," "intelligent," etc.). Future work will need to use similar samples from each

culture before any complete answer can be found. The sample specific problems may have also contributed to the moderate levels of fit found in the items. The major comparison results have tended to use bilingual subjects(e.g., Hulin, et al., 1982) and, thereby, these studies exclude any sample specific variance.

Several suggestions for future research derive from the present study. First, since the sample was taken from one Korean company in this study, the generalizability of the results to other Korean workers may be limited. Future study should be conducted with samples from other Korean organizations to ensure the factor structure and item characteristics of the Korean version of the R-JDI. Second, since much of the previous research concerning the generalizability of the factor structure of the English form of the R-JDI did not use confirmatory factor analysis procedures, more meaningful comparisons with the current research could not be made. Future research focusing on the stability of the factor structure needs to use this technique to eliminate some alternative explanation for some of the problems noted.

The present study has shown that the R-JDI scales appeared to be generalizable to the Korean sample. While cross cultural and sample specific differences between the Korean and the United States samples were more likely to be a plausible explanation for some of the differences found in the factor structure, the overall similarities were greater than the differences between the two forms. The findings do hint at the presence of a Korean "work ethic" that may be different than that found in the United States. This different work ethic may result from religious differences(Confucianism in Korea) and/or basic social and educational processes. Future work needs to be directed at exploring these issues.

In conclusion, this study provides empirical evi-

dence for the generalizability of a job satisfaction measure to a sample in the Korean culture. This provides support for future researchers to begin to utilize the R-JDI in investigations of Korean workers and their organizations. As we move further and further along the path to a truly global economy, the need for this type of research becomes increasingly important. The production and service efforts of many large corporations span international boundaries and help is needed in understanding the impact of their policies and practices upon workers from different cultures and countries.

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직무기술지표(JDI)의 구조타당도 평가

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본 연구의 목적은 Tak과 Downey(1988)의 자료를 재분석하여 한국 종업원을 대상으로 R-JDI의 구조타당도를 조사하기 위한 것이다. 이 목적을 위해 크게 두 가지의 분석이 행해졌다. 먼저 확인적 요인분석결과 R-JDI의 5가지 요인이 한국 표집에도 적용이 되는 것으로 나타났다. 또한 Rasch의 문항반응이론분석결과 한국 표집에서 얻은 자료와 미국 표집에서 얻은 자료가 적절하게 수렴하는 것으로 밝혀졌다. 이상의 결과가 두 나라 사이의 문화적인 차의 관점에서 논의된다.