The cross-cultural generalizability
of the CRT-RMS to Korean samples

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The Conditional Reasoning Test-Relative Motive Strength (CRT-RMS; James, 1998) has been shown to be a psychometrically reliable and valid approach for measuring motives and biases. The use of this measurement system has yielded significant associations with college student achievement in the US and European contexts, with a magnitude of association which has not been demonstrated with self-report personality tests. This study demonstrates how the utility of the CRT-RMS generalizes to college student samples in Korea based on its association with GPA and its discriminant pattern of associations with self-report measures.

Key words : achievement motivation, Conditional Reasoning Test for Relative Motive Strength, cross-culture, assessment

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Conditional Reasoning Test-Relative Motive Strength (CRT-RMS), introduced by James (1998), is a relatively new methodology to measure individual's cognitive biases with respect to their motive to either achieve or avoid failure. With its psychometrically sound properties and its uniqueness in terms of measuring implicit personality, the CRT has been praised by numerous researchers as "psychometrically sound" (Hollenback, cited in Morgeson, Campion, Dipboye, Hollenbeck, Murphy, & Schmitt, 2007, p.718), and as "a model for psychometric, conceptual, and theory-based implicit association measurement" (Landy, 2008 p.390). On the other hand, since relatively little attention has been directed towards samples with different cultural backgrounds, its validity without a restricted sample has been questioned (Ones,

Dilchert, Viswesvaran, & Judge, 2007). Thus, a cross-cultural study of the CRT-RMS was conducted in order to explore its external validity.

The CRT-RMS was developed based on the idea that people, in their daily lives, act according to what they believe is right or think is appropriate. This judgment, belief, or idea is not the same for everybody when they are dealing with demanding tasks. James (1998) has identified several reasoning biases that operate during demanding tasks. Each reasoning bias makes the person's actions appear rational and sensible to that person. Biases that achievement motivated individuals use are called "Justification Mechanisms for Achievement Motivation (JM-AM)" while biases that individuals with a motive to avoid failure use are called JMs for

Table 1. Justification Mechanisms for Achievement Motivation

1. Personal responsibility inclination: tendency to favor personal factors such as initiative, intensity, and persistence as the most important causes of performance on demanding tasks.
2. Opportunity inclination: tendency to frame demanding tasks on which success is uncertain as "challenges" that offer "opportunities" to demonstrate present skills, to learn new skills, and to make a contribution.
3. Positive connotation of achievement striving: tendency to associate effort (intensity, persistence) on demanding tasks to "dedication," "concentration," "commitment," and "involvement."
4. Malleability of skills: tendency to assume that the skills necessary to master demanding tasks can, if necessary, be learned or developed via training, practice, and experience.
5. Efficacy of persistence: tendency to assume that continued effort and commitment will overcome obstacles or any initial failures that might occur on a demanding task.
6. Identification with achievers: tendency to empathize with the sense of enthusiasm, intensity, and striving that characterize those who succeed in demanding situations. Selectively focus on positive incentives that accrue from succeeding.

Sources: James, R. L. (1998). Measurement of personality via conditional reasoning. *Organizational Research Methods, 1*, 131-163.

Table 2. Justification Mechanisms for Fear of Failure

1. External attribution inclination: tendency to favor external factors such as lack of resources, situational constraints, intractable material, or biased evaluations as the most important causes of performance on demanding tasks.

2. Liability inclination: tendency to frame demanding tasks as personal liabilities or "threats" because one may fail and be seen as incompetent. Perhaps of threat are euphemistically expressed in terms of such as risky, costly, or venturesome.

3. Negative connotation of achievement striving: tendency to frame effort (intensity, persistence) on demanding tasks as "overloading" or "stressful." Perseverance on demanding tasks after encountering setbacks or obstacles is associated with "compulsiveness" and "lack of self-discipline."

4. Fixed skills: tendency to assume that problem-solving skills are fixed and cannot be enhanced by experience, training, or dedication to learning. Thus, if one is deficient in a skill, then one should not attempt demanding tasks or should withdraw if one encounters initial failures.

5. Leveling: tendency to discount a culturally valent but, for the reasoned, a psychologically hazardous event (e.g., approaching demanding situations) by associating that event with a dysfunctional and aversive outcome (e.g., cardiovascular disease).

6. Identification with failures: tendency to empathize with the fear and anxiety of those who fail in demanding situation. Selectively focus on negative outcomes that accrue from failing.

7. Indirect compensation: an attempt to increase the logical appeal of replacing a threatening situation with a compensatory (i.e., less threatening) situation by imbuing the less threatening situation with positive, socially desirable qualities.

8. Self-handicapping: an attempt to deflect explanations for failure away from incompetence in favor of self-induced impairments such as not really trying or not being prepared (e.g, defensive lack of effort)

Sources: James, R. L. (1998). Measurement of personality via conditional reasoning. *Organizational Research Methods, 1,* 131-163.

Fear of Failure (JM-FF)" (see Tables 1 and 2).

These biases, or JMs, may not sound logical or reasonable to a person who does not possess them. More interestingly, these biases are implicit, and as a result achievement-motivated or failure-avoidant individuals unconsciously rationalize their actions and beliefs using these JMs. This implicit achievement motivation measured by the CRT-RMS shows promising validities in predicting achievement, such as the

United States Navy SEALS Basic Underwater Demolition/Seals (BUD/S) training outcomes (r=.31) and undergraduate course grades (r=.32) (James, 1998). Also, again with U.S. samples, it has been shown that implicit and explicit measures tend to lack a significant association with each other and predict different behaviors (Frost, Ko, & James, 2006). This differential association is referred to as the "dissociative model." That is, an implicit measure assessing a

specific construct (e.g., relative motive strength) is not expected to be associated with scores on a self-report measure assessing a theoretically similar construct (e.g., a self-report achievement motivation test). Moreover, the two tests often predict different criteria.

While the CRT-RMS shows significant results with the U.S. samples it has not been validated with Asians, yet. In addition, although cross-cultural studies on implicit personality measures are very limited, implicit personality theory provides significantly meaningful information beyond what explicit personality measurements can explain about individual behaviors. For example, implicit and explicit measures of self-esteem demonstrate different results in different cultures. According to the literature, East Asians showed significantly low explicit self-esteem as compared to Westerners (Schmitt & Allik, 2005), whereas their implicitly measured self-esteem were about the same level as that of Americans (Kobayashi & Greenwald, 2003). Therefore, it is worthwhile to explore the utility of the CRT-RMS with samples from another country and investigate its discriminant validity through the dissociation of implicit and explicit measures.

Among Asian countries where the CRT-RMS has not been validated, Korea is selected as Korean students tend to show higher achievement in international student assessments, such as the Program for International Student Assessment (PISA; OECD, 2004) and The

Trends in International Mathematics and Science Study (TIMSS; Leung, 2002). Although objective test scores show that Koreans tend to outperform their Western counterparts, a personality approach to explain this phenomenon is lacking. More importantly, comparisons of the achievement motivation levels of Koreans and Americans should be based on a type of measure that adds to explicit measures. An important reason for this is related to significant methodological problems which arise from attempting to compare students' motives using self-report measures across cultures. The Reference Group Effect (RGE), which refers to "the tendency for people to respond to subjective self-report items by comparing themselves with implicit standards from their culture (Hein, Lenhman, Peng, & Greenholtz, 2002)" is observed when researchers use aggregated data (Hein, Buchtel, & Norenzaya, 2008). Therefore, validated implicit personality measures across countries may provide significant information to understand personality where the explicit personality measures are misleading.

The purpose of this study is validating the CRT-RMS with Koreans by demonstrating its association with Korean college student's GPA and its discriminant validity with self-report measures. Cross-cultural psychologists often assert a belief in the consistency of personality traits across countries (Church & Loner, 1998; Paunonen & Ashton, 1998) and those traits explain human behaviors universally (McCrae,

2000). Therefore, we expect that the justification processes used in solving the CRT-RMS items will be universal across countries.

The specific study hypotheses for the Korean sample were: 1) We expect a significant positive correlation between the CRT-RMS Korean version and objectively obtained GPA; and 2) Based on the dissociative model, we expect that the self-report achievement motivation tests will be significantly correlated with each other but not with the CRT-RMS Korean version and not with objectively obtained GPA.

Method

Participants

Two hundred and thirteen Korean college students enrolled in three different universities' psychology courses (about 80 students from each school) participated in the study. One school was located in "S" city in Korea, and two were located in a suburb. Participants who did not yet have a GPA and those who endorsed more than three illogical responses on the test were excluded from data analysis, leaving 188 cases in the sample. Mean age was 22 and 25% were males. There was a high proportion of women as one of the schools from which participants were recruited was a women's university. Of the participants, 69.5% were from a psychology department.

Procedure

Upon receiving approval from the instructors in each university, students completed the CRT-RMS test and a biographical information form in a classroom. Their cumulative GPA for previous years were obtained by self-report and also from objective records in the academic system.

Measures Implicit achievement motivation and fear of failure

Implicit achievement motivation was measured using the CRT-RMS (James, 1998). It consists of sixteen reasoning items with one bogus item. For each item, premises and a reasoning task are followed by four possible solutions (alternatives). The alternatives are indicative of achievement motivation, fear of failure, and illogical responses. People who endorse achievement motivation alternative are scored +1, fear of failure alternative are scored -1, and the rest of the responses (i.e., illogical alternatives) are scored 0. High scores on the scoring system indicate a high motive to achieve and low scores indicate a high motive to avoid failure. To be seemed as a logical reasoning test, three bogus items were included. The items do not have AM or FF alternatives. Following the CRT-RMS manual, respondents who endorsed more than three illogical responses were dropped from further analysis. This is because the illogical responses are so clearly wrong that no

one who is taking the test should select one of them.

CRT-RMS translation process

We first did a back-translation of the CRT-RMS, which is the most popular translation process and has been shown to be successful since the 1960's (Fink, 1963; Sinaiko, 1963; Werner & Campbell, 1970). To have a more accurate translation process, we used the bilingual technique (Prince & Mombour, 1967), which targeted people who speak both English and Korean. This method has been suggested as a way to check the accuracy and adequacy of a translated measure (Butcher, 1996) with good test-retest reliabilities for Korean-English speakers (e.g., Chug, Weed, & Han, 2006).

A native Korean speaker, who is familiar with the measures, translated the original measure into Korean. Then, in order to test bilingual test-retest reliability, 16 Korean graduate students who were attending schools in the United States were asked to complete both of the Korean and English versions of the CRT-RMS. Half of the participants were asked to complete the Korean CRT-RMS first, and a week later they were asked to complete the English CRT-RMS. The other half of the group was asked to do the same in the reverse order. Next, we compared their responses on both measures and resolved any discrepancies, by changing words in the Korean CRT-RMS. Once the Korean CRT-RMS was completed, we asked a third person, who had never seen the English CRT-RMS measure before and was blind to the purpose of the study, to back-translate it into English. Finally, we asked a native English speaking psychology student who is familiar with the CRT-RMS to check if the meaning of original version of the CRT-RMS and the back-translated version are equivalent and any discrepancies were resolved.

Self-report measures

To measure self-reported motive to achieve we used Helmreich and Spence's (1978) Work and Family Orientation Questionnaire (WOFO), and the NEO Achievement Motivation (NEO-AM) facet of the Conscientiousness factor (Costa & McCrae, 1992). We used Sarason's (1978) Test Anxiety Scale (TA) as an indicator of self-reported motive of fear of failure. These measures were translated into Korean using the back-translation technique.

Results

Item level analysis shows that four items from the CRT-RMS are likely not appropriate to Korean samples. One item requires knowledge about the U.S. school system, on two items more than half of the respondents endorsed illogical responses, and on one item 97% of participants endorsed the fear of failure response. Therefore, these four items were excluded from

further analysis.

The internal consistency of the CRT-RMS Korean version was measured using the Kuder-Richardson (Formula 20). The reliability was 0.60. This coefficient, which is lower than that of the English CRT-RMS (KR = .85), could be due to the reduced number of items in the measure (11 reduced from 15). The CRT-RMS scores with Koreans ranged between -5 and 11 out of a possible range of -11 and +11 which is comparable to the U.S. samples' scores ranging between -7 and 13. A negatively skewed distribution was expected as the samples are drawn from selective colleges. The means core of the Korean CRT-RMS is 4.68 and there is a significant mean score difference between one school and the other two schools. The students from the most competitive and selective program received significantly higher scores than the students from the other two schools (F(2,185)=8.53, p<.01). This was also anticipated as students in more selective colleges tend to have higher achievement motivation than

students in less selective colleges.

As expected, total score of the Korean CRT-RMS shows a significant positive correlation with Korean college student's GPA (r=.176, p<.05) (see Table 4). A priori power analysis showed 200 participants would be large enough to reach a power of .80 with a previous study effect size of .40. However, since the effect size of this study is low, the power is lower than was expected at .68. Gulliksen's (1958) formular for the effect of test length on validity showed that if the number of items is tripled then the validity would be .20 and the power would reach to an acceptable level of .80. To investigate discriminant validity we looked at the associations between the Korean CRT-RMS and the self-report measures of WOFO, NEO-AM or TA. We found no significant correlations. This result supports previous studies showing that the CRT-RMS is not associated with the self-report counterparts. Although two self-report measures of achievement motivation, WOFO and NEO-AM, are highly correlated with each other

Table 3. Descriptive Statistics

	n	M	SD
Age	185	22.24	2.99
GPA from School Record	152	3.59	.43
Self-Reported GPA	186	3.47	.51
CRT-RMS Korean version	188	3.73	2.84
Work and Family Orientation	186	65.92	7.97
Test Anxiety	186	56.16	7.80
NEO-Achievement Motivation	186	25.25	5.01

Table 4. Correlation between CRT-RMS, GPA and self-report measures

	GPA from School Record	Self-Reported GPA	CRT-RMS Korean version	Work and Family Orientation	Test Anxiety	NEO-Achievement Motivation
GPA from School Record	1					
Self-Reported GPA	.867**	1				
CRT-RMS Korean version	.177*	.101	(.57)			
Work and Family Orientation	.081	.130	-.069	(.63)		
Test Anxiety	-.120	.039	-.132	-.037	(.75)	
NEO-Achievement Motivation	.098	.227**	-.031	.581**	.006	(.83)

Note. *p<.05, **p<.01. Numbers in parentheses are reliabilities.

(r=.581, p<.01), these two did not correlate with the implicit measure of relative motive strength. As the next step, the dissociative model is tested. First of all, the Korean CRT-RMS score is significantly associated with GPA school records but not with self-reported GPA. Interestingly enough, none of the self-report measures have a significant relationship with objectively obtained GPA. But the NEO-AM is significant in predicting self-reported GPA (r=.227, p<.01). The result is consistent with the previous studies that self-reported test is significantly associated with self-reported behaviors or criteria (Forst, Ko, & James, 2007). A t-test for dependent correlations was used to determine whether or not the two correlations

are significantly different (Steiger, 1980). In other words, the correlation between the CRT-RMS and objective GPA is significantly different from the correlation between the NEO-AM and self-reported GPA. The CRT-RMS and WOFO, NEO-AM, or TA, predict significantly different behaviors (i.e., self-reported behaviors or objective behaviors) in terms of predicting objective college GPA (t(185) = -7.18, p<.05, t(185) = .68, p<.05, and t(185) = 2.72, p<.05, respectively).

Discussion

One of the strengths of the CRT-RMS is that it does not allow faking or responses that are

simply socially acceptable (LeBreton, Barksdale, Robin, & James, 2007; Motowidlo, Hooper, Jackson, 2006) while self-reported measures do (Cook, 1993; Hogan, Hogan, & Roberts, 1996). Therefore, when researchers and practitioners use self-report measures, they find that socially desirable responses are not valid for assessing one's personality. The present study introduces the CRT to Korean population for the first time and attempts to explore external and discriminant validity of the CRT-RMS with Korean college students. First of all, the CRT-RMS is a valid measure of achievement motivation within the Korean sample as it shows a significant association with objective college GPA. The most important finding in this study is that although in Korea most of the research in the field of achievement is conducted with self-report measures (e.g., Chang & Lee, 1994) none of the self-report measures of achievement motivation predicted objective college GPA. On the other hand, the NEO-AM did predict only self-report GPA while the CRT-RMS did not predict self-reported GPA. This result is along the same line of previous research which suggests that explicit and implicit measures predict behavior differentially, which is the basis of the dissociative model. Not only the U.S. samples but also Korean samples support the dissociative model.

The internationally best selling book "The World is Flat" by Friedman emphasized outsourcing as the world gets flatter. To hire people from outside of the U.S., a global selection measure is essential. Furthermore, a number of previous studies question the self-report measures for their accuracy (Greenwald & Farnham, 2000), precision when comparing conscientiousness across countries (Hein, Buchtel, & Norenzayan 2008), and their usefulness in understanding cultural differences between countries (Chen, 2008). Thus, in addition to self-report measures of personality, a more valid and reliable measure of personality is needed. In this sense, the CRT-RMS, implicit personality measure, which shows promising validities with samples from outside of the U.S. will definitely contribute to the selection processes, in addition to the self-report measures as a selection tool.

This study explored novel findings but has some limitations. First, the sample size was relatively small for a cross-cultural study. Final sample sizes for both Korean and American were less than 200, therefore it may be hard to generalize the results. Second, no cognitive ability measures were available. Therefore, it is unknown whether the motivation has an incremental predictive validity over cognitive abilities in the prediction of college GPA in Korea. The U.S. and European samples showed that the CRT-RMS has an incremental predictive validity above and beyond college admission exam in predicting college GPA. As college admission systems are often changed in Korea, some students were required to take colleges admission tests while some students were

accepted just with sufficient high school GPA without taking any college entrance exams. In addition, total possible points for college entrance exam varied depending on the year of highschool graduation. Therefore, any objective cognitive measures were not available for this sample. Third, we did not investigate reasons as to why four CRT-RMS items did not work with Korean samples. A 97% endorsement of the fear of failure response alternative was unexpected, and more than half of respondents chose alternatives that were not expected to choose. It should be further investigated whether this is a result of problems from the translation process or due to differences in cultural biases. In any event, the Korean version of the CRT-RMS needs to be augmented with new items to evaluate its reliability and perhaps its validity.

For future studies, it will be interesting to compare differences in mean scores of implicit and explicit measures. Cross-cultural studies on self-esteem show different results between implicit and explicit measures, therefore U.S. samples ' self-report achievement motivation level maybe higher than that of Koreans, while Koreans' implicit level of achievement motivation can be higher than that of the U.S. samples, or vice versa. Also, another future direction is analyzing the structure invariance of implicit and explicit measures across cultures. This may show exciting results whether both measures are invariant across countries, or just one of them is invariant or none of them are. Cross-cultural study of implicit personality is a promising area that will increase our understanding of personality.

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성취동기를 측정하는 조건추론검사의
비교문화적 일반화가능성 연구:
한국 대학생들을 대상으로

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조건추론검사-상대동기강도(CRT-RMS; James, 1998)는 성취동기의 측정을 위해 미국에서 새롭게 개발된 암묵적 측정도구이다. CRT-RMS는 여러 심리측정적 연구들을 통해 학생의 학업성적과 성취동기를 측정하는데 있어서 높은 타당도와 신뢰도를 보여주었다. 미국과 유럽 대학생을 상대로 한 연구에서 학업성적은 CRT-RMS에서의 성취동기 점수와 유의미한 관계를 보였다. 본 연구의 목적은 미국에서 개발된 CRT-RMS를 한국 문화에 맞게 개발하고, 한국 대학생들의 학업성적과 CRT-RMS 및 자기보고형 성취동기 측정치와의 관계를 규명하는데 있었다. 한국 대학생 188명을 대상으로 연구한 결과, CRT-RMS와 자기보고형 검사는 객관적으로 수집한 학점과 자기보고에 의한 학점 간에 상이한 관련성을 보였다. 즉, CRT-RMS에 의한 성취동기는 객관적으로 얻은 학점과 유의미한 관계를 보였지만, 자기보고를 통한 성취동기는 자기보고에 의한 학점과 유의미한 관계를 보였다. 한국에서 개발된 CRT-RMS가 대학생들의 학업성적 뿐만 아니라 다른 다양한 변인과의 새로운 관계를 밝힐 수 있을 가능성에 대해 논의하였다.

주요어 : 성취동기, 조건추론검사, 비교문화, 암묵적 측정치