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Evidence for the role of the General Factor of Personality (GFP) in enculturation: The GFP and self-construal in Japanese and American samples

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ABSTRACT

Data from Midlife in the United States (MIDUS) studies, one with American participants and one with Japanese participants, were used to test the hypothesis that the General Factor of Personality (GFP) is positively associated with enculturation. To this end, the relationships between the GFP and independent self-construal and interdependent self-construal were examined. Consistent with the hypothesis, the results showed that an independent self-construal was more closely associated with the GFP in the American sample.

1. Introduction

Just as there appeared to be movement toward a consensus amongst researchers in individual differences in personality that the structure of personality could be conceptualized as having five traits (i.e., the Big Five of openness, conscientiousness, extraversion, agreeableness, and neuroticism) sitting atop of an organizational hierarchy, recent findings have suggested that the Big Five are not at the apex. The Big Five are correlated, which suggests that higher-order constructs sit above the Big Five. It was first suggested that there are two higher-order factors (Digman, 1997) and subsequently that there is one general factor at the top of the hierarchy (Musek, 2007). The highest order factor is now most commonly referred to as the General Factor of Personality (GFP).

The debate surrounding the existence and substance of the GFP has been especially active with a large number of recently published articles suggesting that the GFP represents something meaningful and important (e.g., Rushton & Irwing, 2011) with the counter position being that the GFP is a statistical artifact and does not reflect meaningful individual differences, but something akin to a response bias reflecting social desirability (e.g., Ashton, Lee, Goldberg, & de Vries, 2009; Bäckström, Björklund, & Larsson, 2009). To counter the counter argument against the meaningfulness of the GFP, it can be said that the ability to recognize and follow ascribed socially acceptable behaviors is in itself meaningful.

Indeed, there is evidence that the GFP may reflect social effectiveness and emotional intelligence (Rushton, Bons, & Hur, 2008). In computing the GFP from multiple scales Loehlin (2012) found that scales reflecting social effectiveness such as sociability, empathy, and adjustment had the highest loadings and that the GFP was associated with friendliness, communication, and creativity. Similar results are found when looking at individual items; items reflecting social effectiveness have the strongest loadings on the GFP (Loehlin & Martin, 2011). Likewise, van der Linden, te Nijenhuis, and Bakker (2010) and van der Linden, Scholte, Cilliessen, te Nijenhuis, and Segers (2010) found that the GFP was associated with others' ratings; ratings that reflect aspects of social functioning. van der Linden, te Nijenhuis, et al. (2010) found that the GFP was a predictor of supervisors' ratings of employee job performance. In a sample of adolescents, van der Linden, Scholte, et al. (2010) found that the GFP was associated with peers' ratings of likeability and perceived popularity. Most recently van der Linden, Tsaousis, and Petrides (2012) found that GFPs, utilizing two personality scales and multiple methods for extracting GFPs from the measures, were quite strongly associated with emotional intelligence with an average correlation of $r = .72$.

Following the line of thought that the GFP reflects the ability to successfully navigate the social world leads to the hypothesis that cultural differences in the normative expectations of behavior should be reflected in associations of these expectations with the GFP. More simply put, the GFP should be positively associated with enculturation. This leads to the prediction that interactions between the GFP and culture are expected where the ascribed normative expectations differ between cultures. One such differ-

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ence is between Eastern and Western cultural expectations concerning the relationship between self and others (Markus & Kitayama, 1991).

1.1. Self-construal

The concept of self-construal as introduced by Markus and Kitayama (1991) refers to one's self-definition especially in relation to others. Markus and Kitayama (1991) differentiated between an independent and an interdependent self-construal and posited that significant differences between cultures in the use of the different types of self-construal would emerge. Independent self-construals define the self as separate and autonomous from others. Interdependent self-construals define the self as interconnected and associated with others. Cultures that are more individualistic are thought to promote independent self-construals and cultures that are collectivist are thought to promote interdependent self-construals with the quintessential difference seen in the United States' promotion of independent self-construals in comparison to Japan's promotion of interdependent self-construals (Cross, Hardin, & Gercek-Swing, 2011). It follows that given the hypothesized relationship between the GFP and enculturation that the GFP should be positively associated with the independent self-construal in the United States and the GFP should be positively associated with interdependent self-construal in Japan. However, an addendum needs to be added to this prediction.

The main effect of culture on self-construal is often not found (Cross et al., 2011; Matsumoto, 1999). In fact it has been found that samples from the West score higher on interdependent self-construal than samples from the East (Essau et al., 2011), and samples from the East score higher on independent self-construal than samples from the West (Lu et al., 2001) leading to the understanding that the two types of self-construal do not represent opposite poles and that individuals can be low or high in both independent and interdependent self-construal (Levinson, Langer, & Rodebaugh, 2011). Thus the balance between the two types of self-construal may be important. This leads to the prediction that the balance between independent and interdependent self-construal should be associated with the GFP so that the balance of favoritism for an independent self-construal should be more strongly linked to the GFP in a sample from the United States in comparison to a sample from Japan.

2. Method

2.1. Description of samples

The initial data for the Midlife in the United States (MIDUS) study was collected in 1995–96. Metropolitan areas, siblings, and twin pairs were over sampled. A follow-up (MIDUS-II) with the same sample was conducted in 2004–06. Additionally, to include more African Americans, a supplemental group of African Americans from Milwaukee was added. The total sample size for the MIDUS-II data was 4963. The age range was from 28 to 84 years ($M = 55.43$, $SD = 12.45$). The sample was 52% female and just over 90% White. The MIDUS-II sample was administered the three-item measures of independent and interdependent self-construal.

A subsample of the 1255 participants from the overall MIDUS-II sample was included in the Biomarker Project. Included in the Biomarker Project were additional items measuring independent and interdependent self-construal. These additional items comprise the seven-item measure of independent self-construal and the ten-item measure of interdependent self-construal.

In 2008 a comparison sample of middle-aged Japanese adults was obtained. Many of the same psychological variables measured in the MIDUS-II data set were measured in the Japanese data set, including the measures of independent and interdependent self-construal. The sample ($N = 1027$) included adults from 30 to 79 years of age ($M = 54.36$, $SD = 14.15$). The sample was 50.8% female. Original MIDUS scale items were translated and then back translated by native Japanese speakers (Park et al., 2013).

2.2. Description of the measures

GFP. The Big Five were measured in each sample by having participants rate the self-descriptiveness of adjectives using a four point Likert-type scale. Openness included seven items (e.g., creative), conscientiousness included five items (e.g., thorough), extraversion included five items (e.g., outgoing), agreeableness included five items (e.g., helpful), and neuroticism included four items (e.g., moody). The internal consistencies of the scales for each sample were as follows: openness (American, $\alpha = .77$; Japanese, $\alpha = .84$), conscientiousness (American, $\alpha = .68$; Japanese, $\alpha = .67$), extraversion (American, $\alpha = .76$; Japanese, $\alpha = .83$), agreeableness (American, $\alpha = .80$; Japanese, $\alpha = .87$), neuroticism (American, $\alpha = .74$; Japanese, $\alpha = .51$).

Initially, two methods were used to compute the GFP. In order to construct a comparable apples-to-apples measure of the GFP across samples the weights for each trait score from the meta-analysis by van der Linden, te Nijenhuis, et al. (2010) were used. For the present analysis, the raw scores for the Big Five were transformed to *z*-scores, multiplied by the weights, and then summed. Secondly, Principal Components Analysis (PCA) was used to compute GFPs for the American and Japanese samples separately. The first unrotated component was used as the GFP with both samples. In the American sample the first unrotated component had an Eigenvalue of 2.24 and accounted for 44.89% of the variance in the Big Five. In the Japanese sample the first unrotated component had an Eigenvalue of 2.68 and accounted for 53.58% of the variance in the Big Five.

For the American sample, the GFP using the weights from the meta-analysis correlated with the GFP using PCA $r = .98$. For the Japanese sample, the GFP using the weights from the meta-analysis correlated with the GFP using PCA $r = .97$. Due to the high correlations the different methods for computing the GFP were deemed redundant and for the sake of simplicity only the GFPs computed using the weights from the meta-analysis were examined.

2.3. Self-construal

The three-item measures of self-construal had the drawback of being narrow in scope and low in internal consistency (see Table 1 for reliabilities of the self-construal measures), but the advantage of being administered to a larger and more representative American sample. The seven-item and ten-item measures of self-construal had the benefit of more broadly measuring the self-construal constructs and having higher reliabilities, but of being administered to a smaller and less representative American sample. For these reasons both the shorter and longer version of the measures were analyzed.

A sample item of independent self-construal is, "I act in the same way no matter who I am with", while a sample item of interdependent self-construal is, "It is important to listen to others' opinions." In addition to the scales' internal consistencies, the correlations among self-construal scales for the Americans and Japanese can be seen in Table 1. The correlations both between (independent and interdependent) and within self-construal type (e.g., three-item and seven-item measures of independent self-construal) are stronger in the Japanese sample.

Table 1
Internal consistencies and bivariate correlations among self-construal measures for American and Japanese Samples.

Self-construal	American					Japanese				
	α	1	2	3	4	α	1	2	3	4
1. Interdependent (3-item)	.37	–				.49	–			
2. Independent (3-item)	.27	.01	–			.54	.39*	–		
3. Interdependent (7-item)	.69	.26*	.05	–		.69	.58*	.37*	–	
4. Independent (10-item)	.67	−.04	.31*	.26*	–	.66	.34*	.62*	.40*	–

Note. *$p < .001$.

3. Results

3.1. Analyses for the three-item measures

The descriptive statistics for the three-item measures of self-construal can be seen in Table 2. The means show the expected trend in that for the American sample the means for the independent self-construal are higher than the means for interdependent self-construal, $t\,(4016) = 21.54$, $p < .001$, while the opposite trend is witnessed in the Japanese sample, $t\,(1021) = 6.88$, $p < .001$.

The bivariate correlations for the three-item measures can be seen in Table 2. For the American sample, independent self-construal was positively correlated with the GFP and each of the Big Five in the direction consistent with the make-up of the GFPs. Independent self-construal was negatively correlated with neuroticism and positively correlated to openness, conscientiousness, extraversion, and agreeableness. For the American sample the GFP was not correlated with interdependent self-construal. The correlations between interdependent self-construal and the Big Five reveal a positive correlation with agreeableness and neuroticism, and a negative correlation with openness.

For the Japanese sample, independent self-construal was positively correlated with the GFP and each of the Big Five in the direction consistent with the make-up of the GFP. The GFP was negatively correlated with neuroticism and positively correlated with openness, conscientiousness, extraversion, and agreeableness. However, diverging from the American sample the same pattern is seen with interdependent self-construal. Interdependent self-construal is positively correlated with the GFP and the Big Five of openness, agreeableness, extraversion, and conscientiousness, and negatively correlated with neuroticism.

Next, difference scores were computed by subtracting participants' interdependent self-construal score from their independent self-construal score. This supplies an indication of the degree of preference for the independent self-construal over the interdependent self-construal. For the American sample the correlation between the GFP and this difference score was $r\,(3959) = .22$. For the Japanese sample the correlation between the GFP and the difference score was $r\,(1015) = .11$. The magnitude of the correlations was significantly different, $z = 3.21$, $p < .001$, one-tailed test.

3.2. Analyses for the seven and ten-item measures

The descriptive statistics for the seven and ten-item measures of self-construal can be seen in Table 3. The means show the expected trend, for the American sample the means for independent self-construal were higher than the means for interdependent self-construal, but the difference was not significant, $t\,(1248) = 1.05$, $p > .05$. The opposite trend was witnessed in the Japanese sample and was significant, $t\,(1018) = 3.39$, $p = .001$.

The bivariate correlations for the measures can also be seen in Table 3. For the American sample, independent self-construal was positively correlated with the GFP and significantly correlated with each of the Big Five in the direction consistent with the make-up of the GFP. The same trend was seen with interdependent self-construal minus its correlation with openness. For the Japanese sample, independent and interdependent self-construal were both positively correlated with the GFP and correlated with each of the Big Five in the direction consistent with the make-up of the GFP.

Next, difference scores were computed by subtracting participants' interdependent self-construal score from their independent self-construal score. The correlation between the GFP and difference scores for the American sample was $r\,(1043) = .27$ for the seven-item measure. The correlation between the GFP and difference score for the Japanese sample was, $r\,(1015) = .14$ for the ten-item measures. The magnitude of the correlations was significantly different, $z = 3.08$, $p < .001$, one-tailed test.

3.3. Relative importance of the GFP

To examine the importance of the GFP in comparison to the unique variance of the Big Five in accounting for the self-construal, the R^2 between the GFP and measures of self-construal were compared with the total R^2 in regression analysis in which each of the Big Five were regressed simultaneously on the different measures of self-construal and the difference scores. The difference in the amount of variance accounted for between the R^2 for the GFP and total R^2 for the Big Five is the amount of variance in self-construal accounted for by the unique variance of the Big Five. Comparisons across samples allows for an examination of the expected cross-cultural differences. Results can be seen in Table 4.

Table 2
Bivariate correlations between personality and self-construal (three-item) for Americans and Japanese samples.

Variable	American		Japanese	
	Independent *M* = 5.25 *SD* = 1.07	Interdependent *M* = 4.72 *SD* = 1.13	Independent *M* = 4.83 *SD* = .91	Interdependent *M* = 5.04 *SD* = .85
GFP	.32*	.00	.38*	.28*
Openness	.29*	−.05*	.43*	.19*
Conscientiousness	.17*	−.02	.19*	.14*
Extraversion	.29*	.03	.34*	.25*
Agreeableness	.20*	.12*	.33*	.31*
Neuroticism	−.14*	.07*	−.10*	−.09*

Note. *$p < .01$, two-tailed.

Table 3
Bivariate correlations between personality and self-construal (seven-item and ten-item) for Americans and Japanese samples.

Variable	American		Japanese	
	Independent *M* = 5.20 *SD* = .82	Interdependent *M* = 5.17 *SD* = .66	Independent *M* = 4.66 *SD* = .76	Interdependent *M* = 4.75 *SD* = .67
GFP	.43*	.17*	.39*	.28*
Openness	.48*	−.01*	.47*	.18*
Conscientiousness	.22*	.12*	.22*	.21*
Extraversion	.37*	.11*	.40*	.22*
Agreeableness	.16*	.23*	.36*	.31*
Neuroticism	−.24*	−.07*	−.10*	−.09*

Note. *$p < .01$, two-tailed.

Table 4
variance accounted for in self-construal by the GFP relative to the Big Five.

Variable	American		Japanese	
	GFP	Big Five	GFP	Big Five
Three-item measures				
Independent	R^2 = .10	R^2 = .12 (83%)	R^2 = .15	R^2 = .20 (75%)
Interdependent	R^2 = .00	R^2 = .03 (0%)	R^2 = .08	R^2 = .10 (80%)
Difference	R^2 = .05	R^2 = .07 (71%)	R^2 = .01	R^2 = .07 (14%)
Seven-item and ten-item measures				
Independent	R^2 = .19	R^2 = .28 (68%)	R^2 = .15	R^2 = .21 (71%)
Interdependent	R^2 = .03	R^2 = .07 (43%)	R^2 = .08	R^2 = .09 (89%)
Difference	R^2 = .07	R^2 = .23 (30%)	R^2 = .02	R^2 = .11 (18%)

Note. The percentile in parentheses represents the amount of variance accounted for by the Big Five that is attributable to the GFP.

Comparing the percentage of variance explained by the GFP and the Big Five in independent self-construal and interdependent self-construal in the two samples shows that the GFP explains more variance (relative to the Big Five) in independent self-construal compared to interdependent self-construal for the American sample while the opposite trend is seen in the Japanese sample. This is most clearly seen in interdependent self-construal. For the three-item measure, in the American sample, the GFP accounts for zero percent of the variance accounted for by the Big Five while for the Japanese sample the GFP accounts for 80% of the variance accounted for by the Big Five. For the ten-item measure, in the American sample, the GFP accounts for 43% of the variance accounted for by the Big Five while for the Japanese sample the GFP accounts for 89% of the variance accounted for by the Big Five. There is one notable exception, for the seven-item independent self-construal measure the GFP accounted for a greater percentage of the Big Five variance in the Japanese sample. However, the general pattern is reiterated in the difference scores associations. The differences scores represent the degree of preference for independent self-construal relative to interdependent self-construal. This difference is more strongly associated with the GFP, relative to the Big Five, in the American sample.

4. Discussion

It was proposed that individuals who score higher on the GFP would be more likely to be enculturated, adopting the normative orientation of their host cultures. Thus, it follows that because American culture has been found to promote a view of the self as independent from others and Japanese culture has been found to promote views of the self as interdependent with others that the GFP should be associated with these cultural differences in self-construal.

Although not all of the outcomes were in line with the expected trend, the results generally supported this hypothesis. With the three-item measures for the American sample it was found that an independent, but not interdependent, self-construal was positively correlated to the GFP. On the other hand, when the relationship between self-construal and personality was examined in the Japanese sample it was found that the GFP was positively correlated to both the independent and interdependent self-construal. Similar to the findings with the three-item measures, the seven-item measure of independent self-construal was positively correlated with the GFP in both samples. Contrary to the findings with the three-item measures, this was also the case with the ten-item measure of interdependent self-construal. The GFP was positively correlated with interdependent self-construal in each sample.

However, it was proposed that the strength of the correlations between the GFP and interdependent self-construal across the two samples varies so that there is a greater discrepancy between the association between the GFP and independent and interdependent self-construal in the American sample. Ancillary analyses supported this assessment. Difference scores between independent and interdependent self-construal were computed for each sample and correlated with the GFP. The results showed that the difference scores were positively correlated with the GFP for each sample. This suggests that there is a positive association between an independent self-construal and the GFP independent of culture. This could be due to the association of the GFP with self-esteem (Erdle, Irwing, Rushton, & Park, 2010). Along this line, analysis of the data files showed that for each the American and Japanese samples independent self-construal was moderately positively correlated with self-esteem and while interdependent self-construal and self-esteem were positively correlated, they only shared a small amount of variance. However, consistent with hypotheses, the relationship proved stronger in the American sample.

Regression analyses, as indexed by the R^2, were used to test the variance accounted for in self-construal by the GFP and the combined unique variance of the Big Five. The results of these analyses were also in line with the more fine-tuned predicted cross-cultural differences. The relative importance of the GFP to the Big Five varied across culture and type of self-construal. The GFP weighed more heavily for independent self-construal in the American sample and interdependent self-construal with the Japanese sample, with the exception of the seven-item independent self-construal measure. Also, the percentage of variance in the differences scores (which index predilection toward an independent self-construal) accounted for by the GFP (relative to the Big Five) was higher in the American sample.

4.1. Limitations and directions for future research

The primary issue with the current research was the low reliabilities of the self-construal measures, and some of the measures of the Big Five (e.g., neuroticism for the Japanese sample), which is associated with an even broader issue; the reliance upon self-report measures for both self-construal and the GFP. These issues

could be addressed in future research by looking at the cross-cultural relationships between the GFP and other indices of enculturation using a number of scales of enculturation. This should help to address the problem of low reliabilities found in the measures of self-construal used in the current investigation. Future research should also look at socialization within given cultures: Is the GFP associated with the adoption of specific cultural norms and values? The use of objective verifiable behavioral measures may be of key importance.

For example, while it appears that the GFP is not associated with political orientation (Bell, Woodley, Schermer, & Vernon, 2012), based on the results of the current investigation one might expect that broader cultural orientations (e.g., support for representative democracy, acceptance and promotion of the Protestant work ethic, rule of law) to exhibit a positive association with the GFP. Thus the particular candidate an individual votes for may have little association with the GFP, while voting behavior itself as representative of civic engagement may. Bell et al. (2012) found that while political orientation was not related to the GFP, interest in politics was positively correlated with the GFP. Looking at objective verifiable behavior measures like voting and criminal behavior through arrest records is a way in which this could be accomplished.

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