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The Personal Globe Inventory: The Structure of Vocational Interest in Vietnam

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Abstract

The Personal Globe Inventory (PGI) proposes a unified model of vocational interests, integrating Holland's established interest dimensions, with occupational prestige dimensions. The current study evaluates the structural validity of the PGI short form in Vietnam (N =1140). The results of the randomized tests of hypothetical order relations support the inclusion of prestige in the PGI spherical model, as a means to better calibrate the assessment of vocational interest across cultural contexts, specifically to Vietnam. Furthermore the results endorse the application of the abbreviated form of the PGI in a career counseling context as a time-efficient, screening method.

Keywords: Vocational Interest; Personal Global Inventory Short; Spherical Model; Holland's RIASEC; Vietnam.

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The Personal Globe Inventory (PGI) builds on a foundational model for accessing vocational interests within personnel psychology namely Holland's model, a model which has become the prevalent tool for gauging vocational interest across national work and educational settings (Babarović et al., 2019; Ferreira et al., 2016; Savickas & Taber, 2006). Holland's model is comprised of six vocational interest types; Realistic, Investigative, Artistic, Social, Enterprising and Conventional, hereupon referred to in an abbreviated form as RIASEC (Holland, 1973, 1985, 1997). Each of the RIASEC types are represented as hexagonal points, with the less spatial distance between points representing a higher degree of similarity. Correspondingly, the structural hypotheses between points can be tested by assessing the correlations between RIASEC types and clusters of activities and vocations. However, it has been demonstrated that the distribution of the RIASEC six types on the

hexagonal model is largely arbitrary, leading to calls to further evolve and refine the RIASEC model (Tracey & Rounds, 1995).

In order to address the deficiencies of the RIASEC model a spherical model of vocational interest was developed, from which the PGI emerged (Rounds & Tracey, 1996). In common with Holland's (1997) RIASEC model, the spherical model also conceptualises vocational interests as manifesting on the dimensions of Things/People and Data/Ideas, whilst also incorporating the additional dimension of Prestige (Rounds & Tracey, 1996; Tracey, 2002). The dimension of prestige extends the RIASEC circular conceptualisation to a spherical model which also incorporates, the eight scales Social Facilitating, Managing, Business Detail, Data Processing, Mechanical, Nature/Outdoors and Artistic and Helping. These dimensions are derived from three item type's vocational activity liking, activity competence and occupation preference. The resulting PGI model can be interpreted via various levels of analysis as depicted in figure 1.

Insert Figure 1 about here

The PGI's integration of additional levels of analysis of vocational interest, represents a further evolution of the hierarchical ordering clusters of the RIASEC, originally proposed by Gati (1979), and subsequently refined by Prediger (1982, 1999, 2000). Prediger, proposed that there were two underlying dimensions of the hexagonal model of vocational interests, people-things and ideas-data. In a meta-structural analysis, Rounds and Tracey (1993) found support for Prediger's proposed structure, and support for utilising eight types, rather than the original six type model. Building on this work Tracey and Rounds (1995) proposed a third dimension of prestige, alongside the two additional dimensions proposed by Prediger,

collimating in Tracey's (2002) PGI and corresponding vocational interest typology. The PGI spherical model positions the prestige dimensions relative to people-things and ideas-data dimensions, with one of the higher prestige types positioned at the top of the sphere and one lower prestige at the bottom. The remaining four prestige types are positioned in one of the quadrants of their hemisphere. The PGI can be seen to advance the more heuristic nature of the Holland's representations, into a more practically applicable tool for evaluating vocational interest.

The incorporation of prestige into the PGI model allows for the simultaneous assessment of occupational prestige alongside the long-established vocational interest dimensions included in the RIASEC model. Hence, the resulting the PGI spherical model provides a more detailed and reflective representation of vocational interests whilst also incorporating the original RIASEC measurement. Specifically, the inclusion of prestige in the PGI is an important enhancement of the influential RIASEC model, as although prestige is not incorporated in Holland's model, facets of prestige have long been acknowledged to be an important influence on both occupational perceptions and choice (Campbell, 1971; Gottfredson, 1980; Schwarzweller, 1960; Smith, 1943). Vocational researchers have captured prestige via other constructs, including status and level of training (Holland et al., 1985), occupational level (Campbell, 1971), and level of difficulty and responsibility (Roe, 1956). Correspondingly, prestige is known to play and influential role in perceptions and preferences related to particular occupations (Coxon & Jones, 1978; Ganzeboom et al., 1992). However, despite prestige's role in vocational choice and perceptions, prior to the development of the PGI, prestige had not been explicitly incorporated into a vocational interest inventory, alongside other core dimensions of vocational interest.

One justification for evolving RIASEC model into the PGI spherical model, was the questionable cross-cultural structural validity of the RIASEC circular model, given the mixed

support for the applicability of the RIASEC model across cultural contexts (Hansen, 1987; Long & Tracey, 2006; Rossier, 2005). Consequently the generalisability of the results generated by the RIASEC model across cultures have been questioned (Farth et al., 1998; Leong et al., 1998). Echoing these contradictory findings a structural meta-analytic review, found a lack of fit for the RIASEC model across cultures (Rounds & Tracey, 1996). The RIASEC model has been found to be particularly problematic when applied to Asian cultural settings namely, Hong Kong, China and Taiwan (Farh & Law, 1998; Rounds & Tracey, 1996). Thus, the PGI spherical model by incorporating the dimension of prestige and associated scales, offers a model with the potential for a higher degree of cross-cultural transferability, outside of Western contexts.

The PGI model was originally developed and validated on a United States sample, by Tracey & Rounds (1996) and Tracey (2002). However, the PGI has also demonstrated structural validity in other cultural contexts, including Japan (Tracey et al., 1997), China (Long et al., 2005), Jamaica and Trinidad (Wilkins et al., 2013), Ireland (Darcy, 2005), Serbia (Hedrih, 2008), Turkey (Vardarlı et al., 2017) and Germany (Etzel et al., 2016). Notably, when applied in China and Japan the PGI octant scales were found to possess a superior fit relative to the RIASEC model (Tracey et al., 1997). The PGI-S been shown to produce no reduction in structural validly relative to the regular PGI on U.S and Chinese samples (Tracey, 2010; Zhang et al., 2013). An explanation of the apparent enhanced applicability of the PGI model to Asian cultures is the influence on Confucian principles within these relatively collectivist cultures, instigating clearly defined hierarchies consequentially manifested in perceptions of relative occupational status (Hofstede & Hofstede, 2005). Hence, the incorporation of the dimension of prestige as it relates to vocational interest may account for the enhanced generalisability of the PGI spherical model to Asia relative to the RIASEC circular model.

In order to develop a more concise instrument with a reduced number of items, an abbreviated form of the PGI was developed, the resulting PGI Short (PGI-S), incorporates the eight basic interest scales and the high and low prestige scales (Tracey, 2010). The original PGI is a lengthy measure consisting or 108 occupational items and 236 activity items (118 liking and 118 competency beliefs) and is reliant on norms for analysis. Whereas the PGI-S provides a substantially shortened measure for ease of administration with a total of 80 items, capturing the core components of the PGI, and importantly is not reliant on norms for analysis. The PGI-S has demonstrated psychometric properties consistent with the parent PGI (Tracey, 2010; Zhang et al., 2013).

Although, the generalisability of the PGI spherical model has been demonstrated across a number of cultural contexts, Tracey and Gupta (2008) have advocated for the continued validation of measures, particularly when a scale is applied to a new cultural context. The assessment of the structural validity of the abbreviated PGI-S as a standalone scale, across cultural contexts remains sparse, necessitating an examination of the structural validity of the PGI-S on additional international samples (Tracey, 2010; Zhang et al., 2013). Towards this end the current study applies the PGI-S to the previously unexamined cultural context of Vietnam. In order to contribute to the development of a comprehensive model for the assessment of vocational interests across cultural contexts.

Method

Participants and Procedure

The sampling frame for the current study included 3,125 first-year enrolled undergraduate students, prior to commencing their study at a major university in Vietnam. The access to the e-mail addresses on this university data base was approved by the university's administration, and the relevant university IRB requirements were satisfied for utilising student participants.

A sample constituted of university students is consistent with the validation of the original

PGI scale and subsequent validation studies which utilised university student samples (Long

et al., 2005; Tracey, 2002; Wilkins et al., 2013). After been piloted, a link to a web page

which was developed specifically for this project was then sent to 3,125 participants after a

two-week interval, follow-up e-mails were sent, 1,341 responses were completed on the web-

page. Casewise deletion was used to eliminate 201 cases including missing data, resulting in

a final sample consisting of 1,140 valid responses for analysis with a response rate of 36.5%

of the valid responses 95% were in age range of 19 to 20 years old and 67% were female.

Measurement

The PGI-S scale is comprised of 40 vocationally related activities, for which each respondent

provides two answers the first related to their liking of the activity and the second to their

perceived level of competence to undertake the activity. Responses were measured on seven-

point scales, representing the degree of liking from 1 (strongly dislike) to 7 (strongly like) and

for perceived competence from 1 (unable to do) to 7 (very competent). Sample items for liking

and competence items are as follows "Seat patrons at a restaurant", "Establish a business

accounting procedure" and "help children with learning problems". A score is produced for

each respondent associated with the six RIASEC types the eight basic interest scales, high and

low prestige, dimensional scores of People/Things, Data/Ideas, and Prestige.

The internal reliability coefficients, means and standard deviations of the resulting

scales are presented in table 1. Although, three scales achieved a Cronbach alpha marginally

below the .70 typical evaluation of internal reliability. This, is not regarded as problematic

relative to the objective of the current study, which is to investigate the PGI the uniform

placement of items in two dimensional space, rather than the simple assessment of the

dimensionality of items incorporated into in an individual scale (Armstrong et al., 2003;

Hubert & Arabie, 1987; Zhang et al., 2013).

Insert Table 1 about here

Analysis

An examination of the fit of six RIASEC types, PGI octant and PGI spherical scales was

conducted via a randomized test of hypothesized order relations (Hubert & Arabie, 1987;

Tracey, 1997), utilizing the computer program RANDAL (Tracey, 1997). Within the circular

structure the correlations of each individual scale's adjacent in that they are 1 step removed

are hypothesized to be greater than the correlations between those which are 2 steps removed,

which in turn are hypothesized to be greater than those which are 3 steps removed and so

forth. This examination allows each scale to be assessed in relation to the other scales. The

resulting correlation matrixes allow the number of predictions which are met by the data to be

accessed. A number which provides a distribution against which the actual predictions met is

compared.

In order to further access the output of the hypothesized order relations Hubert and

Arabie (1987) propose using a Correspondence Index (CI), representing the number of

predictions met and number of predictions violated, divided by the number of predictions.

The resulting correspondence index can be interpreted as +1.0 a been perfect model fit, 0.0 an

equal number of predictions met to those violated, and -1.0 every prediction and points in

between.

Results

Descriptive statistics for RIASEC, Octant and Spherical Scales are reported in table 1, and results of the randomization tests conducted on the correlation matrices for the RIASEC and the octant model are presented in Table 2. These results indicate a significant fit between the data and the RIASEC six type circular model, for both activity liking and competence, the fit for the model was also significant for both male and female participants (all p's .0004). The CI values yielded the RIASEC six type circular model for both Liking and Competence were high at 0.94 and 0.88 respectively, with a composite score of 0.94. In regards to gender differences in CI values for both liking and competence no significant difference was found in this application of the RIASEC model. Similarly, the results of the randomized tests for the octant model summarized in table 2, indicate a strong fit to the data, the fit for the model was also significant for both male and female participants all (all p's .0004). Likewise, the CI values produced for the octant model for both Liking and Competence were high at 0.88 and 0.80 respectively, with a composite score of 0.87.

In regards to the PGI model, the results of the randomized tests for the octant model summarized in table 3 also indicate a strong fit to the data, the fit for the model was also significant for both male and female participants (all p .0005). Likewise, the CI values produced for the spherical model for both male and female were good at 0.56 and 0.50 respectively, with a composite score of 0.57. In regards to gender differences in CI values for both liking and competence yielded no significant difference between genders in this application of the PGI spherical model.

The results of the current application of the PGI-S relative to six type RIASEC model, the Octant model and the PGI spherical model all yielded good fit to the Vietnamese data, consistent with previous applications of the PGI. Although the PGI spherical model yielded relatively low CI values in relation to the RIASEC and octant models, the CI values produced between .50 and .60 are consistent with previous applications of the PGI spherical in a variety

of cultural contexts (Etzel et al., 2016; Long et al., 2005; Long et al., 2006). Furthermore, the results yielded by this application of the PGI-S are consistent results with previous applications of the PGI-S in other cultural contexts (Tracey, 2010; Zhang et al., 2013) specific comparisons with previous structural studies will be discussed in the following section of the paper.

Insert Table 2 about here

Insert Table 3 about here

Discussion

The study's findings empirically substantiate the structural validity of the PGI model and more specifically the PGI-S on a Vietnamese sample, thereby contributing to the development of a unifying frame work of vocational interests, building on the established RIASEC model. The application of PGI model to Vietnam allows for a finer grained interpretation of vocational interests, with an enhanced applicability across national counseling contexts. Ultimately, the study contributes to the end of establishing a generalizable and accurate means of matching individuals to their optimal job. Such a matching is a long established objective of both vocational researchers and practitioners alike, given that vocational interests are key antecedents of vocational choice and subsequently vocational success (Nye et al., 2017; Rounds & Su, 2014; Volodina & Nagy, 2016).

More specifically the structural examination of the six type RIASEC scales yielded a strong fit to the Vietnamese data with a liking and competence composite CI value higher than other national contexts (CI=.94), including United States, (CI=.89) (Tracey, 2002) ,

China, (CI= .92) (Long & Tracey, 2006) , Japan (CI= .73) (Tracey et al., 1997) , Ireland

(CI=.80) (Darcy, 2005), Turkey (CI=.81) (Vardarlı et al., 2017), Jamaica (CI=.92), and

Trinidad (CI=.83 .) (Wilkins et al., 2013). Likewise, the Vietnamese data supported the

structural validity of the octant model liking and competence composite value of comparative

to previous applications of the octant model in other national contexts (CI=.87) with a

comparative CI score to previous studies conducted in different national contexts United

States, (CI=.93) (Tracey 2002), China, (CI= .92) Long et el 2005), Japan (CI= .73)) (Tracey

et al., 1997), Ireland (CI=.90) (Darcy, 2005), Turkey (CI=.71) (Vardarlı et al., 2017), Jamaica

(CI=.82) and Trinidad (CI= .79) (Wilkins et al., 2013). In regards to the application of the

PGI-S to Vietnam, the results endorse its structural validity within the Vietnamese context,

yielding a CI value (CI=.57).

It is expected that the CI indices for the spherical model are lower than those of the

RIASEC or Octant models. Thus, these results need to be interpreted relative to the

complexity Spherical PGI, given number of order predictions associated with the RIASEC

and octant models respectively. Thus, the results yielded from the Vietnamese sample is

consistent with previous applications of the PGI spherical model, for instance United States,

(CI=.60) (Tracey 2002), China, (CI= .53) Long et el 2005) and Japan (CI= .50) (Tracey et al.,

1997). Notably the spherical model's fit to the data was strong relative to Jamaica (CI=.26)

and Trinidad (CI= .27) suggesting that a divergence in the structure of vocational interest

within this Caribbean cultural grouping (Wilkins et al., 2013).

The study adds further support to the strong stability of the PGI for assessing the

structure of vocational interests across countries and cultural contexts (e.g., Atitsogbe et al.,

2018; Darcy, 2005; Etzel, Nagy, & Tracey, 2015). Echoing work which has long asserted

prestige as an integral component of occupational choice and perception (Coxon & Jones,

1978; Gottfredson, 1981). Specially supporting work which asserts that because of the

incorporation of prestige, the PGI is better able to capture distinctions between individual

occupational preferences across employment contexts (Tracey & Rounds, 1996).

The dimension of prestige incorporated into the PGI model, has been noted in

previous studies as an explanation for the superior fit of PGI model relative to the RIASEC in

East-Asian cultures (Long et al., 2005). The current study's findings further support this

assertion, given that in common other East-Asian culture Vietnam scores relatively high

Hofstede's cultural dimensions of High Power Distance Culture and Collectivism (Hofstede

& Hofstede, 2005). Within cultures scoring high on these dimensions, individuals are highly

imbedded in social networks and one's position relative to others within the network is of

importance. Therefore individuals from collectivist cultures, such as within East Asia, have

an increased orientation towards utilizing external rather than internal criteria when

evaluating their success and their quality of life, within this evaluation occupation is a core

criteria (Hofstede & Hofstede, 2005) . Highlighting, to employment counselors, that within

such cultural contexts prestige is given an increased weighting in occupational perceptions

and choice. Because in these cultural contexts the status of an occupation becomes not only

important for the individual, but also for the reputation of one's family and for their position

in society relative to others. This, finding also has implications for those operating within

Western employment counselling contexts, as such cultural norms may prevail in individuals

from relatively collectivist cultural heritages, demonstrated in the resilient impact of cultural

and family origin on Asian American's career aspirations (Fouad et al., 2008; Leung et al.,

1994).

Therefore, our findings support the inclusion of prestige in the PGI spherical model,

as a means to better calibrate the assessment of vocational interest across cultural contexts

including Vietnam. This study's findings are particularly timely, as it has been noted that at

the current juncture of Vietnam's economic transition, there is an increasing uncertainty in

career orientation amongst new graduates, linked to a mismatch between educational and vocational choices (Vietnam Breaking News, 2019; Vietnam News, 2018). Therefore, our findings advocate an application of PGI spherical model, possibly mirroring Singapore, where every high school student is required to complete the PGI as a component of their career guidance curriculum (Caulum et al., 2011).

Importantly the current study is one of the few studies to validate the abbreviated version of the PGI, indicating structural consistency with the regular PGI scale, further endorsing the application of the abbreviated form the PGI-S (Tracey, 2010; Zhang et al., 2013).The endorsement of the PGI-S's application to a new cultural context, is notable given the substantially reduced number of items in the PGI-S relative to the original scale, and its ability to conduct non-normed studies. Therefore, suggesting the practical advantages of applying the PGI-S as research instrument across cultural contexts and advocating it as a viable alternative for researches, when efficiency in the administration of the PGI is a priority. Furthermore, within a career counseling context the PGI-S could be used as a time-efficient screening instrument when less specific results are required regarding the counselee's vocational interests.

Limitations and Future Research

In order to further endorse the application of the PGI across cultural contexts, including in Vietnam, requires future work to establish both the concurrent of predictive validity of the PGI and PGI-S, relative to relevant scales and vocational outcomes, emulating studies which provide such additional evidence of validity (e.g.Etzel & Nagy, 2019; Holtrop et al., 2015; Su et al., 2019). Furthermore, in may be advisable for future work to move beyond the universal application of Western derived models such as PGI across cultural contexts, towards the end of the developing hybrid or indigenous models of vocational

interest, more finely calibrated to the specific national or employment counselling context of

interest.

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Figure 1

RIASEC and PGI Spherical Models of Vocational Interest

RIASEC

High Prestige Hemisphere

Low Prestige Hemisphere
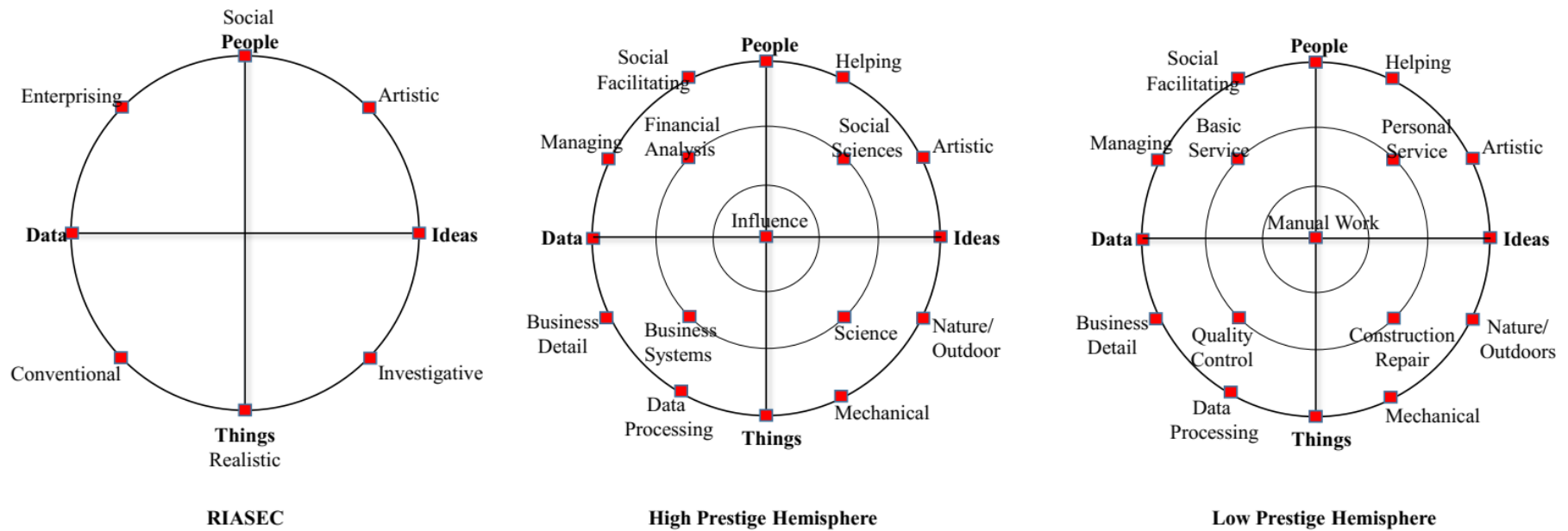
Table 1

Descriptive Statistics RIASEC, Octant and Spherical Scales

	RIASEC Scales				Octant & Spherical Scales		
	M	SD	α		M	SD	α
Realistic	2.34	1.17	.79	Social Facilitating	3.25	1.13	.62
Investigative	3.04	1.44	.81	Managing	4.17	1.25	.80
Artistic	2.86	1.52	.81	Business Detail	3.24	1.38	.87
Social	3.40	1.07	.75	Data Processing	2.86	1.20	.72
Enterprising	3.87	1.08	.77	Mechanical	2.34	1.17	.79
Conventional	2.99	1.17	.87	Nature/Outdoors	3.04	1.44	.81
				Artistic	2.85	1.55	.81
				Helping	3.50	1.20	.64
				High Prestige	3.30	1.15	.60
				Low Prestige	1.67	0.84	.70

Table 2

Results of randomized test of hypothesized order relations: RIASEC and Octant

	Liking	Competence	Liking Competence Composite	Male Liking	Female Liking	Male Competence	Female Competence
RIASEC Scales							
N	1140	1140	1140	377	763	377	763
Predictions Made	72	72	72	72	72	72	72
Predictions Met	70	68	70	70	69	68	69
P	.0167	.0167	.02	.0167	.0167	.0167	.0167
CI	.94	.88	.94	.94	.92	.89	.92
Octant Scales							
N	1140	1140	1140	377	763	377	763
Predictions Made	288	288	288	288	288	288	288
Predictions Met	272	274	270	272	264	264	272
P	.0004	.0004	.0004	.0004	.0004	.0004	.0004
CI	.88	.90	.87	.89	.83	.83	.89

Note: *$p < .05$. **$p < .01$. ***$p < .001$

Table 3

Results of randomized test of hypothesized order relations by: PGI Spherical

	Male	Female	All
SPHERICAL			
N	377	763	1140
Prediction Made	9472	9472	9472
Prediction Met	7428	7136	7428
P	.0005	.0005	.0005
CI	.56	.50	.57

Note: *$p < .05$. **$p < .01$. ***$p < .001$