CPI 260® Validity: Comparing Leaders in Three Countries

Nancy A. Schaubhut, Richard C. Thompson, and Michael L. Morris

CPP, Inc

This study was conducted to examine the factor structure of the CPI 260® assessment in three different countries. The similarities between the factors in U.S., Canadian, and Australian samples were examined by means of the coefficient of congruence. These results lend support for factorial validity of the CPI 260 assessment.

The comparison of factor structures across samples has long been used in psychological research to determine if the factor structure of an assessment is the same in two or more different groups (Chan, Ho, Leung, Chan, & Yung, 1999). Factor structure similarity of personality inventories has been studied by many researchers (Barrett, Petrides, Eysenck, & Eysenck, 1998; De Bruin, Nel, & Comrey, 1997; Noller, Law, & Comrey, 1988; Rodrigues & Comrey, 1974; Stumpf, 1993). Similarity of factors is most often evaluated by using the factor congruence coefficient (Burt, 1948; Reise, Waller, & Comrey, 2000; Tucker, 1951; Wrigley & Neuhaus, 1955).

Equivalence studies on assessments used with international respondents is vital. The use of employment testing as a tool for selection, training and development has become widespread as more companies become multinational, conducting business and employing individuals in several countries. "The globalization of industry is resulting in the spread of testing and selection practices of major international companies to smaller national organizations wherever they compete in local marketplaces" (Bartram, 1998, p.155). Assessments that may be ethically used across different cultures thus become increasingly relevant. The

California Psychological Inventory™ instrument has been successfully used in U.S. and international employment settings for decades as a tool for leadership, coaching, selection, and retention.

Recently, the CPI™ underwent a revision to create a shorter form of the assessment, developed specifically for use in organizations for the purposes of managerial and executive evaluation and development (Gough & Bradley, 2005). As a result of this revision, the CPI 260® needs to be examined in a variety of cultures and countries for factorial equivalence. Establishing equivalence means the instrument may be used with more confidence in the countries examined in the same ways it is used in the U.S.

Thus far, the factorial structure for the CPI 260 assessment has been examined among three different groups: U.S. CPI 260 normative sample, U.K. normative sample, and a sample drawn from the CPP, Inc. archive of commercially completed assessments. The results showed all three samples had essentially the same factorial structure (Gough & Bradley, 2005). In this study, three samples of English speaking participants were compared to further assess the CPI 260 assessment's cross- cultural utility.

Poster presented at the Annual Conference of the Society for Industrial Organizational Psychology, New York, NY, April 27-April 29, 2007.   Page - 1
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According to Paunonen and Ashton (1998), invariance in psychometric properties, such as factor structure, across two cultures is evidence that a measure has utility in both. Given that the samples utilized in the current study are all from English-speaking Westernized countries with similar cultures, the factor structures were expected to be very similar.

METHOD

Participants. This study used three samples totaling nine hundred eighteen leaders employed as full-time managers and executives, who completed the CPI 260 assessment between April, 2002 and August, 2006. This archival data consisted of participants who took the assessment via CPP, Inc.'s online assessment delivery system. Any respondents who were identified by CPI 260 indices as possibly responding in a fake bad, fake good or random fashion were removed from the pool of respondents. The samples of leaders work in three different countries – the United States (N = 322; 72% managers, 28% executives), Canada (N = 239; 66% managers, 34% executives), and Australia (N = 357; 72% managers, 28% executives).

The U.S. sample completed the CPI 260 assessment primarily for training purposes (68%) and personal growth (21%), and consists of 39% women. The average age is 42.4 years (SD = 9.1), and average number of years employed in current occupation is 15.5 (SD = 8.8). Almost all, 99%, are satisfied with their current job. Respondents are employed in a variety of fields, including business and financial operations (49%); education, training, and library occupations (7%); and computer and mathematical occupations (6%). For most, the highest level of education

completed is a Bachelor's degree (37%) or Master's degree (31%).

The respondents in the Canadian sample have an average age of 40.6 years (SD = 13.90, and average of 15.3 years (SD = 8.3) employed in their current occupation. Their fields of employment include business and financial operations (46%); architecture and engineering (11%); and production occupations (8%). The majority (97%) of this sample is satisfied with their current job. Most have completed either a Bachelor's degree (46%) or Master's degree (26%). Twenty-eight percent of the Canadian sample is female, and seventy-three percent of the sample completed the CPI 260 assessment for training purposes.

The Australian sample is comprised of twenty-four percent women. Many of the respondents are employed in business and financial operations (42%); computer and mathematical occupations (9%); and healthcare support occupations (8%). Most are satisfied with their current job (96%), and completed the CPI 260 assessment for either training (70%) or personal growth (18%). The average number of years working in their current occupation is 11.1 (SD = 8.6), and average age is 39.7 (SD = 8.7). The highest level of education completed for most respondents is a Bachelor's degree (45%) or Master's degree (24%).

Measures. The CPI 260 assessment is a measure of normal personality that is often used by organizations in coaching, leadership development, retention, and as a component of selection programs. It is comprised of three sets of scales. First, twenty folk scales that are grouped into the following four broad categories that measure interpersonal aspects: self-management, motivations and thinking style, and personal characteristics. The CPI 260 assessment also contains three

vector scales, assessing one's orientations toward the interpersonal world, societal values, and the self (Gough & Bradley, 2005). The final group is special purpose scales that typically measure various work-related dispositions. The current study focused on the folk and special purpose scales, as they make up the four factors that have typically been found on the CPI 260 assessment (Gough & Bradley, 2005). Additionally, Gough and Bradley (1996) recommend excluding the vector scales for purposes of factor analysis.

Procedure. A principal components factor analysis with varimax rotation and a four factor solution was run on the CPI 260 folk and special purpose scales for each of the three samples. Gough and Bradley (2005) have named these four factors as interpersonal effectiveness, dependability, originality or creativity, and interpersonal sensitivity. A comparison among the factor structures in the three samples was calculated using the Wrigley-Neuhaus factor similarity coefficient (1955). The programmer of an automated program permitted us to use his method to compute the factor similarity coefficients (A.L. Comrey, personal communication, August 30, 2006).

RESULTS

Table one shows CPI 260 scale means and standard deviations for each sample. The factor loadings for each sample appear to be similar to each other (Table 2), as well as to those shown in the CPI 260 Manual (Gough & Bradley). The results of the factor similarity analysis are shown in Table 3. The average coefficients for each factor are: factor 1 = .99, factor 2 = .98, factor 3 = .93, and factor 4 = .81. Coefficients of .90 or higher are typically accepted as showing congruence between factors (Guadagnoli

& Velicer, 1991). Others have suggested the minimum range for considering two factors to be equivalent is .70-.90 (Hall & Kaye, 1977). Therefore, it may be concluded that the factorial structure of the CPI 260 scales is very similar across the American, Canadian, and Australian samples. Factors one and two are nearly identical among the three samples, and factor three is very similar. Factor four, however, shows slightly less congruence among the three samples. The coefficient of congruence for the Canadian and Australian samples demonstrates high similarity of factor four, while the American sample diverges more from the Canadian and Australian samples.

DISCUSSION

The present study sought to demonstrate initial validity and factor similarity of the CPI 260 scales in three English-speaking countries. Future studies should seek to replicate these findings using samples from additional countries, as well as different translations of the CPI 260 assessment. Three factors showed near equivalence, while the fourth was quite similar across American, Canadian, and Australian samples. Factor four, termed interpersonal sensitivity by Gough & Bradley (2005), is comparable in the Canadian and Australian sample, while slightly less in the U.S. sample. This suggests subtle cultural differences in the CPI 260 measures that comprise interpersonal sensitivity, specifically a potential difference in sensitivity to the feelings of others, adherence to societal ethics, affiliative needs, emotional vulnerability, or tender mindedness (Gough & Bradley, 2005). One possible explanation for the slight difference between the U.S, and Canadian and Australian samples on the interpersonal sensitivity factor is that the U.S. sample consisted of a higher number of women than the other two samples (U.S. 39%

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women, Canadian 28% women, Australian 24% women). Research has shown that Western women tend to be higher in some aspects of interpersonal sensitivity than men (Hall, 1978; Hall, 1979; Hoffman, 1977; Snodgrass, 1985). Follow-up research may seek to examine the precise difference between the American and other Westernized cultures.

Overall, this study supports the validity of the CPI 260 scales, as well as the cross-cultural viability of the factors. The substantial similarity in the CPI 260 structure across these three samples means that findings from previous CPI 260 research completed with American samples should generalize to both Canadian and Australian samples. This gives organizations administering this assessment internationally confidence that it may be utilized in other countries as it is in the U.S. Additionally, this study demonstrates that the personality elements measured by the CPI 260 may be universal, and should hold up across cultures.

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Table 1. CPI 260® Scale Means for Each Sample

Scale	U.S. Mean	SD	Canada Mean	SD	Australia Mean	SD
Dominance (Do)	61.49	7.62	60.82	7.95	60.06	7.27
Capacity for Status (Cs)	58.40	8.34	58.37	7.84	58.24	7.60
Sociability (Sy)	55.56	8.90	55.83	8.82	55.68	8.13
Social Presence (Sp)	53.23	9.03	55.01	8.92	55.02	8.52
Self-acceptance (Sp)	58.20	7.98	58.97	7.64	59.08	7.33
Independence (In)	61.22	7.02	61.61	6.90	61.05	6.57
Empathy (Em)	61.32	9.15	61.96	9.16	61.75	9.10
Responsibility (Re)	55.52	7.12	55.35	7.42	52.83	7.11
Social Conformity (So)	54.05	7.06	54.21	7.19	54.67	6.86
Self-control (Sc)	55.91	8.41	54.80	8.61	54.17	8.46
Good Impression (Gi)	58.43	8.29	57.81	8.65	56.93	7.99
Communality (Cm)	52.04	7.33	52.08	6.70	50.95	7.38
Well-being (Wb)	55.95	7.14	56.72	6.49	55.96	6.27
Tolerance (To)	59.11	7.41	59.78	6.90	58.85	7.36
Achievement via Conformance (Ac)	57.23	6.39	56.11	7.05	54.74	6.18
Achievement via Independence (Ai)	60.31	6.95	61.80	6.67	60.71	7.05
Conceptual Fluency (Cf)	57.14	6.84	57.60	6.72	57.02	6.55
Insightfulness (Is)	58.61	7.38	58.24	7.38	56.31	7.03
Flexibility (Fx)	54.18	10.39	54.77	10.79	54.93	10.25
Sensibility (Sn)	43.44	8.06	42.33	7.59	43.01	7.94
Managerial Potential (Mp)	63.86	7.33	64.19	7.22	63.07	6.67
Work Orientation (Wo)	56.22	6.60	56.07	6.88	55.37	6.56
Creative Temperament (Ct)	56.90	9.52	58.71	10.26	59.07	10.24
Leadership (Lp)	61.85	6.86	61.91	6.74	60.96	6.59
Amicability (Ami)	56.95	8.22	57.08	8.69	56.60	8.06
Law Enforcement Orientation (Leo)	59.76	8.66	59.05	8.76	58.47	8.40

Note: N = 322 U.S., N = 239 Canada, N = 357 Australia.

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Table 2. Loadings of CPI 260 Factored Scales for Three Different Samples

	Factor 1			Factor 2			Factor 3			Factor 4		
Scale	US	Can	Aust	US	Can	Aust	US	Can	Aust	US	Can	Aust
Do	.922	.938	.935	.159	.085	-.010	.047	-.051	-.049	-.066	-.022	.042
Cs	.754	.782	.771	-.021	.008	-.019	.468	.423	.395	.094	.080	.072
Sy	.869	.868	.828	.046	.039	.067	.176	.162	.121	.082	.032	.003
Sp	.734	.711	.714	-.146	-.067	-.067	.395	.457	.394	-.136	-.154	-.233
Sa	.868	.882	.852	-.106	-.135	-.088	.115	.089	.087	-.111	-.040	-.036
In	.720	.795	.768	.167	.226	.091	.202	.124	.129	-.245	-.155	-.095
Em	.622	.573	.648	.054	.135	.072	.517	.546	.451	.091	.085	.097
Re	.273	.294	.157	.561	.585	.365	.163	-.109	.221	.372	.465	.633
So	.204	.032	.068	.705	.593	.663	-.017	-.250	-.165	.013	.231	.050
Sc	-.415	-.330	-.310	.768	.789	.768	.029	-.180	-.082	.182	.135	.239
Gi	-.080	-.174	-.067	.797	.830	.739	.022	-.117	-.084	.174	.056	.249
Cm	-.042	.033	-.126	.481	.218	.317	-.032	-.397	-.241	-.213	.294	.197
Wb	.278	.372	.378	.679	.746	.725	.275	.042	.132	-.286	-.170	-.198
To	.124	.263	.141	.552	.744	.623	.639	.363	.588	.068	.135	.037
Ac	.453	.356	.300	.578	.561	.476	-.089	-.301	-.208	.325	.443	.572
Ai	.298	.315	.297	.307	.466	.367	.777	.579	.703	.036	.269	.259
Cf	.499	.544	.509	.361	.488	.435	.547	.343	.389	-.006	.157	.229
Is	.283	.346	.356	.351	.495	.322	.568	.317	.433	-.062	.154	.255
Fx	.069	.221	.176	-.101	.085	-.043	.848	.845	.834	.002	-.054	.084
Sn	-.198	-.239	-.350	.044	.026	-.088	-.002	.130	.252	.821	.806	.652
Mp	.462	.478	.492	.591	.698	.584	.401	.101	.278	-.025	.093	.081
Wo	.124	.139	.151	.723	.822	.755	.412	.050	.255	-.073	-.066	.098
Ct	.420	.570	.531	-.024	.104	.022	.793	.679	.721	.006	-.057	-.030
Lp	.839	.874	.872	.376	.321	.276	.140	-.050	.005	-.088	.048	.096
Ami	-.043	-.080	-.041	.798	.886	.878	.363	.089	.236	.082	-.007	-.002
Leo	.128	.048	.158	.537	.427	.479	-.348	-.620	-.544	-.362	-.186	-.005

Note: US = United States, Can = Canada, Aust = Australia.

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Table 3. Coefficients of Congruence for CPI 260 Factors in Three Samples

	US factor 1	US factor 2	US factor 3	US factor 4
Canada factor 1	.99			
Canada factor 2	.29	.98		
Canada factor 3	.38	-.12	.87	
Canada factor 4	.06	.37	.17	.80
	US factor 1	US factor 2	US factor 3	US factor 4
Australia factor 1	.99			
Australia factor 2	.24	.98		
Australia factor 3	.43	.15	.96	
Australia factor 4	.12	.50	.22	.73
	Canada factor 1	Canada factor 2	Canada factor 3	Canada factor 4
Australia factor 1	.99			
Australia factor 2	.24	.99		
Australia factor 3	.50	.32	.95	
Australia factor 4	.11	.49	.01	.91