Available online at www.sciencedirect.com
ScienceDirect
Personality and Individual Differences 42 (2007) 1515–1526
PERSONALITY AND INDIVIDUAL DIFFERENCES
www.elsevier.com/locate/paid

The IPIP–HEXACO scales: An alternative, public-domain measure of the personality constructs in the HEXACO model

Michael C. Ashton [a,*], Kibeom Lee [b], Lewis R. Goldberg [c]

[a] *Department of Psychology, Brock University, St. Catharines, ON, Canada L2S 3A1*
[b] *Department of Psychology, University of Calgary, Calgary, AB, Canada T2N 1N4*
[c] *Oregon Research Institute, 1715 Franklin Boulevard, Eugene, OR 97403-1983, USA*

Received 18 April 2006; received in revised form 10 August 2006; accepted 19 October 2006
Available online 4 December 2006

Abstract

Recently, Lee and Ashton (2004) described the HEXACO Personality Inventory (HEXACO-PI), a new instrument designed to assess the six dimensions observed in lexical studies of personality structure of various languages. Here, we describe the development of an alternative measure of the HEXACO factors and their facets, using the items of the International Personality Item Pool (IPIP). The scales of the resulting IPIP–HEXACO inventory showed satisfactory psychometric properties, as assessed by internal-consistency reliability, convergent and discriminant correlations with the original HEXACO-PI scales, and factor structure. We discuss the potential usefulness of the new IPIP–HEXACO inventory and its strengths and limitations.

Keywords: Personality assessment; HEXACO model; HEXACO Personality inventory; International personality item pool

* Corresponding author.
E-mail addresses: mashton@brocku.ca (M.C. Ashton), kibeom@ucalgary.ca (K. Lee), lewg@ori.org (L.R. Goldberg).

0191-8869/$ - see front matter © 2006 Elsevier Ltd. All rights reserved.
doi:10.1016/j.paid.2006.10.027

1. Introduction

Two recent innovations in personality assessment have been the construction of the International Personality Item Pool (IPIP; Goldberg, 1999a) and the construction of the HEXACO Personality Inventory (HEXACO-PI; Lee & Ashton, 2004, 2006). The IPIP was developed for the purpose of providing a public-domain item pool whose brief but contextualized items would allow the efficient assessment of various personality characteristics via self- or observer report. The HEXACO-PI was developed for the purpose of assessing the six personality dimensions observed in the lexical studies of personality structure in diverse languages (e.g., Ashton, Lee, & Goldberg, 2004). In the present article, we report on the development of an IPIP-based measure of the HEXACO-PI constructs. We begin by reviewing the origins of the HEXACO model and the development of the HEXACO-PI itself, and we then describe the construction and the psychometric properties of the IPIP–HEXACO scales.

2. Origins of the HEXACO model

The HEXACO model of personality structure originated in findings from lexically-based personality research conducted in several languages. The lexical approach to personality structure rests on the assumption that the most important personality characteristics have been encoded as words (typically adjectives) in human languages (e.g., Goldberg, 1981). Based on this assumption, we would expect that any major axis of personality variation would be represented by many adjectives, each of which would describe some manifestation of the underlying dimension. The lexical investigations conducted thus far have typically involved factor analyses of self-ratings (or occasionally peer ratings) using the most familiar personality-descriptive adjectives of a given language. These analyses are intended to reveal the large and replicable factors that underlie the personality lexicons of various languages.

The first language in which these studies had been conducted was English, which produced the five dimensions known as the Big Five personality factors (see Goldberg, 1993, for a review), now generally labeled Extraversion, Agreeableness, Conscientiousness, Emotional Stability (versus Neuroticism), and Intellect/Imagination. During the 1990s, lexical studies were conducted in several other languages, and those findings revealed many similarities to the Big Five factor structure. However, some differences tended also to recur across languages.

One such difference was the apparent recovery of a sixth factor that had not emerged in early English-language studies. This factor, called Honesty–Humility, has been defined by terms such as *sincere*, *fair*, *modest*, and *unassuming* versus *sly*, *deceitful*, *greedy*, and *pretentious*, and has been observed in lexical studies of several diverse languages (e.g., Ashton, Lee, & Goldberg, 2004; Ashton, Lee, Perugini, et al., 2004; Ashton et al., 2000). Another difference involved the content of the Agreeableness and Emotional Stability factors. In some English investigations (e.g., Saucier & Goldberg, 1996), terms related to sensitivity versus toughness loaded chiefly on the Agreeableness factor, and terms related to patience versus irritability loaded chiefly on the Emotional Stability factor. However, in several other languages (see Ashton, Lee, Perugini, et al., 2004), terms related to patience versus irritability loaded mainly on an Agreeableness factor, and terms related to sensitivity versus toughness loaded mainly on the low pole of an Emotional Stability factor.

(Because this pole includes sensitivity but not anger, it lacks the undesirable and pathological connotations of the label ''Neuroticism'', and is better described as ''Emotionality''.)

Based on these findings, the HEXACO model of personality structure was conceptualized. In this model, there are six broad and roughly independent dimensions of personality, interpretable as Honesty–Humility (H), Emotionality (E), eXtraversion (X), Agreeableness (A), Conscientiousness (C), and Openness to Experience (O). Note that the name ''Openness to Experience'' (McCrae & Costa, 1985), which is used instead of Intellect/Imagination, is meant to summarize the breadth of content defining this factor, including artistic imagination, intellectual curiosity, creativity, and unconventionality.

3. Development of the HEXACO personality inventory

Following the conceptualization of the HEXACO model, Lee and Ashton (2004) constructed a new personality inventory to measure these six personality factors. They developed a questionnaire containing 192 items phrased as self-descriptive statements, each of which uses a five-point response scale. The HEXACO Personality Inventory (HEXACO-PI), which assesses the six broad factors of the HEXACO model, also measures four narrower traits (or ''facets'') within each factor. These narrow traits were defined in such a way as to represent distinct but related aspects of the content of the lexical factors obtained in the various languages described previously.

The construction of the HEXACO-PI was primarily based on a rational test-construction strategy as described by Jackson (1970). Items were generated with the aim of representing as fully as possible the trait domains as defined a priori (see Lee & Ashton, 2004). After initial item trials based on samples of Australian and Canadian university students, items were selected based on several psychometric criteria, such that (a) items within a facet should be relatively, highly intercorrelated, (b) items within different facets of the same factor should be moderately intercorrelated, and (c) items representing different factors should be at best only weakly intercorrelated. In addition, item selection was also influenced by considerations of maintaining the breadth of content of each facet and factor, and ensuring scales that were roughly balanced for positively and negatively keyed items.

As reported by Lee and Ashton (2004), the psychometric properties of the HEXACO-PI in a normative sample of Canadian university students were generally quite satisfactory: internal-consistency reliabilities were high, the 24 facet scales defined the intended factor structure, inter-factor correlations were modest, and convergent and discriminant correlations with external variables were largely as expected. Subsequent data from samples of American adults (the Eugene–Springfield Community Sample) confirmed these results (Lee & Ashton, 2006).

Some recent research has investigated the psychometric performance of the HEXACO-PI when translated into other languages. For example, Ashton et al. (in press) reported the relations of Dutch-, Italian-, and English-language versions of the HEXACO-PI with indigenous adjective markers of the six lexical factors obtained in each language. Their results indicated that, in each language, the HEXACO-PI scales showed high convergent and low discriminant correlations with the adjective scales, thus further supporting the psychometric adequacy of the HEXACO-PI. The Dutch and English findings are especially interesting, because the lexical six-factor solutions of those languages were unknown when the HEXACO-PI was constructed.

Taken together, these findings suggest both that the HEXACO-PI scales have satisfactory psychometric properties and also that those scales do indeed assess constructs that correspond to the six dimensions that have been recovered across various languages in lexical studies of personality structure. For these reasons, along with the theoretical basis associated with the HEXACO model and the predictive validity of the HEXACO variables in a variety of contexts (see Ashton and Lee, in press, for a review), the HEXACO-PI is likely to be of considerable value in psychological research.

4. Measuring HEXACO constructs using the International Personality Item Pool

The International Personality Item Pool (IPIP: Goldberg, 1999a) was developed to provide a public-domain source of instruments that could be used in assessing a variety of personality characteristics via self- or other report. As discussed recently by Goldberg et al. (2006), the IPIP website (details from the author) allows any researcher (including student researchers) to have immediate access, free of charge, to personality scales assessing the wide array of constructs included in many published personality inventories. Moreover, the format of the IPIP items—each of which includes a short verbal phrase—allows greater contextualization than is allowed by personality-descriptive adjectives, but greater brevity and efficiency than is typical of the item formats used in many personality inventories.

The potential usefulness of the IPIP scales in general can apply also to the assessment of the constructs measured by the HEXACO-PI. Although this inventory has been available free of charge (for non-profit research purposes) from the authors, it is not a public-domain instrument as are all IPIP variables, insofar as permission from the test authors is required of researchers who wish to use this copyrighted instrument. Moreover, the extreme brevity of the IPIP items might potentially allow some savings in terms of assessment time relative to the full-length original HEXACO-PI, whose items are longer statements typical of those found in omnibus personality inventories. Thus, the availability of an IPIP measure of the HEXACO constructs would be of some value in psychological research. In a later section, we will discuss the limitations associated with the IPIP measure, but we first provide a detailed description both of the development of the IPIP–HEXACO scales and also of those scales' psychometric properties, especially in relation to the scales of the original HEXACO-PI.

5. Construction of an IPIP inventory to measure the HEXACO variables

The first step in the selection of IPIP items for the IPIP–HEXACO inventory was to correlate all 2036 IPIP items with the 24 HEXACO-PI facet scales, using data from the 411 Eugene–Springfield Community Sample participants who completed both the full set of IPIP items and the HEXACO-PI. (For more information on the demographic characteristics and on the recruitment of the participants, see Goldberg, 1999b; Goldberg & Strycker, 2002.) Subsets of IPIP items were administered at various times between early 1994 and late 2003, whereas the HEXACO-PI was administered during early 2003. These intervals will tend to reduce somewhat both the internal-consistency reliabilities of the IPIP–HEXACO scales and also those scales' correlations with HEXACO-PI scales.

The items were then sorted according to the scale with which they showed their highest absolute correlations. Within each of these 24 groups of IPIP items, the 10 items showing the highest absolute correlations with their corresponding HEXACO-PI scale were then selected. For most scales, however, a few item substitutions were made at this stage, in order to avoid (where possible) the inclusion of items judged to be too similar to each other and in order to obtain (where possible) a roughly similar number of positively and negatively keyed items. The resulting set of 24 IPIP–HEXACO scales showed internal-consistency reliabilities ranging from .73 to .88 with a mean of .81. Convergent correlations with HEXACO-PI scales ranged from .57 to .83 (.76–.98 after disattenuation for imperfect reliability in both sets of scales), and averaged .72 (.90 after disattenuation).

The initial psychometric performance of the resulting IPIP–HEXACO scales, as judged in terms of reliability and convergent correlations with HEXACO-PI scales, was rather good. However, further analyses of the IPIP–HEXACO scales suggested the need for some improvements. Specifically, when we constructed six domain-level IPIP–HEXACO scales, by averaging scores across the four facets within each domain, we found that the highest correlation was that between Honesty–Humility and Agreeableness. This value ($r = .49$) was considerably higher than the corresponding correlation ($r = .30$) between the HEXACO-PI variants of Honesty–Humility and Agreeableness for the same participants ($N = 411$). In addition to these results involving the Honesty–Humility and Agreeableness scales, another analysis suggested some problematic features of the factor loading patterns of the IPIP–HEXACO scales. Specifically, when we extracted six factors from the set of 24 IPIP–HEXACO scales and rotated those factors to a varimax criterion, the Anxiety scale loaded almost as strongly on low Agreeableness (−.54) as on Emotionality (.56).

In order to improve the IPIP–HEXACO scales, we revised several of the 24 facet scales by substituting some items. First, for facets within the Honesty–Humility and Agreeableness domains, we considered the correlations of the selected items with the IPIP–HEXACO facet scales belonging to the other of these two domains, and identified some items having high correlations with the facets of the other HEXACO-PI domain. We then replaced those items with other IPIP items that showed lower correlations with those facets but that still had relatively high correlations with the corresponding HEXACO-PI facet (and, to a lesser extent, with other HEXACO-PI facets of the same domain). Replacements were made within three Honesty–Humility facet scales (two items in Sincerity, one in Fairness, and one in Modesty) and within three Agreeableness facet scales (two items in Forgiveness, two in Gentleness, and four in Flexibility). We followed a similar procedure for the Anxiety facet scale, by considering IPIP items' correlations with the HEXACO-PI scales for Anxiety, for other Emotionality facets, and for Agreeableness facets. We then removed three IPIP–HEXACO Anxiety items that showed relatively high negative correlations with HEXACO-PI Agreeableness facets, replacing them with three other IPIP items that showed weaker correlations with those variables but still showed substantial correlations with HEXACO-PI Anxiety (and, to a lesser extent, with other HEXACO-PI Emotionality facet scales).

The IPIP–HEXACO item substitutions described above changed the psychometric properties of those scales in the expected ways (see Section 6). These substitutions produced only trivial changes in other psychometric properties of the scales, such as their internal-consistency reliabilities and convergent correlations with HEXACO-PI scales. The items of the final IPIP–HEXACO scales are listed on the website of the International Personality Item Pool (details from the author).

6. Psychometric properties of the refined IPIP–HEXACO scales

Tables 1–4 show the psychometric properties of the refined versions of the IPIP–HEXACO scales, along with those of their HEXACO-PI counterparts for the same sample of participants ($N = 411$). As seen in Table 1, the descriptive statistics were generally similar for the two sets of scales, even though every pair of corresponding subtests showed statistically significant mean score differences between the two inventories (this is largely a function of high convergent correlations, as discussed below). For some scales, however, there were noteworthy differences: in the

Table 1
Descriptive statistics for the IPIP–HEXACO and HEXACO-PI scales

	IPIP–HEXACO		HEXACO-PI	
	Mean	SD	Mean	SD
Honesty–Humility	3.85	0.45	3.91	0.46
Sincerity	3.96	0.59	3.79	0.57
Fairness	4.32	0.54	4.26	0.58
Greed–Avoidance	3.57	0.59	3.71	0.64
Modesty	3.55	0.69	3.88	0.61
Emotionality	3.17	0.46	3.19	0.47
Fearfulness	3.21	0.73	3.05	0.69
Anxiety	2.68	0.72	3.12	0.72
Dependence	3.07	0.55	2.93	0.62
Sentimentality	3.70	0.64	3.65	0.61
Extraversion	3.33	0.57	3.19	0.53
Expressiveness	2.86	0.74	2.89	0.71
Social boldness	3.30	0.79	3.16	0.76
Sociability	3.45	0.75	3.12	0.67
Liveliness	3.69	0.65	3.60	0.62
Agreeableness	3.54	0.51	3.13	0.47
Forgiveness	3.66	0.59	2.87	0.65
Gentleness	3.68	0.59	3.19	0.60
Flexibility	3.27	0.54	3.07	0.54
Patience	3.53	0.77	3.38	0.62
Conscientiousness	3.82	0.48	3.58	0.45
Organization	3.78	0.72	3.60	0.79
Diligence	4.01	0.58	3.55	0.60
Perfectionism	3.68	0.59	3.57	0.55
Prudence	3.80	0.58	3.60	0.54
Openness to Experience	3.41	0.52	3.39	0.53
Aesthetic appreciation	3.64	0.72	3.64	0.69
Inquisitiveness	3.60	0.66	3.64	0.68
Creativity	3.70	0.66	3.17	0.72
Unconventionality	2.71	0.71	3.11	0.66

Note: $N = 411$.

Table 2
Mean inter-item correlations (r) and internal-consistency reliabilities (α) of IPIP–HEXACO and HEXACO-PI scales, and convergent correlations of those scales

	IPIP–HEXACO		HEXACO-PI		Convergent correlation
	r	α	r	α	
Honesty–Humility	.16	.88	.22	.90	.77 (.87)
Sincerity	.26	.78	.29	.76	.62 (.81)
Fairness	.26	.76	.33	.79	.72 (.93)
Greed–Avoidance	.24	.69	.32	.79	.70 (.95)
Modesty	.29	.80	.35	.81	.71 (.88)
Emotionality	.16	.88	.18	.87	.82 (.94)
Fearfulness	.36	.84	.31	.78	.78 (.96)
Anxiety	.33	.84	.34	.80	.75 (.91)
Dependence	.21	.73	.30	.77	.57 (.76)
Sentimentality	.28	.79	.33	.80	.75 (.94)
Extraversion	.23	.92	.24	.91	.88 (.96)
Expressiveness	.34	.84	.40	.84	.79 (.94)
Social boldness	.39	.86	.41	.85	.83 (.97)
Sociability	.36	.85	.32	.79	.77 (.94)
Liveliness	.31	.82	.33	.79	.77 (.96)
Agreeableness	.22	.92	.20	.89	.76 (.84)
Forgiveness	.28	.79	.37	.82	.65 (.81)
Gentleness	.28	.79	.31	.78	.65 (.83)
Flexibility	.20	.72	.20	.67	.56 (.81)
Patience	.42	.88	.33	.80	.72 (.86)
Conscientiousness	.21	.91	.19	.88	.84 (.94)
Organization	.37	.85	.47	.88	.81 (.94)
Diligence	.31	.81	.32	.79	.74 (.93)
Perfectionism	.30	.80	.25	.72	.61 (.80)
Prudence	.29	.80	.29	.77	.74 (.94)
Openness to Experience	.21	.91	.22	.90	.86 (.95)
Aesthetic appreciation	.34	.83	.33	.80	.80 (.98)
Inquisitiveness	.26	.78	.30	.78	.73 (.94)
Creativity	.36	.84	.34	.80	.71 (.87)
Unconventionality	.34	.84	.33	.79	.78 (.96)

Note: $N = 411$. IPIP–HEXACO and HEXACO-PI facet scales each contain 10 and 8 items, respectively. Correlations in parentheses are disattenuated for unreliability.

Agreeableness and Conscientiousness domains, the IPIP–HEXACO scales showed mean scores that were 0.31 and 0.24 raw score units higher (and further from the scale midpoint), respectively, on the 1-to-5 response scale.

As seen in Table 2, inter-item correlations tended to be slightly higher for the HEXACO-PI scales, but internal-consistency reliabilities tended to be slightly higher for the IPIP–HEXACO scales. This discrepancy is due to the different lengths of the inventories' scales, with 8 items per HEXACO-PI facet scale and 10 items per IPIP–HEXACO facet scale. Also shown in Table 2 are the convergent correlations between the IPIP–HEXACO and HEXACO-PI facet scales.

Table 3
Correlations among and between the domain-level scales of the IPIP–HEXACO and the HEXACO-PI

	IPIP–HEXACO scales						HEXACO-PI scales					
	H	E	X	A	C	O	H	E	X	A	C	O
IPIP–HEXACO scales												
Honesty–Humility												
Emotionality	.10											
Extraversion	−.24	−.13										
Agreeableness	.41	−.24	.14									
Conscientiousness	.17	−.10	.18	.05								
Openness to Experience	−.19	−.18	.34	.04	.00							
HEXACO-PI scales												
Honesty–Humility	**.77**	.12	−.16	.33	.07	−.12						
Emotionality	.12	**.82**	−.07	−.15	−.03	−.12	.08					
Extraversion	−.26	−.09	**.88**	.02	.15	.38	−.18	−.04				
Agreeableness	.31	−.10	−.05	**.76**	−.09	−.01	.30	−.08	−.09			
Conscientiousness	.12	−.08	.13	.02	**.84**	.03	.06	−.04	.14	−.08		
Openness to Experience	−.16	−.19	−.24	.08	−.03	**.86**	−.11	−.13	.32	.06	.04	

Note: $N = 411$. Convergent correlations are in bold type.

These values ranged from .57 to .83 (.76–.98 when disattenuated for imperfect reliability in both sets of scales) with a mean of .72 (.90 when disattenuated).

Correlations among domain-level scales of the IPIP–HEXACO, among domain-level scales of the HEXACO-PI, and between the domain-level scales of the two inventories are shown in Table 3. Within the IPIP–HEXACO, the highest correlation was .41, for Honesty–Humility and Agreeableness; within the HEXACO-PI, the highest correlation was .32, for Extraversion and Openness to Experience. Convergent correlations for the six domain-level scales ranged from .76 to .86, with a mean of .82; discriminant correlations were generally lower, with the highest values being .33 (HEXACO-PI Honesty–Humility with IPIP–HEXACO Agreeableness) and .38 (HEXACO-PI Extraversion with IPIP–HEXACO Openness).

Separate factor analyses of the IPIP–HEXACO scales and of the HEXACO-PI scales, based on the subset of participants who had completed both inventories, produced patterns of results that were similar across the two instruments. However, the break in size between the sixth and seventh eigenvalues was much clearer for the HEXACO-PI than for the IPIP–HEXACO: for the HEXACO-PI the first 10 eigenvalues were 3.9, 3.3, 2.4, 2.3, 1.7, 1.6, 0.9, 0.8, 0.7, and 0.7, whereas for the IPIP–HEXACO, the first 10 eigenvalues were 4.6, 4.1, 2.6, 2.3, 1.8, 1.1, 0.9, 0.7, 0.6, and 0.6. For both variable sets, we extracted six factors using principal components analysis and rotated them by varimax, and for both variable sets every facet scale showed its highest loading on its intended factor.

The six factors of the two solutions accounted for 63.5% and for 68.4% of the variance in the HEXACO-PI and the IPIP–HEXACO facet scales, respectively. Within both solutions, the three largest factors (in descending order of size) were Agreeableness, Openness to Experience, and Extraversion, and the sixth-largest was Emotionality. In the HEXACO-PI solution, the

Table 4
Primary factor loadings and important secondary loadings of the IPIP–HEXACO and HEXACO-PI scales in varimax-rotated six-factor solutions

Factor and facets	IPIP–HEXACO scales	HEXACO-PI scales
Honesty–Humility (H)		
Sincerity	.80	.82
Fairness	.61 (C, .30)	.69 (C, .32)
Greed–Avoidance	.69 (X, −.31)	.78
Modesty	.57 (X, −.34)	.68
Emotionality (E)		
Fearfulness	.56 (O, −.40)	.64 (X, −.31)
Anxiety	.59 (A, −.52)	.64
Dependence	.78	.74
Sentimentality	.68 (H, .36)	.73
Extraversion (X)		
Expressiveness	.85	.72 (A, −.43)
Social boldness	.75 (O, .32)	.77
Sociability	.79 (A, .30)	.70 (E, .37)
Liveliness	.52 (A, .32; C, .31)	.73
Agreeableness (A)		
Forgiveness	.74	.63
Gentleness	.82	.80
Flexibility	.73	.71
Patience	.86	.84
Conscientiousness (C)		
Organization	.74	.67
Diligence	.75	.69
Perfectionism	.81	.71
Prudence	.71	.75
Openness to Experience (O)		
Aesthetic appreciation	.75 (E, .32)	.79
Inquisitiveness	.77	.74
Creativity	.71 (X, .33)	.70 (X, .32)
Unconventionality	.73 (C, −.33)	.79

Note: $N = 411$. Principal-components analysis. Separate analysis for each inventory. Values in main rows are primary loadings; values in parentheses are secondary loadings with absolute values of at least .30, and letters in parentheses indicate identity of secondary factor.

Honesty–Humility and Conscientiousness factors were fourth- and fifth-largest, respectively, but these factors reversed those positions in the IPIP–HEXACO solution.

As seen in Table 4, the primary loadings were similar for the two inventories, with values ranging from .52 to .86 for the IPIP–HEXACO and from .63 to .84 for the HEXACO-PI. The highest secondary loadings were −.52 for IPIP–HEXACO Anxiety (on low Agreeableness) and −.42 for HEXACO-PI Expressiveness (also on low Agreeableness); overall, the IPIP–HEXACO facet

scales showed 13 secondary loadings having absolute values of .30 or higher, and the HEXACO-PI facet scales showed five secondary loadings meeting this threshold.

Note that the rather high secondary loading of IPIP–HEXACO Anxiety on the low pole of Agreeableness is much larger than the corresponding value (−.28) for the HEXACO-PI version of that facet scale within the analysis of the HEXACO-PI variables. This difference reflects two aspects of the content of the IPIP–HEXACO facet scales: first, the Anxiety facet scale emphasizes stress tolerance, which tends to produce some relation with the low pole of Agreeableness; also, the four facet scales within the IPIP–HEXACO Agreeableness domain emphasize (at the negative pole) irritability, frustration, and difficulty in adjustment, which tend to produce some relation with Anxiety. These elements of content are represented somewhat less strongly within the HEXACO-PI versions of these scales, and thus the relations are weaker.

7. Strengths and limitations of the IPIP–HEXACO scales

The results described above indicate that the IPIP–HEXACO scales generally provide sound measures of the constructs originally assessed by the HEXACO-PI. Several aspects of the psychometric properties of the IPIP–HEXACO scales can be considered. First, with regard to descriptive statistics, the IPIP–HEXACO facet scales all showed reasonably wide standard deviations, and none of those scales showed unduly extreme scale means; in general, the scale score distributions of IPIP–HEXACO scales were similar to those of their HEXACO-PI counterparts. Similarly, with regard to item-total correlations and internal-consistency reliabilities, the IPIP–HEXACO scales showed rather high values that were, again, broadly similar to those of their HEXACO-PI counterparts. Moreover, the IPIP–HEXACO scale scores were strongly correlated with those of the corresponding HEXACO-PI scales, with strong convergent correlations at both the facet and factor levels; when disattenuated for the imperfect (albeit high) reliability of the scales, these correlations averaged .90.

In a few respects, however, the psychometric properties of the IPIP–HEXACO scales differed from those of the original HEXACO-PI scales. One important difference involved correlations among the six domain-level scales of each inventory. Even after application of the refinements in scale construction procedures as described earlier in this article, the IPIP–HEXACO scales representing Honesty–Humility and Agreeableness showed a moderately strong correlation of .41. (In contrast, the correlation between the original HEXACO-PI measuring these two constructs was .30 in this participant sample, and the highest correlation between HEXACO-PI factor-level scales was .32, for Extraversion and Openness.) Thus, this result indicates that the IPIP–HEXACO scales do not assess the factor-level constructs of Honesty–Humility and Agreeableness as independently as do the scales of the HEXACO-PI. The IPIP–HEXACO scales may therefore have somewhat less discriminant validity than will the original HEXACO-PI in predicting criteria associated uniquely with either of these two constructs. Similarly, when the IPIP–HEXACO and HEXACO-PI instruments were each factor-analyzed at the level of their facet scales, the IPIP–HEXACO variable set did not produce the clear break in eigenvalue sizes between the seventh and sixth factors as was observed for the HEXACO-PI variable set. In addition, the IPIP–HEXACO variables tended to show stronger secondary loadings than did their HEXACO-PI counterparts, with an especially strong secondary loading of the Anxiety facet on the low pole of the Agreeableness factor.

8. Need for cross-validation in future research

Because the psychometric properties reported here for the IPIP–HEXACO scales are based on the same participant sample as that in which these items were selected, the relations between these scales and those of the HEXACO-PI may be inflated somewhat due to capitalization on chance within this derivation sample, despite its fairly large size ($N > 400$). However, the somewhat long time intervals between administration of (some) IPIP items and the HEXACO-PI items would likely have the opposite effect; that is, the imperfect stability of personality across these intervals would tend to reduce somewhat the strength of the relations between the scales of the two inventories. Thus, one task in future research will be to examine the relations between IPIP–HEXACO and HEXACO-PI scales as administered at roughly the same time to the participants of a large new sample. In this way, the limitations of the present study will be overcome, and the relations between the scales of the two inventories will be more accurately known.

9. Conclusions

Overall, the results of this investigation suggest that the IPIP–HEXACO scales can provide a satisfactory measures of the constructs assessed originally by the HEXACO-PI. On most grounds, including score distributions, reliabilities, and convergent correlations, the IPIP–HEXACO variables do correspond closely to their HEXACO-PI counterparts, and should provide useful measures of the HEXACO-PI constructs. On the other hand, the IPIP–HEXACO scales do not assess some of the HEXACO domains quite as independently as do the original HEXACO-PI variables. Therefore, in contexts in which it is important to obtain relatively uncorrelated measures of the factor-level variables, or to obtain relatively factor-pure measures of the facet-level variables, the use of the HEXACO-PI would be recommended. In addition, recent additions to the HEXACO-PI (e.g., Lee & Ashton, 2006) are not yet assessed by the IPIP–HEXACO, and an IPIP counterpart of the half-length HEXACO-PI is not yet available. In general, however, the psychometric performance of the IPIP–HEXACO scales suggests that these variables should serve as useful alternative measures of the HEXACO-PI constructs within many assessment contexts.

Acknowledgement

This research was supported by Social Sciences and Humanities Research Council of Canada Grants 410-2003-0946 and 410-2003-1835 and by Grant MH-49227 from the National Institute of Mental Health.

References

Ashton, M. C., & Lee, K. (in press). Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and Social Psychological Review*.

Ashton, M. C., Lee, K., de Vries, R. E., Perugini, M., Gnisci, A., & Sergi, I. (in press). The HEXACO Model of personality structure and indigenous lexical personality dimensions in Italian, Dutch, and English. *Journal of Research in Personality*.

Ashton, M. C., Lee, K., & Goldberg, L. R. (2004). A hierarchical analysis of 1710 English personality-descriptive adjectives. *Journal of Personality and Social Psychology, 87*, 707–721.

Ashton, M. C., Lee, K., Perugini, M., Szarota, P., de Vries, R. E., Di Blas, L., et al. (2004). A six-factor structure of personality-descriptive adjectives: solutions from psycholexical studies in seven languages. *Journal of Personality and Social Psychology, 86*, 356–366.

Ashton, M. C., Lee, K., & Son, C. (2000). Honesty as the sixth factor of personality: correlations with machiavellianism, primary psychopathy, and social adroitness. *European Journal of Personality, 14*, 359–368.

Goldberg, L. R. (1981). Language and individual differences: The search for universals in personality lexicons. In L. Wheeler (Ed.). *Review of personality and social psychology* (Vol. 2, pp. 141–165). Beverly Hills, CA: Sage.

Goldberg, L. R. (1993). The structure of phenotypic personality traits. *American Psychologist, 48*, 26–34.

Goldberg, L. R. (1999a). A broad-bandwidth, public-domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.). *Personality psychology in Europe* (Vol. 7, pp. 7–28). The Netherlands: Tilburg University Press.

Goldberg, L. R. (1999b). The curious experiences survey, a revised version of the dissociative experiences scale: factor structure, reliability, and relations to demographic and personality variables. *Psychological Assessment, 11*, 134–145.

Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., et al. (2006). The international personality item pool and the future of public-domain personality measures. *Journal of Research in Personality, 40*, 84–96.

Goldberg, L. R., & Strycker, L. A. (2002). Personality traits and eating habits: the assessment of food preferences in a large community sample. *Personality and Individual Differences, 32*, 49–65.

Jackson, D. N. (1970). A sequential system for personality scale development. In C. D. Spielberger (Ed.). *Current topics in clinical and community psychology* (Vol. 2, pp. 61–96). New York: Academic Press.

Lee, K., & Ashton, M. C. (2004). Psychometric properties of the HEXACO personality inventory. *Multivariate Behavioral Research, 39*, 329–358.

Lee, K., & Ashton, M. C. (2006). Further assessment of the HEXACO Personality Inventory: two new facet scales and an observer report form. *Psychological Assessment, 18*, 182–191.

McCrae, R. R., & Costa, P. T. Jr., (1985). Openness to experience. In R. Hogan & W. H. Jones (Eds.). *Perspectives in personality* (Vol. 1, pp. 145–172). Greenwich, CT: JAI Press.

Saucier, G., & Goldberg, L. R. (1996). Evidence for the big five in analyses of familiar English personality adjectives. *European Journal of Personality, 10*, 61–77.