



## The position of authenticity within extant models of personality

John Maltby<sup>a,\*</sup>, Alex M. Wood<sup>b</sup>, Liz Day<sup>c</sup>, Diana Pinto<sup>a</sup>

<sup>a</sup>School of Psychology, University of Leicester, Leicester LE1 9HN, UK

<sup>b</sup>School of Psychological Sciences, University of Manchester, Manchester M13 9PL, UK

<sup>c</sup>Faculty of Development and Society, Sheffield Hallam University, Sheffield S10 2BP, UK

### ARTICLE INFO

#### Article history:

Received 1 June 2011

Received in revised form 23 August 2011

Accepted 12 October 2011

Available online 12 November 2011

#### Keywords:

Authenticity

Honesty–Humility

Five-factor

Biological models of personality

### ABSTRACT

The aim of the current study was to explore where authenticity, derived from the humanistic tradition of psychology, was positioned within a number of extant models of personality. Exploratory and Confirmatory Factor Analysis of data from four samples (total  $N = 1286$ ) suggested that authenticity can be considered as loading on the Honesty–Humility factor of personality. These findings are discussed in terms of the wider theoretical overlaps between Honesty–Humility and psychological functioning as emphasised by the humanistic tradition of psychology.

© 2011 Published by Elsevier Ltd.

### 1. Introduction

Within the humanistic tradition of psychology authenticity is seen as the core aspect of human functioning (Horney, 1951; Rogers, 1959). Authenticity comprises three aspects: (1) a lack of *self-alienation*, involving a consistent sense of identity which is consistent with all deep down beliefs, actual feeling, inherent tendencies, and objective reality; (2) *authentic living*, in line with this identity, and (3) *not accepting external influence*, when it goes against personal beliefs (Wood, Linley, Maltby, Baliousis, & Joseph, 2008). Authenticity occurs when the three are in alignment. Therefore a person is authentic when they have a fully consistent identity in line with reality (low self-alienation), behave consistently with this (high authentic living), and do not allow external influences to either distort self-perception or prevent the authentic behavioural expression of one's self (low accepting external influences). Clinically, distress is caused when inauthenticity comes to conscious awareness (Joseph & Linley, 2005). The Authenticity Scale (Wood et al., 2008) measures conscious awareness of authenticity, with the self-alienation, accepting external influence, and authentic living subscales measuring stable ways of functioning, demonstrating trait like properties evidenced by consistency between scores over time (e.g.  $r = .79-.84$  over 2 weeks and  $r = .78-.81$  over 4 weeks).

Given the central role of authenticity in the Humanistic school in psychology, its place within wider extant personality models has been little considered. Studies examining the tripartite model of authenticity shows appropriate but distinct variance from the

six main personality traits; the five factor model of personality (Costa & McCrae, 1992), comprising extraversion, neuroticism, agreeableness, conscientiousness, and openness, and the sixth factor of personality, 'Honesty–Humility' (Lee & Ashton, 2008). These traits account for a small but significant 11–13% of the variance in authenticity (Wood et al., 2008). Further, Gray's (1987) and Cloninger's (Cloninger, Svrakic, & Przybeck, 1993) models of personality account for between 5.8% and 18% of the variance in authenticity (Pinto, Maltby, & Wood, 2011). However, little is known as to where authenticity can be exactly positioned in regards to extant models of personality, or whether, authenticity, similarly to other variables, such as religiosity, conservatism, or risk taking (Paunonen & Jackson, 2000), are positioned outside extant models of personality.

The first context is the six main factors of personality. Authenticity may load on more than one of these factors. For example, authenticity is intrinsically related to positive well-being (Wood et al., 2008). Given the prominence of neuroticism and extraversion in predicting affect across the life-span, respectively (Wilson & Gullone, 1999), either of these two personality factors may encompass authenticity. However, authenticity seems most comparable to Honesty–Humility, which comprises adjectives such as truthfulness, positive values, honesty and sincerity (Ashton & Lee, 2007). Similarly, the literature emphasises authenticity as comprising the promotion of positive experiences, truthfulness, uniqueness, and positive growth (Rogers, 1965). Therefore, Honesty–Humility seems most similar to encompass authenticity. However, Wood et al. (2008) found correlations no larger than  $r = .11$  between the tripartite model of authenticity and the Honesty/Humility subscale of the HEXACO Personality Inventory (Lee

\* Corresponding author. Tel.: +44 (0)116 229 7198; fax: +44 (0)116 229 7196.

E-mail addresses: [jm148@le.ac.uk](mailto:jm148@le.ac.uk), [jm148@leicester.ac.uk](mailto:jm148@leicester.ac.uk) (J. Maltby).

& Ashton, 2004). This finding seems surprising given the identified overlaps in descriptions between the constructs. Therefore the relationship between the tripartite model of authenticity and honesty/humility requires further consideration.

The second context is to include other extant personality models. These include the biological models of personality; Eysenck's (1990) model of personality (neuroticism, extraversion and psychoticism); Gray's (1987) reinforcement sensitivity theory (behavioural approach and inhibition systems); and Cloninger's (Cloninger et al., 1993) model of temperaments (novelty seeking, harm avoidance, reward dependence and persistence) and character domains (self-directedness, cooperativeness and self-transcendence). These personality models can be positioned largely within the six factor personality framework (Revelle, 1997). For example, Eysenck's model maps directly onto the five factor model with psychoticism as better represented by low agreeableness and low conscientiousness. Gray's behavioural approach and Cloninger's novelty seeking are thought to mirror extraversion, and Gray's behavioural inhibition and Cloninger's harm avoidance mirror neuroticism (Revelle, 1997; Stewart, Ebmeier, & Deary, 2004). However, Pinto et al. (2011) have noted theoretical and empirical overlaps between Horney's (1951) descriptions of low authenticity emerging from neurosis and leading to inhibited behaviours reminiscent of Gray's inhibitory system or Cloninger's harm avoidance, and therefore the consideration of biological models of personality is important in this consideration.

Furthermore, any deliberation should include Self-Determination Theory (Deci & Ryan, 2002) that makes the distinction between autonomy, controlled and impersonal motivations. Autonomy, controlled and impersonal motivations of Self-Determination Theory seem to be largely independent of the five factor model, though control and impersonal motivations overlap with agreeableness and neuroticism, respectively (Olesen, Thomsen, Schnieper, & Tonnesvang, 2010). However, autonomy places an emphasis on demonstrating intrinsic and truthful (albeit by being consistent), needs, values, and motivations and therefore may reflect authenticity.

To properly consider whether authenticity is positioned within or outside existing personality theory and research, it is necessary to consider the position of the tripartite model of authenticity within a range of extant personality theories. Using the biological and self-determination theories alongside the six factors derived from the lexical hypothesis would be useful to ensure factors were optimally operationalized. The aim of the current study was to explore whether authenticity was positioned within the six factors emerging from the lexical hypothesis, biological and self-determination theories of personality.

## 2. Method

### 2.1. Samples

#### 2.1.1. Sample 1

Seven hundred and eight respondents (332 males, 376 females) were sampled from a series of community groups and workplaces in the Midlands and Yorkshire region of the United Kingdom. Ages ranged from 18 to 70 years ( $M = 33.54$ ,  $SD = 9.9$ ). Participants were predominantly White (57.6%), with 17.5% of respondents Asian and 16.7% Black.

#### 2.1.2. Sample 2

One hundred and seventy-nine respondents (60 males, 119 females) were sampled from a midlands university undergraduate student population in the United Kingdom. Ages ranged from 18 to

24 years ( $M = 19.55$ ,  $SD = 1.2$ ). Participants were predominantly White (69.8%), with 18.4% of respondents Asian and 8.4% Black.

#### 2.1.3. Sample 3

One hundred and ninety-two respondents (79 males, 113 females) were sampled from six large employers in the Yorkshire region of the United Kingdom. Ages ranged from 18 to 60 years ( $M = 38.50$ ,  $SD = 10.4$ ). Participants were predominantly White (60.2%), with 17.2% of respondents Asian and 13.0% Black.

#### 2.1.4. Sample 4

Two hundred and seven respondents (86 males, 121 females) were sampled from a number of community and religious groups in the Yorkshire region of the United Kingdom with the aim of obtaining an ethnically diverse sample. Ages ranged from 18 to 68 years ( $M = 38.2$ ,  $SD = 12.7$ ). Participants were predominantly White (37.2%) with 30.9% of respondents Asian and 30.0% Black.

## 2.2. Measures

*Authenticity* was measured using the Authenticity Scale (Wood et al., 2008) comprising three four-item subscales; Authentic Living (e.g. "I am true to myself in most situations"), Accepting External Influence (e.g. "I usually do what other people tell me to do") and Self-Alienation (e.g. "I feel out of touch with the 'real me'"). Responses are scored on a 7-point scale, anchored to 1 (*Disagree Strongly*) to 7 (*Agree Strongly*). Internal reliabilities range from .70 to .86 and test-retest reliabilities range between .78 and .91 (Wood et al., 2008). The subscales demonstrate validity via expected relationships with positive emotional and social functioning (Wood et al., 2008).

The *Five Factor Model of Personality* was assessed via the 50-item International Personality Item Pool (IPIP) measures of extraversion (e.g. "Start conversations"), neuroticism (e.g. "Get upset easily"), agreeableness (e.g. "Feel others' emotions"), conscientiousness (e.g. "Like order") and openness (e.g. "Have excellent ideas"; Goldberg et al., 2006). Responses are scored on five-point scales, anchored to 1 (*Very Inaccurate*) and 5 (*Very Accurate*). The scales show internal reliability statistics of between .77 and .86 and correlations with the NEO Personality Inventory (Costa & McCrae, 1992) of between .85 and .92 (Goldberg et al., 2006).

The Honesty–Humility factor was assessed via the four 8-item IPIP Facet Scales (Sincerity, e.g. "Don't pretend to be more than I am"; Fairness, e.g. "Try to follow the rules"; Greed Avoidance, e.g. "Don't strive for elegance in my appearance" and Modesty e.g. "Am just an ordinary person") for the HEXACO Personality Inventory (IPIP–HEXACO; Ashton, Lee, & Goldberg, 2007; Goldberg et al., 2006). Responses are scored on a five-point scale, anchored to 1 (*Very Inaccurate*) and 5 (*Very Accurate*) and the subscales scores were added together to form an overall score for Honesty–Humility. The IPIP–HEXACO scales internal-consistency reliabilities range from .73 to .88, and convergent correlations of between .76 and .98 with the original HEXACO facet scales (Ashton et al., 2007).

*Cloninger's model of personality* was assessed by using the IPIP–TCI Scales (Goldberg et al., 2006). Two hundred and eighty-nine items from the IPIP are used to measure four temperament domains; Novelty-Seeking (e.g. "Break rules"), Harm-Avoidance (e.g. "Avoid dangerous situations"), Reward Dependence (e.g. "Follow directions") and Persistence (e.g. "Meet challenges") and three character domains; Self-Directedness (e.g. "Know what I want"), Cooperativeness (e.g. "Reassure others") and Self-Transcendence (e.g. "Radiate joy"). Responses are scored on 5-point scales, anchored to 1 (*Very Inaccurate*) and 5 (*Very Accurate*). The scales show internal reliability statistics of between .66 and .86 and

appropriate correlations with the Temperament and Character Inventory (Cloninger et al., 1993; Goldberg et al., 2006).

Gray's model of personality was measured via the 24-item BIS/BAS Scales (Carver & White, 1994). The BIS scale assesses anxiety sensitivity to events (e.g. "Criticism or scolding hurts me quite a bit"). The BAS scale is subdivided into Drive (e.g. "I go out of my way to get things I want"), Fun-Seeking (e.g. "I crave excitement and new sensations") and Reward Responsiveness (e.g. "It would excite me to win a contest"). Responses are anchored to 1 (Very true for me) to 4 (Very false for me) format. Internal reliabilities for the scales range from .77 for the BIS, and .89 for Reward Responsiveness, .85 for Drive and .80 for Fun Seeking (Cooper, Gomez, & Aucote, 2007). Validity for the scale is demonstrated via corresponding performances on reward and punishment tasks (Brenner, Beauchaine, & Sylvers, 2005).

The dimensions of Self-Determination Theory were assessed by the *General Causality Orientation Scale* (GCOS; Deci & Ryan, 1985). The scale comprises 17 vignettes which describe social or achievement orientated situations (e.g. a scenario where the individual is asked to lead a work project), each with three reactions. Then, on a 7-point scale, from 1 (Very unlikely) to 7 (Very likely), respondents indicate the extent to which their reaction is autonomous (e.g. "seek participation from others"), controlled (e.g. "take charge in making decisions"), and impersonal (e.g. "follow precedent"). Internal reliability (>.75) and test-retest (>.74) coefficients are reported for the three scales (Deci & Ryan, 1985). The validity of the scales is demonstrated via the autonomy orientation being positively related to self-esteem and self-actualisation, the controlled orientation being related to public self-consciousness, and the impersonal orientation being related to poorer well-being (Deci & Ryan, 1985; Hodgins, Koestner, & Duncan, 1996).

The administration order of the measures was counterbalanced within each sample. Due to the length of the questionnaire, participants were allowed as much time as required to complete the questionnaire and return it at a later date if required.

### 3. Results

#### 3.1. Exploratory Factor Analysis

The first step of the analysis was to determine the factor structure of the data using the data from sample 1 ( $n = 708$ ). The 23 scales were subjected to Maximum Likelihood Analysis (Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .815; Bartlett's Test of Sphericity,  $\chi^2 = 5261.15$ ,  $df = 253$ ,  $p < .001$ ).

The decision on the number of factors to retain is important to Exploratory Factor Analysis. Typically, this is based on the K1 method (eigenvalues greater than one, Kaiser, 1960), Scree Plot (Cattell, 1966) and parallel analysis of Monte Carlo simulations (Horn, 1965), the latter allowing the comparison of the eigenvalues to those that might be expected from purely random data with no structure. The K1 approach may overestimate the number of factors and the Scree Test can be more exact but it can be ambiguous, difficult to interpret and interpretation can vary between researchers (Ledesma & Valero-Mora, 2007; Zwick & Velicer, 1986). Consequently, various studies have suggested that parallel analysis is the most appropriate and accurate method to determine the number of factors because it demonstrates the least variability and compares well to other methods (Ledesma & Valero-Mora, 2007). Therefore, parallel analysis was used to determine the number of factors, with the eigenvalues relevant to producing a Scree Plot included.

For the parallel analysis of the current data, the 7th eigenvalue (4.51, 3.12, 2.29, 1.75, 1.27, 1.19, .86, .75, .74) failed to exceed the 7th mean eigenvalue (1.34, 1.29, 1.24, 1.20, 1.17, 1.15, and 1.12) calculated from 1000 generated datasets with 708 cases and 23

variables. This suggests an optimal six factor solution with the first six factors accounting for 19.62%, 13.57%, 9.97%, 7.61%, 5.54%, and 5.18% of the variance, respectively.

These factors were then subjected to oblique (promax) rotation with delta set to 0. An oblique rotation was used as the factors were expected to be correlated. Table 1 presents the rotated matrices (noting the inclusion of internal reliability statistics for each scale).

For interpretation purposes, the criteria of .32 was used for a minimum loading of an item, because this equates to 10% overlapping variance with other items on the factor (Tabachnick & Fidell, 2001). In this solution, the first factor to emerge would be the sixth factor of personality with the IPIP Honesty-Humility subscales loading on this factor. Moreover, the authenticity subscales load on this factor, with accepting external influence and self-alienation loading negatively on the factor, and autonomous orientation loading positively, and the controlled orientation loading negatively on this factor. The second factor is an Extraversion factor with extraversion loading alongside the three behavioural activation system subscales and novelty seeking. The third factor is an Agreeableness factor, with agreeableness, loading alongside reward dependence and cooperativeness. The fourth factor is a Neuroticism factor, with neuroticism loading alongside behavioural inhibition and harm avoidance. The fifth factor is a Conscientiousness factor with conscientiousness loading alongside persistence and self-direction. The final factor is an Openness factor, with openness to experience loading alongside self-transcendence. Finally, amotivation orientation derived from Social Determination Theory failed to load above .32 on any of the six factors, but loaded the most highest on the neuroticism factor.

The correlations between the factors, using Cohen's (1992) effect size criteria (.1 = small, .3 = medium, .5 = large) to assess

**Table 1**  
Reliability statistics and maximum likelihood factor analysis with promax rotation of all the variables.

	Factors						
	$\alpha$	1	2	3	4	5	6
<i>Five Factor Model</i>							
Neuroticism	.79	.01	-.04	.01	<b>.87</b>	-.05	-.01
Extraversion	.82	.07	<b>.73</b>	.18	.05	.24	-.21
Openness to Experience	.79	-.03	.29	-.08	.04	.19	<b>.71</b>
Agreeableness	.84	-.01	-.15	<b>.79</b>	-.02	-.11	.07
Conscientiousness	.81	-.05	-.19	-.05	.02	<b>.71</b>	.08
<i>Gray</i>							
BIS	.77	-.03	-.01	.02	<b>.50</b>	.03	.02
BAS Fun Seeking	.73	.06	<b>.58</b>	-.10	-.04	-.11	.18
BAS Drive	.80	.01	<b>.48</b>	-.01	-.05	-.17	.12
BAS Reward	.76	-.02	<b>.53</b>	-.08	-.04	-.12	.11
<i>Responsiveness</i>							
<i>Cloninger</i>							
Novelty Seeking	.87	-.04	<b>.58</b>	-.03	.01	-.08	.18
Harm Avoidance	.91	.05	-.04	-.03	<b>.71</b>	-.05	.04
Reward Dependence	.85	-.06	.16	<b>.86</b>	-.01	.05	-.06
Persistence	.81	-.02	-.18	-.10	.01	<b>.72</b>	.11
Self Direction	.83	.04	.05	-.05	-.13	<b>.41</b>	.06
Cooperativeness	.82	.01	-.11	<b>.70</b>	.02	-.12	.09
Self-Transcendence	.75	.04	.11	.28	.02	.03	<b>.58</b>
<i>Honesty-Humility</i>							
Honesty-Humility	.93	<b>.52</b>	-.14	.16	.09	.19	.11
<i>Self-Determination Theory</i>							
Autonomous	.81	<b>.67</b>	.07	-.02	-.14	.01	.03
Controlled	.78	-. <b>36</b>	.28	-.05	.11	-.07	-.04
Impersonal	.79	-.24	.06	-.06	.28	-.08	.06
<i>Authenticity</i>							
Authentic Living	.71	<b>.79</b>	-.05	.04	-.01	-.08	.05
External Influence	.73	-. <b>86</b>	-.04	.11	-.06	.04	.02
Self Alienation	.74	-. <b>85</b>	-.12	.06	-.07	.03	.11

the degree of association, were generally small ( $r < .25$ ) with three exceptions. The Honesty–Humility factor shared a positive correlation of a medium effect size with the agreeableness ( $r = .36$ ) and conscientiousness ( $r = .31$ ) factors and a negative correlation of a medium effect size with the neuroticism factor ( $r = -.36$ ).

### 3.2. Confirmatory Factor Analysis

The factor structure suggested by the EFA was tested with multigroup Confirmatory Factor Analysis (CFA), using Samples 2, 3, and 4, and performed using covariance structural equation modelling with the Analysis of Moment Structure (AMOS) software. In contrast to conventional CFA, multigroup CFA additionally tests whether the factor structure is invariant across samples and demographic groups (Byrne, 2004). Thus, the multigroup approach provides several replications of the CFA, as well as testing the generalizability of the findings.

Three multigroup analyses were performed to test the fit of the six factor model, and to, respectively test whether the model was invariant across (a) sample, (b) gender, and (c) ethnicity. Each multigroup analyses tested the same model. Six latent factors were specified, as in Table 1. Each variable was specified as loading on only one factor. The six factors were allowed to correlate, however the error variances of the observed variables were not allowed to covary. This provides a highly conservative test of the six factor model, specifying that each variable loaded on only the theoretically expected factor, and variables were only correlated due to their shared loadings on this factor. Model fit was tested with the chi-squared test of the difference between the implied and reproduced correlation matrices, the standardised root-mean-square residual (SRMR), and the root mean square error of approximation. As the chi squared test is sensitive to sample size, Hu and Bentler (1999) recommend basing model fit assessments on the CFI and SRMR. CFA models are sensitive to the number of variables in the model, and the high number of observed variables (23) in the model, combined with no correlated errors, determined *a priori* that fit of the model could never be very high. As such, relatively lenient values of SRMR and RMSEA  $\leq .10$  were adopted as indicating acceptable fit, which are nevertheless conventionally

considered acceptable (Hu & Bentler, 1999), although perhaps at the upper limit of acceptability. For the multigroup analysis, in the constrained model factor loadings (measurement weights) and the correlations between factors (structural covariances) were fixed to be equal across the groups, whilst in the unconstrained models they were allowed to vary. The test of the difference between the constrained and unconstrained model was based on the difference in chi squared fit between the models (itself chi squared distributed).

The loadings of each variable for each CFAs performed as part of the multigroup analyses are presented in Table 2 (noting the inclusion of internal reliability statistics for each scale). In most cases variables loaded highly on the latent variable. The table also shows a remarkable amount of consistency in the size of the loadings across the three samples, three broad ethnic groupings and both genders. Based simply on visual examination, it seems that the model is invariant across these categories – although this assessment is tested statistically through the multigroup CFA.

The first multigroup analysis tested fit across sample. The constrained model ( $\chi^2$ [df = 722;  $n = 578$ ] = 1297.44, RMSEA = .04 [90% CI = .03–.04], SRMR = .08) fit the data well, to an equal degree as the unconstrained model ( $\chi^2$ [df = 648;  $n = 578$ ] = 1226.56, RMSEA = .04 [90% CI = .04–.04], SRMR = .08;  $\Delta\chi^2 = 70.88$   $\Delta$ df = 74,  $p = .58$ ), indicating that the factor loadings were equal between the groups, and the measure was sample invariant. This is significant, given the samples differed through sampling technique and composition (two student groups, and one ethnically diverse occupational sample).

As the model showed sample invariance, it is acceptable to combine the samples and then create demographic groups (Byrne, 2004). In the next multigroup CFA, the samples were then split according to gender (225 male, 353 female) and showed that again the constrained model ( $\chi^2$ [df = 469,  $n = 578$ ] = 787.60, RMSEA = .03 [90% CI = .03–.04], SRMR < .10) fit the data well, to an equal degree as the unconstrained model ( $\chi^2$ [df = 432,  $n = 578$ ] = 749.99, RMSEA = .04 [90% CI = .03–.04], SRMR = .11;  $\Delta\chi^2 = 37.61$ ,  $\Delta$ df = 37,  $p = .44$ ), suggesting the gender invariance of the measure.

Finally, the samples were then split between three ethnic groups. Participants were classed as either White ( $n = 319$ ), Asian

**Table 2**  
Reliability statistics and factor loadings from three multi-group factor analyses.

Latent Factor	Variable	$\alpha$ Sample			Sample			Gender		Ethnicity		
		S1	S2	S3	S1	S2	S3	Men	Women	Asian	Black	White
Honesty–Humility	Self Alienation	.73	.76	.73	-.80	-.80	-.79	-.82	-.81	-.83	-.86	-.76
	External Influence	.75	.78	.77	-.79	-.80	-.80	-.82	-.77	-.80	-.84	-.78
	Authentic Living	.71	.74	.73	.74	.75	.77	.75	.72	.70	.81	.75
	Honesty–Humility	.90	.91	.88	.58	.60	.53	.59	.62	.58	.67	.56
	Controlled	.77	.75	.74	-.38	-.35	-.53	-.41	-.43	-.39	-.48	-.43
	Autonomous	.70	.79	.72	.62	.63	.73	.69	.66	.62	.74	.67
Neuroticism	Neuroticism	.72	.75	.71	.90	.91	.91	.88	.88	.89	.88	.90
	Harm Avoidance	.90	.88	.85	.72	.71	.72	.68	.75	.74	.77	.69
	BIS	.74	.81	.73	.57	.60	.57	.48	.60	.46	.67	.60
	Impersonal	.70	.76	.77	.41	.38	.29	.29	.42	.39	.38	.33
Extraversion	Extraversion	.73	.80	.70	.29	.48	.37	.28	.36	.28	.44	.40
	BAS Fun-Seeking	.75	.74	.72	.68	.66	.69	.66	.63	.66	.68	.67
	BAS Drive	.80	.74	.77	.60	.64	.55	.65	.61	.58	.67	.61
	BAS Reward Responsiveness	.78	.79	.71	.70	.68	.63	.59	.63	.56	.70	.69
	Novelty Seeking	.84	.75	.79	.56	.68	.68	.64	.67	.59	.67	.67
Agreeableness	Reward Dependence	.77	.77	.82	.75	.78	.71	.73	.69	.66	.77	.78
	Cooperativeness	.88	.85	.79	.63	.60	.67	.59	.45	.57	.69	.59
	Agreeableness	.76	.73	.77	.78	.78	.72	.69	.76	.85	.69	.75
Conscientiousness	Conscientiousness	.73	.72	.78	.74	.79	.77	.72	.78	.82	.68	.78
	Self Direction	.79	.82	.83	.36	.44	.41	.23	.40	.44	.45	.35
	Persistence	.70	.78	.75	.88	.84	.82	.81	.81	.79	.91	.84
Openness	Openness	.76	.82	.74	.69	.61	.18	.79	.76	1.00	.49	.44
	Self-Transcendence	.81	.76	.81	.82	.68	1.00	.58	.71	.24	1.00	1.00

( $n = 130$ ), or Black ( $n = 102$ ). Finer grained comparisons between ethnic groups (e.g., Indian or Chinese) were not possible due to an insufficient  $n$  for CFA. The multigroup CFA again showed the constrained model ( $\chi^2[\text{df} = 722, n = 551] = 1249.75$ , RMSEA = .04 [90% CI = .03–.04], SRMR < .10) fit the data well, to an equal degree as the unconstrained model ( $\chi^2[\text{df} = 648, n = 551] = 1173.29$ , RMSEA = .04 [90% CI = .04–.04], SRMR = .09;  $\Delta\chi^2 = 76.37$ ,  $\Delta\text{df} = 74$ ,  $p = .40$ ), suggesting that the measure is invariant across ethnic groups. The three multigroup CFAs showed the six factor model provided an acceptable fit to the data, with the model being invariant across sample, gender, and ethnicity.

The correlations between the factors across the samples were generally low with some notable exceptions. In terms of effect size across the three samples there was a negative correlation of a large effect size between the Extraversion and Conscientiousness factors, ranging from  $r = -.49$  (Sample 1) to  $r = -.65$  (sample 3). Among Samples 1 and 2, the Honest–Humility factor shared a positive correlation of a medium effect size with the Agreeableness (Sample 1,  $r = .37$ ; Sample 2,  $r = .38$ ) and Openness factors (Sample 1,  $r = .33$ ; Sample 2,  $r = .43$ ) and a negative correlation of a medium effect size with the Neuroticism factor (Sample 1,  $r = -.34$ ; Sample 2,  $r = -.46$ ). Additionally the Openness factor shared a positive correlation of a medium effect size with the Agreeableness factor among sample 1 ( $r = .34$ ) and 2 ( $r = .45$ ) and the Extraversion factor in sample 2 ( $r = .35$ ).

#### 4. Discussion

From the Exploratory Factor Analyses of a number of personality measures a factor solution emerges that reflects the six main personality factors; Honesty–Humility, extraversion, agreeableness, neuroticism, conscientiousness and openness to experience, with authenticity loading on the first of those factors. The subsequent Confirmatory Factor Analysis suggests that this six factor model provided an acceptable fit to the data, and the model was invariant across three samples, gender, and ethnicity. This finding suggests authenticity, a key concept in Humanistic and Counselling psychology, is positioned within the six factors of personality. This finding contrasts with Wood et al. (2008) who found no significant association between authenticity and Honesty–Humility. However, the previous finding is based on one single correlation among one sample. We present a finding replicated across Exploratory and Confirmatory Factor Analysis, and within a multi-group CFA which shows the relationships to be invariant across samples, ethnicity and gender. This suggests the current findings provide a more robust consideration of the relationship.

One aspect to consider from the current findings is the loadings of authenticity and autonomy orientation alongside Honesty–Humility. Ashton and Lee (2007) have used an evolutionary theoretical framework, specifically reciprocal altruism, to explain the concept of Honesty–Humility. The current findings indicate that the Honesty–Humility factor may expand in another theoretical direction regarding psychological functioning as emphasised by the humanistic tradition of psychology.

In summary, the study shows how authenticity is positioned within extant models of personality, with all three aspects of the tripartite model of authenticity loading on the honesty-humility factor of personality.

#### References

- Ashton, M. C., & Lee, K. (2007). Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and Social Psychology Review*, 11, 150–166.
- Ashton, M. C., Lee, K., & Goldberg, L. R. (2007). The IPIP-HEXACO scales: An alternative, public-domain measure of the personality constructs in the HEXACO model. *Personality and Individual Differences*, 42, 1515–1526.
- Brenner, S. L., Beauchaine, T. P., & Sylvers, P. D. (2005). A comparison of psychophysiological and self-report measures of BAS and BIS activation. *Psychophysiology*, 42, 108–115.
- Byrne, B. M. (2004). Testing for multigroup invariance using amos graphics: A road less traveled. *Structural Equation Modeling*, 11, 272–300.
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS Scales. *Journal of Personality and Social Psychology*, 67, 319–333.
- Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, 1, 140–161.
- Cloninger, C. R., Svrakic, D. M., & Przybeck, T. R. (1993). A psychobiological model of temperament and character. *Archives of General Psychiatry*, 50, 975–990.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155–159.
- Cooper, A., Gomez, R., & Aucote, H. (2007). The Behavioural Inhibition system and Behavioural approach system (BIS/BAS) scales: Measurement and structural invariance across adults and adolescents. *Personality and Individual Differences*, 43, 295–305.
- Costa, P. T., Jr., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.
- Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality*, 19, 109–134.
- Deci, E. L., & Ryan, R. M. (2002). Self-determination research: Reflections and future directions. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 431–441). Rochester, NY: University of Rochester Press.
- Eysenck, H. J. (1990). Biological dimensions of personality. In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 244–276). New York: Guilford.
- 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.
- Gray, J. A. (1987). *The psychology of fear and stress* (2nd ed.). Cambridge: Cambridge University Press.
- Hodgins, H. S., Koestner, R., & Duncan, N. (1996). On the compatibility of autonomy and relatedness. *Personality and Social Psychology Bulletin*, 22, 227–237.
- Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, 30, 179–185.
- Horney, K. (1951). *Neurosis and human growth*. London: Routledge.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55.
- Joseph, S., & Linley, P. A. (2005). Positive adjustment to threatening events: An organismic valuing theory of growth through adversity. *Review of General Psychology*, 9, 262–280.
- Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, 20, 141–151.
- Ledesma, D. R., & Valero-Mora, P. (2007). Determining the number of factors to retain in EFA: an easy to use computer program for carrying out parallel analysis. *Practical Assessment, Research and Evaluation*, 12, 1–11.
- Lee, K., & Ashton, M. C. (2004). Psychometric properties of the HEXACO personality inventory. *Multivariate Behavioral Research*, 39, 329–358.
- Lee, K., & Ashton, M. C. (2008). The HEXACO personality factors in the indigenous personality lexicons of English and 11 other languages. *Journal of Personality*, 76, 1001–1053.
- Olesen, M. H., Thomsen, D. K., Schnieper, A., & Tonnesvang, J. (2010). Distinguishing general causality orientations from personality traits. *Personality and Individual Differences*, 48, 538–543.
- Paunonen, S. V., & Jackson, D. N. (2000). What is beyond the Big Five? Plenty! *Journal of Personality*, 68, 821–835.
- Pinto, D. G., Maltby, J., & Wood, A. M. (2011). Exploring the tripartite model of authenticity within Gray's approach and inhibition systems and Cloninger's biosocial model of personality. *Personality and Individual Differences*, 51, 194–197.
- Revelle, W. (1997). *Three fundamental dimensions of personality* [WWW document]. Retrieved from <http://personality-project.org/perproj/theory/big3.table.html>, 9th May 2011.
- Rogers, C. R. (1959). A theory of therapy, personality and interpersonal relationships, as developed in the client-centred framework. In S. Koch (Ed.), *Psychology: A study of a science* (Vol. 3). New York: McGraw-Hill.
- Rogers, C. R. (1965). *Client-centered therapy: Its current practice, implication, and theory*. Boston: Houghton Mifflin.
- Stewart, M. E., Ebmeier, K. P., & Deary, I. J. (2004). The structure of Cloninger's Tridimensional Personality Questionnaire in a British sample. *Personality and Individual Differences*, 36, 1403–1418.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed). Boston: Allyn and Bacon.
- Wilson, K., & Gullone, E. (1999). The relationship between personality and affect over the lifespan. *Personality and Individual Differences*, 27, 1141–1156.
- Wood, A. M., Linley, P. A., Maltby, J., Baliousis, M., & Joseph, S. (2008). The authentic personality: A theoretical and empirical conceptualization, and the development of the authenticity scale. *Journal of Counseling Psychology*, 55, 385–399.
- Zwick, W. R., & Velicer, W. F. (1986). Comparison of five rules for determining the number of components to retain. *Psychological Bulletin*, 99, 432–442.