Trait Variance and Response Style Variance in the Scales of the Personality Inventory for *DSM–5* (PID–5)

Michael C. Ashton, Reinout E. de Vries & Kibeom Lee

Published online: 05 Aug 2016.

Submit your article to this journal

View related articles

View Crossmark data

Routledge
Taylor & Francis Group

PERSONALITY ASSESSMENT IN THE DIAGNOSTIC MANUALS

Trait Variance and Response Style Variance in the Scales of the Personality Inventory for *DSM–5* (PID–5)

Michael C. Ashton,[1] Reinout E. de Vries,[2,3] and Kibeom Lee[4]

[1]Department of Psychology, Brock University, Canada; [2]Department of Social and Organizational Psychology, Vrije Universiteit Amsterdam, The Netherlands; [3]Department of Educational Science, University of Twente, The Netherlands; [4]Department of Psychology, University of Calgary, Canada

ABSTRACT

Using self- and observer reports on the Personality Inventory for *DSM–5* (PID–5) and the HEXACO Personality Inventory–Revised (HEXACO–PI–R), we identified for each inventory several trait dimensions (each defined by both self- and observer reports on the facet-level scales belonging to the same domain) and 2 source dimensions (each defined by self-reports or by observer reports, respectively, on all facet-level scales). Results (*N* = 217) showed that the source dimensions of the PID–5 were very large (much larger than those of the HEXACO–PI–R), and suggest that self-report (or observer report) response styles substantially inflate the intercorrelations and the alpha reliabilities of the PID–5 scales. We discuss the meaning and the implications of the large PID–5 source components, and we suggest some methods of controlling their influence.

The Personality Inventory for *DSM–5* (PID–5; Krueger, Derringer, Markon, Watson, & Skodol, 2012; Krueger et al., 2011) was finalized only 4 years ago, but has already been examined in many empirical studies. In several investigations, self-report scores on the PID–5 scales have shown theoretically appropriate correlations with self-report scores on the scales of various personality inventories (e.g., Ashton, Lee, De Vries, Hendrickse, & Born, 2012; Quilty, Ayearst, Chmielewski, Pollock, & Bagby, 2013). Recent evidence also suggests that the PID–5 scales show moderate levels of agreement between self-reports and reports from informants who are closely acquainted with the target person: Markon, Quilty, Bagby, and Krueger (2013) reported that across the 25 PID–5 facet-level scales, the mean self–informant correlations were .47 (in a normative sample) and .36 (in an elevated-risk community sample).

The results just summarized suggest that self-reports on the PID–5 scales do contain some important element of personality trait variance. However, there are some reasons to expect that PID–5 self-reports also contain some considerable proportion of variance due to biases in responding that are independent of actual personality trait levels.

First, the PID–5 items are overwhelmingly scored in the positive direction; only 16 of the 220 items of the full-length PID–5 are scored negatively, and no items of the shorter 100-item PID–5 are scored negatively. Also, most PID–5 items describe highly undesirable traits or tendencies, such that only persons with rather high levels of the intended traits would be likely to choose a response option other than the lowest; as a result, the mean self-report responses to PID–5 items, even in clinical samples, tend to be very low,

with many items having means below 1.00 on a 0 to 3 response scale.[1] These features of the PID–5 items make it likely that individual differences in "acquiescence" or the elevation of responses to self-report personality items will contribute to scores on all of the PID–5 facet scales, thereby inflating their alpha reliabilities as well as the correlations between them. Note also that, beyond any individual differences in acquiescence of responses to personality items in general, the consistently undesirable content of the PID–5 items might induce additional variance in acquiescent responding. That is, the highly undesirable content of most PID–5 items might lead a respondent to answer in a more similar way across the various items, including even those few whose content is not clearly undesirable. Finally, PID–5 scales are also likely to be influenced by individual differences in the tendency to endorse socially desirable versus undesirable items, independent of their content; given that few PID–5 items appear to be roughly neutral in their social desirability, variance due to socially (un)desirable responding might be even more prominent than in normal-range personality inventories. To summarize, we expect that variance in self-report scores on PID–5 scales reflects not only variance in the intended traits, but also variance in the self-report response styles of elevation (acquiescence) and social desirability, independent of actual trait levels.

A useful strategy for separating trait variance from response style variance in personality questionnaire scale scores is to administer those scales not only in self-report form, but also in observer (informant) report form, where the observer is closely acquainted with the target person. By

---

[1]Consider, for example, the items "I don't care if my actions hurt others" or "Everything seems pointless to me."

obtaining self-reports and observer reports for each respondent, where the two reports are provided independently, one can identify for each scale the variance that is shared between self- and observer reports, the variance that is unique to the self-reports, and the variance that is unique to the observer reports. Normally, the shared variance can be interpreted as variance due to the intended personality trait, whereas the self-report-specific and observer report-specific variance can be interpreted as mainly being variance due to response styles associated with each source of data. Of course, for any given scale, some of the source-specific variance might represent real trait variance, but the source-specific variance that is shared across many scales that are theoretically unrelated (or even inversely related) is likely to be response style variance. When self- and observer reports are used jointly in examining the factor structure of a diverse set of scales, one can separate dimensions representing the sources of the measurements (defined respectively by self-reports across all scales and by observer reports across all scales) from dimensions representing various broad personality traits (each defined jointly by self-reports and observer reports on a subset of scales).

This study

In this study, we use this strategy of jointly analyzing self- and observer reports so that we can investigate the contributions of trait and source variance to the facet-level scales of the PID–5. For any given PID–5 facet scale, we determine the extent to which its variance is attributable to each of the five broad trait dimensions presumed to underlie the PID–5 variable set, and also to the source of information on that scale, whether self-report or observer report. To the extent that the source dimensions contribute heavily to scores on the PID–5 scales, this would suggest that within each source of data, the correlations between PID–5 scales are inflated by response styles associated with self-reports or with observer reports.

As a basis for comparison with the PID–5 and to provide further information on the obtained PID–5 dimensions, we also obtained self- and observer reports for our participants on the HEXACO Personality Inventory–Revised (HEXACO–PI–R; see http://hexaco.org), a measure of the major dimensions of normal personality variation. By conducting analyses analogous to those for the PID–5, we can compare the relative sizes of the trait and source dimensions for the two instruments. In addition, we can examine the correspondences between the two sets of trait and source dimensions, and conduct further analyses aimed at comparing acquiescence and desirability as influences on the PID–5 source dimensions.

Method

Sample and procedure

The data were collected as part of a multiwave Internet panel study through a Netherlands national ISO-certified Internet panel company (see Ashton et al., 2012; De Vries & Van Kampen, 2010). This study contained data that were collected in 2008 (HEXACO–PI–R self-reports), 2011 (PID–5 self-reports), and 2015 (HEXACO–PI–R and PID–5 observer reports and additional HEXACO–PI–R and PID–5 self-reports). From the original 1,377 participants who completed the HEXACO–PI–R in 2008, 476 respondents completed the PID–5 in 2011. The respondents from 2011 were approached in 2015 to provide contact information of well-acquainted others to allow us to obtain observer reports. From this sample, we obtained 118 usable HEXACO–PI–R and PID–5 observer reports (self-reports: 48.3% women; observer reports: 66.9% women). In 2015, we obtained an additional sample of respondents, from which we obtained a set of 99 usable HEXACO–PI–R and PID–5 self-reports and a matching set of observer reports (self-reports: 36.4% women; observer reports: 62.6% women). The total sample thus consisted of 217 persons who provided self-reports and 217 other persons who each provided observer reports of a different target person. The sample of persons who provided self-reports was roughly representative of the Dutch adult population with respect to gender, age, region, and educational background; it consisted of 42.9% women, with $M_{age} = 46.8$ ($SD_{age} = 13.5$), and of low (26.3%), medium (49.8%), and high (24.0%) educational levels.[2] The sample of observers consisted of 65.0% women, with $M_{age} = 48.7$ ($SD_{age} = 16.8$). Most dyads consisted of married or cohabiting intimate partners (62.2%) and direct family members (e.g., parent–child or siblings; 28.1%) and had known each other for an average of 27.2 years ($SD = 15.7$).

Measures

HEXACO–PI–R

Participants of the 2008 sample completed the 200-item version of the Dutch HEXACO–PI–R, and participants of the 2015 sample completed the 100-item half-length version, the items of which are all contained in the longer version. For consistency, all analyses were conducted on the 100-item version, which consists of 16 items for each of the six factor-level scales and four items for each of the facet-level scales (each factor scale consists of four facet-level scales, with an additional facet assessing the interstitial trait of altruism). Items are administered using a response scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Each facet-level scale of the 100-item form contains between one and three reverse-scored items. Alpha reliabilities and validity information on the half-length and full Dutch self- and observer report versions of the HEXACO–PI–R are provided elsewhere (De Vries, Ashton, & Lee, 2009; De Vries, Wawoe, & Holtrop, 2016). In this study, alpha reliabilities ranged from .76 and .78 (conscientiousness) to .84 and .88 (emotionality) for, respectively, the self- and observer report HEXACO–PI–R factor-level (domain) scales.

PID–5

The 2011 sample completed the 220-item version of the Dutch PID–5 (De Clercq, De Fruyt, Mervielde, Krueger, & Markon,

---

[2] These educational levels distinguish three levels of academic attainment, with low levels associated with lower level skills (e.g., primary education or low-level secondary or tertiary education), medium levels associated with high-level secondary education or medium-level tertiary education, and high levels associated with higher level tertiary and university-level education.

2011) and the 2015 sample completed the 100-item version, the items of which are all contained in the longer version (see Maples et al., 2015, for the English 100-item PID–5). This 100-item version was used for all analyses. The self-report version of the Dutch PID–5 was translated and validated by De Clercq et al. (2011), who also kindly provided the Dutch observer (informant) report version, which has not been used in published research until now. The 100-item PID–5 consists of 25 facets—each with four items—subsumed within five domain-level scales, each consisting of three to seven facets. Items are administered using a 4-point response scale ranging from 0 (*very false*) to 3 (*very true*). In this study, alpha reliabilities ranged from .77 and .78 (Disinhibition) to .92 and .92 (Detachment) for, respectively, the self- and observer report domain scales.

Method of analysis

In separate analyses of PID–5 facet scales (self- and observer reports jointly) and of HEXACO–PI–R facet scales (self- and observer reports jointly), we used principal components analysis with targeted orthogonal Procrustes rotation (Ashton & Lee, 2010; McCrae, Zonderman, Costa, Bond, & Paunonen, 1996; Paunonen, 1997; Schönemann, 1966) to obtain trait components (defined jointly by self- and observer reports on the facets assigned to a given trait domain) and source components (defined by self- or observer reports, respectively, across all facets). The advantage of using a targeted rotation—as opposed to a simple-structure-seeking rotation such as varimax—is to divide more clearly the scale variance that is shared between self- and observer reports (but not with self- or observer reports on conceptually unrelated scales) from the scale variance that is shared with conceptually unrelated scales as assessed by the same source (but not by the other source).

We defined the PID–5 trait and source dimensions as follows. Using the assignments of PID–5 facets to the five broad PID–5 domains (e.g., Krueger et al., 2012), we assigned on each dimension target loadings of .75 to the self- and observer reports on each facet belonging to a given domain and target loadings of 0 to all self- and observer reports on all other facets. (Note that the restricted affectivity and rigid perfectionism facets were assigned loadings of –.75 on the negative affect and disinhibition trait dimensions, respectively, as these facets are scored negatively for those domains.) Every PID–5 facet was also assigned a target loading of .30 on the appropriate source dimension (i.e., self or observer); all of the source target loadings were positive.

We defined the HEXACO trait and source dimensions analogously. We assigned each HEXACO–PI–R facet as assessed by each rating source a target loading of .75 on its hypothesized trait dimension and a target loading of .30 on the appropriate rating source dimension. (In the case of three Emotionality facets—fearfulness, anxiety, and dependence—the latter loadings were given as –.30, because these three facets, but not the remaining Emotionality facet of sentimentality, were expected to be influenced by source-specific response biases in a direction opposite to that for all other HEXACO–PI–R facets; see Ashton & Lee, 2010.) For the interstitial altruism facet, we

assigned target loadings of .45 on the Honesty-Humility, Agreeableness, and Emotionality trait dimensions (according to its theoretical location within the HEXACO factor space) as well as a target loading of .30 on the appropriate source dimension.[3]

For both analyses, we used principal components analysis rather than common factor analysis, so that we could obtain exact scores for participants on each dimension.

Results

Descriptives, reliabilities, self/observer correlations

Table 1 shows the means, standard deviations, and alpha reliabilities for all PID–5 and HEXACO–PI–R facet-level scales in self- and observer report data, along with the convergent self–observer correlations.

For the PID–5 scales, the self–observer convergent correlations averaged .44, and the within-source correlations averaged .36 (self-reports) and .31 (observer reports); that is, the within-source correlations were about three-quarters as large as the self–observer convergent correlations. For the HEXACO–PI–R scales, the self–observer convergent correlations averaged .52, and the within-source correlations averaged .08 (self-reports) and .10 (observer reports); that is, the within-source correlations were less than one fifth as large as the self–observer convergent correlations.

PID–5 trait and source dimensions

As seen in Table 2, the PID–5 trait components generally showed high loadings for the scales targeted on them. Congruence coefficients between targeted and obtained components were very high (about .95) for the source components and moderately high (between .75 and .80) for the trait components; all of these values would reach the 5% level of significance following Paunonen's (1997) Monte Carlo findings. The somewhat lower congruences for the trait components are attributable in part to our use of binary target loadings (i.e., .75 or 0) and to the many moderately large, nontargeted secondary loadings that were obtained; note, however, that these secondary loadings were theoretically appropriate and consistent with previous findings.

The most striking results in Table 2 involve the source components: On the self-report source component, the self-report PID–5 scales showed loadings ranging from .34 to .66, and on the observer report source component, the observer report PID–5 scales showed loadings ranging from .20 to .65. Overall,

---

[3] We used target trait loadings of .75 and target source loadings of .30 for each PID–5 facet and each univocally assigned HEXACO–PI–R facet, so that these target loadings would be proportional to those used by Ashton and Lee (2010), who assigned target trait and source loadings of 1 and .40, respectively. For these analyses, we multiplied those loadings by .75 in response to a suggestion from an anonymous reviewer, who recommended making the target loadings closer to the values that could realistically be obtained. (Note that multiplying all of the target loadings by a constant does not change the obtained solutions.) For the HEXACO–PI–R altruism facet, which was not included in the analyses of Ashton and Lee (2010), our choice of target trait loadings of .45 for Honesty-Humility, Emotionality, and Agreeableness was intended to correspond to a communality for altruism similar to that of the other facet scales.

Table 1. Means, standard deviations, internal consistency reliabilities (α), and self–observer correlations of the facet-level personality scales.

	Self-reports			Observer reports					Self-reports			Observer reports			
PID–5	α	M	SD	α	M	SD	Self–observer r	HEXACO–PI–R	α	M	SD	α	M	SD	Self–observer r
Anxiousness	.86	.94	.71	.84	.96	.69	.53	Sincerity	.65	3.48	.69	.60	3.47	.68	.38
Emotional Lability	.78	1.03	.62	.77	.98	.61	.51	Fairness	.78	3.76	.86	.83	4.05	.87	.57
Hostility	.81	.93	.65	.81	.91	.64	.53	Greed Avoidance	.72	3.44	.78	.76	3.53	.84	.53
Perseveration	.79	.96	.59	.82	1.13	.62	.41	Modesty	.67	3.89	.59	.61	3.76	.62	.33
Restricted Affectivity	.80	1.01	.62	.82	1.07	.66	.53	Fearfulness	.60	2.76	.68	.66	2.77	.73	.50
Separation Insecurity	.73	.94	.62	.77	1.12	.67	.37	Anxiety	.64	3.21	.73	.70	3.09	.81	.61
Submissiveness	.76	1.18	.58	.76	1.21	.56	.31	Dependence	.77	3.15	.76	.74	3.18	.77	.51
Anhedonia	.83	.61	.57	.76	.66	.56	.46	Sentimentality	.68	3.31	.74	.80	3.22	.84	.53
Depressivity	.89	.47	.62	.91	.54	.66	.58	Social Self-Esteem	.64	3.73	.60	.75	3.67	.69	.51
Intimacy Avoidance	.80	.76	.64	.84	.97	.70	.46	Social Boldness	.72	3.00	.79	.74	3.06	.84	.70
Suspiciousness	.66	.75	.50	.71	.79	.55	.44	Sociability	.58	3.11	.67	.58	3.10	.71	.53
Withdrawal	.85	.91	.66	.83	.93	.67	.47	Liveliness	.74	3.42	.74	.72	3.41	.75	.56
Eccentricity	.88	.79	.72	.83	.73	.62	.36	Forgivingness	.78	2.73	.78	.80	2.84	.85	.57
Perceptual Dysregulation	.81	.37	.49	.81	.42	.51	.43	Gentleness	.64	3.27	.61	.76	3.34	.75	.47
Unusual Beliefs & Experiences	.79	.53	.58	.77	.49	.55	.47	Flexibility	.48	2.97	.60	.64	2.86	.71	.46
Attention Seeking	.86	.99	.68	.83	1.06	.66	.47	Patience	.72	3.25	.73	.73	3.33	.78	.53
Callousness	.84	.50	.52	.83	.60	.58	.45	Organization	.58	3.57	.68	.66	3.62	.78	.54
Deceitfulness	.79	.54	.52	.81	.56	.56	.35	Diligence	.64	3.68	.63	.67	3.82	.67	.57
Grandiosity	.82	.53	.54	.83	.56	.54	.36	Perfectionism	.66	3.55	.68	.63	3.59	.66	.51
Manipulativeness	.79	.96	.61	.75	.98	.59	.38	Prudence	.58	3.21	.62	.46	3.30	.63	.40
Distractibility	.87	1.03	.68	.88	1.00	.71	.47	Aesthetic Appreciation	.61	3.11	.78	.59	2.98	.80	.67
Impulsivity	.69	1.05	.54	.52	1.16	.51	.36	Inquisitiveness	.71	3.34	.86	.77	3.20	.95	.68
Irresponsibility	.70	.54	.49	.74	.49	.50	.43	Creativity	.56	3.14	.76	.63	3.10	.82	.58
Rigid Perfectionism	.81	1.13	.70	.75	1.25	.65	.46	Unconventionality	.51	3.02	.64	.47	2.78	.63	.44
Risk Taking	.76	.67	.54	.76	.65	.53	.48	Altruism	.55	3.69	.58	.63	3.65	.64	.44

Note. Personality Inventory for *DSM–5* (PID–5) items use a 0 to 3 response scale; HEXACO–PI–R items use a 1 to 5 response scale.

the self-report source component accounted for 22.9% of the variance in the self-report scales (but only 1.2% of the variance in the observer report scales), and the observer report source component accounted for 19.7% of the variance in the observer report scales (but only 0.6% of the variance in the self-report scales). Within each source of data, the source component was about two and a half times as large as the average trait component.

Note that if we repeat the preceding analysis using common factor analysis (specifically, principal axis factoring) rather than principal components analysis, the results are nearly identical. In particular, the self- and observer report source factors are only slightly smaller than the corresponding source components: The self-report source factor accounted for 21.5% of the variance in the self-report scales, and the observer report source factor accounted for 18.2% of the variance in the observer report scales.

HEXACO–PI–R trait and source dimensions

As seen in Table 3, the HEXACO–PI–R trait components generally showed high loadings for the scales targeted on them. Congruence coefficients between targeted and obtained components were fairly high (about .70) for the source components and very high (averaging nearly .90) for the trait components; the somewhat lower values for the source components reflect the tendency for the facets to differ widely in their loadings on those components. The HEXACO–PI–R source components were modest in size, each of them accounting for 7.7% of the variance in the scales as assessed by that source (and only about 2% of the variance in the scales as assessed by the other source). Within each

source of data, the source component was about as large as the average trait component.[4]

Correspondences between PID–5 and HEXACO–PI–R trait and source components

Table 4 shows the correlations of the seven PID–5 components with the eight HEXACO–PI–R components. These results indicate fairly strong correspondences between PID–5 Negative Affectivity and HEXACO Emotionality, between PID–5 Detachment and low HEXACO Extraversion, and between PID–5 Disinhibition and low HEXACO Conscientiousness; in addition, PID–5 Detachment also showed a moderate association with low HEXACO Agreeableness, and PID–5 Antagonism showed moderate associations with low HEXACO Honesty-Humility, low HEXACO Agreeableness, and to some extent HEXACO Extraversion. PID–5 Psychoticism showed only weak associations with the HEXACO components, and HEXACO Openness showed only weak associations with the PID–5 components. The PID–5 self- and observer report source components showed moderate negative correlations (in the –.30s) with their HEXACO–PI–R counterparts. The negative sign of the latter

---

[4] We repeated all of the preceding analyses for the $n = 118$ subsample (from which self-reports were collected in 2008 [HEXACO–PI–R] or 2011 [PID–5] and from which observer reports were collected in 2015) and for the $n = 99$ subsample (from which self-and observer reports were obtained concurrently in 2015 for both inventories). The results were highly similar across subsamples, beyond the expected tendency for trait components to be slightly smaller within the subsample in which self- and observer reports were separated by several years. In both PID–5 subsamples, the source factors were still between two and three times larger than the respective average trait factors, whereas in both of the HEXACO subsamples, the source factors were still about as large as the respective average trait factors.

Table 2. The orthogonal Procrustes rotated seven-component solution from the Personality Inventory for *DSM–5* facet scales.

	Negative affect	Detachment	Psychoticism	Antagonism	Disinhibition	Self source	Observer source	Congruence coefficient
Self-reports								
Anxiousness	**.60**	.43	.17	.01	.08	**.38**	−.07	.82
Emotional Lability	**.62**	.30	.17	.04	.01	**.34**	−.05	.89
Hostility	**.38**	.36	−.13	.34	.26	**.35**	.01	.62
Perseveration	**.46**	.18	.09	.18	.09	**.61**	.06	.80
Restricted Affectivity	**−.40**	.32	−.19	.05	.12	**.58**	.16	.71
Separation Insecurity	**.56**	−.07	.12	.01	.02	**.43**	.04	.94
Submissiveness	**.32**	−.15	−.02	−.26	.10	**.66**	.04	.68
Anhedonia	.23	**.63**	.10	.06	.21	**.44**	−.08	.89
Depressivity	.31	**.65**	.14	.05	.11	**.39**	−.05	.89
Intimacy Avoidance	−.06	**.43**	.12	.03	−.08	**.48**	.01	.87
Suspiciousness	.36	**.39**	.27	.16	.06	**.44**	−.10	.68
Withdrawal	−.12	**.64**	.02	−.03	.03	**.49**	.05	.95
Eccentricity	.11	.28	**.23**	.20	.24	**.55**	−.08	.56
Perceptual Dysregulation	.26	.12	**.60**	.18	.10	**.49**	.02	.87
Unusual Beliefs & Experiences	.24	.16	**.64**	.24	.14	**.38**	−.01	.87
Attention Seeking	.17	−.22	.01	**.59**	.02	**.40**	−.08	.91
Callousness	−.19	.39	.04	**.36**	.40	**.45**	−.02	.61
Deceitfulness	.07	.16	.15	**.60**	.18	**.55**	−.04	.88
Grandiosity	.05	.14	.16	**.62**	−.01	**.40**	−.11	.93
Manipulativeness	−.02	−.14	.15	**.61**	−.08	**.42**	.01	.93
Distractibility	.39	.14	−.07	.08	**.37**	**.51**	.15	.69
Impulsivity	.31	−.07	.01	.27	**.36**	**.43**	.04	.71
Irresponsibility	.00	.24	.13	.39	**.43**	**.51**	−.01	.72
Rigid Perfectionism	.30	.03	.11	.05	**−.38**	**.61**	.15	.72
Risk Taking	.02	.02	.21	.34	**.30**	**.51**	.13	.65
Observer reports								
Anxiousness	**.63**	.40	.13	.02	−.06	−.11	**.31**	.85
Emotional Lability	**.68**	.25	.11	.05	.02	−.12	**.36**	.92
Hostility	**.31**	.37	−.17	.38	.29	−.13	**.36**	.53
Perseveration	**.24**	.23	−.01	.13	.15	.12	**.65**	.60
Restricted Affectivity	**−.43**	.37	−.19	.19	.17	.14	**.51**	.70
Separation Insecurity	**.58**	−.01	−.06	.17	−.02	.00	**.32**	.96
Submissiveness	**.26**	−.21	.19	−.30	.14	.18	**.50**	.58
Anhedonia	.20	**.62**	.07	.12	.08	−.07	**.46**	.91
Depressivity	.29	**.69**	.15	.03	.04	−.06	**.33**	.92
Intimacy Avoidance	−.15	**.46**	.10	−.08	−.26	.08	**.46**	.82
Suspiciousness	.40	**.49**	.07	.26	.15	−.08	**.39**	.74
Withdrawal	−.06	**.64**	−.06	−.12	−.06	.04	**.48**	.94
Eccentricity	.05	.19	**.20**	.18	.36	.09	**.55**	.53
Perceptual Dysregulation	.17	.08	**.61**	.21	.19	−.09	**.49**	.87
Unusual Beliefs & Experiences	.16	.12	**.71**	.20	.08	−.13	**.32**	.92
Attention Seeking	.30	−.22	.09	**.58**	.09	−.02	**.29**	.85
Callousness	−.10	.30	.08	**.46**	.36	−.07	**.42**	.73
Deceitfulness	.10	.08	.27	**.46**	.30	.00	**.57**	.75
Grandiosity	.12	.16	.17	**.54**	.14	−.16	**.44**	.86
Manipulativeness	.05	−.19	.09	**.47**	.09	.10	**.50**	.85
Distractibility	.43	.11	.03	−.12	**.42**	.07	**.52**	.72
Impulsivity	.23	−.17	.13	.19	**.53**	.04	**.20**	.84
Irresponsibility	.01	.14	.35	.29	**.43**	−.01	**.53**	.72
Rigid Perfectionism	.27	.03	−.14	.26	**−.49**	.29	**.46**	.75
Risk Taking	−.04	−.08	.28	.36	**.28**	.07	**.42**	.61
Congruence coefficient	.78	.78	.75	.79	.75	.96	.96	.79

Note. N = 217. Loadings of variables on targeted components are shown in bold; see text for details of targeting.

correlations is theoretically appropriate given that the PID–5 source components are defined in the direction of undesirable responses, whereas the HEXACO–PI–R source components were defined (as in Ashton & Lee, 2010) in the direction of desirable responses.

PID–5 and HEXACO domain scale scores (self- and observer report) in relation to PID–5 trait and source components

The correlations of Table 4 show how the two sets of components are related, but it is also of interest to examine how the domain scale scores of each inventory (in both self- and observer report) are related to each set of components. These latter correlations will show how the variance of self- or observer report scores on a given domain scale is distributed across the various components.

Table 5 shows the correlations of the seven PID–5 components with self- and observer reports on the five domain scales of the PID–5 (plus the mean across all PID–5 items) and the six domain scales of the HEXACO–PI–R. These results show that the PID–5 domain scales did correlate fairly strongly with their corresponding trait components: For four of the scales, the correlations ranged from .66 to .76, and for Psychoticism, the correlations were .54 and .59. However, all five domain scales also correlated strongly with the corresponding source components: The self-report scales correlated .41 to .58 with

Table 3. The orthogonal Procrustes rotated eight-component solution from the HEXACO–PI–R facet scales.

	H	E	X	A	C	O	Self source	Observer source	Congruence coefficient
Self-reports									
Sincerity	**.51**	.02	−.11	−.11	.04	−.06	**.10**	.12	.91
Fairness	**.63**	.12	.16	.14	.12	−.08	**.36**	−.06	.92
Greed Avoidance	**.64**	.14	−.08	.08	−.08	−.04	**.33**	−.03	.96
Modesty	**.46**	−.03	−.14	.15	.09	−.08	**.21**	−.10	.89
Fearfulness	−.10	**.56**	−.08	−.03	−.08	−.21	**−.02**	−.02	.85
Anxiety	.07	**.67**	−.21	−.08	.15	.07	**−.26**	−.17	.91
Dependence	.02	**.72**	.05	−.07	−.06	.04	**−.05**	−.10	.93
Sentimentality	.03	**.71**	.00	.10	.05	.02	**.10**	−.20	.92
Social Self-Esteem	.01	−.30	**.42**	.09	.10	−.03	**.53**	.13	.77
Social Boldness	.06	−.03	**.69**	−.17	.03	.27	**.03**	.03	.85
Sociability	−.07	.21	**.65**	.03	−.14	−.02	**−.08**	−.07	.81
Liveliness	−.11	−.14	**.59**	.25	.13	.05	**.36**	.06	.89
Forgivingness	.09	−.21	.24	**.59**	−.06	.05	**.08**	−.10	.84
Gentleness	.03	−.03	−.04	**.70**	−.13	−.09	**.21**	−.09	.96
Flexibility	.02	.24	.04	**.32**	−.14	−.06	**.54**	.19	.69
Patience	.05	−.16	−.03	**.65**	.02	.05	**.22**	.18	.94
Organization	−.20	.24	−.05	−.11	**.50**	−.22	**.31**	.25	.77
Diligence	.08	.02	.43	.15	**.64**	.13	**.07**	−.19	.75
Perfectionism	.07	.12	−.19	.11	**.70**	.06	**.02**	−.20	.85
Prudence	.01	−.14	−.12	−.15	**.45**	−.12	**.46**	.20	.82
Aesthetic Appreciation	.10	.23	.02	−.20	−.01	**.52**	**.44**	.32	.79
Inquisitiveness	−.12	−.27	−.02	.02	.17	**.65**	**.17**	−.03	.88
Creativity	.03	.13	.19	−.02	−.10	**.67**	**.07**	.03	.90
Unconventionality	−.08	−.11	−.06	−.02	−.06	**.69**	**−.10**	−.07	.84
Altruism	**.41**	**.34**	.02	**.24**	.04	.09	**.46**	.09	.92
Observer reports									
Sincerity	**.51**	−.12	−.26	−.06	.05	.03	−.21	**.27**	.84
Fairness	**.64**	.07	.17	.12	.26	.02	.06	**.12**	.86
Greed Avoidance	**.69**	.03	−.17	.09	.00	−.09	.19	**.22**	.93
Modesty	**.45**	−.05	−.08	.27	.09	−.10	−.19	**.45**	.79
Fearfulness	−.05	**.60**	−.12	−.05	.03	−.07	.07	**−.09**	.94
Anxiety	−.01	**.64**	−.24	−.11	.15	.13	−.19	**−.24**	.87
Dependence	.05	**.66**	.13	−.06	−.05	−.07	−.18	**.01**	.86
Sentimentality	.00	**.69**	.02	.21	.09	−.04	−.05	**.14**	.93
Social Self-Esteem	−.05	−.35	**.53**	.02	.04	−.07	.22	**.43**	.81
Social Boldness	−.12	−.04	**.72**	−.17	.07	.23	−.03	**.08**	.88
Sociability	−.15	.25	**.69**	.04	−.22	.01	−.06	**.02**	.83
Liveliness	−.07	.00	**.64**	.23	.01	−.10	.16	**.41**	.91
Forgivingness	.10	−.11	.12	**.65**	.01	−.01	−.10	**.17**	.95
Gentleness	.13	.06	−.10	**.75**	.00	−.05	−.09	**.29**	.97
Flexibility	.05	.24	.02	**.63**	.01	−.16	.14	**.35**	.91
Patience	.08	−.11	.03	**.70**	.15	.05	−.01	**.37**	.96
Organization	.05	.15	−.15	−.15	**.50**	−.23	.06	**.48**	.83
Diligence	.18	.00	.33	.13	**.62**	.19	−.08	**.20**	.83
Perfectionism	.11	.12	−.07	.08	**.72**	.21	.05	**.01**	.87
Prudence	.36	−.12	−.16	−.12	**.43**	−.02	.05	**.37**	.76
Aesthetic Appreciation	.05	.16	−.02	−.12	.04	**.62**	.28	**.42**	.89
Inquisitiveness	−.09	−.29	.10	.04	.10	**.63**	.07	**.11**	.86
Creativity	.00	.20	.22	.08	−.06	**.65**	.07	**.22**	.90
Unconventionality	−.18	−.05	−.08	.12	−.09	**.66**	.01	**.02**	.88
Altruism	**.45**	**.23**	.04	**.36**	.13	.11	−.08	**.39**	.92
Congruence coefficient	.92	.87	.87	.90	.91	.92	.68	.75	.87

Note. N = 217. Loadings of variables on targeted components are shown in bold; see text for details of targeting. H = Honesty–Humility; E = Emotionality; X = Extraversion; A = Agreeableness; C = Conscientiousness; O = Openness to Experience.

Table 4. Correlations of the Personality Inventory for *DSM–5* (PID–5) components with the HEXACO–PI–R components.

	PID–5 components						
HEXACO–PI–R components	Negative affect	Detachment	Psychoticism	Antagonism	Disinhibition	Self source	Observer source
Honesty–Humility	−.07	.06	−.24	**−.49**	−.18	−.04	−.16
Emotionality	**.72**	−.01	.24	−.15	−.15	−.16	−.10
Extraversion	.04	**−.65**	.03	**.33**	.08	−.10	−.14
Agreeableness	−.10	**−.33**	.15	**−.39**	−.10	.19	.03
Conscientiousness	.09	−.08	−.12	.04	**−.61**	.09	−.05
Openness	−.02	−.04	.04	.24	−.04	.10	−.07
Self source	−.25	−.17	.13	−.15	−.12	**−.36**	.17
Observer source	−.24	−.18	.02	−.05	−.22	.07	**−.34**

Note. N = 217. Correlations with absolute values of .30 or greater are shown in bold.

Table 5. Correlations of Personality Inventory for *DSM–5* (PID–5) component scores with the two inventories' self- and observer report domain scale scores.

	PID–5 components						
	Negative affect	Detachment	Psychoticism	Antagonism	Disinhibition	Self source	Observer source
Self-report PID–5							
Negative Affect	**.76**	.18	.14	.07	.10	**.49**	−.03
Detachment	.17	**.71**	.16	.06	.08	**.58**	−.04
Psychoticism	.23	.23	**.54**	.24	.19	**.56**	−.04
Antagonism	.03	.06	.13	**.73**	.12	**.57**	−.06
Disinhibition	.14	.10	.04	**.33**	**.66**	**.41**	.05
PID–5 total	**.33**	**.35**	.20	**.32**	.19	**.77**	.01
Observer report PID–5							
Negative Affect	**.76**	.17	.09	.07	.08	−.06	**.47**
Detachment	.16	**.76**	.08	.04	−.03	−.02	**.55**
Psychoticism	.15	.16	**.59**	.24	.26	−.05	**.55**
Antagonism	.13	.02	.18	**.66**	.25	−.04	**.57**
Disinhibition	.14	.00	**.30**	.11	**.74**	−.05	**.39**
PID–5 total	**.33**	**.35**	.20	**.33**	.22	.02	**.75**
Self–report HEXACO							
Honesty–Humility	−.04	−.04	−.10	**−.58**	−.20	−.19	−.04
Emotionality	**.65**	.06	.17	−.15	−.10	−.11	−.06
Extraversion	−.12	**−.62**	.01	**.30**	−.03	−.24	−.08
Agreeableness	−.21	**−.31**	.10	**−.33**	−.07	.03	.03
Conscientiousness	.10	−.17	−.02	−.09	**−.52**	−.06	−.01
Openness	−.11	−.10	.04	.23	−.10	.07	−.08
Observer report HEXACO							
Honesty–Humility	−.15	−.04	−.25	**−.50**	−.29	.06	−.24
Emotionality	**.72**	.04	.18	−.15	−.16	−.12	−.07
Extraversion	−.08	**−.66**	.09	**.30**	.04	−.01	−.19
Agreeableness	−.19	**−.32**	.14	**−.42**	−.24	.18	−.10
Conscientiousness	−.01	−.03	−.15	−.04	**−.69**	.05	−.21
Openness	−.09	−.23	.08	.18	−.04	.02	−.09

Note. N = 217. Correlations with absolute values of .30 or greater are shown in bold.

the self-report source component, and the observer report scales correlated .39 to .57 with the observer report source component. The total of raw self-report responses to the PID–5 items correlated .77 and .01 with the self-report and observer report source components, respectively, and the total of raw observer report responses to the PID–5 items correlated .02 and .75 with the self-report and observer report source components, respectively. These correlations involving the PID–5 total scores support the interpretation of the source components as dimensions of source-specific variance; that is, the total PID–5 item score from each source correlated highly with the appropriate source component and was virtually uncorrelated with the other source component.[5] The HEXACO–PI–R scales also showed strong links with four of the PID–5 trait components: Emotionality with Negative Affect, low Extraversion (and to some extent, low Agreeableness) with Detachment, low Conscientiousness with Disinhibition, and low Honesty-Humility (and to some extent, low Agreeableness and high Extraversion) with Antagonism. In contrast, none of the HEXACO–PI–R scales correlated substantially with the Psychoticism component, a result that reflects the absence of scales assessing delusional tendencies from the HEXACO–PI–R. Also, the HEXACO–PI–R scales were correlated only weakly with the PID–5 source components.

PID–5 and HEXACO domain scale scores (self- and observer report) in relation to HEXACO trait and source components

Table 6 shows the correlations of the eight HEXACO–PI–R components with self- and observer reports on the six domain scales of the HEXACO–PI–R and the five domain scales of the PID–5 (plus the total across all PID–5 items). These results show particularly strong correlations of the HEXACO–PI–R domain scales with their corresponding trait components, with values ranging from .79 to .88. Those scales showed modest correlations with the corresponding source components, with absolute values of .07 to .36 (self) and .06 to .38 (observer).

The PID–5 scales showed moderately high correlations with four of the HEXACO–PI–R trait components: low Antagonism with Honesty-Humility, Negative Affect with Emotionality, low Detachment with Extraversion, and low Disinhibition with Conscientiousness. In contrast, none of the PID–5 scales correlated substantially with the Agreeableness or Openness components. However, the correlations of self- and observer reports on PID–5 scales with the corresponding HEXACO–PI–R source components (−.26 to −.41 for self, −.28 to −.39 for observer) were about as high as those shown by the HEXACO–PI–R scales themselves.

Acquiescence and the PID–5 self-report source component

The preceding analyses indicate that the PID–5 source components are large, but do not establish that those components represent the influence of response styles. To examine the role of acquiescence in the PID–5 self-report source component, we

[5] The finding that each of the PID–5 source components showed essentially zero correlations with the PID–5 total scores suggests that the targeted rotation was successful in isolating the source-specific variance of the scales. If instead these correlations had been nontrivially positive or negative, then this would have suggested that the target loadings for the source components should be modified.

Table 6. Correlations of HEXACO–PI–R component scores with the two inventories' self- and observer report domain scale scores.

	HEXACO–PI–R components							
	H	E	X	A	C	O	Self source	Observer source
Self–report HEXACO								
Honesty–Humility	**.79**	.10	−.04	.09	.06	−.09	**.36**	−.03
Emotionality	.01	**.87**	−.08	−.03	.02	−.02	−.07	−.16
Extraversion	−.04	−.09	**.84**	.06	.04	.11	.28	.05
Agreeableness	.07	−.08	.09	**.79**	−.10	−.01	**.35**	.06
Conscientiousness	−.02	.09	.02	.00	**.85**	−.06	**.31**	.03
Openness	−.02	−.01	.05	−.07	.01	**.88**	.22	.09
Observer report HEXACO								
Honesty–Humility	**.82**	−.01	−.10	.14	.15	−.05	−.02	**.35**
Emotionality	.00	**.87**	−.07	.00	.08	−.01	−.12	−.06
Extraversion	−.13	−.04	**.87**	.03	−.03	.04	.09	**.31**
Agreeableness	.11	.01	.02	**.86**	.05	−.05	−.03	**.36**
Conscientiousness	.23	.06	−.02	−.03	**.79**	.04	.03	**.38**
Openness	−.07	−.01	.09	.03	.01	**.85**	.15	.27
Self–report PID–5								
Negative Affect	−.15	**.48**	−.09	−.09	.01	.04	**−.34**	−.22
Detachment	−.08	.05	**−.45**	−.15	−.07	.05	**−.37**	−.06
Psychoticism	−.24	.11	−.09	−.11	−.12	.14	−.26	−.16
Antagonism	**−.45**	−.15	.14	−.14	−.02	.23	**−.37**	−.01
Disinhibition	−.25	−.07	.07	−.04	**−.46**	.12	**−.41**	−.18
PID–5 Total	−.28	.08	−.16	−.11	−.05	.13	**−.45**	−.15
Observer report PID–5								
Negative Affect	−.17	**.52**	−.10	−.19	−.05	−.04	−.14	**−.39**
Detachment	−.08	.08	**−.57**	−.20	−.11	−.05	−.09	**−.37**
Psychoticism	**−.40**	.13	−.07	−.09	−.24	.08	.02	−.28
Antagonism	**−.56**	−.05	.16	−.24	−.17	.06	.04	**−.31**
Disinhibition	−.28	.02	.08	−.03	**−.53**	.01	−.01	**−.32**
PID–5 total	**−.37**	.13	−.19	−.24	−.18	.01	−.07	**−.45**

Note. N = 217. Correlations with absolute values of .30 or greater are shown in bold. PID–5 = Personality Inventory for *DSM–5*.

computed an acquiescence index using some items from the full-length, 220-item PID–5 that were not among the 100 items used for computing the scale scores used throughout this article. As mentioned in the Method section, 118 of our participants had provided self-reports on the full 220-item PID–5. Although the scales of the 100-item PID–5 contain no reverse-keyed items, the remaining 120 items of the full-length PID–5 contain a total of 16 reverse-keyed items, 6 of which belong to the Risk Taking scale. Those 120 items also contain 4 other Risk Taking items that are not reverse-keyed. As we will now show, these reverse-keyed and non-reverse-keyed items in the Risk Taking scale are particularly useful in interpreting the source components, as well as in showing how acquiescence variance influences correlations involving the PID–5 scales.

We computed two new Risk Taking scales, one as the mean across the four non-reverse-keyed items (i.e., excluding the items of the 100-item subset), and the other as the mean across the six reverse-keyed items (i.e., after the recoding of those items). We then computed an acquiescence scale as the difference between these two Risk Taking scales, and an overall Risk Taking scale as the sum of these two Risk Taking scales.

In the subsample of 118 participants for whom these scale scores could be computed, the non-reverse-keyed and reverse-keyed Risk Taking scales intercorrelated at .17. The self-report source component correlated .53 with the non-reverse-keyed Risk Taking scale, but correlated −.33 with the reverse-keyed Risk Taking scale; thus, the two correlations were highly divergent and actually opposite in sign. The self-report source component also correlated .08 with the overall Risk Taking scale, and correlated .65 with the acquiescence scale. Thus, these results indicate that the self-report source component is

strongly related to acquiescence as indexed by these PID–5 items.

We can also examine differences between the two "new" Risk Taking scales in their relations with the scales of the 100-item PID–5, none of which contain any reverse-keyed items. Self-reports on (100-item) PID–5 Risk Taking correlated .59 with the non-reverse-keyed Risk Taking scale and .32 with the reverse-keyed Risk Taking scale. The large difference between the correlations presumably reflects the fact that acquiescence variance in PID–5 self-reports inflates the former correlation and deflates the latter. Note that, in contrast, observer reports on (100-item) PID–5 Risk Taking correlated .39 with the non-reverse-keyed Risk Taking scale and .38 with the reverse-keyed Risk Taking scale. The fact that these latter correlations are about equal in size suggests that the reverse-keyed and non-reverse-keyed Risk Taking scales are similarly valid indicators of Risk Taking, and that the large difference between their correlations with the self-report (100-item) PID–5 Risk Taking scale cannot be explained by any difference in validity between them.

For self-reports on the other 24 PID–5 scales, there were again large differences in correlations with the new Risk Taking scales: Across those 24 self-report scales, the average correlation with the non-reverse-keyed Risk Taking scale was .36, and the average correlation with the reverse-keyed Risk Taking scale was −.12. For observer reports on those other 24 PID–5 scales, however, there were no such differences, as the average correlations with the non-reverse-keyed and reverse-keyed Risk Taking scale were .07 and .06, respectively. Thus, these results suggest that for any given self-report PID–5 scale, acquiescent responding will distort associations with self-report personality

scales with items that are not balanced for direction of keying: Correlations with scales consisting only of non-reverse-keyed items will be inflated, and correlations with scales consisting only of reverse-keyed items will be deflated.[6]

Discussion

In this study we compared trait and source dimensions defined by the scales of a personality disorders inventory, the PID–5, with those defined by the scales of a normal personality inventory, the HEXACO–PI–R. Although both inventories contain substantial trait variance, as follows from their moderate to high levels of self–observer agreement, the results showed that the PID–5 was characterized by much higher levels of self- and observer report source variance than was the HEXACO–PI–R. Furthermore, whereas the HEXACO–PI–R self- and observer report scales were largely unrelated to the corresponding PID–5 (self- and observer) source components and only moderately related to their own corresponding source components, PID–5 self- and observer reports were moderately related to the corresponding HEXACO–PI–R source components and strongly related to their own corresponding source components. Additional analyses indicated that the PID–5 self-report source component was strongly related to an independent index of acquiescent responding. In the following section we discuss (a) the interpretation of the PID–5 source components in terms of response biases or valid variance, (b) the size of the PID–5 source components and the implications thereof, (c) the generalizability of our findings, and (d) some possible ways of controlling the influence of the PID–5 source components.

PID–5 source components: Valid variance or response styles?

We begin by discussing the interpretation of the PID–5 source components. Recall that each of those components showed positive loadings for every PID–5 scale as assessed by the appropriate source, accounting for roughly 20% of the variance in those scales. In contrast, each of those components showed near-zero loadings for the PID–5 scales as assessed by the other source, with loadings averaging only .01 in each case and accounting for only about 1% of the variance in these scales. These results mean that our attempts to isolate self-report variance and observer report variance on separate source components were successful. Consequently, those components are correctly interpreted as source-specific dimensions, and not as dimensions of valid variance shared between sources.

As explained in the introduction, our efforts to isolate source-specific variance in the PID–5 were motivated a priori by our concern that its scales would be highly susceptible to response styles of acquiescence and desirability. For the PID–5 self-report source component, we were able to examine the role of acquiescence variance by correlating scores on that component with scores on an independent index of acquiescent responding. The self-report source component was very strongly associated ($r = .65$) with the acquiescence index, and this result confirms that acquiescence in responding to PID–5 items—independent of item content—is heavily implicated in that component. Our data set did not include variables that would permit an analogous assessment of the role of acquiescence in the PID–5 observer report source component, but we expect that acquiescent responding would also be substantially implicated in that component.

We believe that beyond acquiescence in responding to PID–5 items, much of the variance in the PID–5 source components is attributable to variance in socially (un)desirable responding. The desirability hypothesis is supported by our finding that the PID–5 source components were correlated in the –.30s with the HEXACO–PI–R source components. Recall that the latter components were derived from a highly diverse array of scales assessing normal (not pathological) personality characteristics, with those scales being roughly balanced for direction of item keying, and with scale loadings in directions consistent with a desirability interpretation (see also Ashton & Lee, 2010).

Despite the evidence implicating acquiescence and desirability in the source-specific PID–5 dimensions, the possibility remains that those dimensions contain at least some valid variance in a broad construct of maladjusted personality. To establish such validity, it would be necessary to examine the relations of the source-specific components with criterion variables not derived from those sources. For example, one could derive source-specific PID–5 components from a large sample of persons assessed by self- and observer reports (the latter provided by persons well acquainted with the target person), and then correlate the obtained source dimensions with directly observed behaviors or with objectively recorded biodata. However, it would be necessary to ensure that the criterion variables would not themselves simply represent an alternative or modified form of self- or observer report, as might be the case for interview-based ratings made by clinicians. In any case, we emphasize that any claim that the PID–5 source-specific components represent valid variance must be tested empirically.

We should emphasize also that even if the self-report source component is not found to predict clinically important non-self-report outcomes, this would not contradict the view that self-reports alone can provide clinically important information. Not only do self-reports tend to agree with independently provided observer reports from knowledgeable persons, but the unique perspective of the person providing self-reports can be informative in its own right. For example, we have suggested elsewhere (e.g., Ashton & Lee, 2010) that there might be valid variance unique to self-reports on the HEXACO–PI–R sincerity facet. As another example, it would be useful for a clinician to know that a person reports being very unhappy regardless of whether or not this unhappiness is perceived by others. Thus, a self-report measure such as the Minnesota Multiphasic

---

[6] We also obtained an alternative acquiescence scale not based on any Risk Taking items. We first took 9 other reverse-keyed items of the 220-item PID–5, and then identified for each of those items the most conceptually similar non-reverse-keyed item in the 220-item PID–5 (but excluding the items of the 100-item subset). (Note that we could not use all 10 of the other reverse-keyed items, because the subset of items being examined contained two reverse-keyed Suspiciousness items but only one non-reverse-keyed Suspiciousness item.) We then computed an acquiescence scale as the sum of the nine reverse-keyed and the nine non-reverse-keyed items. The resulting scale correlated .48 with the acquiescence scale derived from the Risk Taking items and correlated .50 with the self-report source component. The sum of these two acquiescence scales (i.e., the scale based on Risk Taking items and the scale based on other items) correlated .68 with the self-report source component.

Personality Inventory–2 (MMPI–2) Demoralization scale—which was designed to assess a broad subjective happiness–unhappiness dimension (Tellegen et al., 2006)—would be clinically valuable.

However, the self-report source dimension identified in this study differs in important respects from a scale such as Demoralization. Beyond the fact that the self-report source dimension represents only the variance that does not overlap with observer reports, its content is much more diverse even than that of a broad unhappiness dimension, being defined not only by scales assessing unhappiness (e.g., Depressivity, Anhedonia) but also by scales assessing "psychopathic" tendencies (e.g., Callousness, Manipulativeness, Impulsivity, Irresponsibility) and even psychoticism (e.g., Perceptual Dysregulation). In fact, the source dimension is defined by the entire array of PID–5 scales, including those assessing traits that are conceptually unrelated if not in opposition: Emotional Lability as well as Restricted Affectivity, Attention-Seeking as well as Withdrawal, and Distractibility as well as Rigid Perfectionism.[7]

The size of the PID–5 source components, and the implications thereof

Recall that the PID–5 source components were very large, accounting for 22.9% (self-reports) and 19.7% (observer reports) of the facet scale variance for that source; in contrast, each of the HEXACO–PI–R source components accounted for about 7.7% of facet scale variance for its respective source. In this section we consider the implications of the size of the PID–5 source components for the internal-consistency reliability, the convergent validity, and the discriminant validity of its scales.

First, the PID–5 source components contribute heavily to the alpha reliabilities of the PID–5 facets, making them appear to be more discriminating of their respective trait levels than is actually the case. For example, in this sample the difference between the mean alpha reliabilities of self-reports on PID–5 facets (.80) and on HEXACO–PI–R facets (.65) matched the difference between the variances accounted for in self-report facets by the PID–5 self-report source component (22.9%) and the HEXACO–PI–R self-report source component (7.7%). Our analyses indicate that much of this additional reliability is due to acquiescence in PID–5 item responding and that some is very likely due to social desirability.

With regard to convergent validity, the large size of the PID–5 source components is a modest although not trivial limiting factor. With roughly 20% of PID–5 facet scale variance being attributable to source components, as opposed to roughly 8% of HEXACO–PI–R facet scale variance, the PID–5 facet scales would be expected to show about 87% (i.e., 80/92) as much convergent validity as the HEXACO–PI–R facets. This

approximately matches the mean convergent validities found for the two inventories' facet scales: .44 for PID–5 versus .52 for HEXACO–PI–R. Thus, the large source-specific components of the PID–5 diminish somewhat the convergent validity of its scales, but not to a large degree.

The impact of the PID–5 source components on the discriminant validity of the PID–5 is large, at least when discriminant validity is considered with respect to variables assessed by the same source. Consider that even when we used common factor analysis rather than principal components analysis, the self-report source dimension accounted for 21.5% of the variance in the PID–5 facets overall. Given that the PID–5 facets all loaded positively on that dimension, this result implies that the correlation between self-reports on any two PID–5 facets will be .215 higher, on average, than would be obtained if this source of variance were not present. One illustration of this point comes from our supplementary analyses in which we correlated the various PID–5 facets (based on the 100-item PID–5) with self-reports on non-reverse-keyed and reverse-keyed Risk Taking scales consisting of PID–5 items not included in the 100-item form. Observer reports on the PID–5 facets (other than Risk Taking) showed correlations averaging .07 and .06 with those Risk Taking scales, but self-reports on the PID–5 facets showed correlations averaging .36 and –.12; that is, the latter two correlations were respectively inflated and deflated due to individual differences in self-report acquiescence.

Likewise, correlations of self-report PID–5 scales with various self-report non-PID–5 variables will also be inflated, whenever the latter variables are also saturated with variance due to self-report response biases. Such a large degree of inflation means that many associations involving PID–5 scales could actually be eliminated or greatly reduced if self-report response biases were controlled. As a likely example of the inflation of correlations between self-report PID–5 scales and other self-report variables, consider a recent study by Swami, Weis, Lay, Barron, and Furnham (2016) in which 259 persons provided self-reports on the full-length PID–5 and on a measure of belief in conspiracy theories that consisted of 15 items, all keyed positively. Every single PID–5 facet scale correlated positively with the conspiracy scale, with correlations ranging from .24 to .48; positive correlations were obtained even for the PID–5 facet scales that contribute negatively to their domains (recall that Restricted Affectivity and Rigid Perfectionism are markers of low Negative Affectivity and of low Disinhibition, respectively). We think that these results reflect the operation of self-report response biases—acquiescence and (un)desirability—that are common to the PID–5 scales and in some degree to the conspiracy scale. Consistent with this interpretation is the fact that the PID–5 scale showing the lowest correlation with the conspiracy scale was Risk Taking, the only PID–5 scale that (in the 220-item inventory) has nearly balanced item keying. Note that such inflation of correlations does not necessarily obscure the substantive links between the PID–5 scales and conspiracy beliefs, as some of the strongest associations were obtained for scales having clear theoretical links with conspiracist ideation (e.g., Unusual Beliefs and Experiences, Suspiciousness). However, we suggest that many of the PID–5 scales' associations with conspiracy beliefs would be greatly reduced if self-report response styles were controlled in either or both instruments.

---

[7] Tellegen et al. (2006) argued that the major MMPI dimension interpreted as social desirability by Jackson and Messick (1961) should in fact be considered a substantive, clinically descriptive dimension akin to Demoralization. We suspect that this major MMPI dimension—which unlike our self-report source component would include some variance that is shared with observer reports from close acquaintances—does contain an important element of substantive variance in Demoralization as well as social desirability response style variance, and we think that Jackson and Messick would not have disagreed.

Generalizability of findings

As noted earlier, this sample was reasonably representative of the Dutch population in terms of gender, age, and educational level. This fact, in combination with the apparent comparability of Dutch and English versions of the PID–5 (e.g., De Fruyt et al., 2013), leads us to expect that these findings would generalize to community samples in English-speaking countries. We also expect that the main features of these findings would generalize to clinical samples, given that the structure of the PID–5 scales and their associations with normal personality measures appear to be maintained in such samples (Quilty et al., 2013).

The sample size of this study was more than adequate to gain some approximate indication of the size of source components for a given inventory and of the extent to which the trait and source components of one inventory correlate with those of the other. However, given that the sample was not extremely large, we have avoided paying undue attention to any particular findings that seemed somewhat anomalous, such as a higher or lower than typical loading of a given scale on a given factor. In any case, the levels of self–observer agreement for the scales examined in this study were very similar to those reported in other research: The average convergent correlation for the PID–5 facets was .44 in this study (cf. $r = .47$ and $r = .36$ in the samples of Markon et al., 2013) and the average convergent correlation for the HEXACO–PI–R facets was .52 in this study (cf. $r = .42$ in the data set of Ashton & Lee, 2010).[8]

Finally, we believe that our findings regarding the source-specific dimensions of the PID–5 are unlikely to be unique to this particular instrument. We would expect instead that these results would generalize to many other inventories that assess pathological personality characteristics through items having very low endorsement levels. However, the relative sizes of source and trait dimensions would depend on the particular traits and items of a given inventory.

Controlling the influence of response styles in the PID–5

We hope that the construction of the PID–5 will be an important step in the evolution of the *DSM*. By identifying a diverse array of pathological personality traits and constructing self-report (and informant [observer] report) scales to measure those traits, the developers of the PID–5 have greatly facilitated research on abnormal personality variation.

However, the findings of this study—which echo those of Jackson and Messick (1961) for the MMPI over a half-century ago—indicate that PID–5 scale scores are heavily influenced, and their interpretation heavily confounded, by the influences of self-report (or observer report) response styles. We therefore suggest some possible methods of controlling those influences in future research using the PID–5.

One obvious possibility would be to obtain both self-reports and observer reports on the PID–5, with the latter being provided by persons closely acquainted with the target person. This would allow the source components to be computed directly. However, this approach has the important drawback that in many contexts it would not be feasible to obtain observer reports.

Another approach is to derive some index of acquiescence to PID–5 items and use that index as a statistical control for this response style. This approach would require the use of the full-length, 220-item PID–5, and could presumably involve some methods more sophisticated than those that we used in this article. Note that, if acquiescence is considered to be of clinical importance in its own right, then this approach has the advantage of assessing that response style directly and of isolating its variance from that of the specific traits to be assessed. Relevant to this point, many clinically oriented self-report personality inventories (e.g., the MMPI–2) do include measures of acquiescence and other response styles.

Finally, we think it is worth considering the possibility of revising the PID–5 to make its scales resemble those of normal personality inventories, whose items are less extreme in their social undesirability and are roughly balanced for direction of keying. We understand that one important argument favoring the use of scales with items that have extremely undesirable content is that such scales might discriminate well between individuals having high and clinically significant levels of certain traits. However, some findings suggest that normal personality inventory scales compare fairly well with psychopathological scales in predicting clinical diagnoses (Quirk, Christiansen, Wagner, & McNulty, 2003). Also, one recent comparison of items having more and less extreme content showed only modest advantages of the more extreme items in discriminating persons having high levels of the intended trait domains, and only for two out of four trait domains (Suzuki, Samuel, Pahlen, & Krueger, 2015). Even this limited support for the hypothesis that more extreme items will show better discrimination at higher trait levels is difficult to interpret: In the self-report data of Suzuki et al. (2015) variance due to self-report response biases cannot be separated from trait variance. We believe that the question of whether specifically "pathological" items can outperform "normal" items in assessing pathological personality traits has not yet been resolved, and we expect that the latter might well equal or exceed the former in validity with respect to other-source criteria. The likely exception would involve "psychotic" tendencies, which generally are not assessed by normal personality inventories.

---

[8] One participant of this sample was an extreme outlier on several variables: In self-report data, this participant was more than 4 *SD* above the mean on the PID–5 Psychoticism and PID–5 Antagonism domain scales, more than 4 *SD* below the mean on the HEXACO Honesty-Humility domain scale, and more than 3 *SD* above the mean on the PID–5 Negative Affect domain scale; in observer report data, this participant's scores were roughly 4 *SD* from the mean on Psychoticism, Antagonism, and (low) Honesty-Humility, and about 2 *SD* from the mean on Negative Affect. If this participant were removed from the analysis, correlations between these variables would become as much as .08 weaker, and the corresponding trait components would become as much as 8% smaller (in the case of PID–5 Antagonism), but the source components would be essentially unchanged in size. Thus, our decision to include this participant in the analyses reported here does not affect the main findings of our study.

Conclusion

The results of this investigation suggest that PID–5 scale scores contain considerable personality trait variance but also considerable variance due to source-specific (i.e., self- or observer report) response styles. The latter variance substantially inflates

the reliabilities of PID–5 scales and their intercorrelations within self-reports and within observer reports.

Disclosure

The authors have received royalties for non-academic use of the HEXACO–PI–R.

References

Ashton, M. C., & Lee, K. (2010). Trait and source factors in HEXACO–PI–R self– and observer reports. *European Journal of Personality*, 24, 278–289.

Ashton, M. C., Lee, K., de Vries, R. E., Hendrickse, J., & Born, M. P. (2012). The maladaptive personality traits of the Personality Inventory for *DSM–5* (PID–5) in relation to the HEXACO personality factors and schizotypy/dissociation. *Journal of Personality Disorders*, 26, 641–659.

De Clercq, B., De Fruyt, F., Mervielde, I., Krueger, B., & Markon, K. (2011). *Official Dutch translation of the Personality Inventory for DSM–5 (PID–5)*. Unpublished manuscript.

De Fruyt, F., De Clercq, B., De Bolle, M., Wille, B., Markon, K., & Krueger, R. F. (2013). General and maladaptive traits in a five-factor framework for *DSM–5* in a university student sample. *Assessment*, 20, 295–307.

De Vries, R. E., Ashton, M. C., & Lee, K. (2009). De zes belangrijkste persoonlijkheidsdimensies en de HEXACO persoonlijkheidsvragenlijst [The six most important personality dimensions and the HEXACO Personality Inventory]. *Gedrag & Organisatie*, 22, 232–274.

De Vries, R. E., & Van Kampen, D. (2010). The HEXACO and 5DPT models of personality: A comparison and their relationships with psychopathy, egoism, pretentiousness, immorality, and Machiavellianism. *Journal of Personality Disorders*, 24, 244–257.

De Vries, R. E., Wawoe, K. W., & Holtrop, D. (2016). What is engagement? Proactivity as the missing link in the HEXACO model of personality. *Journal of Personality 84*, 178–193.

Jackson, D. N., & Messick, S. (1961). Acquiescence and desirability as response determinants on the MMPI. *Educational and Psychological Measurement*, 21, 771–790.

Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for *DSM–5. Psychological Medicine*, 42, 1879–1890.

Krueger, R. F., Eaton, N. R., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2011). Personality in *DSM–5*: Helping to delineate personality disorder content and framing the meta-structure. *Journal of Personality Assessment*, 93, 325–331.

Maples, J. L., Carter, N. T., Few, L. R., Crego, C., Gore, W. L., Samuel, D. B., … Miller, J. D. (2015). Testing whether the *DSM–5* personality disorder trait model can be measured with a reduced set of items: An item response theory investigation of the Personality Inventory for DSM–5. *Psychological Assessment*, 27, 1195–1210.

Markon, K. E., Quilty, L. C., Bagby, R. M., & Krueger, R. F. (2013). The development and psychometric properties of an informant-report form of the Personality Inventory for DSM–5 (PID–5). *Assessment*, 20, 370–383.

McCrae, R. R., Zonderman, A. B., Costa, P. T., Jr., Bond, M. H., & Paunonen, S. V. (1996). Evaluating replicability of factors in the Revised NEO Personality Inventory: Confirmatory factor analysis versus Procrustes rotation. *Journal of Personality and Social Psychology*, 70, 552–566.

Paunonen, S. V. (1997). On chance and factor congruence following orthogonal Procrustes rotation. *Educational and Psychological Measurement*, 57, 33–59.

Quilty, L. C., Ayearst, L., Chmielewski, M., Pollock, B. G., & Bagby, R. M. (2013). The psychometric properties of the Personality Inventory for *DSM–5* in an APA *DSM–5* field trial sample. *Assessment*, 20, 362–369.

Quirk, S. W., Christiansen, N. D., Wagner, S. H., & McNulty, J. L. (2003). On the usefulness of normal personality for clinical assessment: Evidence of the incremental validity of the Revised NEO Personality Inventory. *Psychological Assessment*, 15, 311–325.

Schönemann, P. H. (1966). A generalized solution of the orthogonal Procrustes problem. *Psychometrika*, 31, 1–10.

Suzuki, T., Samuel, D. B., Pahlen, S., & Krueger, R. F. (2015). *DSM–5* alternative personality disorder model traits as extreme variants of the Five-Factor Model: An item-response theory analysis. *Journal of Abnormal Psychology*, 124, 343–354.

Swami, V., Weis, L., Lay, A., Barron, D., & Furnham, A. (2016). Associations between belief in conspiracy theories and the maladaptive personality traits of the personality inventory for *DSM–5. Psychiatry Research*, 236, 86–90.

Tellegen, A., Ben-Porath, Y. S., Sellbom, M., Arbisi, P. A., McNulty, J. L., & Graham, J. R. (2006). Further evidence on the validity of the MMPI–2 Restructured Clinical (RC) Scales: Addressing questions raised by Rogers, Sewell, Harrison, and Jordan and Nichols. *Journal of Personality Assessment*, 87, 148–171.