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Psychometric properties of an informant personality questionnaire (the HAP) in a sample of older adults in the Netherlands and Belgium

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In geriatric psychiatry, informant reports are often important due to cognitive problems and related impaired insight and judgment. Informant questionnaires to identify personality traits among older adults are sparse. The Dutch informant personality questionnaire (the HAP) is especially developed to address this need. The objective of this study is the psychometric evaluation of the HAP among older adults in the Netherlands and Belgium. We investigated the internal consistency, gender differences, the test–retest and inter-rater reliability, the factorial structure, and the concurrent validity. Informants completed the HAP ratings of nursing home residents ($n = 385$) and elderly psychiatric patients ($n = 204$). The internal consistency of the scales is good. Medium gender differences on three scales were found in the population Psychiatry. The inter-rater and test–retest reliability are good to excellent. There are significant similarities between a number of HAP scales and dimensions of the Big Five. The congruence between the factor structures in both samples is very high. We labeled the three factors externalizing/antagonistic, internalizing/neurotic, and compulsive. The HAP meets the need for validated and reliable informant instruments for personality assessment among older adults in geriatric psychiatry. The content scales of the questionnaire address traits of the premorbid personality. Therefore, the HAP might be useful for personality assessment and selecting treatment options in mental healthcare and can be applied in scientific research in the area of personality aspects in late life.

Keywords: personality; personality disorders; older adult; informants; questionnaire; HAP

Introduction

Personality assessment among older adults (over 65s) is a relatively new area of interest (van Alphen, Derksen, Sadavoy, & Rosowsky, 2012). In mental healthcare, personality assessment is important for selecting treatment options and to help generate intervention strategies with the older patient, family, and caregivers (Segal, Coolidge, & Rosowsky, 2006; van Alphen, Engelen, Kuin, & Derksen, 2006). However, only a limited number of validated instruments for personality assessment of older adults are available (Oltmanns & Balsis, 2011). Personality questionnaires are generally tailored to the social–cultural circumstances, the physical condition, the environment, and lifestyle of younger adults up to the age of approximately 40 years (Mroczek, Hurt, & Berman, 1999). The development of suitable norms is hampered because from a bio-psycho-social perspective older people constitute a highly heterogeneous population (Schindler, Staudinger, & Nesselroade, 2006). As one grows older, the risk increases to be confronted with restrictions, such as retirement, cognitive disorders, and chronic illnesses, which interfere with day-to-day functioning. These typical difficulties, especially of the oldest-old, may be methodologically addressed by the construction of questionnaires based on age-neutral items that take these different contexts and

challenges into account (Oltmanns & Balsis, 2011). In that case, norm tables need only be based on cohort effects. Moreover, most instruments for personality assessment are based on self-report (Leising, Erbs, & Fritz, 2010). In geriatric psychiatry, informant reports are important and generally indispensable when the patient has cognitive problems and related impaired insight and judgment capacity (American Psychological Association, 2004). However, informant questionnaires to identify personality traits among older adults are sparse. Only instruments, based on the Big Five traits (neuroticism, extraversion, openness, agreeableness, and conscientiousness), such as the Revised NEO Personality Inventory (NEO PI-R; McCrae & Costa, 2010) have been validated for use with informants and standardized for older people (Archer et al., 2006). Although the Big Five trait model and associated measures were not specifically developed for personality assessment of a patient population (Harkness & McNulty, 1994) recent literature shows that the NEO-PI-R can be used to screen for personality pathology in older adults (Van den Broeck, Rossi, De Clercq, Dierckx, & Bastiaansen, 2012). Also, the age-neutrality of the NEO-PI-R items has been empirically validated (Van den Broeck, Rossi, Dierckx, & De Clerq, 2012) and a short form specifically aimed for older adults has been developed

(Mooi et al., 2011), making this also a promising approach.

This study stemmed specifically from the clinical practitioners need in the Dutch nursing home setting for a tool using informant information to assess traits associated with DSM pathology in the assessment of personality of older adults. The Dutch informant questionnaire (the HAP; Barendse & Thissen, 2006) is especially developed to address this need. Moreover, it covers the premorbid personality traits. The idea was that the current personality traits of the patient can be influenced by cognitive impairment, somatic disorders, and severe Axis-I disorders (Oltmanns & Balsis, 2011; Widiger, 2011). It is of clinical relevance to differentiate between Axis-I disorders, such as dementia, and specific personality traits in order to indicate optimal clinical services in mental healthcare. Severe Axis-I disorders can bias personality traits, either based on self-report or informant information. The HAP is a tool to prevent this bias by focusing on premorbid personality traits. The HAP is specifically based on age-neutral items and reports by informants (Barendse & Thissen, 2006). This study addresses the internal consistency, gender differences, the test–retest and inter-rater reliability, the construct validity and the concurrent validity of the HAP in nursing home, and elderly psychiatric patient populations.

Method

Item and scale development

Scale construction was a phased project (Barendse & Thissen, 2006). The item development phase started in the first years of the 1990s. Criteria based on observable behavior of the DSM personality disorder criteria of that time (American Psychiatric Association, 1987) were 'reduced' to normal behavior. The guiding principle was the syndromal continuity hypothesis (Millon & Everly, 1985), which assumes that all psychological abnormalities are quantitative deviations from the average of a distribution of traits. This approach was expected to create scales of clinically relevant behavior problems. Following a critical assessment by a panel of experienced clinicians, possible age effects were not considered in the formulation (Barendse and Thissen in preparation). To emphasize that the questionnaire concerns *premorbid* behavior, that is behavior present before the current psychiatric disorder (e.g., dementia or depression), the items were put in the past tense. Because of the informant report, the items were formulated in the third person singular. To identify somatization in populations with relatively many physical disorders items for the scale somatizing behavior were added. Further development took place by the analysis of multiple consecutive data collections with the provisional questionnaire. First items with non-significant ($p > 0.05$) inter-rater correlations were omitted. Eventually, new items were formulated. Preliminary scales were made up on the base of

maximum likelihood factor analysis. Then scales were tested and rearranged to fit the demands of the Rasch model: unidimensionality and local statistic independency (whereby so called 'item-easiness' was prevented). This resulted in 10 scales with 4–9 distinctive items. In using informant reports there is a risk of confounding of the results by feelings of sympathy and antipathy toward the assessed person (Kenny, 1991, 2004). Therefore, items were formulated to assess the positive and negative response tendencies of the informant.

Participants

During the period from 2003 to 2010, across the Netherlands and Belgium, some 50 institutions of geriatric psychiatry took part in the study. The total population ($n = 589$) consisted of Dutch-speaking persons ranging from 45 to 102 years ($M = 78.5$). The sub-population Nursing home ($n = 385$) comprised 281 women and 104 men ranging from 45 to 102 years ($M = 81.2$). Part of the population Nursing home (21%) was included selectively following a request for personality assessment by the practitioner. No significant differences ($p < 0.05$) were found between the selected and non-selected population (t-test on the content scales). The sub-population Psychiatry ($n = 204$) consisted of elderly psychiatric patients (outpatient and short-stay clinical treatment) and comprised 135 women and 69 men ranging from 57 to 96 years ($M = 73.8$). The informants were Dutch-speaking, generally contact persons of the patient and usually a child or partner. Conditions for inclusion were that the patients agreed for the contact person to be approached and that the contact person had known the patient for a long time in a variety of circumstances (private, work, and leisure) and was able to read Dutch. A limited number of informants did not respond and incomplete filled in questionnaires were excluded, resulting in a 95% response rate.

Instruments

For cross-validation purposes, a personality questionnaire was needed which met the following criteria: responses of informants, identification of premorbid behavioral characteristics, phrasing in the third person singular, and items phrased in the past tense. In the Dutch-speaking regions only the Quick Big Five personality questionnaire (QBF; Vermulst & Gerris, 2006) met these conditions. The list consists of 30 adjectives from the Goldberg (1992) list which describe the 'Big Five' personality dispositions (neuroticism, extraversion, openness, agreeableness, and conscientiousness). Responses by informants are provided on a seven-point scale. The psychometric quality of the QBF used for cross-validation has been graded as good by independent researchers (Vermulst & Gerris, 2006).

Statistical analyses

Statistical processing was done using SPSS Inc. (2009) and Effect Size Calculators (Becker, 2000). The following rules of thumb were used. Internal consistency was examined using average inter-item correlations (AIC), in addition Cronbach's alpha was reported. However, AIC is considered to be a better measure of internal consistency than Cronbach's alpha as it is independent of the number of items of a scale. So to evaluate the scales' reliability, we considered AIC above 0.15 as a rule of thumb (Clark & Watson, 1995; Spilioutopoulu, 2009). Significant gender differences were determined by independent samples t-tests and the size evaluated with Cohen's d effect sizes (Cohen, 1988): 0.20 small, 0.50 medium, and 0.80 large. The inter-rater reliability of independent informants of the same subject and the test–retest reliability were measured using intraclass correlations. Values from 0.60 onwards are considered as good to excellent (Cicchetti, 1994; Portney & Watkins, 2000). To determine the expected number of components, parallel analysis was applied (Hayton, Allen, & Scarpello, 2004). This involves retaining a factor in the real data set if the eigenvalue is larger than the average eigenvalue for this factor calculated on the basis of random data sets. Next, the factor structure for the populations 'nursing home' and 'psychiatry' was determined by principal component analysis (PCA) with varimax rotation (Bryant & Yarnold, 1994). Scales were considered to significantly load on a factor if the factor loading was at least 0.45 (Comrey & Lee, 1992). Construct equivalence is operationally defined as factor invariance. The level of congruence between both sub-populations was calculated using the coefficient of congruence (Wrigley & Neuhaus, 1955). Factors are considered congruent if the coefficient is higher than 0.93 (Lorenzo-Seva & Ten Berge, 2006; Ten Berge, 1986). The concurrent validity between the HAP and the QBF was examined using Pearson's correlations. This correlation was also used as an effect size to assess the strength of the relationship between scales. As a rule of thumb 0.50 or higher was interpreted as a strong relationship and 0.30 as fair (Cohen, 1988).

Results

Internal consistency

The AIC value of the HAP scales varies from 0.23 to 0.53 (Table 1). All correlations are significant at the level $p < 0.001$ and above the minimum required level of 0.15 (Clark & Watson, 1995; Spilioutopoulu, 2009).

Gender differences

Gender differences on the scales of the HAP were assessed by t-tests for independent samples for both the Nursing home (281 women and 104 men) and Psychiatry (135 women and 69 men) population (Table 2). In the population Nursing home there are

no significant gender differences ($p < 0.05$). In the population Psychiatry women show more uncertain behavior and men show more disorderly behavior and self-satisfied behavior ($p < 0.05$). The effect size was calculated by Cohen's d. The differences between men and women are small to medium on these scales (0.25–0.6; Cohen, 1988).

Inter-rater reliability

The correlations (Table 1) between 0.63 and 0.85 are all significant ($p < 0.001$) and range from good to excellent (Cicchetti, 1994; Portney & Watkins, 2000).

Test–retest reliability

The retest was conducted after three months among 25 informants. The reliability with intraclass correlations between 0.60 and 0.98 (Table 1) is all significant and ranges from good to excellent (Cicchetti, 1994; Portney & Watkins, 2000).

Construct validity

Parallel analysis resulted for both sub-groups in three components (Table 2). Based on varimax rotation (oblique rotation showed that there is no mutual correlation between the factors), the PCA components explain 67.9% of the variance for the sample Nursing home and 67.1 % of the variance for the sample Psychiatry (Table 3). The coefficients of congruence with values of, respectively, 0.99, 0.96, and 0.98 for factors 1, 2, and 3 between congruent factors are considered very high (Sakamoto, Kijima, Tomoda, & Kambara, 1998) and indicate that the factor structure across the sub-groups is stable (Lorenzo-Seva & Ten Berge, 2006). The tables with the results of the PCA direct oblimin rotation and varimax rotation are available upon request from the first author. Factor I refers to *externalizing/antagonistic* with the behavior characteristics: dominant, hostile, impulsive, egocentric, and susceptible to negative judgment. Factor II refers to *internalizing/neurotic* with the behavior characteristics: anxious, uncertain, avoidant, reserved, rigid, and susceptible to negative judgment. Factor III refers to *compulsive* with the behavior characteristics: excessive controlling and perfectionist.

Concurrent validity

Table 4 gives an overview of the correlations between the scales of the QBF and the HAP in the samples Nursing home and Psychiatry. Strong relationships in the logical direction ($r > 0.50$) are found between: the two response tendencies and agreeableness (0.70 with POS and −0.74 with NEG), socially avoidant behavior and extraversion (−0.59), uncertain behavior and neuroticism (0.54), vulnerable in interpersonal relationships and neuroticism (0.58), disorderly behavior

Table 1. Scales, number of items per scale, internal consistency (Cronbach's alpha (C_a) and AIC), inter-rater reliability (intraclass correlation and single measure), and test–retest reliability (Pearson correlation).

| | | Internal consistency | | | | Inter-rater reliability | Test–retest reliability |
| | | Nursing home ($n = 385$) | | Psychiatry($n = 204$) | | Nursing home ($n = 70$) | $n = 25$ |
Scales	Number of scale items (total $= 62$)	C_a	AIC	C_a	AIC		
POS	5	0.80	0.45	0.77	0.40	0.84	0.84
NEG	5	0.70	0.32	0.69	0.31	0.65	0.63
SOC	5	0.80	0.45	0.77	0.39	0.74	0.79
UNC	5	0.75	0.38	0.79	0.43	0.79	0.98
VUL	6	0.82	0.45	0.82	0.43	0.85	0.85
SOM	4	0.82	0.54	0.82	0.53	0.74	0.78
DIS	4	0.78	0.48	0.80	0.50	0.67	0.60
RIG	4	0.60	0.27	0.56	0.24	0.77	0.92
PERF	4	0.70	0.37	0.55	0.23	0.83	0.91
ANT	9	0.85	0.39	0.84	0.38	0.85	0.91
SELF	5	0.77	0.42	0.83	0.51	0.76	0.69
UNP	6	0.80	0.40	0.78	0.37	0.77	0.69

Notes: POS, positive response tendency; NEG, negative response tendency; SOC, socially avoidant behavior; UNC, uncertain behavior; VUL, vulnerability in interpersonal relationships; SOM, somatizing behavior; DIS, disorderly behavior; RIG, rigid behavior; PERF, perfectionist behavior; ANT, antagonistic behavior; SELF, self-satisfied behavior; and UNP, unpredictable and impulsive behavior.

Table 2. Mean, standard deviation (SD), and Cohen's d of males and females on the HAP scales in the populations 'nursing home' and 'psychiatry'.

| | Nursing home | | | Psychiatry | | |
| | Males ($n = 104$) Mean (SD) | Females ($n = 281$) Mean (SD) | Cohen's d | Males ($n = 69$) Mean (SD) | Females ($n = 135$) Mean(SD) | Cohen's d |
Scale						
POS	4.58 (3.09)	5.10 (3.09)	−0.17	3.55 (2.56)	4.50 (2.89)	−0.35
NEG	1.80 (1.94)	1.50 (2.03)	0.15	2.28 (2.38)	1.68 (2.03)	0.27
SOC	2.19 (2.72)	2.66 (2.42)	−0.18	2.25 (2.56)	2.66 (2.42)	−0.17
UNC	2.40 (2.44)	3.08 (2.71)	−0.26	2.86 (2.74)	4.34 (3.17)	−0.50*
VUL	3.20 (2.98)	3.72 (2.87)	−0.18	4.61 (3.02)	4.98 (3.37)	−0.12
SOM	0.72 (2.18)	1.22 (2.38)	−0.22	1.57 (2.78)	1.87 (2.61)	−0.11
DIS	1.81 (2.09)	1.73 (2.25)	0.04	2.42 (2.64)	1.81 (2.21)	0.25*
RIG	4.09 (2.04)	3.65 (2.26)	0.20	4.17 (2.00)	4.26 (2.21)	0.04
PERF	3.32 (2.47)	2.34 (2.37)	0.41	3.80 (2.63)	2.46 (2.14)	0.59
ANT	7.74 (3.40)	6.99 (3.37)	0.22	8.45 (3.46)	6.76 (3.33)	0.50
SELF	2.58 (2.16)	2.45 (2.25)	0.59	3.64 (2.71)	2.16 (2.31)	0.59*
UNP	3.98 (2.59)	3.43 (2.27)	0.23	4.36 (2.26)	3.42 (2.18)	0.42

Note: An asterisk indicates that the hypothesis of equal mean scores was rejected by an independent sample's t-test at $p \leq 0.05$.

Table 3. Rotated component matrix for PCA with sample 'nursing home' (rotation converged in five iterations) and 'psychiatry' (rotation converged in four iterations).

| | Nursing home | | | Psychiatry | | |
| | Component | | | Component | | |
Scales	1	2	3	1	2	3
SOC	0.343	**0.676**	0.010	0.255	**0.764**	−0.152
UNC	−0.264	**0.857**	−0.052	−0.214	**0.850**	−0.094
VUL	**0.610**	**0.611**	−0.025	**0.592**	**0.596**	−0.026
SOM	0.308	0.381	−0.062	0.372	0.199	0.042
DIS	0.164	0.226	**−0.798**	0.293	0.067	**−0.716**
RIG	0.406	**0.579**	0.335	0.357	**0.613**	0.410
PERF	0.054	0.188	**0.819**	0.165	−0.049	**0.842**
ANT	**0.857**	0.285	−0.007	**0.888**	0.106	0.047
SELF	**0.866**	−0.166	−0.038	**0.824**	−0.315	−0.065
UNP	**0.830**	0.316	−0.057	**0.839**	0.238	−0.123

Note: Significant factor loadings (> 0.45) are given in bold.

and conscientiousness (−0.83), and between antagonistic behavior and agreeableness (−0.53).

Table 5 gives an overview of the correlations between the scales of the QBF and the higher order factors of the HAP. Strong negative relations were found between *agreeableness* and Factor I externalizing/antagonism (−0.64) and between *extraversion* and Factor II internalizing/neurotic (−0.55). Strong positive relations exist between neuroticism and Factor II (0.66) and between *conscientiousness* and Factor III compulsive (0.79).

Discussion

The psychometric properties of the HAP are generally reasonable to excellent. Since some scales only have

Table 4. Pearson correlations of the QBF and the HAP scales and higher order factors of the total sample.

Scales	Extraversion	Neuroticism	Conscientiousness	Agreeableness	Openness
POS	0.07	−0.42***	0.17*	0.70***	0.24**
NEG	−0.14	0.23**	−0.20**	−0.74***	−0.26***
SOC	−0.59***	0.47***	0.01	−0.24**	−0.14
UNC	−0.44***	0.54***	−0.08	0.04	−0.20**
VUL	−0.20**	0.58***	0.01	−0.34***	−0.19**
SOM	−0.01	0.32***	−0.02	0.01	−0.01
DIS	−0.08	0.10	−0.83***	−0.23**	−0.23**
RIG	−0.20**	0.43***	0.12	−0.39***	−0.28***
PERF	−0.06	0.31***	0.36***	−0.19**	0.06
ANT	−0.02	0.23**	0.02	−0.53***	−0.04
SELF	0.36***	0.00	−0.01	−0.27***	0.10
UNP	0.00	0.34***	−0.03	−0.17*	−0.01

Notes: QBF and the HAP lists completed by the same information ($n = 195$). Significance level: ***$p < 0.001$, **$p < 0.01$, and *$p < 0.05$.

Table 5. Pearson correlations (controlled by gender and age) of the QBF and the higher order factors of the HAP of the mixed population 'nursing home' and 'psychiatry'.

Scales	Factor I	Factor II	Factor III
Extraversion	0.17**	−0.55***	−0.13*
Neuroticism	0.20**	0.66***	0.05
Agreeableness	−0.64***	−0.30***	0.06
Conscientiousness	−0.02	−0.02	0.79***
Openness	−0.13	−0.31***	0.14*

Notes: QBF and the HAP lists completed by the same informant ($n = 242$). Significance level: ***$p < 0.001$, **$p < 0.01$, and *$p < 0.05$.

four items, AIC values were used to evaluate the scales' reliability, and these values confirmed the internal consistency of the scales. Three gender differences were significant and two of a medium effect size. Females score higher on the scale uncertain behavior. This is according to earlier research findings: females were higher than males in anxiety (Feingold, 1994). Males were higher on the scale self-satisfied behavior. This finding is also in line with the outcome of previous research: males were found to be more assertive and had higher self-esteem than females (Feingold, 1994). However, the significant differences on the HAP are more limited and the effect sizes are smaller than typically found with self-report (Costa, Terracciano, & McCrae, 2001). Gender differences in self-perception tend to increase gender differences on self-report (Beyer, 1998). Informant reporting controls for bias in the accuracy of self-perception resulting in lower gender differences. The inter-rater reliability and the test–retest reliability are good to excellent. The construct validity, as operationalized through factor analyses, shows the same factor structure in both populations. The three factors externalizing/antagonistic, internalizing/neurotic, and compulsive show parallels with three factors also found in maladaptive trait models (e.g., Krueger et al., 2011; Widiger & Simonsen, 2005). The concurrent validity with the QBF confirms the intended scale content, showing logical correlations with the HAP scales, as well as the with the higher order factors.

The strengths of this study are the theoretical background, the meticulousness with which the items have been construed and, as far as the population of older adults is concerned, the large number of respondents. The HAP may generally be completed, orally or in written form, in 10 minutes using various informants such as children, partner, or friends of the patient. The results on the HAP may contribute to care needs assessment, tailoring treatment to the personality and the compilation of advice for informal care provided by family members, friends, and professional care. After a short training course, the scores can be easily interpreted by both psychologists and physicians working in geriatric psychiatry. The clinical utility and quick administration are important assets.

Some limitations of this study should also be mentioned. A first limitation is the use of a nursing home population as a general population to develop the norm group. The instruments' intention is to capture personality features in order to assess the HAP in a general population as well as concerning psychogeriatric populations. However, the nursing home sample is possibly more hampered with personality problems than a general population of older adults and as such less representative for more adaptive strengths (Donati, Pocnet, Rossier, & Van Gunten, 2010). The representativeness in different population samples of older adults therefore remains partly debatable and is a point that needs to be further addressed in follow-up study. A second limitation is the lack of research concerning the criterion validity with DSM personality disorders, although in contrast to the HAP, these criteria do not seem to be formulated in an age-neutral context (Balsis, Segal, & Donahue, 2009). A third limitation is the focus on Dutch-speaking populations. To respond to the international interest in specific instruments for older adults and to be able to cross-validate the instrument in

different cultures recently, an English version of the HAP became available. The next step is to stimulate research with the HAP in other countries. A fourth limitation is that the influence of characteristics of the informant, such as quality of the relation with the patient, has not been explored yet. The congruence of multiple ratings of the same person by spouse, children, and friends could be examined in future studies. Also further research regarding the congruence between self-ratings of older adults and informant ratings related to the HAP is recommended. From a clinical perspective, personality assessment with informant questionnaires is a priori incomplete, because it does not include the self-perception of the person examined. The validity of personality assessment can be maximized by a multi-methodological approach, using various diagnostic sources such as self-reporting, reporting by informants, and behavior observation (Achenbach, Krukowski, Dumenci, & Ivanova, 2005). In conclusion, the HAP meets the need for validated and reliable instruments for personality assessment among older adults with the aid of informants. Besides, by using the control scales positive response tendency and negative response tendency possible confounding of the results by the response tendencies of the informants can be measured and corrected. Using age-neutral items, this structured use of informant reporting as a diagnostic source may also be interesting for use in other mental healthcare sectors. Finally, although the proposed DSM-5 revisions regarding personality disorders result in a heavy debate among theoreticians, researchers, and clinicians, the conceptual similarity between the factors of the HAP and traits and domains proposed for the future DSM-5 personality disorders provides an important topic for further research.

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