To know personality is to measure it

Introducing a Dutch brief form of the Multidimensional Personality Questionnaire

Eigenhuis, A.

Chapter 5

Robustness of general and clinical profiles of personality

Clinical profiles are embedded in the general population

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Abstract

Personality pathology can be conceptualized as maladaptive constellations of traits. Recently, Eaton et al. (2011) showed that empirically derived personality profiles were not robust across samples. We demonstrate that personality profiles from a clinical sample can be traced back to a subset of the general population characterized by maladaptive scores on primary emotional risk markers for psychopathology. We therefore argue that these profiles are robust, and that ideas about robustness of personality profiles should be updated. Specifically, we subjected scores from the Dutch brief form of the Multidimensional Personality Questionnaire (MPQ-BF-NL) to multivariate normal mixture modeling. Profiles were derived for a clinical sample (N = 365) in combination with each of two subsamples of a general population sample (N = 1,055): one matched on gender and age (n = 365), resulting in non-robust profiles, and one selected on maladaptive scores on Stress Reaction and Wellbeing (n = 365), resulting in robust profiles. The two robust profiles reflected Emotional/Internalizing and Behavioral/Externalizing personality styles. In the Emotional/Internalizing profile, Paranoid, Antisocial, Borderline and Narcissistic PD traits were less prevalent than in the Behavioral/Externalizing profile. Our analytical approach and conceptualization of robustness may aid in validating models such as the hybrid categorical-dimensional model described in section III of DSM-5.

Introduction

Personality pathology can be conceptualized as a maladaptive constellation of traits, as for example described in Section III of DSM-5 (American Psychiatric Association, 2013), where rationally constructed profiles of multiple pathological traits are distinguished. Profiles like these may also be empirically derived. A recent example of this approach was presented by Eaton and others (Eaton, Krueger, South, Simms, & Clark, 2011) using the Schedule for Nonadaptive and Adaptive Personality (SNAP; Clark, 1993). Profiles were derived for different samples (clinical, college, community and military), using hierarchical cluster analysis. For all samples, profiles had meaningful correlates, but the profiles were not robust over samples. Accordingly, these authors rejected the utility and ontology of qualitatively different personality profiles.

We reason, as did Eaton et al. (2011) as well as others (e.g. De Fruyt, Mervielde, & Van Leeuwen, 2002) that the lack of generalization of the profiles may be due to specific sample characteristics. However, we contend against the assertion that the profiles therefore are devoid of utility or ontology. Clinical samples for example would be very homogenous with respect to negative affectivity (i.e. high levels uniformly present), while base rates of these trait levels are expected to be very low in the general population, which would prevent clustering techniques from detecting these regularities when applied to more heterogeneous samples. However, it stands to reason that any specific subpopulation *should* be part of the general population.

In this paper we present a novel approach to pursue the problem of robustness of profile solutions across clinical and general samples. Building on the premise that each (clinical) subpopulation is logically embedded in the broader general population, it should be possible to select a subset from the general population similar to the more specific sample of interest when sampling on appropriate risk factors. Convergence of profile solutions across these samples would be an indication for robustness. Showing robustness in this sense would amplify the utility of personality profiles. More specifically, in the present study we used this approach to identify a subset of the general population whose personality profiles correspond to those in a personality pathology sample.

The most potent characteristic of psychopathology described in the literature is negative emotionality. The disposition to experience negative emotions is associated with general psychopathology, and with anxiety in specific (Krueger et al., 2000; Ormel, Rosmalen, &

Farmer, 2004). Another characteristic associated with psychopathology is lack of positive emotionality. Positive emotionality is specifically related to feelings of anhedonia (Clark, 2005; Naragon-Gainey, Watson, & Markon, 2009), and higher levels of positive emotionality might guard for the detrimental effects of negative emotionality (Clark, 2005). Here, we used markers of negative and positive emotionality to identify a subset of the general population that is at risk for developing psychopathology.

We applied multivariate normal mixture modeling to responses on the Dutch brief form of the Multidimensional Personality Questionnaire (MPQ-BF-NL; chapter 2; Tellegen & Waller, 2008) to derive profiles for both a general population sample, a risk for psychopathology subsample from this general population sample and an outpatient clinical sample. More specifically, we a) attempted a replication of the findings reported by Eaton et al. (2011) showing that profiles derived from a general sample and from a clinical sample were not robust; b) examined whether robustness could be achieved when profiles were derived for a clinical sample and for a psychopathology risk sample; and c) determined the associations between the personality pathology profiles and DSM-IV-TR Personality Disorders (PDs) to ascertain meaningfulness and applicability of the profiles. Robustness of profiles across the 'at risk' subsample of the general population sample and the clinical sample could add to our understanding of the structure of personality and to the empirical basis of both dimensional and hybrid dimensional-categorical conceptualizations of personality and personality pathology as described in section III of DSM-5.

Method

Samples

Profile solutions were derived for subsamples of a general population sample and an outpatient personality pathology sample. Both general population subsamples (1a and 1b) were taken from a larger general population sample. Descriptives of the employed samples, as well as mean trait scale scores, can be found in Table 5.1.

Table 5.1. Descriptions of high scorers on scales and descriptives – mean T scores (Standard Deviations), Cronbach's alphas – for (sub)samples

		(Sub)sample					
			General (1)	General stratified (1a)	General 'at risk' (1b)		Clinical (2)
Scale	Description of a high scorer	T(*SD*)	α	T(*SD*)	T(*SD*)	T(*SD*)	α
Wellbeing	Has a happy, cheerful disposition; feels good about self and sees a bright future	50 (9.6)	.80	50 (9.8)	**41 (6.3)**	**34 (9.2)**	.83
Social Potency	Is forceful and decisive; fond of influencing others; fond of leadership roles	50 (9.6)	.84	50 (9.6)	47 (9.1)	47 (9.9)	.85
Achievement	Works hard; enjoys demanding projects and working long hours	50 (9.8)	.76	50 (10.2)	49 (9.9)	52 (10.4)	.79
Social Closeness	Is sociable, likes people, and turns to others for comfort	50 (9.7)	.81	52 (9.2)	47 (9.7)	47 (10.5)	.84
Stress Reaction	Is nervous, vulnerable, sensitive, prone to worry	50 (9.7)	.84	51 (10.0)	**59 (6.0)**	**61 (7.7)**	.74
Aggression	Hurts others for own advantage; will frighten and cause discomfort for others	50 (9.4)	.73	51 (9.4)	52 (9.7)	51 (9.9)	.77
Alienation	Feels mistreated, victimized, betrayed, and the target of false rumors	50 (9.0)	.82	50 (9.1)	54 (9.5)	56 (9.7)	.85
Control	Is reflective, cautious, careful, rational, planful	50 (9.7)	.75	49 (9.9)	50 (10.1)	46 (11.8)	.84
Harm Avoidance	Avoids excitement and danger; prefers safe activities even if they are tedious	50 (9.5)	.72	48 (9.6)	51 (9.3)	46 (10.6)	.78
Traditionalism	Desires a conservative social environment; endorses high moral standards	50 (9.7)	.70	47 (9.5)	50 (9.3)	**41 (8.7)**	.67
Absorption	Is responsive to evocative sights and sounds; readily captured by entrancing stimuli	50 (9.9)	.80	50 (10.3)	51 (9.4)	50 (9.9)	.79
N	-	1,055	-	365	365	365	-
% Male	-	48	-	36	37	36	-
Age	-	45.8 (15.7)	-	34.1 (11.2)	45.2 (15.9)	34.2 (11.0)	-

Note. Bold-faced values are either ≤ 43 or ≥ 57, indicating that the samples are characterized by these values; underlined values show the likeness of gender and age of the samples because of stratification.

General population sample (1)

As a general population sample a Dutch sample (*N* = 1,055) was used. The sample was stratified on gender, age, educational level, and county to be representative of the general Dutch population (Centraal Bureau voor de Statistiek, 2009). The sample consisted of 510 (48.3%) men and 545 women. Age ranged from 18 to 61 years, with a mean of 45.83 years (*SD* = 15.74; for a more elaborate description see chapter 2).

General population subsample stratified on gender and age to match clinical sample (1a)

To guard against effects of sample size, gender, and age, a subset of the general population sample was selected that matched the clinical sample on these variables. Protocols were divided in 2 (male/female) x 10 (age groups) cells. For each cell, a random selection from the general population sample was taken to match the amount of cases in that cell within the clinical sample. The resulting subsample consisted of 131 (35.9%) men and 234 women. Age ranged from 18 to 61 years, with a mean of 34.06 years (*SD* = 11.19).

General population 'at risk' subsample (1b)

A subsample of people that are hypothesized to be at risk for psychopathology was taken from the general population sample on basis of their Wellbeing and Stress Reaction scores on the MPQ-BF-NL. Wellbeing and Stress Reaction are the primary markers of higher-order Positive and Negative Emotionality respectively (see Measures section). We observed little overlap in the distributions of Wellbeing and Stress Reaction over the general and clinical samples. As can be derived from Table 5.1, the general sample (that served as the norm group for deriving the T scores) had a mean around 50 and a standard deviation of 10 on both scales. The clinical sample however, had mean scores strongly diverging from these norms (i.e. Wellbeing *M* = 34, *SD* = 9.2; Stress Reaction *M* = 61, *SD* = 7.7).

Not only did the univariate distribution of Wellbeing and Stress Reaction differ between the general and the clinical sample, also their multivariate distribution showed a clear divergence. In supplementary Tables S.5.3 and S.5.4 the percentage of specific score combinations on Wellbeing and Stress Reaction within the general population sample and clinical sample are displayed. Not only were more maladaptive scores in Wellbeing *or* Stress Reaction more likely in the clinical sample, also, a maladaptive score on one scale predicted a maladaptive score on the other scale, which is to be expected given the association between Wellbeing and Stress Reaction (chapter 2; Tellegen & Waller, 2008). Because of these observations we decided that to be included in the general population 'at risk' sample

both Wellbeing *and* Stress Reaction needed to be relatively maladaptive. In effect, this meant that T scores on Stress Reaction were higher than 46 and Wellbeing scores were all lower than 51. The cut-offs for inclusion show that some of the included protocols consist of combinations of scores that cannot be said to be very extreme. However, the mean score on Wellbeing was about a standard deviation below the general population mean (M = 41, SD = 6.3), and the mean score on Stress Reaction was about a standard deviation above the general population mean (M = 59, SD = 6.0). The sample consisted of 136 (37.3%) men and 229 women. Age ranged from 18 to 97 years, with a mean of 45.25 years (SD = 15.86).

Clinical sample (2)

The clinical sample consisted of people who were referred to 'De Viersprong', the Netherlands Institute for Personality Disorders (N = 365). The clinic offers specialized assessment and treatment for individuals suffering from personality disorders. For reference with the 'at risk' subsample of the general population sample, the mean Wellbeing score was notably lower (M = 34, SD = 9.2), while the mean Stress Reaction score was similar (M = 61, SD = 7.7). The sample consisted of 131 (35.9%) men and 234 women. Age ranged from 19 to 61 years, with a mean of 34.17 years (SD = 11.04). Data were collected during the intake phase of the treatment process.

Measures

The Dutch brief form of the Multidimensional Personality Questionnaire (MPQ-BF-NL)

Personality profiles were derived for trait scores on the MPQ-BF-NL (see chapter 2). The 11 MPQ-BF-NL primary trait scales are measured by 12 binary items each. Including three extra items needed for determining scores on validity scales, the full measure consists of 135 items. The primary trait scales coalesce into three higher-order factors: Positive Emotionality (PEM), Negative Emotionality (NEM), and Constraint (CON). PEM is comprised of primary trait scales Wellbeing (WB), Social Potency (SP), Achievement (AC), and Social Closeness (SC). NEM includes Stress Reaction (SR), Aggression (AG) and Alienation (AL), and CON includes Control (CO), Harm Avoidance (HA) and Traditionalism (TR). Absorption (AB) is not allocated to any of the three higher-order factors. Table 5.1 provides reliabilities and further descriptions of the measurement domain for each primary scale. The range of raw scale scores of the primary trait scales is 0-12. For the current study normalized T scores were used, benchmarked on the distribution of scores in the general population sample that was also employed here.

The original U.S. MPQ scales have demonstrated good reliability in a variety of samples and theoretically predicted correlations with other instruments (Tellegen & Waller, 2008). Moreover, the scale scores have been shown to predict behavior (Kamp, 1986), to distinguish between different forms of psychopathology (see for example McGue et al., 1997, 1999; Miller et al., 2003), and to predict clinical variables better than most other personality scales (Grucza & Goldberg, 2007). The MPQ-BF-NL showed similar internal consistencies, with Cronbach's alpha in the range of .75 to .84 for most scales, and between .70 and .73 for Traditionalism, Harm Avoidance, and Aggression. Moreover, higher-order structure and correlational patterns of the MPQ-BF-NL are quite similar to the U.S. (chapter 2). Relevantly for the current application, the covariance structures of responses on the MPQ are highly similar for general and clinical samples (see chapter 4), yielding a relatively bias free comparison of the groups.

Structured Clinical Interview for the DSM-IV Axis II disorders (SCID-II)

For external validation of the personality profiles, mean proportion of DSM-IV Axis II symptoms were examined in the clinical sample, based on the SCID-II (Gibbon et al., 1997). Inter-rater reliability is good for the Dutch translation of the instrument (mean κ = .84; range κ = .77-.94; Lobbestael, Leurgans, & Arntz, 2011) Licensed clinicians, experienced in administering the SCID-II, conducted all interviews. Observed internal consistencies for the most prevalent Personality Disorder (PD) symptoms in our sample were .80 (Borderline PD), and .74 (Avoidant PD). Data on the SCID-II was available for 337 of the 365 assessed patients.

Analytic strategy

To empirically discern personality trait profiles, primary trait scale scores from the MPQ were subjected to multivariate normal mixture modeling using Mplus 7.3. In multivariate mixture modeling, a limited set of relatively homogenous classes of individuals with respect to a number of variables is distinguished within a larger, more heterogeneous sample. When the indicator variables are continuous, as is the case with the trait scores used in this study, it is common to talk about profiles. The different profiles show different mean score combinations for the indicator variables. In the current study, variances of the indicator variables were also allowed to vary over profiles, allowing the extent of homogeneity within variables to differ over profiles. Furthermore we chose to allow for certain dependencies between variables within profiles. More specifically, we allowed primary trait scale scores to covary that are conceptually related because of the higher-order structure of the MPQ

(Tellegen & Waller, 2008). For example Wellbeing, Social Potency, Achievement and Social Closeness were allowed to covary because of their conceptual relatedness as Positive Emotionality indicators. In addition to allowing for higher-order dependencies, also Wellbeing and Stress Reaction scores were allowed to covary, because of their well-documented association (chapter 2; Tellegen, 1985; Tellegen, Ben-Porath, & Sellbom, 2009). In all analyses gender was used as a covariate, allowing the estimation of different probabilities for each sex regarding profile membership.

For estimation Maximum Likelihood (ML), and for optimization the Mplus accelerated Expectation Maximization (EMA) algorithms were used. We evaluated AIC, BIC as indices for relative model fit. Lower values of these indices indicate better fit. We further examined Entropy as a measure of the quality of profile differentiation. Higher values indicate less ambiguity in the classification. Lastly, we used the Lo, Mendell, and Rubin likelihood ratio test (LMR-LRT; Lo, Mendell, & Rubin, 2001) to determine whether k profiles provide a better description of the data than k-1 profiles. When fit-indices did not agree on the best model, the model that was favored by most indices was chosen.

The analyses presented in the main body of this article follow the strategy taken by Eaton et al. (2011). Profiles were discerned for combinations of different samples: a) for the combination of the general – stratified on gender and age – (1a) sample and the clinical (2) sample, and b) for the general 'at risk' (1b) sample in combination with the clinical (2) sample. In these analyses it is assumed that the distribution of cases from the different samples across profiles is informative about robustness of the solutions. When classification is not dependent on sample (i.e. distribution of cases over profiles is more or less equal for each of the samples), the solution can be said to be suited for both samples, and would therefore be robust. When most individuals from each sample are classified into separate profiles, the solutions cannot be considered robust. We expected that the profiles derived from the combination of the general (1a) sample and the clinical (2) sample would not be robust, because of the homogeneity in Wellbeing and Stress Reaction score combinations in the latter sample. Such a result would replicate the findings of Eaton et al. (2011). We also expected that the profiles derived from the combination of the general 'at risk' (1b) sample and the clinical (2) sample would be robust, because these samples are matched on this defining characteristic. This finding would extent on the findings by Eaton et al. (2011) by showing that specific profile solutions are embedded in the general population.

Another way to glean the robustness of profile solutions across different samples is to derive profile solutions for each of the samples separately, and to then compare their characteristics. Patterns resulting from this strategy would not necessarily converge with profiles derived from combinations of samples. Accordingly, in the supplementary material of chapter 5 we present the profiles derived for each of the samples separately.

To explore external validity of the profile solutions mean proportion of DSM-IV-TR Axis II traits present within each of the profiles within the clinical sample was examined. *t*-tests with mean proportion of specific PD traits as dependent variable and profile classification as independent variable were conducted for each of the DSM-IV-TR Axis II PDs. *p*-values were corrected for multiple comparisons using the false discovery rate (fdr) procedure (Benjamini & Hochberg, 1995). For these analyses the stats and compute.es packages within R3.2.1 were used (R Core Team, 2015).

Results

Profile solutions for the combination of general and clinical samples

Fit statistics for two-, three- and four-profile solutions for the combined general –stratified on gender and age – (1a) and clinical (2) samples are displayed in Table 5.2. The AIC index (58950) favored the four-profile solution, while the BIC (59441) was lowest for both three and four-profile solutions. Relying on the LMR-LRT a fourth profile did not add significantly to the description over and above three profiles (p = .242; for three profiles in comparison to two p = .001). Entropy was best for the two-profile solution (.806), but Entropy was not much lower for three profiles (.786). Because only AIC favored more than three profiles, and Entropy was good for three profiles, the three-profile solution was chosen. Mean trait scores for the three profile solution as well as demographics of the individuals classified into each of the profiles can be found in Table 5.3. The mean scores are also graphically depicted in Figure 5.1a.

The three-profile solution included an adaptive profile, characterized by mean T scores around the general population mean (i.e. 50). The solution also included two maladaptive profiles characterized by specific patterns in mean scores that deviated from the mean of the general population. One of the profiles included high Stress Reaction (M = 62) and Alienation (M = 56) scores. Low mean scores in this profile were observed for Wellbeing (M = 32), Social Potency (M = 43) and Traditionalism (M = 42). The other maladaptive profile

also included high Stress Reaction (*M* = 62) and Alienation (*M* = 58) scores, but also high scores for Aggression (*M* = 61). As in the other maladaptive profile, low scores were observed for Wellbeing (*M* = 34) and Traditionalism (*M* = 42), but also scores on Social Closeness (*M* = 43), Control (*M* = 41) and Harm Avoidance (*M* = 38) were low. The score patterns of the two maladaptive profiles converged with the higher-order structure of psychopathology (Caspi et al., 2014; Krueger et al., 2001), and we therefore termed them Emotional/Internalizing and Behavioral/Externalizing (as per Tellegen & Ben-Porath, 2008).

Table 5.2. Fit statistics for multivariate normal mixture models for combined clinical and general subsamples

	General, stratified (1a) & clinical (2)			General, 'at risk' (1b) & clinical (2)	
Statistic	2 profiles	3 profiles	4 profiles	2 profiles	3 profiles
AIC	59237	59059	58950	48544	48469
BIC	59508	59441	59441	48750	48767
Entropy	.806	.786	.729	.551	.561
LMR-LRT	.000	.001	.242	.003	.411

Note. The models based on samples (1a) and (2) include all primary trait scales of the MPQ-BF-NL, while the models for samples (1b) and (2) do not include Wellbeing and Stress Reaction scores. Underlined values are an indication for the best fitting model for the specific comparison. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; LMR-LRT = Lo, Mendel, and Rubin Likelihood Ratio Test.

The adaptive profile mainly consisted of individuals from the general sample (only 13% originated from the clinical sample). Conversely, the majority in both less adaptive profiles consisted of people from the clinical sample (82% and 80% for Emotional/Internalizing and Behavioral/Externalizing. As classification proved highly dependent on sample, these profiles were not robust. Accordingly, our results replicate those of Eaton et al. (2011).

Profile solutions for combination of general 'at risk' and clinical sample

Fit statistics for two- and three-profile solutions for the combined general 'at risk' (1b) and clinical (2) samples are displayed in Table 5.2. Since the 'at risk' subsample of the general population was selected on basis of their Wellbeing and Stress Reaction scores, we did not include these scores in the models. Solutions containing more than three profiles are not given because the LMR-LRT already predicated that more than three profiles did not add to the description of the data (three profiles in comparison with two: $p = .003$; four profiles in comparison to three: $p = .411$). The AIC index (48469) and Entropy (.561) were best for the

Table 5.3. MPQ-BF-NL mean T scores (Standard Deviations) and demographics for best fitting profile solutions for combined clinical and general subsamples

		General (1a) & clinical (2)		General, 'at risk' (1b) & clinical (2)					
		Emotional/	Behavioral/	Emotional/Internalizing			Behavioral/Externalizing		
Scale	Adaptive	Internalizing	Externalizing	Total	1b	2	Total	1b	2
Wellbeing	53 (7.3)	**32 (6.8)**	**34 (7.3)**	**37 (8.9)**	**41 (6.0)**	**33 (9.5)**	**38 (8.4)**	**41 (6.5)**	**35 (8.8)**
Social Potency	52 (9.4)	**43 (8.7)**	54 (8.0)	44 (8.5)	44 (7.9)	44 (9.1)	51 (9.0)	51 (8.9)	51 (9.2)
Achievement	51 (9.9)	53 (10.3)	49 (11.0)	50 (10.4)	48 (10.2)	52 (10.4)	51 (10.0)	50 (9.4)	52 (10.4)
Social Closeness	53 (8.9)	48 (10.1)	**43 (9.2)**	50 (9.7)	50 (8.9)	50 (10.5)	44 (9.5)	44 (9.6)	44 (9.4)
Stress Reaction	49 (9.3)	**62 (6.6)**	**62 (6.6)**	**59 (6.9)**	**58 (5.7)**	**60 (7.7)**	**61 (7.2)**	**59 (6.3)**	**62 (7.6)**
Aggression	50 (9.0)	47 (7.5)	**61 (9.5)**	47 (7.2)	48 (7.6)	46 (6.7)	56 (9.8)	**57 (9.7)**	56 (10.0)
Alienation	49 (8.5)	56 (9.5)	**58 (10.0)**	53 (9.4)	52 (9.1)	55 (9.5)	**57 (9.5)**	**57 (9.3)**	**58 (9.8)**
Control	49 (10.2)	50 (10.6)	**41 (11.2)**	50 (10.3)	51 (9.6)	50 (10.9)	45 (11.4)	48 (10.3)	**43 (11.9)**
Harm Avoidance	48 (9.4)	50 (9.7)	**38 (8.4)**	53 (8.3)	55 (7.3)	51 (8.8)	**43 (9.1)**	45 (8.6)	**40 (8.8)**
Traditionalism	46 (10.1)	**42 (9.3)**	**42 (7.9)**	46 (10.4)	50 (9.6)	**41 (9.0)**	45 (9.6)	49 (8.9)	**41 (8.4)**
Absorption	49 (10.3)	49 (10.3)	53 (8.3)	47 (9.2)	49 (9.2)	46 (9.2)	54 (9.1)	54 (8.9)	54 (9.4)
n	331	282	117	387	195	191	343	170	174
Age	34.6 (11.4)	33.5 (10.7)	34.3 (11.4)	40.3 (15.2)	46.7 (15.8)	33.7 (11.2)	39.1 (14.2)	43.5 (15.8)	34.7 (10.9)
% Male	38	20	70	12	11	14	64	68	61
% Clinical	13	82	80	50	-	-	50	-	-

Note. Values are descriptives of the classified samples, not of the models themselves. Bold-faced values are either ≤ 43 or ≥ 57, and underlined values are either ≤ 45 or ≥ 55 indicating that the samples are characterized by these values.

three-profile solution, while relying on BIC (48750) and LMR-LRT one would choose for two profiles. Because Entropy for the two-profile solution was not vastly different from the three-profile solution, the two-profile solution was chosen. Mean trait scores for the two profile solution as well as demographics of the individuals classified into each of the profiles can be found in Table 5.3. The mean scores are also graphically depicted in Figure 5.1b.

The two profiles contained trait score patterns that were similar to the two maladaptive profiles from the previous analyses. Again we observed an Emotional/Internalizing profile characterized by high mean T scores on Stress Reaction (M = 59) and low scores on Wellbeing (M = 37) and Social Potency (M = 44). Alienation and Traditionalism means however did not differ notably from the general population (Alienation: M = 53; Traditionalism: M = 46). The other profile showed a Behavioral/Externalizing personality style again with high Stress Reaction (M = 61), Aggression (M = 56), and Alienation (M = 57) scores. Like the Behavioral/Externalizing profile from the previous analyses, here also Wellbeing (M = 38), Social Closeness (M = 44), Control (M = 45), Harm Avoidance (M = 43), and Traditionalism (M = 45) scores were low.

Although the interpretation of the two profiles converged with the interpretation of the maladaptive profiles from the combined general (1a) and clinical (2) samples, the distribution of individuals from the different samples over the profiles was equivalent across samples. Both profiles included exactly 50% of the individuals from the clinical sample and 50% from the 'at risk' subsample of the general population sample. We therefore concluded that these profiles were robust across our employed samples.

Although the distribution of samples over profiles was equal, individuals from the two samples could be differentiated on the extremity of the score patterns. In Table 5.3 mean T scores for each sample can be found for each of the profiles. The same traits differed in the same direction in comparison to the general population mean for the two samples, but deviations were more extreme for individuals from the clinical sample than for individuals from the 'at risk' subsample of the general population sample. Regardless of profile, Wellbeing and Traditionalism were notably lower for the clinical sample, as can also be inferred from Table 5.1 (Wellbeing 'at risk' M = 41; clinical M = 34; Traditionalism 'at risk' M = 50; clinical M = 41). For the Behavioral/Externalizing profile specific especially scale scores from the domain of Constraint were notable lower within the clinical sample than within the 'at risk' sample (Control 'at risk' M = 48; clinical M = 43; Harm Avoidance 'at risk'

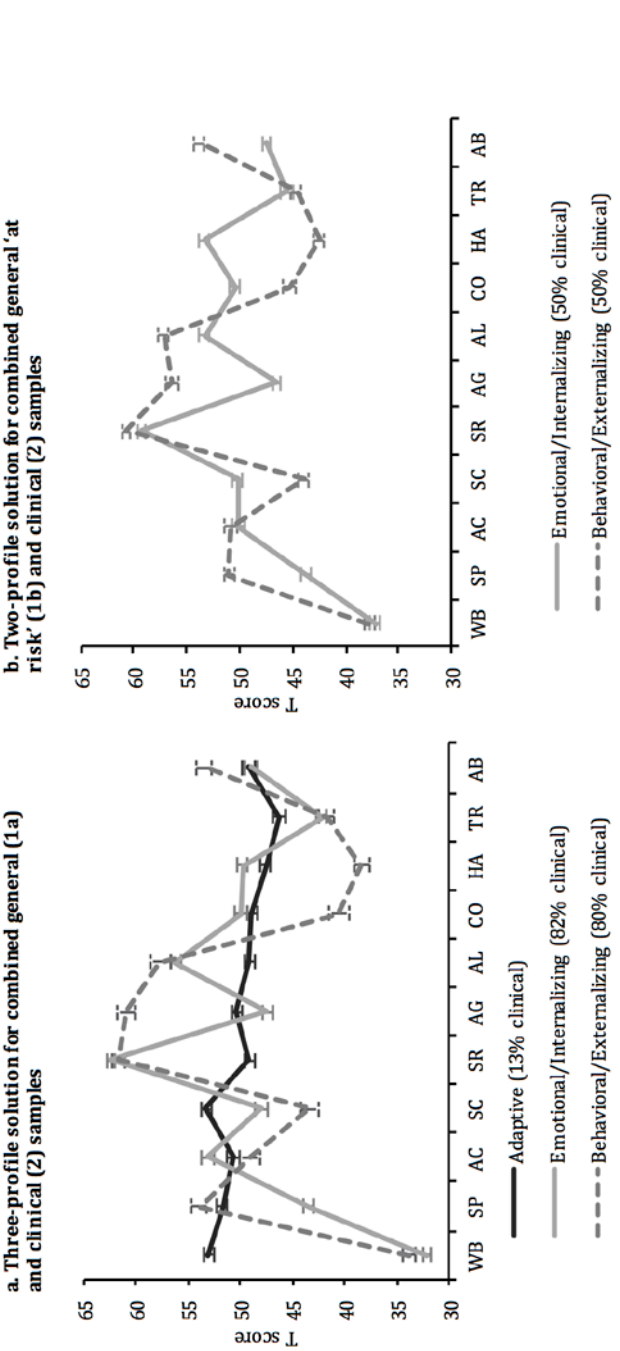

Figure 5.1. Mean trait scores within profiles for selected profile solutions of (a) the combined general, gender/age stratified (1a), and clinical (2) samples; (b) the combined general 'at risk' (1b), and clinical (2) samples. Values are descriptives of the classified samples, not of the models themselves. WB = Wellbeing; SP = Social Potency; AC = Achievement; SC = Social Closeness; SR = Stress Reaction; AG = Aggression; AL = Alienation; CO = Control; HA = Harm Avoidance; TR = Traditionalism; AB = Absorption.

M = 48; clinical *M* = 43). This observation suggests that not the extremity of personality is decisive for how trait scores are patterned, but that both in more extreme samples and more moderate samples the same trait score patterns can be found.

Profile classification and DSM-IV-TR Axis II symptoms in the clinical sample

SCID-II interview data was available for patients in the clinical sample. Figure 5.2 depicts the mean proportion of Axis II symptoms scored within the Emotional/Internalizing and Behavioral/Externalizing profiles. Mean proportions of symptoms are presented as this provides a more fine-grained picture than associations with categorical diagnoses. As can be seen in the Figure, the most striking finding is that Borderline and Avoidant symptoms are much more common in the clinical sample than symptoms of any other PD. Regardless of type of profile, the mean proportion of Borderline and Avoidant symptoms was .19 and .23 respectively, which is notably higher than the other proportions (ranging from .003 for Schizoid to .07 for Dependent symptoms).

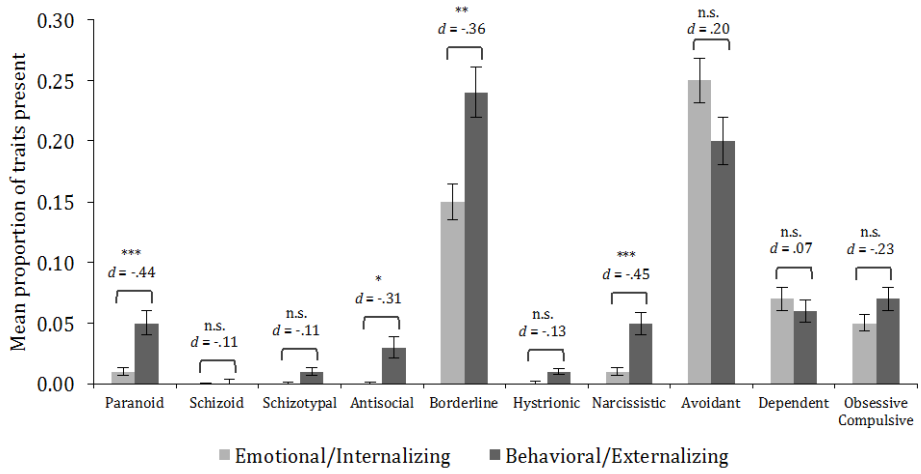

Figure 5.2. Mean proportion of DSM-IV-TR Axis II symptoms present within each profile for the clinical sample (classification from the combined general 'at risk' (1b) and clinical (2) samples analyses)

* false discovery rate (fdr) corrected $p < .05$. ** fdr corrected $p < .01$. *** fdr corrected $p < .001$.

t-tests, controlled for multiple comparisons with fdr, showed that Paranoid ($t(189.32) = -4.00$, $p = .0004$, $d = -.44$), Antisocial, ($t(167.65) = -2.86$, $p = .01$, $d = -.31$), Borderline ($t(291.35) = -3.32$, $p = .003$, $d = -.36$), and Narcissistic PD symptoms ($t(200.63) = -4.16$, $p = .0004$, $d = -.45$) were less prevalent in the Emotional/Internalizing profile than in the

Behavioral/Externalizing profile. No other significant differences in prevalence of PD symptoms were observed.

Discussion

We showed that personality profiles from an outpatient clinical sample could be traced back to a subset of the general population that was theorized to be at risk of psychopathology. We applied multivariate normal mixture modeling to trait scores on the MPQ-BF-NL from a clinical sample in combination with both a stratified subsample from a general population sample, and a subsample from a general population sample that had relatively maladaptive combinations of scores on Wellbeing and Stress Reaction. We replicated the findings reported by Eaton et al. (2011), showing again that profile solutions were not robust across general and clinical samples. However, we also showed that profile solutions *were* robust across an at risk group of the general population sample and the clinical sample. Therefore there is reason to believe that solutions from each specific sample are embedded in the larger general population, and are therefore in a sense robust; even though profiles from specific samples are not necessarily apparent in other specific samples.

Substantively, the emergent profiles converged with clusterings found within specific diagnostic categories, such as Post Traumatic Stress Disorder (Miller et al., 2003) and Borderline PD (Ramos, Canta, de Castro, & Leal, 2014) as well as with predominant contemporary conceptualizations of the higher-order structure of psychopathology: systematic covariance between both personality scales and DSM disorders can be explained by two factors: Internalizing is a dimension that encompasses depressive and anxious pathologies and is associated with traits in the domain of Negative Emotionality. Externalizing is a dimension that encompasses substance use and antisocial pathologies and is associated with personality traits in the domains of reversed Constraint and reversed Agreeableness (Caspi et al., 2014; Krueger et al., 2001). In similar vein, our results parallel the Resilient, Undercontrolled, and Overcontrolled (RUO) personality types that have been described numerous times in the social/personality literature (Alessandri et al., 2014; Asendorpf, Borkenau, Ostendorf, & Van Aken, 2001; Klimstra, Luyckx, Teppers, Goossens, & Fruyt, 2011; Specht, Luhmann, & Geiser, 2014). These typologies are usually derived using Big Five operationalizations of personality. The resilient type is characterized by low Neuroticism and high trait levels otherwise. The undercontrolled type consists of both low Agreeableness and Conscientiousness. Individuals conforming to the overcontrolled type

have high Neuroticism and low Extraversion scores. Conceptually, the undercontrolled and overcontrolled types are linked to the two higher-order dimensions of psychopathology.

In the above description categorical (typological) and dimensional accounts of personality could be mistaken as interchangeable: the undercontrolled and overcontrolled categorical types are aligned with externalizing and internalizing dimensions. Conceptually however, categorical and dimensional models are highly different, with the former assuming qualitative differences between people and the latter assuming quantitative differences between people. There are two reasons for pursuing the hybrid dimensional-categorical approach presented here. First, in the proposed alternative model for PDs in section III of DSM-5, dimensional trait scores are combined to define a categorical typology of persons in order to bridge the gap between Kraepelian categorical nosology and dimensional trait models. Second, it is appealing to us that with techniques used to derive typologies, a person-centered approach instead of a variable-centered approach is taken. Instead of examining how variables covary, heterogeneity across people is tried to be explained by clustering people together with similar scores across variables (Muthén & Muthén, 2000). Arguably, this representation fits better with the perspective of practicing clinicians, and accordingly working with such person-centered variables may be of clinical utility.

Nevertheless, sampling on the relevant characteristics to ensure robustness of profiles is not without difficulties. In our case the clinical sample was marked by maladaptive score combinations of Wellbeing and Stress Reaction (as illustrated by supplementary Tables S.5.3 and S.5.4). Other samples, even clinical ones, might be marked by other deviations from general population characteristics. In forensic samples for example, one would expect homogeneities in the domain of Constraint (i.e. unequivocally low), and less so in affect. Consequently robustness is only then likely when sampling from the general population occurs on the specific homogeneities in the comparison sample. We do not consider this to derogate utility of personality profiles, but to shed light on how different samples are embedded in the general population.

A more conceptual issue is what is meant by robustness. Following Eaton et al (2011), we considered profile solutions to be robust when analyses on combined samples resulted in even distributions in classification of samples over profiles. However, uneven distribution of samples over profiles would not rule out robustness. We demonstrated another strategy to examine robustness of profile solutions in the supplementary material of chapter 5

where we visually compared solutions for the samples separately. The interpretation of the profiles was commensurate for the clinical and 'at risk' samples, but classification into profiles shifted somewhat.

By showing that personality pathology profiles are embedded in the general population we demonstrated that these profiles can be robust. This demonstration may also point to novel ways one might empirically derive hybrid dimensional-categorical conceptualizations of personality and personality pathology as exemplified in section III of DSM-5.