




Maladaptive facet trait profiles and psychopathology: a person-centered assessment approach

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Accepted: 30 October 2023 / Published online: 10 November 2023
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Abstract

Person-centered approaches in personality allow greater understanding of how different subpopulations with specific personality profiles are linked with relevant outcomes. Studies under the Five Factor Model agree on the observation of a Resilient, an Undercontrolled and an Overcontrolled profile. However, studies using maladaptive traits are much more limited. The present research identify personality profiles based on the 25 maladaptative facet and examined the relationships with personality dysfunctioning, internalizing and externalizing symptoms.

A mixed sample composed of community adults ($n = 742$) and patients ($n = 312$) completed the Personality Inventory for DSM-5 Short Form, the Inventory of Depression and Anxiety Symptoms-II, Externalizing Spectrum Inventory–Brief Form, the 12 items Spanish version of the WHO Disability Assessment Schedule II and Level of Personality Functioning Scale–Brief Form 2.0. Latent profile analysis was performed on PID-5-SF score. The scores on internalizing, externalizing and functioning were compared across the profiles.

Four profiles emerged: Resilient, Undercontrolled, Overcontrolled, and Ordinary type. The Overcontrolled and Undercontrolled types showed higher scores on pathology scales. While the Overcontrolled profile appeared more related to internalizing symptoms and impairment in self-functioning, the Undercontrolled profile was more linked to higher scores on externalizing symptoms and interpersonal dysfunctioning.

Keywords Latent profile analysis · Maladaptive traits · Internalizing symptoms · Externalizing symptoms · Personality functioning

Background

To allow greater understanding of how distinctive subpopulations are linked with related predictors or outcomes, the field of personality applies a "person-centered approach". Using latent class (or profile) or cluster analysis subgroups of individuals are identified with similar profiles (traits), but that differ from other subgroups in terms of profile shape and level differences. These profiles are validated for clinical

relevance by examining how they can be differentiated on clinically relevant external variables. (Collins & Lanza, 2013; Yin et al., 2021).

An extensive number of studies used the personality domains defined in the Five Factor Model (FFM) or the Big Five Model (i.e. openness, conscientiousness, extraversion, agreeableness and emotional stability/neuroticism) (see review by Yin et al., 2021) to identify such profiles. Differences between studies in the number of profiles identified can be noted, ranging between three (Exley et al., 2022; Ferguson & Hull, 2018; Fisher & Robie, 2019; Specht et al., 2014), four (Specht et al., 2014) and five (Zhang et al., 2015) profiles. Despite the observed heterogeneity, a majority of these studies consistently identified three profiles. A first profile is characterized with high scores in openness, conscientiousness, extraversion, agreeableness, and low scores in neuroticism. This adaptive – usually labelled Resilient—profile has been related to higher self-esteem, well-being, and quality of life (Yin et al., 2021). A second is the

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Undercontrolled prototype (characterized by high neuroticism, low conscientiousness and low agreeableness) and a third is the Overcontrolled profile (high neuroticism, low extraversion and moderate conscientiousness) (Exley et al., 2022; Gilbert et al., 2021; Specht et al., 2014). Some studies, with four or five emerging profiles, detected a variety of additional profiles, such as the Reserved (low Extraversion, low Neuroticism, low Openness, high Agreeableness and high Conscientiousness) (Kerber et al., 2022), the Ordinary (with intermediate scores on agreeableness, openness to experience, and conscientiousness) (Zhang et al., 2015), the Agentic Resilient (moderate neuroticism, high extraversion and low conscientiousness) (Li et al., 2020) or the Vulnerable-Resilient types (high neuroticism, high extraversion and conscientiousness) (Kerber et al., 2022). Differences between profiles identified accounted for both level of severity and shape, although especially level differences were found (Yin et al., 2021).

Person-centered approach studies using maladaptive traits are much more limited. The few available studies (Bastiaens et al., 2021; Gamache et al., 2021; Rossi et al., 2021) applied the maladaptive DSM-5 Section III Alternative Model of Personality Disorders (AMPD; APA, 2013), and three (Rossi et al., 2021), four (Gamache et al., 2021) and six-profile (Bastiaens et al., 2021) solutions have emerged. For example, the study by Rossi et al. (2021) corroborated the Resilient, Undercontrolled, and Overcontrolled type and demonstrated the types could be clinically meaningfully differentiated from each other in terms of personality functioning and trait style. While the Resilient showed overall lower scores on personality dysfunctioning and maladaptive trait domains, the Overcontrolled type exhibited a particular elevation of negative affect and the Undercontrolled displayed greater severity on all maladaptive trait domains, as well as greater interpersonal functioning impairment than the other two profiles. Similarly, the four different profiles found by Gamache et al. (2021) in a sample of patients with borderline personality disorder (BPD) reflect both the severity of the disorder as well as the qualitative differences. Here, impulsivity and depressivity were found to be the most discriminative facets among profiles, however only facets related with BDP were included in this study. In the study of Bastiaens et al. (2021), most of the differences between the six types identified, accounted for level differences in personality functioning and severity of maladaptive trait presence. Further, among the profiles identified, the Overcontrolled profile did not emerge. The authors suggested the absence of the compulsivity component in the AMPD model might explain this finding (Bastiaens et al., 2021).

Up to our knowledge, none of the person-centered approach AMPD studies focused on the complete lower-level trait facets. The 25 facet traits might better capture variance between personality profiles than the broader domain

level and detect the underlying common mechanisms among different personality disorders (Clark et al., 2020). This knowledge is important to be able to develop transdiagnostic interventions for personality disorders, in a similar way as for emotional disorders (Barlow et al., 2017).

Lastly, the AMPD person-centered studies have been carried out either in non-clinical samples (Bastiaens et al., 2021) or in patients with specific disorders like BPD (Gamache et al., 2021). Rossi et al. (2021) used a more varied clinical sample with patients referred to a mental health care center specialized in assessment and treatment of personality disorders, yet identified profiles using the AMPD domains. A mixed sample applying the facet level might reveal more relevant clinical differences of personality profiles on relevant external clinical variables. Different authors also emphasized the relevance of understanding how personality profiles relate with other psychopathological symptoms (Bohane et al., 2017), in order to understand the transdiagnostic processes underlying PDs (Widiger et al., 2019). Specially, recent impact of COVID-19 pandemic has shown that pathological traits, as well as depressive and anxiety symptoms, have been significantly increased (Amerio et al., 2021) and affected variables associated to psychiatric admissions (Ambrosetti et al., 2021). Importantly, relation of traits with mental health outcomes should be further considered. Phenotypic relationships between these symptoms and traits have also been evidenced on variable-centered approaches through factor analyses studies (Markon, 2010) and by empirical networks' evidence (Borsboom & Cramer, 2013; De la Rosa et al., 2022), and was integrated into theoretical models such as the Hierarchical Taxonomy of Psychopathology (HiTOP; Kotov et al., 2017). The aforementioned study by Rossi et al. (2021), showed that the Resilient type showed less pathology than the other types, Overcontrolled profiles had a higher prevalence of mood disorders, while the Undercontrolled exhibited higher scores on borderline and narcissistic scales. However, up to our knowledge, no "person-centered" analyses have been performed that apply the facet level traits defined in the AMPD and to identify personality profiles and examine how these profiles are associated with the symptoms from the internalizing and externalizing spectra.

Therefore, the present research aims to: i) identify personality profiles based on the 25 facet traits of the AMPD; ii) examine the relationships between the profiles and internalizing and externalizing symptoms, functional impairment and personality dysfunctioning. According to previous studies, we hypothesize to find at least three latent profiles differing in terms of level and shape (Exley et al., 2022; Ferguson & Hull, 2018; Fisher & Robie, 2019; Rossi et al., 2021; Specht et al., 2014): i) one profile with low scores on most maladaptive facets, similar to the resilient profile (Rossi et al., 2021; Yin et al., 2021); ii) another profile with higher

scores on the facets related with negative affect but lower on disinhibition facets (equivalent to the overcontrolled profile) (Exley et al., 2022; Gilbert et al., 2021; Rossi et al., 2021; Specht et al., 2014); iii) a third profile with higher scores on disinhibition and antagonism facets (similar to the undercontrolled type) (Bastiaens et al., 2021; Rossi et al., 2021). If additional personality profiles could be identified, we expect these will be mainly useful for further differentiating profiles in terms of severity of level of maladaptive traits being present (Yin, et al., 2021). Regarding the relation between the profiles and psychopathological symptoms, based on previous research, we expect the Overcontrolled profile to have higher scores on internalizing symptoms – such as dysphoria, insomnia or lassitude – (Rossi et al., 2021; Watson & O’Hara, 2017), while the Undercontrolled profiles to score higher in externalizing symptoms – such as lack of empathy, impulsivity or alcohol use – (Kotov et al., 2017; Moraleda et al., 2019). In relation to personality functioning, according to previous results (Bastiaens et al., 2021; Rossi et al., 2021), lowest scores in terms of dysfunctionality are expected on the Resilient profile and highest scores on especially interpersonal dysfunctioning are expected in the undercontrolled group. Functional impairment has not yet been examined.

Method

Participants and procedure

The study was conducted in a mixed sample ($N=1054$) composed of community adults ($n=742$) and patients ($n=312$). According to Nylund et al. (2007), a sample size over 500 ensure enough accuracy in identifying a correct number of latent profiles. To ensure variability in responses, the sample size was composed of two groups (community and patient sample) with a ratio of approximately 30%.

The community sample was selected from an online access panel provider using a stratified random sampling with proportional allocation according to gender, age (between 18 and 75 years), and geographical region of the Spanish territory. Prior to the administration of the instruments, questions that assessed participant’s reading and comprehension skills were administered, and a verification of no automatic response style was made. Only participants with consistent responses on these initial questions were included in the final sample. 16 participants were excluded for not completing the complete set of instruments, 2 participants were excluded for completing the responses in less than 20% of the estimated duration and 6 participants were dropped by automatic responses detected with a security question included in the middle

of the administration. The final 742 selected participants completed the instruments online.

The 312-patient sample consisted of people undergoing treatment in mental health services in the province of Huelva (Spain) selected by systematic sampling. Participants who did not sign the informed consent form were excluded. Tests were administered by a trained psychologist. Table 1 shows the diagnoses present in the clinical sample. 29.60% ($n=312$) of the sample met the diagnostic criteria for at least one mental disorder according to DSM-5 and 13.66% ($n=144$) had diagnostic comorbidity. The most frequent diagnostic categories were Anxiety Disorders (10.44%) and Depressive Disorders (10.39%).

The total sample ($N=1054$) consisted of 50.6% women ($n=533$), with an age range from 18 up to 80 ($M=43.83$; $SD=14.98$). Regarding educational level, 1.6% of participants had not completed primary education, 5.0% had completed primary education, 55.5% had completed secondary education and 37.9% had completed university studies. 57.3% were in employment at the time of completing the study.

All participants were informed about the anonymous and voluntary nature of their participation and gave their written informed consent before taking part in the study. Participants were rewarded for their participation. This study was approved by the Ethics Committee of Research Centers in the province of Huelva (Junta de Andalucía, Spain) (file number PI 040/18).

Table 1 Distribution of diagnoses in the clinical sample ($n=312$)

	<i>n</i>	%
Neurodevelopmental Disorders	30	9.62
Schizophrenia Spectrum and Other Psychotic Disorders	21	6.73
Bipolar and Related Disorders	12	3.85
Depressive Disorders	120	38.46
Anxiety Disorders	110	35.26
Obsessive–Compulsive and Related Disorders	15	4.81
Trauma- and Stressor-Related Disorders	77	24.68
Dissociative Disorders	4	1.28
Somatic Symptom and Related Disorders	2	0.64
Feeding and Eating Disorders	6	1.92
Disruptive, Impulse-Control, and Conduct Disorders	6	1.92
Substance-Related and Addictive Disorders	11	3.53
Personality Disorders	29	9.29
Other Conditions That May Be a Focus of Clinical Attention	2	0.64

The model with best fit is shown in bold. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; SABIC = Sample size-adjusted BIC; BLRT (p) = p -value for Bootstrapped Likelihood Ratio Test; LMR (p) = p -value for Adjusted Lo-Mendell-Rubin test

Measures

Personality Inventory for DSM-5-Short Form (PID-5-SF Spanish version) (Díaz-Batanero et al., 2019). It is composed of 100 items with a Likert-type format (from 0 = "very false or often false" to 3 = "very true or often true") assessing the 25 personality traits established in section III of DSM-5 (APA, 2013). In the present study Cronbach's alpha internal consistency coefficients at facet level ranged from 0.61 (Irresponsibility) to 0.90 (Intimacy avoidance).

Inventory of Depression and Anxiety Symptoms-II (IDAS-II Spanish version) (De la Rosa-Cáceres et al., 2020). The IDAS-II is composed of 99 items with a 5-point scale (from 1 = "not at all" to 5 = "extremely"), grouped into 18 specific scales that assess the severity of symptoms of depression, anxiety and bipolar disorder during the last two weeks. Cronbach's alpha for the symptom scales ranged in present sample from 0.75 (Euphoria and Ordering) to 0.93 (Dysphoria and Panic).

Externalizing Spectrum Inventory–Brief Form (ESI-BF Spanish version) (Blanc-Molina et al., 2023). The ESI-BF is composed of 160 items with a Likert response format (from 0 = "true" to 3 = "false") that assess the severity of 23 externalizing symptoms. In the present study Cronbach's alpha values between 0.60 (Fraud) and 0.93 (Marijuana use) were found for the symptom scales.

12 items Spanish version of the WHO Disability Assessment Schedule II (WHODAS 2.0; Vázquez-Barquero et al., 2000) was used to measure functional impairment. Each item is scored on a 5-point Likert scale (from 0 = "none" to 4 = "extreme or cannot do"). Cronbach's alpha coefficient was 0.89 for the present sample.

Level of Personality Functioning Scale–Brief Form 2.0 (LPFS-BF-2.0; Weekers et al., 2019). The Spanish version of LPFS-BF 2.0, available on the website of the original version (LPFS-BF Scale), was applied. The scale consists of two domains: LPFS self-functioning and LPFS interpersonal functioning, measured on a 4-point Likert scale ranging from 1 (completely untrue) to 4 (completely true). In the present sample, internal consistency values of general scale and domains were adequate: Total scale ($\alpha=0.86$); Self-functioning ($\alpha=0.87$); Interpersonal functioning ($\alpha=0.70$).

Data analysis

Latent profile analysis was applied to identify profiles or groups of individuals who showed similar patterns of responses on the 25 personality trait facets of the DSM-5 Section III as assessed by the PID-5-SF. The optimal number of latent profiles was determined by evaluating the goodness of fit of each model (from 2 to 6 classes) according to Bayesian Information Criterion (BIC), sample-adjusted BIC (SABIC), and Akaike Information Criteria (AIC).

Adjusted Lo-Mendell-Rubin test (LMR), Bootstrap Likelihood Ratio test (BLR), and entropy were also considered. Lower BIC, SABIC and AIC values indicate a better fit of the model. LMR and BLRT compare the estimated model with a median with $k-1$ classes, where k is the number of classes. Significant values of LMR and BLRT indicate that the estimated model is better than the model with one class less. Entropy values range from 0 to 1, where values > 0.80 indicate a more accurate classification (Clark & Muthén, 2009). To determine the stability or replicability of the profiles, a cross-validation procedure was performed by randomly selecting 70% of the sample.

Finally, to analyze the equality of means of internalizing and externalizing symptoms, functional impairment and personality functioning across latent profiles we applied the method by Lanza et al. (2013). Among the existing methods to relate latent profiles to external variables, the method of Lanza et al. (2013) was selected due to violation of heteroscedasticity for the continuous outcome (Bakk & Kuha, 2021). The method of Lanza et al. (2013) overcomes the limitations of ANOVA in case of such a violation (i.e. ANOVA estimation could result in erroneous conclusions about the significance of an effect) (Clark & Muthén, 2009) by taking into account the probability of membership in each class (Bakk & Kuha, 2021; Lanza et al., 2013) instead of most likely profile membership being treated as an exact variable.

Transparency and Openness

We report how we determined our sample size, data exclusions, design, and all measures in the study. All data have been made publicly available at https://osf.io/hg29n/?view_only=061349bbf93e4a43aec7e2671735914e. All analyses were performed in MPlus version 8.7 (Muthen & Muthen, 2018) This study's design and its analysis were not pre-registered.

Results

Latent Profiles identification

The fit indicators for the solutions from 2 to 6 latent profiles are shown in Table 2. The values of AIC, BIC and SABIC decreased as the number of classes increased, indicating a better fit of the 6-class model. However, this model was the least parsimonious and performed the worst classification of subjects according to the entropy value. BLRT p -values were statistically significant for all solutions although LMR p -values suggested the two-latent profile solution as the best solution, being the only model with a significant improvement compared to the one class solution. Entropy values indicated a clear classification of subjects in all models

Table 2 Latent profile analysis: Model fit indices for 2-class to 4-class patterns of the PID-5, profile prevalences, and kappa estimate for cross-validation

Model	AIC	BIC	SABIC	BRLT (p)	LMR (p)	Entropy	Profile prevalence n (%/100)						% Kappa	
							1	2	3	4	5	6		
2 class	46.656,397	47.033,384	46.791,996	<.001	<.001	.953	747 (.70)	307 (.30)						.965
3 class	44.477,132	44.983,087	44.659,119	.482	<.001	.928	537 (.51)	400 (.38)	117 (.11)					.860
4 class	43.163,102	43.798,027	43.391,479	.172	<.001	.940	464 (.44)	101 (.10)	107 (.10)	382 (.36)				.996
5 class	42.152,480	42.916,374	42.427,245	.153	<.001	.932	328 (.31)	437 (.41)	133 (.13)	104 (.10)	52 (.05)			.949
6 class	41.599,796	42.492,659	41.920,950	.142	<.001	.924	117 (.11)	372 (.35)	334 (.32)	50 (.05)	138 (.13)	43 (.04)		.887

(> 0.90), especially for the 2 and 4 profile models. The percentage of agreement following cross-validation produced a more stable result when considering the 4-profile solution (kappa=0.996). Although the 2-class and 4-class models were thus taken together the most appropriate alternatives, the four-class solution was chosen for reasons of interpretability.

Figure 1 and Supplementary Table S1 show the results for each of the four profiles. Latent profile 1, labeled as “Resilient” represented 44% of the sample (n=464), and was characterized by the lowest scores on all trait facets. Profile 2, named “Ordinary”, comprising 36% of the sample (n=382), showed higher scores than profile 1 but lower scores than profile 3 and 4 in all trait facets (except some of the Antagonism domain related trait facets of profile 4). Profile 3, named “Undercontrolled” included 10% of the sample (n= 101), and showed the highest scores in the traits Hostility, Manipulativeness, Deceitfulness, Grandiosity, Attention seeking, and Callousness (from the Antagonism domain), and Irresponsibility, Impulsivity, Risk taking, and Rigid Perfectionism (from the Disinhibition domain). Profile 4 labeled “Overcontrolled”, comprising 10% of the sample (n= 107), was characterized by the highest scores in Intimacy avoidance, and Anhedonia, Depressivity (from the Detachment domain); Emotional lability and Anxiousness (from the Negative Affect domain), and Distractibility (from the Disinhibition domain).

Patient and community sample participants were distributed as follows across profiles: Resilient profile consisted of 87.5% community adults (n=406) and 12.5% patients (n= 58); Ordinary profile consisted of 67.5% of community adults (n=258) and 32.5% of patients (n=124); Undercontrolled profile consisted of 67.3% of community adults (n=68) and 32.7% of patients (n=33); and the Overcontrolled profile consisted of 9.3% of community adults (n= 10) and 90.7% of patients (n=97),

Relations with externalizing and internalizing symptoms, functional impairment and personality functioning

The results of the equality test are shown in Table 3, where the mean scores of the internalizing and externalizing symptoms, functional impairment and personality functioning scales observed in each profile are reported. The Resilient profile showed significantly lower scores for all internalizing and externalizing symptoms than other profiles, with the exception of lacking empathy, for the Overcontrolled profile showed the lowest score. However, the scores for cleaning, alcohol use, drug use and lack of honesty in the Resilient profile did not differ significantly from those obtained in the Overcontrolled type. As for the highest scores, five internalizing symptoms (appetite gain, appetite loss, checking,

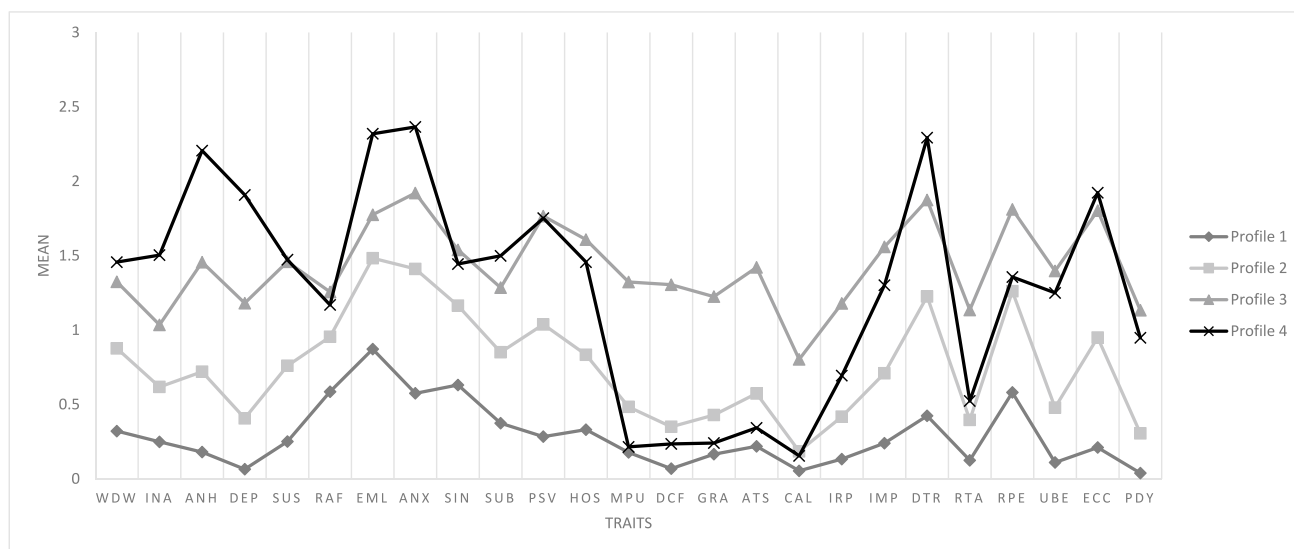


Fig. 1 PID-5 trait facet personality profiles

cleaning, and ill temper) and three externalizing symptoms (blame externalization, lacks planful control and problematic impulsivity) showed equally high scores in Undercontrolled and Overcontrolled profiles. Overcontrollers showed significantly higher scores in the remaining internalizing symptoms (except euphoria and ordering), whereas Undercontrollers showed significantly higher scores in the remaining externalizing symptoms (except alienation and boredom proneness). The Ordinary profile showed intermediate scores on internalizing and externalizing symptoms.

Regarding functional impairment, a gradual significant increase was observed across groups with Resilient presenting the lowest scores and Overcontrolled the highest scores (see Table 3). A similar tendency was observed for personality functioning, measured by LPFS-BF 2.0, although Undercontrolled and Overcontrolled did not differ significantly on the total score but they did differ on the subscales. While the Undercontrolled type scored higher on interpersonal dysfunctioning ($M=2.19$; $DT=0.61$), the Overcontrolled type showed greater self-functioning impairment ($M=2.90$; $DT=0.60$).

Discussion

The present research showed four personality profiles that differed in both level and shape. These four profiles—named Resilient, Undercontrolled, Overcontrolled, and Ordinary—differed in their relationships with internalizing and externalizing symptomatology, degree of functional impairment and personality functioning. While the Overcontrolled profile appeared more related to higher scores on internalizing symptoms and impairment in self-functioning, the

Undercontrolled profile was more linked to higher scores on externalizing symptoms and interpersonal functioning of personality and both thus showed more pathology compared to the Resilient and Ordinary types. These results are further discussed below.

Latent Profiles identified

Firstly, congruent with our hypotheses and with previous studies (Exley et al., 2022; Gamache et al., 2021; Gilbert et al., 2021; Rossi et al., 2021; Specht et al., 2014; Yin et al., 2021), the four profiles identified in present results included the three RUO (Resilient, Undercontrolled and Overcontrolled) types (Asendorpf et al., 2001). Among these, the Resilient type presented significant lower scores compared to the rest of profiles for all AMPD trait facets. This result is congruent with previous research in both FFM and AMPD. The review by Yin et al. (2021) found that twenty-nine out of thirty-four studies found this resilient profile to have the lowest values in neuroticism (and higher values for other normative adaptive trait domains). Similarly, studies using AMPD domains identified the resilient profile as having lower scores on all pathological trait domains (Bastiaens et al., 2020; Rossi et al., 2021).

The Overcontrolled profile, as expected, showed higher scores than the other groups in facets related to the detachment and the negative affect domains. These results are congruent with work carried out on the FFM, with most samples included in the review by Yin et al. (2021) identifying Overcontrollers with highest scores on neuroticism and lowest in extraversion. However, our results are partially congruent with more recent results within the AMPD. For example, the study of Rossi et al. (2021) obtained elevations

Table 3 Equality tests of internalizing symptoms, externalizing symptoms, functional impairment, and personality functioning across latent profiles

Distal outcome	Profile 1: Resilient (R)		Profile 2: Ordinary (Or)		Profile 3: Undercontrolled (U)		Profile 4: Overcontrolled (Ov)	
	Mean	<i>M</i> (<i>SD</i>)	Mean	<i>M</i> (<i>SD</i>)	Mean	<i>M</i> (<i>SD</i>)	Mean	<i>M</i> (<i>SD</i>)
Internalizing symptoms								
Appetite gain (3)	4.64 _{Or, U, Ov}	1.55 (0.63)	6.06 _{R, U, Ov}	2.02 (0.95)	8.12 _{R, Or}	2.71 (1.19)	7.26 _{R, Or}	2.42 (1.11)
Appetite loss (3)	4.12 _{Or, U, Ov}	1.37 (0.61)	5.21 _{R, U, Ov}	1.74 (0.90)	6.49 _{R, Or}	2.16 (1.11)	6.63 _{R, Or}	2.21 (1.11)
Checking (3)	4.42 _{Or, U, Ov}	1.41 (0.57)	6.04 _{R, U, Ov}	2.01 (0.90)	8.08 _{R, Or}	2.70 (1.14)	8.13 _{R, Or}	2.71 (1.11)
Claustrophobia (5)	6.40 _{Or, U, Ov}	1.28 (0.51)	8.75 _{R, U, Ov}	1.75 (0.93)	10.71 _{R, Or, Ov}	2.14 (1.13)	12.97 _{R, Or, U}	2.59 (1.21)
Cleaning (7)	14.90 _{Or, U}	2.13 (0.93)	16.38 _R	2.77 (1.00)	17.12 _R	2.45 (1.03)	16.02 _{R -}	2.29 (0.97)
Dysphoria (10)	16.25 _{Or, U, Ov}	1.62 (0.52)	23.49 _{R, U, Ov}	2.35 (0.83)	29.02 _{R, Or, Ov}	2.90 (0.90)	36.10 _{R, Or, U}	3.61 (0.75)
Euphoria (5)	7.11 _{Or, U, Ov}	1.42 (0.50)	8.59 _{R, U}	1.72 (0.77)	11.13 _{R, Or, Ov}	2.23 (0.90)	8.85 _{R, U}	1.77 (0.73)
Ill temper (5)	7.32 _{Or, U, Ov}	1.47 (0.51)	10.29 _{R, U, Ov}	2.06 (0.86)	14.22 _{R, Or}	2.84 (1.07)	14.93 _{R, Or}	2.99 (1.06)
Insomnia (6)	10.65 _{Or, U, Ov}	1.78 (0.79)	14.40 _{R, Ov}	2.40 (1.07)	15.79 _{R, Ov}	2.63 (1.13)	19.19 _{R, Or, U}	3.20 (1.13)
Lassitude (6)	9.49 _{Or, U, Ov}	1.58 (0.50)	12.89 _{R, U, Ov}	2.15 (0.73)	15.82 _{R, Or, Ov}	2.64 (0.85)	17.56 _{R, Or, U}	2.93 (0.87)
Well-being (recoded) (8)	24.48 _{Or, U, Ov}	3.06 (0.74)	26.50 _{R, Ov}	3.31 (0.76)	27.05 _{R, Ov}	3.38 (0.75)	32.48 _{R, Or, U}	4.06 (0.65)
Mania (5)	7.14 _{Or, U, Ov}	1.43 (0.49)	10.38 _{R, U, Ov}	2.08 (0.83)	13.00 _{R, Or, Ov}	2.60 (0.93)	14.98 _{R, Or, U}	3.00 (0.90)
Ordering (5)	8.89 _{Or, U, Ov}	1.78 (0.66)	10.53 _{R, U}	2.11 (0.79)	12.96 _{R, Or, Ov}	2.59 (0.92)	11.43 _{R, U}	2.29 (0.85)
Panic (8)	9.88 _{Or, U, Ov}	1.24 (0.35)	14.43 _{R, U, Ov}	1.80 (0.84)	18.74 _{R, Or, Ov}	2.34 (1.06)	23.63 _{R, Or, U}	2.95 (1.06)
Social anxiety (6)	7.83 _{Or, U, Ov}	1.31 (0.40)	11.00 _{R, U, Ov}	1.83 (0.77)	14.89 _{R, Or, Ov}	2.48 (0.99)	17.30 _{R, Or, U}	2.88 (1.01)
Suicidality (6)	6.42 _{Or, U, Ov}	1.07 (0.16)	7.57 _{R, U, Ov}	1.26 (0.44)	11.71 _{R, Or, Ov}	1.95 (1.02)	13.99 _{R, Or, U}	2.33 (1.15)
Traumatic avoidance (4)	6.91 _{Or, U, Ov}	1.73 (0.78)	9.61 _{R, Ov}	2.40 (1.02)	10.21 _{R, Ov}	2.55 (1.06)	11.63 _{R, Or, U}	2.91 (1.06)
Traumatic intrusions (4)	5.13 _{Or, U, Ov}	1.28 (0.47)	7.49 _{R, U, Ov}	1.87 (0.96)	10.38 _{R, Or, Ov}	2.60 (1.22)	13.15 _{R, Or, U}	3.29 (1.20)
Externalizing symptoms								
Alcohol problems (9)	1.02 _{Or, U, Ov}	0.11 (0.24)	2.36 _{R, U}	0.26 (0.45)	6.72 _{R, Or, Ov}	0.75 (0.84)	3.42 _{R, U}	0.38 (0.58)
Alcohol use (9)	9.32 _{Or, U}	1.04 (0.64)	10.76 _{R, U, Ov}	1.20 (0.66)	12.97 _{R, Or, Ov}	1.44 (0.66)	8.36 _{Or, U}	0.93 (0.62)
Alienation (3)	2.38 _{Or, U, Ov}	0.79 (0.64)	4.08 _{R, U, Ov}	1.36 (0.73)	5.37 _{R, Or, Ov}	1.79 (0.73)	6.54 _{R, Or, U}	2.18 (0.66)
Blame externalization (4)	1.14 _{Or, U, Ov}	0.28 (0.49)	3.27 _{R, U, Ov}	0.82 (0.81)	6.48 _{R, Or}	1.62 (0.88)	6.22 _{R, Or}	1.56 (0.88)
Boredom proneness (4)	2.10 _{Or, U, Ov}	0.53 (0.60)	4.62 _{R, U, Ov}	1.15 (0.79)	6.96 _{R, Or, Ov}	1.74 (0.79)	8.41 _{R, Or, U}	2.10 (0.70)
Destructive aggression (7)	0.19 _{Or, U, Ov}	0.03 (0.58)	0.70 _{R, U, Ov}	0.10 (0.22)	3.76 _{R, Or, Ov}	0.54 (0.60)	1.55 _{R, Or, U}	0.22 (0.35)
Drug problems (11)	0.48 _{Or, U, Ov}	0.04 (0.12)	1.42 _{R, U, Ov}	0.13 (0.31)	7.14 _{R, Or, Ov}	0.65 (0.87)	3.07 _{R, Or, U}	0.28 (0.55)
Drug use (6)	2.53 _{Or, U}	0.42 (0.57)	3.24 _{R, U}	0.54 (0.66)	6.04 _{R, Or, Ov}	1.01 (0.85)	2.92 _U	0.49 (0.62)
Excitement seeking (6)	1.64 _{Or, U, Ov}	0.27 (0.35)	2.88 _{R, U}	0.48 (0.50)	6.29 _{R, Or, Ov}	1.05 (0.71)	2.81 _{R, U}	0.47 (0.49)
Fraud (6)	0.31 _{Or, U, Ov}	0.05 (0.12)	0.82 _{R, U}	0.14 (0.23)	3.64 _{R, Or, Ov}	0.61 (0.58)	0.75 _{R, U}	0.16 (0.21)
Impatient urgency (5)	3.13 _{Or, U, Ov}	0.63 (0.60)	5.97 _{R, U}	1.19 (0.70)	8.93 _{R, Or, Ov}	1.79 (0.67)	6.58 _{R, U}	1.14 (0.71)
Irresponsibility (10)	1.78 _{Or, U, Ov}	0.18 (0.21)	2.96 _{R, U, Ov}	0.30 (0.30)	7.73 _{R, Or, Ov}	0.77 (0.52)	5.14 _{R, Or, U}	0.51 (0.42)
(Lacks) dependability (7)	2.46 _{Or, U, Ov}	0.35 (0.33)	3.78 _{R, U, Ov}	0.54 (0.42)	7.00 _{R, Or, Ov}	1.00 (0.55)	5.27 _{R, Or, U}	0.75 (0.48)
(Lacks) empathy (11)	4.47 _{Or, U, Ov}	0.41 (0.32)	5.51 _{R, U, Ov}	0.50 (0.36)	9.45 _{R, Or, Ov}	0.86 (0.49)	3.36 _{R, Or, U}	0.31 (0.27)
(Lacks) honesty (5)	2.46 _{Or, U}	0.49 (0.51)	2.84 _{R, U}	0.57 (0.54)	5.65 _{R, Or, Ov}	1.13 (0.72)	2.50 _U	0.50 (0.51)
(Lacks) planful control (6)	3.17 _{Or, U, Ov}	0.53 (0.46)	4.56 _{R, U, Ov}	0.76 (0.57)	7.25 _{R, Or}	1.21 (0.73)	7.07 _{R, Or}	1.18 (0.72)
Marijuana problems (7)	0.38 _{Or, U, Ov}	0.05 (0.19)	0.96 _{R, U, Ov}	0.14 (0.37)	4.37 _{R, Or, Ov}	0.62 (0.88)	1.68 _{R, Or, U}	0.24 (0.57)
Marijuana use (7)	2.41 _{Or, U, Ov}	0.34 (0.65)	4.12 _{R, U}	0.59 (0.87)	7.60 _{R, Or, Ov}	1.09 (1.09)	4.63 _{R, U}	0.66 (0.91)
Physical aggression (8)	1.12 _{Or, U, Ov}	0.14 (0.20)	2.18 _{R, U, Ov}	0.27 (0.34)	5.92 _{R, Or, Ov}	0.74 (0.64)	2.89 _{R, Or, U}	0.36 (0.41)
Problematic impulsivity (7)	0.91 _{Or, U, Ov}	0.13 (0.19)	2.89 _{R, U, Ov}	0.41 (0.43)	7.71 _{R, Or}	1.10 (0.79)	6.39 _{R, Or}	0.91 (0.72)
Rebelliousness (6)	1.51 _{Or, U, Ov}	0.25 (0.35)	2.66 _{R, U, Ov}	0.44 (0.51)	6.68 _{R, Or, Ov}	1.11 (0.76)	3.70 _{R, Or, U}	0.62 (0.62)
Relational aggression (8)	1.60 _{Or, U, Ov}	0.20 (0.20)	2.92 _{R, U}	0.37 (0.31)	7.85 _{R, Or, Ov}	0.98 (0.55)	2.79 _{R, U}	0.35 (0.30)
Theft (8)	0.46 _{Or, U, Ov}	0.06 (0.14)	1.12 _{R, U}	0.14 (0.26)	4.34 _{R, Or, Ov}	0.54 (0.68)	0.96 _{R, U}	0.12 (0.23)
Functional impairment (12)	5.69 _{Or, U, Ov}	0.47 (0.64)	14.98 _{R, U, Ov}	1.24 (1.19)	24.62 _{R, Or, Ov}	2.05 (1.45)	37.85 _{R, Or, U}	3.15 (1.46)
Personality functioning (12)	14.17 _{Or, U, Ov}	1.18 (0.17)	19.31 _{R, U, Ov}	1.61 (0.32)	27.87 _{R, Or}	2.32 (0.50)	28.58 _{R, Or}	2.38 (0.50)
Self-functioning (6)	7.05 _{Or, U, Ov}	1.18 (0.23)	10.24 _{R, U, Ov}	1.71 (0.48)	14.77 _{R, Or, Ov}	2.46 (0.66)	17.41 _{R, Or, U}	2.90 (0.60)
Interpersonal Functioning (6)	7.05 _{Or, U, Ov}	1.18 (0.20)	9.11 _{R, U, Ov}	1.52 (0.37)	13.14 _{R, Or, Ov}	2.19 (0.61)	11.18 _{R, Or, U}	1.86 (0.53)

Subscripts denote profiles which differ significantly at $p < .05$. For each profile, the first column indicates the mean value of the scale (estimated from the sum of its items), while the second column indicates the mean value of the scale after dividing it by the number of items that make up the scale to facilitate its interpretation. The number of items making up each scale is shown next to the name of each scale in brackets

in the negative affect domain, but not in detachment in the Overcontrolled group. In the case of the study by Bastiaens et al. (2021), no Overcontrolled profile was found in a non-clinical sample, although two of the profiles identified by these authors scored high on detachment and negative affect domains respectively. Relatedly, present results showed that not all facets of these two domains significantly differed between the Overcontrolled profile and the Undercontrolled one. Only intimacy avoidance, anhedonia, depressivity, emotional lability and anxiousness facets were scored significantly higher by the Overcontrolled compared to other profiles. Similarly, Gamache et al. (2021) found that depressivity had a greater contribution to the identification of different profiles in a specific sample of borderline personality disorder patients. However, in the study by Gamache et al. (2021), anxiousness had a poor discriminant value to distinguish among the different borderline patients' profiles. Although in this latter study not all facets of AMPD were used and a specific sample of patients was used, overall results could indicate that only a specific set of facets of these domains could be relevant for the identification of the Overcontrolled profile. Thus, the assessment of facets at the lower level – instead of using the domain scores – gives a more detailed and pertinent information. More studies at facet level are needed to identify the facets that consistently contribute to the Overcontrolled profile, considering the mixed evidence also for organization of the facets into the Detachment and Negative affect domains in the AMPD (Clark & Watson, 2022).

Concerning the Undercontrolled profile, present results showed significantly higher scores than the other profiles for all facets of antagonism and most of the facets of disinhibition (with the exception of distractibility). Results are in line with the review by Yin et al. (2021) on the FFM model, with Undercontrollers scoring lower in agreeableness and conscientiousness. However, contrary to what was found in another previous study (Rossi et al., 2021), none of the facets exceeded the proposed cutoff point of 2.0 to indicate a clinically relevant elevation (Samuel et al., 2013). This may be due to the type of clinical sample within the current study being different from the clinical sample of Rossi et al. (2021). The present sample included a greater proportion of anxiety and depressive patients, while the study by Rossi et al. (2021) included personality disorder patients. Other previous studies have also shown difficulties in finding this profile with specific clinical samples, particularly with samples of anxiety and depression patients (Spinhoven et al., 2012). It is also worth noticing that none of the facets of Psychoticism domain were significantly different among the Undercontrolled and the Overcontrolled type, having been noted also that the FFM “equivalent” domain of Openness to Experience appeared to be less important for differentiating

profiles (Fisher & Robie, 2019; Morgan et al., 2017; Yin et al., 2021).

Finally, in addition to these three consistently found Resilient, Undercontrolled, and Overcontrolled profiles, our results showed a fourth profile, equivalent to the Ordinary one found in several studies within the FFM framework (Zhang et al., 2015). It was characterized by low scores across all domains, but score levels were higher than the Resilient profile, and moderate scores in emotional lability, anxiousness, perseveration, distractibility and rigid perfectionism. This profile thus adds to differences in shape (from over- and overcontrollers), and level (from resilient). Differences between profiles in shape and level have been reported in most of the studies of the review by Yin et al. (2021).

Relations with externalizing and internalizing symptoms, functional impairment and personality functioning

Regarding the relationship of the profiles with the internalizing and externalizing symptomatology, results are generally congruent with previous studies (Bastiaens et al., 2020; Rossi et al., 2021). The Resilient profile showed significantly lower scores on all symptoms, followed by the Ordinary profile. Additionally, the Overcontrolled profile showed higher scores than the other profiles in 11 of the 18 internalizing scales (e.g. dysphoria, insomnia, lassitude, suicidality). These results provide further evidence for the widely documented link between personality and psychopathology, with neuroticism/negative affect traits being consistently associated with emotional disorders (Sauer-Zavala et al., 2022; Watson & O'Hara, 2017). Particularly, and in line with present results, neuroticism also appeared more strongly correlated with symptoms of depressed mood, anxious mood and worry, but in a less extent with specific phobias or OCD symptoms in FFM studies (Watson & Naragon-Gainey, 2014). Participants having an Undercontrolled profile showed significant elevations in 18 of the 23 externalizing scales (e.g. alcohol use, drug problems, impatient urgency, lack of honesty). Previous FFM studies consistently linked facets related to conscientiousness/ disinhibition and agreeableness/antagonism domains (higher in this profile) with substance use disorders (Moralda et al., 2019).

In relation to personality functioning, when scores in the direction of dysfunctioning, an increase in LPFS scores was observed among the different profiles, with the Resilient profile having lower scores and the two Overcontrolled and Undercontrolled types having higher scores. These results are congruent with the study by Bastiaens et al. (2020) who also found a gradual increase in pathological personality functioning paced by the different profiles (Very Resilient, Resilient, Anxious-Agreeable and Undercontrolled). Also, the study by Rossi et al. (2021) found greater scores on

LPFS-BF 2.0 for the Undercontrolled and Overcontrolled groups compared to the Resilient type. This increase in maladaptive personality functioning is accompanied by an increase in the deterioration of functional impairment, measured by the WHODAS. Overall, these results suggest that personality profiles identified within AMPD traits provide information about the personality dysfunction and functional impairment in general and are thus informative to identify the level of clinical impairment being present.

Interestingly, our results also showed that the Overcontrolled profile scored significantly higher on Self-dysfunctioning and the Undercontrolled type had significant greater scores on Interpersonal-dysfunctioning. Similar with previous variable-centered studies (Lakuta, 2022), self-functioning is apparently more clearly linked to traits of negative affect. Using a person-centered approach, Gamache et al. (2021) also identified two similar types with moderate trait severity among BPD patients: one with identity problems/depressivity and another BPD patients group with impulsive features. Also, the study by Clark et al. (2020), using cut-offs for categorizing participants into potential clinical target groups, found a group characterized by elevations in Negative affect traits and self-pathology and other patients with interpersonal dysfunction having greater scores on antagonism and/or detachment.

Clinical implications

From a clinical point of view, present results support the usefulness of the profiles identified towards type tailored interventions. Classifying a patient according to one of the identified profiles can provide more personalized therapeutic targets, leading to better therapeutic outcomes.

Present results in terms of level of the profiles can be used to determine need for treatment of patients in a stepped-care model. In this, a graduated system of intensity is proposed, where the treatment level is adapted to the needs of the individual (Paris, 2013). Given patients with a resilient and ordinary profile have low scores on pathological trait domains and less internalizing and externalizing pathology compared to other profiles, they could benefit from less intensive treatments. Patients with an undercontrolled or overcontrolled profile are likely to require a more intensive treatment.

Moreover, these subtypes may inform on main focus of treatment planning, targeting on the underlying etiological processes. While treatment in undercontrollers may initially be targeted at improving relational dysfunctions and inhibitory control, overcontrollers may benefit from a treatment focus on emotional regulation (Lynch, 2018). These results can help then for the development of transdiagnostic interventions, such as those developed for emotional disorders (Barlow et al., 2017).

Limitations and future directions

Despite these promising results, some limitations should be emphasized as well. It should be noted that the sample used in the present research includes a mixed group of community and clinical samples. On the one hand, although the proportion of community vs patients was intended to maximize the variability of the severity of the traits measures, this proportion may not adequately represent real expected range of the construct. Moreover, the clinical sample included in the study was mostly composed by patients with internalizing disorders. This may lead to an underrepresentation of the Undercontrolled profile. However, it should be mentioned that internalizing disorders are among the most prevalent disorders and that a mixed clinical sample might be expected to have a higher percentage of patients with anxiety disorders and depression and therefore to have a higher proportion of participants with Overcontrolled profiles. It would be interesting, though, that future research replicates the results within different samples, especially on other clinical samples where externalizing problems may be more prevalent, such as substance use disorder patients.

Secondly, it should be noted that the 100 items PID-5-SF, used in present research to measure personality traits does not allow the assessment of the anankastic domain, since although rigid perfectionism is among the facets covered, the facets of rigidity and orderliness are not included. This element may have increase the difficultness to differentiate between Overcontrolled and Undercontrolled profiles, being necessary to explore the role of the rest of facets defined in the anankastic domain. Despite the aforementioned limitations, the results presented in this research constitute a body of evidence of relevance to the understanding of the role of personality in psychopathological symptomatology.

Conclusions

The four profiles identified in the present work show differences in terms of level and shape, highlight the role that personality variables play in psychopathological symptoms and functionality. Identifying these personality profiles can help to determine the etiological basis of internalising and externalising problems. This information may be relevant for designing of personalized treatment based on the identification of these personality profiles. While undercontrollers may benefit from improving relational dysfunctions and inhibitory control, treatments for overcontrollers may better focus on emotional regulation. Although this information is of relevance, this research should be replicated in other clinical samples more prevalent in externalizing symptoms.

Open science statement

All data have been made publicly available at the Arias Montano repository and can be accessed at https://osf.io/hg29n/?view_only=061349bbf93e4a43aec7e2671735914e.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s12144-023-05381-8>.

Authors contributions CDB, OML, ADIR had contributed on the conceptualization, methodology, investigation and data curation. MSG, MF and ADIR had participated on the formal analysis, software and validation. CDB, GR, MSG, OML had participated on the interpretation of data. CDB, OML had contributed on project administration, supervision and resources management. CDB, OML had participated writing the original draft. All authors have revised the manuscript critically for intellectual content and approved the final version of the manuscript submitted.

Funding Funding for open access publishing: Universidad de Huelva/CBUA This work was supported by the grant “Reliable and clinical relevant change of Inventory of Depression and Anxiety Symptoms II – IDAS-II: a longitudinal clinical utility study (RELY-IDAS-II)”, project PID2020-116187RB-I00 on Proyectos I + D + i 2020 “Retos del Conocimiento” provided by Ministerio de Ciencia e Innovación (Spain).

Data availability The data that support the findings is publicly available in Arias Montano repository: <https://hdl.handle.net/10272/21939>.

Declarations

Ethical approval The study was approved by the Bioethics Committee of the Province of Huelva (Junta de Andalucía, Spain) (No. PY18-4584).

Authors note This study was not pre-registered.

Conflicts of interest The authors declare that there are no conflicts of interest to report.

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