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A new tool to assess the occurrence of personality traits: the Phenomenological Personality Factor questionnaire

NATASCIA DE LUCIA[1], MAURO NELSON MALDONATO[1], VALERIA CIOFFI[2], LUCIA LUCIANA MOSCA[2], ELENA GIGANTE[3], NICOLE NASCIVERA[2], ENRICO MORETTO[2], BENEDETTA MUZII[4], MARIO BOTTONE[1], DANIELA CANTONE[5], RAFFAELE SPERANDEO[2]

[1]Department of Neurosciences, Reproductive and Odontostomatological Sciences, University of Naples "Federico II", Naples, Italy; [2]Postgraduate School of Integrated Gestalt Psychotherapy, Torre Annunziata (Naples), Italy; [3]Postgraduate School of Integrated Gestalt Psychotherapy, Trapani, Italy; [4]Department of Humanistic Studies, University of Naples "Federico II", Naples, Italy; [5]Department of Psychology, University of Campania "L. Vanvitelli", Caserta, Italy.

Summary. Background. Personality traits are patterns of thoughts, feelings and actions that are usually assessed by means of psychometric questionnaires. In the present study we described the Phenomenological Personality Factor (PPF), a short questionnaire assessing the personality traits, taking into account the different interpretative models of personality. **Methods.** A sample of 554 healthy subjects (357 female; 197 males) aged 18-60 years were enrolled. Each participant was required to complete PPF, by indicating the presence/absence of the individual personality trait, and the Italian version of the Affective Neuroscience Personality Scale (ANPS). **Results.** The principal component analysis showed that seven factors explained the 35.07% of the total variance. Moreover, the correlation analysis revealed that the PPF components were significantly and positively associated with the ANPS scales. **Conclusions.** Our findings suggest that the PPF is a useful questionnaire to assess the personality traits, and the adaptive functioning, in healthy individuals.

Key words. Personality questionnaires, personality traits, principal component analysis.

Un nuovo strumento per valutare l'occorrenza dei tratti di personalità: il questionario Phenomenological Personality Factor.

Riassunto. Introduzione. I tratti di personalità rappresentano schemi di pensieri, sentimenti e azioni spesso valutati mediante questionari psicometrici. Nel presente studio noi descriviamo il questionario Phenomenological Personality Factor (PPF), un breve strumento sviluppato per valutare i tratti di personalità in soggetti sani, tenendo in considerazione i diversi modelli interpretativi della personalità. **Metodi.** Sono stati reclutati 554 soggetti sani (357 femmine; 197 maschi), di età compresa tra i 18 e i 60 anni. A ogni partecipante è stato chiesto di completare il PPF, indicando la presenza/assenza dello specifico tratto di personalità, e la versione Italiana dell'Affective Neuroscience Personality Scale (ANPS). **Risultati.** L'analisi delle componenti principali ha estratto sette fattori che spiegavano il 35,07% della varianza totale. Inoltre, l'analisi di correlazione ha mostrato che le componenti del PPF erano associate significativamente e positivamente con le scale dell'ANPS. **Conclusioni.** I nostri risultati suggeriscono che il PPF è un utile strumento per valutare l'occorrenza dei tratti di personalità, e il funzionamento adattivo, nei soggetti sani.

Parole chiave. Analisi delle componenti principali, questionario di personalità, tratti di personalità.

Introduction

Personality characteristics are distinctive and recurrent patterns of thoughts, feelings and actions that occur in response to particular situational demands[1]. Several psychometric questionnaires have been developed to assess and describe the personality and its dysfunctions. Some instruments derived from theoretical models that describe the personality as an organization of dimensions or factors[2-4]. Costa and McCrae[5] constructed the NEO Personality Inventory (NEO-PI), based on the Five-Factors Model (FFM)[2,6]. According to this interpretative model, the personality is organized in specific behavioural, emotional and cognitive patterns, along five broad dimensions: neuroticism, introversion, openness, agreeableness and conscientiousness. Each dimension includes a cluster of specific traits, associated with distinct neural pathways, and is considered as enduring dispositions that underlie individuals' cognitive and emotional tendencies[7,8]. The Eysenck Personality Inventory (EPQ)[2,9], instead, assesses the personality according to a three-dimension model[10], that includes the neuroticism (defined as an increased tendency to emotional reactivity), the extraversion (defined as the degree to which a person is outgoing and interactive with other people), and the psychoticism (referring to an underlying predisposition of personality to develop anomalies of psychiatric nature). Along this account, the personality would arise from the dynamic interaction of these biological systems with external situations. Similarly,

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the Temperament Personality Questionnaire (TPQ) and the Temperament Character Inventory (TCI) were developed[4,11,12] to assess seven dimensions of personality, including four temperaments and three characters. The temperaments refer to novelty seeking (the tendency to response to novelty, danger and cue for reward, associated with low basal dopaminergic activity), harm avoidance (the tendency to avoid aversive stimuli, associated with high serotoninergic activity), reward dependence (the tendency to react actively to rewards, associated with low basal noradrenergic activities), and persistence, that manifest in unique emotional/behavioural patterns expressed in response to environmental stimuli. The characters refer to self-directedness, cooperativeness, and self-transcendence.

However, these instruments would seem to have some limitations. First, the numerous sets of items could impede an accurate assessment of personality since the risk of approximate and incomplete responses, especially in studies with large samples[13,14]. Second, these questionnaires tend to assess frequency and expressive intensity of personality traits, however this approach could not consider the subjective interpretation of the descriptors[15,16].

More recently, the Affective Neuroscience Personality Scales (ANPS)[17] has been derived from the affective neuroscience theory proposed by Panksepp[18]. According to this interpretative model, the personality traits are deeply correlated to functioning of the specific neural and biological circuits[18]. The emotions would represent complex mental processes developed during the phylogenetic evolution to ensure the survival of individual in critical situations, and integrated emotional systems with specific subcortical regions. Panksepp[18] identified seven primary motivation-emotional systems, deeply rooted in subcortical areas of the human brain: seeking (or expectancy), lust, care (or nurturing), play (or social joy), rage (or anger), fear and panic (or sadness). These organizations were then distinguished in a positive emotional system, that included the seeking, lust, care, and play, and a negative emotional valence/punishment system that included the rage, fear and panic, according to the specific emotional value[18]. The seeking motivation system provides energy for obtaining resources to fulfil goals and strive for solutions to everyday problems (i.e., the search for food); it refers to a feeling of being able to accomplish almost anything. The lust motivation system represents the evolutionary older emotion as it is involved in the reproducing and transferring one's own genome, and it is closely entwined with the care emotional system[19]. The care system urges to take attention on family including offspring and the close relatives and friends, and it refers to feeling affection, empathy, and soft-hearted toward people in need. The play system expresses a crucial emotion for regulating the social bondings[20] and shaping physical activities[21], and it refers to being funny, generally happy and joyful, and having humour and laughter. The negative emotional system, instead, would help to move away from danger conditions. Indeed, the rage system is involved in the protection of life resources, as escaping bodily restraint, and it describes feelings of frustration, easy irritation leading to verbal or physical anger. The fear tends to keep away from bodily harm and physical pain, by triggering freezing or flight responses to cope with dangerous situations, and it describes feelings of anxiety, worrying, ruminating about past decisions associated to losing sleep. Finally, the panic system aims to preserve the social contact avoiding the separation from caregivers and loved ones, and it refers to feelings of lonely and distress for dropped relationships[17,22].

However, to exclusively consider the emotional functioning, as the ANPS, could impede a deep comprehension of the personality traits and its dysfunctions. Thus, a novel approach that integrates the study of the personality as organization of dimension or factors with the study of the emotional functioning would seem to be needed.

In the present study we tried to overcome these limitations by developing a short questionnaire comprising a smaller quantity of items, compared to the available personality questionnaires. Therefore, we aimed to describe the Phenomenological Personality Factor (PPF) questionnaire, and present its psychometric characteristics by administering the PPF to a sample of healthy Italian people. Therefore, this study would contribute to the examination of item characteristics, the factor structure, and the reliability of intensity and perceived impact dimensions of a scale used in previous research either in an idiographic format or without having determined psychometric properties.

Materials and methods

Participants

Participants for the present study were recruited from voluntary students attending the undergraduate psychology courses offered at the University of Naples "Federico II". To qualify for the present study, participants had to meet the following inclusion criteria: 1) age comprised between 18 and 60 years; 2) lack of significant neurological and/or psychiatric disorders, as reported by the clinical assessment; 3) no history of alcohol or substance abuse or medications with significant effects on emotion or cognition.

A total of 554 healthy subjects (HS) satisfied the inclusion criteria, comprising 357 (64.5%) females and 197 (35.5%) males. Demographic data of the sample are reported in table 1.

All the participants gave their informal consent to participate in the study. This study was conducted in accordance with the Ethical standards of Helsinki Declaration.

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Table 1. Demographic data in healthy subject participants (n=554).

	Range	Mean (SD)	Frequency
Age	18-55	22.2 (5.9)	
Education level	13-22	14.1 (1.9)	
Graduation	-	-	400/554 (72.2%)
Bachelor's degree	-	-	78/554 (14.1%)
Degree	-	-	70/554 (12.6%)
Master's degree	-	-	3/554 (0.54%)
Post-graduation	-	-	3/554 (0.54%)
Marital status			
Unmarried	-	-	546/554 (98.5%)
Married	-	-	7/554 (1.26%)
Divorced	-	-	1/554 (0.18%)

Note: "Frequency" refers to number of patients (and its percentage) as appropriate.

Procedure

In order to devise the PPF, a working group of five experts in clinical psychology produced a pool of items that reflected difficulties within the seven emotional systems proposed by Panksepp's affective neuroscience theory[18]. These items were written, re-written and edited until consensus among the authors was reached. An initial pool of 180 items was developed. For each item, participants were required to assess whether it applied to themselves, by indicating on a scale ranging from 0 to 1 point, where 0 means absence of the personality trait, and 1 presence of the personality trait.

It has been observed that the frequency and intensity may produce difficulties in the interpretation of the items[15,16]. Thus, in order to overcome this limitation, we decided to present descriptors with dichotomous responses (presence or absence the phenomenon) in order to avoid frequency (e.g., number of behaviour occurrence, such as "sometimes", "often", or "rarely") and intensity (e.g., severity of behaviour, such as "enough", "little", or "very") of the phenomenon.

The items are organized into three distinct areas[23]: emotional characteristics, dissociative phenomena, and psychopathological traits. Emotional characteristics area is focused to detect non-pathological psychic phenomenon, such as the emotional experiences and behaviours, physical sensations, and the impact of cortical functions on emotional systems; the dissociative phenomena area referred to presence of dissociative phenomena in the three dimensions of depersonalization-derealization, dissociated mental states and dissociative amnesia; psychopathological traits area referred to the presence or absence of a pathological phenomenon.

Moreover, participants were asked to complete the Italian version of the ANPS[17] Italian validation by Pascazio et al.[24] to assess the association between personality areas identified by the model and the six basic emotional processes, as depicted in the Affective Neuroscience theory[18,25]. ANPS is a self-report questionnaires consisting of 110 items, each scored on a 4-point Likert-type scale where 0 means maximum agreement and 3 means maximum disagreement. The original version also includes two further categories, Spirituality (defined "for a hypothesized higher-order affective human attribute")[17], and Faking (developed to focus the evidence of social desirability). In the present study we decided to exclude these additional systems since they were designed to reflect individual tendency to a self-image impression management, and do not refer to emotional endophenotypes[24]. Therefore, the final score ranged 0-440.

Statistical analyses

To assess the factorial structure of the PPF and identify the underlying dimensions of emotion regulation, we performed a principal component analysis (PCA), with Oblimin rotation and Kaiser normalization. To this statistical purpose, we considered the factors with eigenvalues >1.5. Bartlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) test were used to assess the sampling adequacy and the suitability of the respondent data for factor analysis.

Then, to explore the possible associations between scores on PPF and ANPS, we computed the Pearson's correlation coefficients among the seven components extracted by the principal components analysis and the ANPS subscales.

Results

Bartlett's test of sphericity was significant and KMO measure was >0.5, suggesting that the factorability was assumed (table 2).

Table 2. Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity.

	Measured value
KMO measure of sampling adequacy	0.747
Bartlett's test of sphericity	
Approx. chi-square	6294.58
df	14
p	<.001

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Results from data processing showed that the PCA extracted seven factors (table 3), explaining the 35.07% of the total variance (table 4).

The PPF's first factor was labelled "Confidence", and includes 12 items describing the belief into own capacities to take part into the world and social rela-

Table 3. Items that composed the seven factors extracted from the principal component analysis.

Factor	Item	
Fiducia (items: 12)	È insicuro davanti ai problemi?	0,674
	Ha paura che le sue cose vadano male?	0,64
	È preoccupato di fronte a situazioni nuove?	0,599
	Si deve impegnare molto per avere fiducia in se stesso?	0,574
	La preoccupano gli imprevisti?	0,568
	È pessimista?	0,411
	Si sente inferiore agli altri?	0,375
	Sta male se perde delle amicizie?	0,324
	È tranquillo sul suo futuro?	-0,548
	È a suo agio anche con le persone sconosciute?	-0,426
	Sa mentire bene?	-0,409
	Mantiene il controllo delle sue emozioni?	-0,377
Grandiosità (items: 8)	Le piacerebbe essere il più forte di tutti?	0,749
	Vorrebbe essere più potente di chiunque altro?	0,742
	Desidererebbe essere il più bello di chiunque altro?	0,722
	Le piacerebbe essere il più bello di chiunque altro?	0,66
	Le piacerebbe non invecchiare mai?	0,421
	Si spazientisce quando gli altri non sono d'accordo con lei?	0,393
	Le piacerebbe fermare il tempo?	0,373
	Impone agli altri il suo modo di fare le cose?	0,321
Riflessività (items: 6)	Riflette intensamente prima di decidere?	0,849
	Riflette molto prima di prendere una decisione?	0,843
	Tende generalmente a risparmiare denaro?	0,503
	Riflette a lungo su ciò che è giusto e ciò che è sbagliato?	0,47
	Tende a risparmiare molto?	0,327
	Gli altri la definiscono distratto?	-0,334
Auto-determinazione (items: 10)	Abbandona facilmente se non è sicuro di ottenere ciò che vuole?	0,71
	Attende che gli altri le risolvano i problemi?	0,585
	Rinuncia facilmente di fronte a compiti impegnativi?	0,577
	Rinuncia facilmente alle cose perché si preoccupa dei rischi?	0,548
	Le sue scelte sono determinate dagli altri?	0,455
	Ignora quale sia lo scopo della sua vita?	0,352
	Affronta le difficoltà prendendole come sfide?	-0,427
	Investe molte energie nel fare le cose?	-0,374
	Quando fa degli errori riesce a cavarsela da solo?	-0,354
	Sa di avere un sesto senso?	-0,35
Spiritualità (items: 7)	Ha fatto intense esperienze spirituali?	0,501
	È connesso spiritualmente agli altri?	0,491
	Si commuove davanti ai prodotti artistici?	0,489

(*Continued*) **Table 3**

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(*Continued*) **Table 3.**

Factor	Item	
	Sente un legame profondo con la natura?	0,486
	Ha idee creative quando si lascia andare all'ozio?	0,464
	Ha avuto esperienze paranormali?	0,438
	È altruista anche con chi l'ha trattata male?	0,363
Socialità (items: 6)	Quando è stanco ha bisogno (o chiede aiuto) degli altri?	0,477
	Ama collaborare con gli altri?	0,475
	Tende a nascondere le sue emozioni?	-0,591
	Ha difficoltà ad aprirsi con gli amici?	-0,566
	Fa fatica a comprendere le persone?	-0,42
	È talmente preso dalle sue attività da perdere il contatto con la realtà?	-0,381
Comportamento assertivo (items: 6)	È molto fortunato/a?	0,491
	Si definisce ottimista?	0,467
	Ha molte buone abitudini quotidiane?	0,39
	È costante nelle cose che fa?	0,357
	La sua vita è priva d senso?	-0,507
	Pensa di avere problemi al cervello?	-0,31

Note: Extraction method= Principal component analysis.

Table 4. Total variance contributed by the extracted components.

Factors	Initial eigenvalues				Rotation sums of squared loadings
	Total	% of variance	Cumulative %		Total
1	5.652	10.276	10.276		4.194
2	3.242	5.894	16.17		3.042
3	2.651	4.82	20.991		2.732
4	2.198	3.996	24.987		3.788
5	2.103	3.824	28.811		2.156
6	1.866	3.393	32.204		2.252
7	1.575	2.864	35.068		2.441

Note: Extraction method= Principal component analysis.

tionships; high scores suggested limited confidence to successfully participate to world. The second component was labelled "Grandness", and includes 8 items reflecting the ideal representation of self; high scores suggested marked grandness. The third component was labelled "Reflectively", and comprises 6 items describing the tendency to carefully consider everything happen with scrupulousness and prudence; high scores implied disproportionate reflectively. The fourth component was labelled "Self-determination" and includes 10 items reflecting the belief to find everyday solutions by means of own resources only; high scores suggested low self-determination. The fifth component was labelled "Spirituality" and includes 7 items describing the presence of a deep openness toward a spiritual meaning of life; high scores suggested high spirituality. The sixth component was labelled "Sociality" and includes 6 items reflecting the tendency to extroversion and to socialization; high scores implied elevated motivation to create social relationships. The seventh component was labelled "Assertive be-

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haviour", and includes 6 items describing the ability to identify and state own thoughts, wishes, and emotions honestly, directly, adequately to other rights; high scores suggested marked assertive behaviour. The inspection of the correlation matrix among the components revealed weak associations between the first factor (Confidence) and the fourth factor (Self-determination), between the first factor and the seventh factor (Assertive behaviour), and between the fourth factor (Self-determination) and the seventh factor (Assertive behaviour; table 5).

Results from the correlation analysis exploring the possible associations between the seven components extracted by the principal components analysis and the ANPS subscales showed significant positive associations of the seven PPF factors and the subscales of ANPS (table 6). In particular, the Confidence factor was significantly and positively correlated to fear, care, rage, and panic subscales of the ANPS (all comparisons $p<.05$); grandness factor was significantly correlated to rage, play, and panic ANPS subscales (all comparisons $p<.05$); reflectively was correlated to fear ($p<.05$); self-determination was correlated to fear, rage, and panic (all comparisons $p<.05$); spirituality was correlated to seeking, care, panic, and lust (all comparisons $p<.05$); sociality was correlated to care, and play (all comparisons $p<.05$); assertive behaviour was correlated to seeking, play, and lust (all comparisons $p<.05$).

Discussion and conclusions

Traditionally, the personality and its dysfunctions have been conceived according to a heterogeneous theoretical model that identifies personality disorders within specific numbers of clinical criteria[26]. However, this approach would seem to have some limitations[27,28]. Indeed, the number of the clinical criteria useful to confirm a clinical diagnosis would seem to derive from non-psychometric procedures. Moreover, different diagnostic categories would seem to include clinic signs rather heterogeneous, and the different diagnosis would seem to have excessive comorbidity[29-31].

Conversely, in the last years, revamped interest has been focused on the empirical models of personality traits[32] that try to describe the temperament and the general tendency of thinks, feelings and behaviours[33-36], and the characteristics of personality dysfunctions[27]. Indeed, the model based on personality traits could overcome the limits of the heterogeneous

Table 5. Correlation matrix of the PPF seven components.

Factors	1	2	3	4	5	6	7
1	1	-0.033	0.021	0.162	0.044	-0.06	-0.119
2	-0.033	1	-0.103	0.044	-0.022	-0.067	-0.058
3	0.021	-0.103	1	-0.093	-0.002	-0.02	0.066
4	0.162	0.044	-0.093	1	0.014	-0.094	-0.148
5	0.044	-0.022	-0.002	0.014	1	0.003	-0.042
6	-0.06	-0.067	-0.02	-0.094	0.003	1	0.036
7	-0.119	-0.058	0.066	-0.148	-0.042	0.036	1

Note: Extraction method= Principal component analysis; Rotation method= Oblimin with Kaiser normalization.

Table 6. Pearson's correlation coefficients between the seven factors of the Phenomenological Personality Factor (PPF) questionnaires and the Affective Neuroscience Personality Scale (ANPS).

ANPS subscales	Confidence	Grandness	Reflectively	Self-determination	Spirituality	Sociality	Assertive behaviour
Seeking	-0.208	0.049	0.053	-0.273	**0.21**	-0.005	**0.274**
Fear	**0.678**	0.087	**0.109**	**0.351**	0.069	-0.192	-0.363
Care	**0.144**	-0.157	0.059	-0.117	**0.337**	**0.162**	0.074
Rage	**0.175**	**0.292**	-0.155	**0.105**	-0.119	-0.135	-0.198
Play	-0.349	**0.122**	-0.165	-0.179	0.014	**0.248**	**0.228**
Panic	**0.511**	**0.100**	0.054	**0.244**	**0.164**	-0.185	-0.359
Lust	-0.027	-0.038	0.084	-0.138	**0.373**	0.077	**0.27**

Note: in bold the significant value.

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categories of personality disorders[28], but they could be not able to describe the maladaptive personality characteristics[37-39]. Indeed, it is common opinion among clinicians[40,41] that the description of personality disorders in category types is crucial for comprehension of disorders suggesting the necessity to preserve it. First, the personality traits model assesses a range of personality functioning without include the dis-adaptive functioning of the subject[42]. Second, the diagnostic categories of personality disease describe the personality characteristics that are flatten by the actual dimensional models of personality[43].

In the current study, we presented a novel and short psychometric instrument, labelled "Phenomenological Personality Factor" (PPF) questionnaire, derived from the psychological and neurobiological interpretative models of the personality[44-47]. Results from the principal component analysis revealed the occurrence of seven components, thus confirming the same structure derived from the study in psychopathological individuals[23]. Indeed, these authors[23] presented a procedure that aimed to combine explanatory and predictive modelling for the construction of new psychometric questionnaires based on psychological and neuroscientific theoretical grounding[45,48]. The PPF includes scores located along a continuum that allow to move from adaptive to dis-adaptive behaviours. Therefore, each factor of the PPF would include a wide range of values able to express the adaptive functioning within the specific category.

Our results even suggest that the psychometric characteristics of the PPF allow to consider this instrument as a useful method of dimensional analysis of the personality traits[45,48], able to describe the empirical dimensions and to identify the dysfunctional phenomena[23].

However, some limitations should be taken into account. We did not compare the PPF performance with questionnaires derived from theoretical models that describe the personality as an organization of dimensions or factors, thus future studies could consider to compare PPF with others instrument, for example the NEO Personality Inventory. Moreover, we did not explore the possible associations of the PPF factors with specific neurobiological mechanisms, thus further studies could address this issue. Notwithstanding these limitations, the PPF could represent a useful instrument to quickly assess the personality traits taking into account the adaptive functioning in healthy individuals.

Conflict of interests: the authors have no conflict of interests to declare.

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Corresponding author:
Dr Natascia De Lucia
E-mail: natascia.delucia@unina.it