Delusional disorder: The role of personality and emotions on delusional ideation

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ABSTRACT

The relationship between personality and Delusional Disorder in still debated. The present study aimed to evaluate the role of personality features and emotional dispositions on the proneness to delusional beliefs, through the lens of a dimensional approach.

91 outpatients were administered the Structured Interview for DSM-IV Personality Disorders, the Pathological Narcissism Inventory, the Positive and Negative Affect Schedule and the Peters et al. Delusions Inventory.

Delusion proneness was positively related to the "Hiding the Self" domain of narcissistic vulnerability and to paranoid traits and negatively related to "Positive Affect". Paranoid traits and "Hiding the Self" significantly interacted in influencing delusion ideation.

These data suggest that proneness to delusion depends, at least in part, on a complex interplay between specific emotional and paranoid dispositions within personality.

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1. Introduction

The term "paranoia" refers to Kraepelin's conceptualization of a third functional psychosis, distinct from either "dementia praecox" or manic-depressive illness [1]. Typically delusions are systematic (i.e. are elaborated through logical thinking), tend to become chronic with preservation of personality and relate to interpersonal interactions and essential human experience [2, 3].

Kraepelinian definition of paranoia had a huge influence in modelling the current diagnostic criteria of "Delusional Disorder (DD)" (DSM III-5) [4].

Although DD is categorically described, delusional beliefs exist as a continuous phenotype, with a dimensional structure rather than an all-or-nothing fashion [5–8]. Along a severity gradient, a gradual transition can be traced from delusion-like experiences (DLEs) (e.g. sub-threshold delusional beliefs such as mild self-reference experiences and non-clinical paranoid ideation) [9, 10] at the one end, to a full-blown DD posited at the opposite end. As claimed by van Os and colleagues, altogether these data suggest that "the search for the determinants of the psychosis phenotype should be conducted along broad dimensional lines, in addition to the more narrow focus on the clinical definition".

Along a delusion continuum, specific personality traits might be involved in the transition from sub-threshold experiences to clinical delusions, as suggested by both classical psychopathology [11–13] and recent research [3]. Consistently, grandiose and narcissistic traits of personality have been traditionally associated with paranoia [13, 14]. Moreover, a high prevalence of personality disorders (PDs) has been found in DD patients, with a rate ranging from 39.5% to 64% [15, 16]. The most frequent PD comorbidity concerns Paranoid (38.4%), Schizoid (12.8%), Obsessive-Compulsive (11.2%) and Avoidant (9.8%) Disorders [16].

In the search of trait variables of delusional proneness, different perspectives have been examined, particularly psychodynamic (defensive mechanisms of denial and projection) [17, 18] and cognitive approaches (theory of mind alterations, probabilistic reasoning or attributional biases hypotheses) [19].

By contrast, the role of emotions in the development of DD is lacking, even though delusions appear to have a strong emotional component [20]; for instance, a vicious circle between cognitive biases and emotional disturbances may be involved in delusional patients [9]. Particularly, worry processing and rumination are associated with DLEs in healthy individuals [21] and increase anomalous experiences in delusional patients [22]. Therefore, in delusion phenomena "emotional processes must be given special consideration, even if their exact role is not well understood yet" [2].

In this connection, Kretschmr [12], a pioneer in the study of DD, emphasized the role of emotional vulnerabilities associated with specific personality traits in the development of delusions.

Particularly, this Author described a specific type of DD, the "sensitive delusion of reference", developing from an underlying "sensitive" personality with "asthenic" traits (feelings of inadequacy and shame,

as well as apathy and fatigue) coexisting with "sthenic" dispositions (i.e. abnormal sensitivity to criticism and grandiose fantasies).

Kretschmer's asthenic-sthenic polarity of sensitive character anticipates the dichotomy between "humiliating shame" and "relentless anger" of narcissistic pathology proposed by Kohut [23] as well as Gabbard's "hypervigilant narcissism" [24] (which refers to a hyper-evaluation of the self with tendency to grandiose fantasy covering shyness, social inhibition and shame).

The more recent model of narcissism vulnerability [25] encompasses most of the above-mentioned personality features, its personality structure being characterized by emotional dysregulation, feelings of inadequacy, hypersensitivity to rejection, and social withdrawal when one's needs for admiration are not met [26].

Interestingly, shame appears to be related to narcissistic injury [27] and associated with higher levels of paranoid ideation [28,29] in general population. By contrast, resistance to experiencing shame could be a marker of resilience [30].

Altogether, these findings suggest that paranoid symptoms might develop from an interaction between specific personality traits and emotional dispositions. To date, studies that investigated this interaction are lacking.

Therefore, the present study aimed to investigate, adopting a dimensional approach, the role of personality traits and emotional disturbances on delusion ideation in a clinical sample of subjects referring to the outpatient unit of the University of Parma.

2. Methods

2.1. Sample

The present study recruited outpatients referring to the Personality Disorders Unit of the University Hospital of Parma from January 2014 and December 2015.

The study sample was preselected in order to guarantee that the entire delusional continuum could be represented.

Patients were included in the study if they met the following criteria: 1) their age was over 18; 2) their written informed consent was obtained. Patients were excluded from the study if they were affected by: 1) a current mental disorder related to a general medical condition; 2) cognitive impairment (Mini-Mental State Examination score lower than 25) which interfered with the ability to reliably complete diagnostic interviews or questionnaires; 3) substance or alcohol abuse or dependence.

Delusional ideation is a psychopathological experience that cuts across different disorders (from schizophrenia to affective disorders or acute psychoses); since the aim of the present study was to deepen the role of personality and emotions specifically in Delusional Disorder, other Axis I diagnoses that could present with delusional ideation were excluded from the study.

All patients have been provided a complete and exhaustive description of the study after the achievement of clinical stabilization.

2.2. Procedures

Demographic information about participants has been collected during the enrolment through a specific schedule that included gender, age, educational level, marital, occupational and living status. The diagnoses of axis I disorder were assessed using the Structured Clinical Interview for DSM-IV axis I disorder, clinical version (SCID-I CV) [31, 32].

All patients completed the Structured Interview for DSM-IV Personality Disorders (SIDP-IV) [33] for the assessment of personality. The Pathological Narcissism Inventory – Italian Version (PNI) [25,34] was adopted to investigate grandiose and vulnerable themes of narcissistic pathology. The PNI is a 52-item self-report measure assessing 7 dimensions of pathological narcissism spanning problems with narcissistic grandiosity (Entitlement Rage, Exploitativeness, Grandiose Fantasy,

Self-sacrificing Self-enhancement) and narcissistic vulnerability (Contingent Self-esteem, Hiding the Self, Devaluing) [25].

The Positive and Negative Affect Schedule (PANAS) [35] was used as measure of Positive Affectivity (PA) and Negative Affectivity (NA).

Finally, the Peters et al. Delusions Inventory – Italian Version (PDI-21) [36] was adopted to evaluate the severity gradient of delusional ideation since its validity in both clinical and non-clinical population [37]. Because the absolute prevalence of answers on the PDI items influences the scores on the 3 subscales, following previous research [38] a "weighted" score for these dimensional subscales was calculated by dividing the total values by the number of endorsed items on the PDI main queries.

The assessment of premorbid personality traits was also based on information collected from relatives. They were specifically interviewed about the patient's behavior in a wide range of social situations in the 5 years before the enrollment in the study.

Personality and psychopathological evaluations were carried out by a trained psychiatrist only if the patient presented a stable clinical picture, in order to allow a valid collaboration.

Personality traits rather than disorders were considered because the number of personality categories found in each subgroup of patients was too small to allow reliable evaluations. Moreover, a dimensional approach is thought to be superior to a categorical model, especially for research purposes [39]; for example, traits are more stable than categories over time [40,41].

With specific regard to the emotional component, we ought to test the "asthenic-sthenic" model of Kretschmer's sensitive character investigating traits of narcissism pathology [25], as well as through the model of Positive (PA) and Negative (NA) Affectivity [35]. PA and NA are the two dominant dimensions in self-reported mood [42] and, viewed as a trait, represent stable individual differences in general affective tone [43].

2.3. Statistical analysis

We first evaluated the normal distribution of the variable and subsequently analysed the correlations, with Pearson's and Spearman's coefficients where appropriate, between personality traits (SIDP-IV), levels of pathological narcissism dimensions (PNI), Positive and Negative Affectivity dimensions (PANAS) and severity of delusional ideation (PDI score). Significant correlation was subsequently entered in a linear regression model (Enter method) to evaluate the effect of personality traits (SIDP-IV scores), levels of pathological narcissism (PNI subscales), general affective tone (PANAS subscales) and socio-demographic features (independent variables) on PDI scores (dependent variables). Significant interactions between independent variables in the prediction of the outcomes (i.e. delusional dimension severity as dependent variable), were further explored in a moderation analyses using PROCESS for SPSS (Model #1) [44] co-varying as appropriate. All statistical analyses were performed with SPSS for Windows (version 25.0, SPSS Inc., Chicago, IL, USA).

3. Results

3.1. Participants

The present study included 91 subjects (31 males; 34.1%; mean age: 48.8 ± 13.3 years); 36 patients (39.%; PDI score 17.46 ± 1.01; age 51.8 ± 12.25 years) received a diagnosis of DD (DSM-IV-TR) [4]. The socio-demographical and clinical features of the study sample are reported in Table 1.

3.2. Correlations

The patterns of correlation among the study variables in the overall sample are reported in Table 2. Paranoid, Schizotypal and Obsessive-Compulsive personality traits resulted positively associated with

Table 1
Socio-demographic and clinical features of the sample.

	Overall sample
	n. 91
Age	48.76 ± 13.34
Education years	11.75 ± 3.87
Gender	
Female	60 (65.9%)
Marital status	
Single	34 (37.4%)
Married	38 (41.8%)
Separated/divorced	13 (14.3%)
Widow	6 (6.6%)
Living status	
Alone	24 (26.4%)
With partner	45 (49.5%)
With parents	18 19.8%)
Other situations	4 (4.4%)
Working status	
Employed/student	74 (81.3%)
Unemployed	17 (18.7%)
Personality features	
Cluster A	
Paranoid traits	1.82 ± 2.12
Schizoid traits	0.30 ± 0.84
Schizotypal traits	0.58 ± 1.28
Cluster B	
Borderline traits	0.75 ± 1.43
Narcissistic traits	1.08 ± 1.65
Histrionic traits	0.65 ± 1.24
Antisocial traits	–
Cluster C	
Avoidant traits	0.70 ± 1.46
Dipendent traits	0.32 ± 0.77
Obsessive-compulsive traits	1.84 ± 2.09
PANAS	
PA	29.02 ± 10.32
NA	23.99 ± 8.88
PNI tot	12.03 ± 6.05
HS	2.22 ± 1.28
CSE	1.40 ± 1.09
EXP	1.20 ± 0.84
SSSE	2.60 ± 1.37
GF	1.33 ± 0.98
DEV	1.21 ± 1.04
ER	1.54 ± 1.08
NV	13.20 ± 7.83
NG	10.29 ± 4.72

delusional severity (PDI score). A negative association was found between Positive Affectivity dimension score (PA; PANAS subscale) and delusional ideation (PDI score), whereas a positive association was found between "Hiding the Self" subscale (HS; PNI subscale) and delusional dimension severity (PDI score).

3.3. Personality traits, emotions and severity of delusions

Linear regression showed that the severity of delusional ideation (PDI scores, dependent variable) was positively related to HS (B = 1.59; CI 95% [0.59;3.05]; p = .006) and to paranoid traits (B = 1.37; CI 95% [0.82;2.08]; p = .050) and negatively related to PA (B = −0.146; CI 95% [−0.30; −0.04]; p = .024) (Table 3).

Therefore, we explored the possible interaction between the aforementioned variables.

3.4. Moderation analysis

Given the significant interaction, we evaluated whether HS and PA interacted with paranoid personality traits on delusional dimension (PDI score), following Hayes procedure for assessing conditional effects of the moderator (PROCESS Model #1). Only HS interacted with paranoid traits in predicting PDI score (interaction HS mean score*paranoid traits: B = −0.70, SE = 0.18, 95% CI = [−1.05; −0.34], p = .000;

interaction PA ∗ paranoid traits: B = −0.01, SE = 0.03, 95% CI [−0.03; 1.87], p = .06) (Table 4; Fig. 1).

4. Discussion

The aim of the present study was to evaluate the role of personality and emotional disturbances on delusional ideation in a clinical sample of outpatients representative of the entire delusional continuum.

To our knowledge, this is the first study adopting a dimensional approach to investigate the relationship between personality, emotions and delusional proneness. Moreover, to date studies that evaluated the relationship between specific PDs and DD are scarce [16]; none of them considering the emotional component of delusions. In fact, previous studies explored the association between delusions and affectivity (especially mood symptoms) [45,46], thus neglecting a broader spectrum of emotional dispositions (such as shame), strongly associated to DD.

With specific regard to premorbid personality, in the present study, higher paranoid, schizotypal and obsessive-compulsive traits were associated with a higher severity in delusional continuum. These data are in line with previous studies [16] and support the hypothesis that specific personality traits are related to delusions. Personality features evaluated in the present study represent stable premorbid traits rather than a possible artifact due to a state condition since: 1) personality traits are more stable than categories and less influenced by the state of illness [40,41]; 2) personality was evaluated collecting data about patients' social behavior in the last 5 years and through external informants.

Therefore, this study finding suggests that the severity of delusional beliefs depends, at least in part, on premorbid personality; in other words, specific personality traits may predispose to more severe delusional experience, thus supporting the view that delusional ideation may develop from predisposing personality features [11,12,16].

Concerning the hypothesis that specific emotions may be associated with delusional beliefs, the present study would confirm this relationship: the severity of delusional ideation resulted negatively associated with PANAS - Positive Affect (PA) and positively with PNI - Hiding the Self (HS). PA reflects the extent to which a person feels enthusiastic, active, and alert. High PA is a state of high energy, full concentration, and pleasurable engagement, whereas low PA is characterized by sadness and lethargy [47]. Conversely, HS reflects an unwillingness to show others own faults and needs and resulted closely related to the experience of shame [25,48]. Noteworthy, both PANAS and PNI scales are adopted to capture stable emotional and cognitive components of personality, in order to minimize a possible "state" effect.

We speculate that lower levels of PA and higher levels of HS may remind the specific emotional component of Kretschmer's sensitive character (particularly its affective nucleus of inadequacy and shame as well as of fatigue and exhaustibility).

Furthermore, these results are consistent with previous studies suggesting a role of negative emotions (particularly depression) in the development of full-blown psychotic symptoms from sub-threshold psychotic experiences [49–53] or from peculiar personality traits [54, 55].

Moreover, the association between higher levels of HS and delusion ideation confirms the clinical prominence of vulnerable characteristics of narcissism [56]. The lack of association between delusion severity and narcissistic traits in the present study may be due to the increasingly narrow criteria of DSM Narcissistic Personality Disorder, which are mainly focused on grandiosity [57]. The DSM narrow criteria likely contribute to the low-prevalence rate of narcissistic traits in the study sample as well as in clinical practice [56].

Since HS is closely related to the experience of shame, these results are in line with the hypothesis that shame is associated with delusion proneness in both clinical [30] and non-clinical samples [28,29]. From a phenomenological perspective, shame shows a double polarity: an objective pole, represented by an observing and judging external eye and a subjective one, dealing with the exposure of inner feelings of self-

Table 2
Spearman's correlation among primary variables of the study.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
1. PDI	–																					
2. PA	−0.225*	–																				
3. NA	0.0372	−0.031	–																			
4. PNI	0.076	0.041	0.442**	–																		
5. HS	0.279**	−0.179	0.322**	0.691**	–																	
6. CSE	−0097	−0.076	0.451**	0.848**	0.516**	–																
7. EXP	−0.140	0.223*	0.048	0.300**	0.078	0.076	–															
8. SSSE	−0.008	0.154	0.255*	0.721**	0.442**	0.520**	0.144	–														
9. GF	0.0057	0.199	0.186	0.612**	0.281**	0.420**	0.461**	0.334**	–													
10. DEV	−0.045	0.098	0.477**	0.798**	0.492**	0.686**	0.176	0.535**	0.479**	–												
11. ER	0.027	0.151	0.432**	0.756**	0.455**	0.585**	0.283**	0.405**	0.457**	0.683**	–											
12. NG	−0.055	0.266*	0.211*	0.795**	0.387**	0.528**	0.563**	0.775**	0.762**	0.531**	0.499**	–										
13. NV	0.0793	−0.039	0.488**	0.956**	0.732**	0.895**	0.142	0.593**	0.466**	0.818**	0.771**	0.601**	–									
14.PARND	0.450**	0.039	0.046	−0.078	−0.045	−0.014	−0.009	−0.197	−0.039	−0.046	0.084	−0.125	−0.013	–								
15. SZOID	0.115	0.043	0.110	−0.002	−0.034	−0.019	−0.018	−0.053	−0.039	0.080	0.172	−0.050	0.049	0.135	–							
16.STYPL	0.259**	0.013	0.072	−0.069	0.071	−0.009	0.029	−0.240*	−0.094	−0.010	0.032	−0.179	0.017	0.333**	0.273**	–						
17.BORDL	−0.0651	0.087	0.276**	0.049	−0.081	0.143	0.138	−0.126	0.117	0.093	0.190	−0.001	0.098	0.284**	0.246*	0.307**	–					
18. NARCI	0.092	0.272**	0.041	0.127	−0.010	−0.016	0.191	−0.003	0.322**	0.155	0.239*	0.200	0.096	0.396**	0.216*	0.231*	0.209*	–				
19. HISTR	−0.014	0.179	−0.004	0.014	−0.137	−0.071	0.231*	0.020	0.097	−0.030	0.093	0.130	−0.028	0.140	0.143	0.186	0.403**	0.370**	–			
20. AVOID	0.045	−0.023	0.196	0.266*	0.205	0.283**	0.148	0.155	0.132	0.101	0.126	0.224*	0.263*	0.092	−0.116	0.211*	0.279**	0.082	0.000	–		
21. DEPEN	0.0075	−0.074	0.226*	0.221*	0.050	0.256*	−0.069	0.276**	0.037	0.167	0.183	0.142	0.235*	−0.004	0.233*	0.009	0.266*	−0.069	0.070	0.537**	–	
22.OBCMP	0.266*	−0.027	0.109	−0.028	−0.015	−0.016	−0.053	−0.069	−0.020	−0.037	0.074	−0.070	0.018	0.504**	0.151	0.297**	0.351**	0.380**	0.133	0.343**	0.188	–

PA = Positive Affectivity; NA = Negative Affectivity; HS = Hiding the Self (mean score); CSE = Contingent Self-esteem (mean score); EXP = Exploitativeness (mean score); SSSE = Self-sacrificing Self-enhancement (mean score); GF = Grandiose Fantasy (mean score); DEV = Devaluing (mean score); ER = Entitlement Rage (mean score); NG = Narcissistic Grandiosity; NV=Narcissistic Vulnerability; PARND = Paranoid traits; SZOID = Schizoid traits; STYPL = Schizotypal traits; BORDL = Borderline traits; NARCI=Narcissistic traits; HISTR = Histrionic traits; AVOID = Avoidant traits; DEPEN = Dependent traits; OBCMP=Obsessive Compulsive traits.

** $p = .01$.
* $p = .05$.

Table 3
Effect of "Hiding the Self" dimension, "Positive Affectivity" dimension and paranoid traits on severity of delusion (PDI Score).

PDI total score				
	B [95%CI]	SE	t	p
STEP 1				
Positive Affectivity	11.67 [6.18;16.95]	0.06	−1.90	**0.000**
Hiding the Self	1.54 [0.56;2.83]	0.57	2.80	**0.007**
STEP 2				
Positive Affectivity	−0.146 [−0.304;-0.309]	0.07	−2.44	**0.024**
Hiding the Self	1.59 [0.59;3.05]	0.56	3.32	**0.006**
Paranoid traits	1.37 [0.82;2.08]	0.27	4.26	**0.000**
Scizotypal traits	0.86 [−0.22;1.62]	0.46	1.75	**0.050**
Obsessive-Compulsive traits	0.21 [−0.48;0.87]	0.34	0.66	0.514

deficiency and inadequacy [58, 59]. We speculate, following either phenomenological [12] or psychodynamic theories [23], that shame may constitute the emotional core of paranoid ideation.

Interestingly, the effect of paranoid traits, HS and PA on severity of delusional dimension was independent from each other, with paranoid traits being the strongest predictor of delusional severity. This finding is consistent with previous studies that emphasize a close relationship between Paranoid PD and DD [60–62].

Finally, we sought to test the hypothesis that personality traits (paranoid) and specific emotional dispositions (PA and HS) interact in influencing the severity of delusional ideation.

We found a significant interaction between paranoid traits and HS in predicting the severity of delusional dimension. Particularly, paranoid traits were positively associated with delusional ideation only at low or moderate HS scores; the effect ceased with high HS scores. Therefore, the study finding suggests, confirming previous research [63], that delusional proneness is mainly attributable to paranoid traits, but with emotional dispositions having a moderating role in the development to delusional beliefs.

The strengths of the present study are: 1) the inclusion in the study sample of the whole range of delusional ideation along a severity continuum; 2) the adoption of a dimensional model for the personality assessment; 3) the investigation of the emotional component of delusional beliefs.

The present study should be considered in light of some limitations. First, caution should be used in drawing firm conclusions from this study due to its small sample size and composition (subjects enrolled were representative of a clinical sample of outpatients referring to a Personality Disorders Unit). Second, the cross-sectional design of the study cannot rule out the possibility that the interplay between delusional ideation and emotional components of personality may change over time or may have a phase-dependent effect. Future research should be addressed to larger cohorts of non-clinical population, adopting a longitudinal perspective.

In conclusion, the present study suggests that delusional ideation depends on a complex interplay between specific emotional and
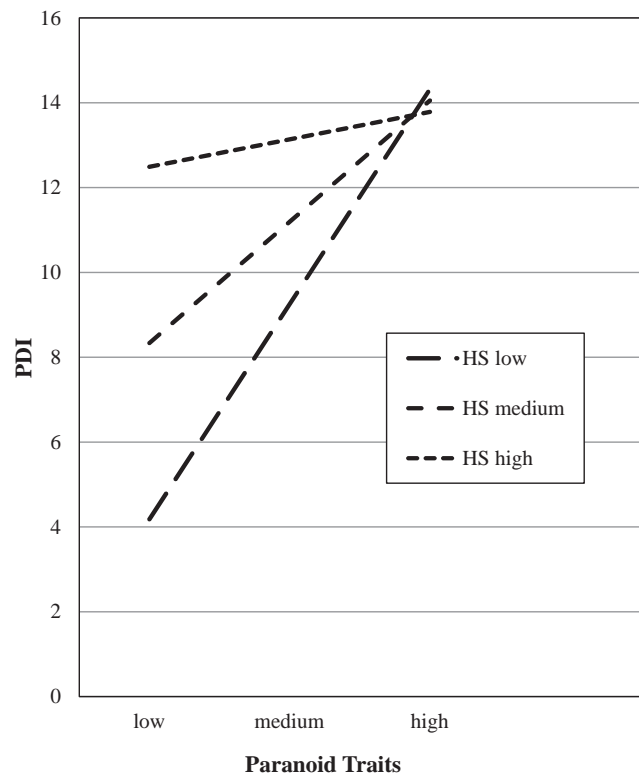

Fig. 1. Interaction between HS mean score and paranoid traits on the severity of delusion ideation (PDI Score).

paranoid dispositions within personality structure. From this viewpoint, delusion may constitute the superficial shell, which develops from and cover inner emotional vulnerabilities of personality.

Conflict of interest and founding source

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Table 4
HS moderates the relationship between paranoid traits and the severity of delusion ideation (PDI Score).

	B [95% CI]	SE	t	p
HS	1.52 [0.59;2.44]	0.47	3.27	**0.001**
Paranoid traits	1.35 [0.78;1.91]	0.28	4.74	**0.000**
HS * Paranoid traits	−0.81 [−1.39;-0.24]	0.29	−2.80	**0.006**
Schizotypal traits	0.85 [−0.29;1.99]	0.57	1.48	0.142
PA	−0.13 [−0.25;-0.01]	0.06	−2.07	**0.041**
Conditional Effect on PDI total score				
Low paranoid traits: −1.28	2.39 [1.40;3.37]	0.50	4.82	**0.000**
HS × Med paranoid traits: 0.00	1.35 [0.78;1.91]	0.28	4.74	**0.000**
High paranoid traits: 1.28	1.28 [−0.56;1.17]	0.44	0.70	0.488

Note. n = 91; HS = Hiding the Self (mean score); PA = Positive Affectivity; Model R^2 = 0.66, F(5,85) = 14.12, p = .00; HS score moderator values represent the mean and ±1 SD.

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