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Abstract

There are few brief measures of identity disturbance for use in clinical practice that have been subject to any cross-culturally validation. This study investigated the construct validity of the Personality Structure Questionnaire (PSQ) in Italian clinical (N=237) and community (N=296) samples. Confirmatory factor analysis was conducted to investigate the internal structure of the PSQ. A three–factor structure (i.e., differing self-states, mood variability and behavioral loss of control) including a second-order factor provided the best fit to the data. This structure was demonstrated to be invariant across sex and clinical diagnosis, with clinical diagnosis significantly predicting increased PSQ scores. A global PSQ score of between 26-28 was found to be an appropriate cut-off for assisting in diagnostic processes. Implications for the assessment and treatment of psychological disorders with a marked identity disturbance component are discussed.

Keywords: identity disturbance, fragmentation, confirmatory factor analysis, scale validation, PSQ.

Assessment of identity disturbance: Factor structure and validation of the Personality Structure Questionnaire in an Italian Sample

In clinical practice when any patient presents in a manner suggestive of the presence of identity disturbance (e.g. lack of narrative coherence; Adler, Chin, Kolisetty & Oltmanns, 2012 and unstable self-image/sense of self; Leichsenring, Leibing, Kruse, New & Leweke, 2011), then swift quantitative assessment is useful in contributing to on-going diagnostic efforts. Adler & Chin (2012) however noted the paucity of appropriate identity disturbance assessment tools that have been subject to intensive psychometric scrutiny. Identity disturbance is suggestive of a poorly integrated personality, with the patient reporting (and often being observed in session) to rapidly shift and switch between quite distinct and sharply differentiated states of mind (Ryle & Kerr, 2002). For example, a patient with dependency problems might describe a 'super-clingy' state in which they see themselves as incompetent and others as superior (and are therefore motivated to seek reassurance from others, including the therapist), in contrast to a depressed mode in which they see themselves as a failure and others as critical (and are therefore unmotivated, behaviourally deactivated and quickly perceive criticism from the therapist).

Identity concerns finding meaning in life and understanding one's place in the world (Wilkinson-Ryan & Westen, 2000) and has been theorised as the key developmental task of adolescence (Erikson, 1972). Whilst identity has been shown to be under slow construction during the adolescent years (Meeus, van de Schoot, Keijsers, & Branje, 2011), marked identity disturbance during adolescence is predictive of ongoing psychopathology (Wiley & Berman, 2013) and future personality dysfunction (Westen, Betan & DeFife, 2011). An integrated adult personality demonstrates longitudinal behavioral consistency, a sense of continuity of inner experience over time, conceptions of significant others which are complex/multifaceted and the ability to tolerate an understanding of self and others that contains both negative and positive qualities (McQuitty, 2006). Wilkinson-Ryan and Wesen (2000) empirically derived four types of identity disturbance in adults; (1) role absorption, (2) painful incoherence, (3) inconsistency of thought, feeling and actions, and (4) lack of commitment. The acknowledgment of the presence of identity disturbance can elicit the painful awareness of a discontinuous and disjointed sense of self and the volatile relationships and poor self-care regimes that ensue (Ryle, 2004). Identity disturbance appears often maintained via chronic substance misuse (Talley, Tomko, Littlefield, Trull & Sher, 2011).

Identity disturbance represents a common clinical feature across the range of Personality Disorders (Kernberg, 2006) and in diagnosis of Borderline Personality Disorder (BPD; DSM-V, 2014) 'lack of identity' is one of core features/symptoms of the disorder (Jorgensen, 2010). In community clinical services, BPD is the most common clinical diagnosis (Dubovsky & Kiefer, 2014) and is a diagnosis with acknowledged and significant risk of eventual suicide (Paris, 2007). The heightened emotion dysregulation common to BPD has been found to predict on-going identity disturbance (Neacsui, Herr, Fang, Rodriguez & Rosenthal (2014). In BPD, identity disturbance is additional enhanced through dissociation between states of mind (Adler & Chin, 2013). Therefore, when dissociation is present, the patient can be in one state and be temporarily oblivious of other potential states of mind. Self-state instability is particularly typical of Cluster B personality disorders, but with Dissociative Identity Disorder (DID; DSM-V, 2014) representing the most pronounced form of identity disturbance (Barlow & Chu, 2014). In DID, the personality structure of the patient features chronic and gross dissociation between various separate personality states with associated memory lapses, fugue states, derealisation and depersonalisation. Reinders, Willemsen, Vos, den Boer & Nijenhuis (2012) have demonstrated differing patterns of neural network activation and cerebral blood flow during state-switching.

Deficits in coherence of identity reflect the theoretical cornerstone of the multiple self-states model (MSSM) central to cognitive analytic therapy (CAT; Ryle, 1995). A state of mind is defined by a key affect, particular beliefs concerning self/others and the degree to which the patient is in touch with (and in control of) core feelings (Bedford, Davies & Tibbles, 2009). Theoretically, the MMSM therefore hypothesizes that identity disturbance the expression lack of integration of the constellation of often opposing and contrasting states. The MSSM also details three levels of increasing identity disturbance (1) restricted flexibility, (2) failure to develop meta-procedures leading to a somewhat discontinuous experience of the self and (3) capacity to self-reflect or self-observe is absent and so on-going experience is totally fragmented. An example on level three fragmentation is the BPD client who seeks perfect care in relationships, becomes disappointed when this is unsustainable and switches into a destructive and attacking self-state without any ongoing awareness or subsequent reflection. State-switching is often an involuntary strategy employed to block out ongoing awareness of unwanted information (Elzinga, Phaf, Ardon & van Dyck, 2003) and therefore dictates stereotyped and unhelpful responses to interpersonal threat (Dalenberg et al. 2012).

Ryle (1995) called for a measure of identity disturbance to be developed, as this would be of significant clinical value in enhancing assessment. A specific measure was subsequently developed based on the MSSM and has been previously tested in two separate studies in the UK; this 8-item measure is titled the Personality Structure Questionnaire (PSQ). In the first validation study (Pollock, Broadbent, Clarke, Dorrian,

& Ryle, 2001) used two clinical samples (general psychiatric out-patient N=52 and DID N = 20) and a community sample (N=255). The clinical sample scored consistently higher on the PSQ compared to the non-clinical sample and exploratory factor analysis (maximum likelihood factor extraction) demonstrated that the PSQ factored into a single scale, with satisfactory reliability coefficients. The test-retest ($r = 0.75$) and coefficient alphas ($\alpha = 0.59$ to 0.87 according to clinical sample) of the PSQ were satisfactory and corrected item-total correlations ranged from 0.31 to 0.62. Convergent validity demonstrated consistent positive associations for PSQ scores and multiplicity ($r = 0.76$), dissociation ($r = 0.34$) and mood variability ($r = 0.48$). Discriminate function analysis showed that the PSQ accurately accounted for the separation between the clinical and community samples.

Bedford, Davies and Tibbles (2009) further tested the psychometric properties of the PSQ in a large clinical sample (N=1296) of patients attending a Primary Care psychological therapy service. The sample therefore presented with a wide range of disorders. Again, PSQ test-retest ($p < 0.00$) and coefficient alphas ($\alpha = 0.87$) were satisfactory. Exploratory factor analysis (maximum likelihood and principal components analysis) also again found a single unifactorial scale, with good reliability coefficients. Convergent validity (but using different self-report measures to Pollock et al, 2001) demonstrated positive associations for PSQ scores with psychological distress ($r = 0.43$) and mood/anxiety ($r = 0.36$). In terms of discriminant validity, clinicians' ratings were used via the Global Assessment of Functioning (GAF; Jones, Thornicroft, Coffey & Dunn, 1995). This enables clinicians to rate independently for symptom level and impairment to functioning. Significant PSQ correlations were reported with clinician-rated symptomology ($r = 0.20$) and functioning ($r = 0.30$). Other clinical assessment ratings were made with respect to the severity of problems of personality, addictions and interpersonal relationships. Significant correlations were found at assessment and discharge with PSQ scores and personality problems (0.25) and interpersonal relationships (0.24). Pollock et al. (2001) stated that the PSQ was grounded in the clinical observation of identity disturbance consisting of the presence of differing self-states, changeability in moods and behavioural loss of control. Accordingly, Bedford et al. (2009) formed three PSQ subscales on this basis and found the highest significant correlations at assessment and discharge were between self-states and mood change (0.73 and 0.71 respectively), and the lowest were between self-states and loss of control (0.51 and 0.48 respectively).

As the PSQ is already established as a valid and reliable clinical tool in the assessment of identity problems, it is however worthy of detailed clarification as to what psychological construct(s) the PSQ actually taps, as previous research has been inconclusive. All the extant PSQ studies have also been restricted to English-speaking only samples. Ryle, Kellett, Hepple, & Calvert (2014) detailed the growth of CAT from its inception in the public services in the UK to also now include Finland, Ireland, Spain, Italy, Australia, Greece and India. As use of the PSQ has also subsequently become central to the assessment process during CAT (Ryle & Kerr, 2002), the measure is in widespread international use, but cross-cultural validation efforts have unfortunately lagged behind clinical uptake. The current study is therefore timely and innovative as it is the first to test the psychometric properties of the PSQ outside of the UK. The present study had two central research aims. Firstly, to assess the factorial structure of the PSQ in a clinical and community Italian sample in order to test and compare the two extant models (i.e. a model representing a single latent construct of identity disturbance versus a model with three sub-factors and a single second order latent factor). Secondly, to provide further evidence of the convergent validity of the PSQ by testing concordance between PSQ scores and clinical diagnosis.

Method

Participants and Procedure

Two independent samples completed the PSQ voluntarily. Ethical approval to complete the study was achieved. One group composed a community sample of N=296 individuals (M_{age} = 33.36 years, SD = 13.26 years; 58% females) and was obtained from a convenience sample of students and workers in Italy. After informed consent was obtained, participants in the community sample completed the PSQ alone. After checking the completion of PSQ and associated demographic information the researchers debriefed participants. The researchers approached local community groups to participate in the study and advertised in local amenities for participants. Researchers completed the PSQ in person with the community sample and no postal measures were used. Participation as a community control had the following inclusion and exclusion criteria applied, (1) not currently in receipt of mental health services, (2) not currently taking any mental health medication, (3) no intellectual disability, (4) aged between 18-65 and (4) standard literacy skills.

The second sample was a group of N=237 participants experiencing chronic psychological distress referred to the Italian Public Health Service (M_{age} = 32.43 years, SD = 13.86 years; 81% females). Clinic participants were invited to participate in the study on clinic attendance and it was made clear that care was not dependent upon participation. Participants completed the PSQ prior to clinical assessment and scores were not fedback to participants. Presenting problem was diagnosed by a Psychiatrist from the clinical assessment using the ICD-10 criteria and clinical assessment was blind to the PSQ score. No personal information was recorded and the medical condition in the clinical sample was saved in a separate file. Because the clinical sample presented with a wide heterogeneity of presenting problems, ICD-10 diagnostic codes were transformed using the DSM-IV (2003) multi-axial classification system, in order to more accurately assess the study's goals (see Table 1). Thus participants were classified as either meeting criteria for Axis-I (e.g., depression, schizophrenia), Axis-II (personality disorder), Axis-III (acute medical condition or physical disorder) or Axis-IV (psychosocial and environmental factors contributing to distress).

The PSQ measure

The PSQ in its Italian version was translated from English into Italian by a professional translator. The measure then underwent (a) face validity checks with a four Psychiatrists and Clinical Psychologists and (b) extended use in clinical practice (one year) to gain feedback from patients concerning readability issues and also ease of understanding of all the items. No issues were subsequently reported with any aspects of face validity from clinicians and patients. As the PSQ was administered under strict controlled settings just a few missing values were present. Consistent with English version of the PSQ, in the final version of the Italian PSQ, participants were required to rate the extent to which 8 bipolar items reflected their sense of self (e.g., *"My sense of* myself is always the same versus *How I act or feel is constantly changing"*) on a 5-point bipolar format-scale ranging from 1 (very true of me) to 5 (very true of me) using the middle point as representing neutrality. Higher PSQ scores indicate greater identity disturbance. The measure reflects the presence of three potential sub-factors: presence of differing self-states (DS; items 1-4; e.g., *"I have a stable and unchanging sense of* myself versus *I'm so different at different times that I wonder who I really am"*); presence of mood variability (CM; items 5-6; e.g., *"My mood and sense of self seldom* change suddenly versus My mood can change abruptly in ways which make me feel *unreal or out of control"*) and behavioural loss of control (BC; items 7-8; e.g., *"I never* lose control versus I get into states in which I lose control and do harm to myself and/or *others"*). The sum of the scores on the eight items provided the total PSQ score ($M_{full-sample}$ = 23.23, SD = 6.92. α = 0.85. Split-half correlation = 0.79). Descriptive statistics and correlations among items, sub-scales and the full scale are found in Table 2.

Data analysis strategy

After the corresponding data screening and checks for normality, data analyses were conducted in three different stages. Firstly, multiple-group CFA models were used to evaluate the measurement invariance of the PSQ considering three first-order latent constructs and one second-order factor both sex (female versus male) and status (clinical versus community sample). Validation demands that the PSQ measures identical constructs with the same structure across divergent groups (Meredith, 1993; van de Schoot, Lugtig, Hox, 2012). To test the PSQ factorial structure for sex and clinical condition, the following models were estimated and compared using goodness of fit indices. (a) A baseline model where all parameters were set to be free across groups (configural invariance) to determine whether common factors were associated with the same PSQ items across groups. (b) A model in which factors loadings were set to be equal across groups, but PSQ item intercepts were allowed to be free across groups (metric invariance) to test whether participants across groups gave the same meaning to the corresponding factors. (c) A model in which item intercepts were held equal across groups (scalar invariance) to illustrate whether PSQ comparisons across groups were meaningful. Lastly, (d) a model in which factor loadings and item intercepts were held equal across groups (strong invariance); this model permitted defensible comparisons across study groups. Fit of each model was established using the χ^2, RMSEA, CFI and SRMR fit indices. It is important to note that the likelihood ratio χ^2 test does have a number of limitations including dependence on sample size (see Hoyle, 2000). Thus, change in model fit between nested models was also tested by inspecting statistical $(\Delta\chi^2)$ and descriptive (ΔRMSEA, ΔSRMR, ΔCFI) indices. Sensitivity of goodness of fit indices were based on the Chen (2007) and Cheung and Rensvolt (2002) cut-off criteria.

Secondly, a confirmatory factor analysis (CFA) was performed considering the full sample, testing two different models: (a) a model with one latent construct, and (b) the model with three sub-factors and one second order latent construct, used in the previous analyses. In order to decompose the item variance explained by each first-order factor, as well as item variance explained by the second order factor we use the Schmid and Leiman transformation (1957; for implementation in higher-order CFA models see Wang & Wang, 2012). Analyses were conducted using Mplus (Muthén & Muthén, 2012) and the default estimator for all CFA models was maximum likelihood.

Finally, convergent validity was assessed by examining the concordance between the second-order factor of the PSQ scores and DSM-IV multi-axial diagnostic classification. This was estimated using two different methods. Firstly, the DSM-IV multi-axial classification was used as a covariate of the hypothesised second-order factor for the PSQ. It was predicted that axes-I and II groups would positively co-vary with the second-order factor of the PSQ, whereas axes-III would negatively co-vary with the second-order factor of the PSQ (axis-IV classification was omitted because of too few cases). Secondly, discriminant analysis was used to determine whether participants classified in axis-I or axis-II scored significantly higher on the second-order factor of the PSQ. This analysis also therefore enabled relevant PSQ cut-off scores to be calculated in order to offer psychometric assistance to diagnostic assessment procedures regarding identity disturbance.

Results

Measurement Invariance

To evaluate the construct comparability of the hypothesised structure of the PSQ (three first-order factors, and one second-order factor) several CFA models were performed across sex and diagnosis. Firstly, a configural model to test PSQ invariance by sex exhibited satisfactory goodness of fit indices (see Table 3). For both male and female respondents, all unstandardized factor loadings were statistically significant (.79 – 1.19, ps < .001). Similarly, the unstandardized factor variance was also significant for the second order factor both for males ($\Phi = .58$, $p < .001$) and females ($\Phi = .44$, $p < .001$). The factor determinacy coefficients were all above .87 suggesting strong correlation among items with their respective factor; therefore, configural invariance was met.

The metric invariance model fitted satisfactorily across all the indices, as shown in Table 3. Furthermore, when the metric invariance model was compared with the configural invariance model, no statistical ($p > .10$) or descriptive differences were detected. This indicates that the associations between the items and the respective factors were the same, regardless of sex. Similarly, the scalar invariance model did not worsen the data fit compared to the configural invariance model, showing that differences in PSQ scores between males and females were genuine. Although, the chi-square difference test revealed significant differences compared to the configural model, the remaining indicators used (ΔRMSEA, ΔSRMR, ΔCFI) permit to hold scalar invariance. Finally, the strong invariance model (metric plus scalar) revealed a similar fit compared to the scalar invariance model, indicating that any differences between males and females were not attributable to measurement problems.

Analyses were then repeated using diagnosis as grouping variable. The configural model to test invariance across the clinical and community samples also showed satisfactory goodness of fit indices. For both participants diagnosed with a clinical condition and community respondents, all unstandardized factor loadings were statistically significant (.87 – 1.30, ps < .001). Similarly, the unstandardized factor variance was also significant for the second-order factor both for the clinical sample ($\Phi = .58$, $p < .001$) and the community sample ($\Phi = .40$, $p < .001$). The factor determinacy coefficients were again all above .87 and so configural invariance was achieved. The metric invariance model fitted satisfactorily across all the indices. When the metric invariance model was compared with the configural invariance model, no statistical ($p > .10$) or descriptive differences were detected.

The scalar model showed similar fit indices compared to the configural invariance model. Nonetheless, the chi-square difference test and ΔSRMR suggest some signs of non-invariance, permitting partial support of the interpretation that observed differences between clinical and nonclinical participants was attributed to greater identity disturbance. Finally, the goodness of fit indices of the strong invariance model (metric plus scalar) were satisfactory and similar to the scalar model, supporting strong invariance. This means that differences between the clinical and community groups relied on genuine differences between scores and not measurement artefacts.

Finally, confirmatory factor analysis (CFA) tested the hypothesised model comprising three first-order factors and one second-order factor. The CFA was completed on the full sample. Results fitted the data very well, $\chi^2(17, N = 533) =$

53.820, CFI = 0.974, RMSEA = 0.064 (90% C.I. = .045-.083), SRMR = 0.029. Further analysis showed that the model with three factors plus one second-order factor fitted the data significantly better (χ^2 = 49.584, p < .001) than the model compressing all PSQ items into a single factor, χ^2(20, N = 533) = 103.404, CFI = 0.940, RMSEA = 0.088 (90% C.I. = .072-.106), SRMR = 0.040. The Schmid and Leiman transformation revealed that the second-order factor accounted for the majority of the item variance, indicating the importance of considering this second-order factor in the model (see Table 4). Overall, results support the three first-order factors and one second-order factor as the preferred model to characterise identity disturbance and so score the PSQ.

Clinical validity

Clinical validity was evaluated by measuring the concordance between the DSM-IV multi-axial classifications and PSQ scores. For all the subsequent analyses only the clinical group was included, as the community sample was not subject to diagnostic procedures. In order to do this, a CFA model using DSM-IV classification as covariates was completed. The association between the second order factor of the PSQ, and the first order factors with the covariates demonstrated whether factor means were significantly higher for participants classified onto various DSM-IV axes. Results of the preferred PSQ model, including dummy codes (i.e., 1=presence; 0=absence) for axis-I, axis-II, and axis-III as covariates, revealed satisfactory model fit indices, χ^2(27, N = 533) = 69.23, CFI = 0.965, RMSEA = 0.054 (90% C.I. = .039-.070), SRMR = 0.033. As expected, patients classified in Axis-I had significantly higher PSQ scores compared to those who were not classified on this axis, b = 0.47, z = 4.50, p < .001, R^2 = 0.28. Patients classified in Axis-II had significantly higher PSQ scores compared to those not classified on this axis, b = 0.65, z = 3.31, p < .001, R^2 = 0.20. In contrast, patients classified on Axis-III had marginally significant lower PSQ scores compared to those that were not classified in axis-III, b = -0.16, z = -1.69, p = .091, $R^2 = 0.09$ (see Figure 1). None of the first order factors was predicted by classifications in axis-I, axis-II or axis-III (all *p's* > .15), demonstrating that the global score is preferred over sub-scales when assessing the clinical utility of the PSQ. Overall, these results indicate that the PSQ can accurately distinguish participants meeting diagnostic criteria for a mental health problem.

Following on from the previous analyses, a discriminant analysis was then conducted to investigate the clinical utility of the PSQ (using only global PSQ scores) in classifying individuals as meeting the diagnostic threshold for either an axis-I or axis-II disorders. Significant mean differences (*Wilks' λ* = .94, F(1, 530) = 32.89, p < .001) were observed for the PSQ scores between individuals classified in axis-I (M = 26.37, SD = 7.65) and those who were not classified in axis-I (M = 22.32, SD = 6.40). While the log-determinants were quite similar (4.1 versus 3.7 for individuals classified versus no classified in Axis-I, respectively). The cross-validated classification showed that overall 79.7% were correctly classified (i.e., 91 out of 115 respondents). Therefore, the 'hit-ratio' was demonstrated to be larger than what would be achieved by chance. Similar results were found using axis-II classification as dependent variable and PSQ scores as predictors. Results revealed significant mean differences (*Wilks' λ* = .97, F(1, 530) = 14.85, p < .001) between participants with an axis-II diagnosis (M = 28.11, SD = 6.05) and those not classified on this axis (M = 22.93, SD = 6.84). In this case, the cross-validated classification rate was shown to increase, with 94.9% overall correctly classified (i.e., 26 out of 27 respondents). Based on the discriminant analysis conducted and the average scores observed, it is possible to support the clinical utility of the PSQ with scores above 26 (axis-I) and above 28 (axis-II) as desirable cut-offs for assisting diagnostic process.

Discussion

This has been the first study to use a non-English sample to assess the factorial structure and the validity of the PSQ. The results overall indicate that the PSQ could be reliably translated and that the internal structure of the measure consisted of a three–factor structure (i.e., differing self-states, mood variability and behavioral loss of control), including a second-order factor. Results therefore provide further empirical support for the Bedford et al. (2009) interpretation of the PSQ as having a three sub-scale internal structure. The internal structure was also invariant (regardless of clinical diagnosis or gender), suggesting that PSQ scores represented genuine differences in identity disturbance between the samples, rather than measurement artefacts. The validation of the PSQ in a non-English speaking sample in the current study has evidenced the transcultural stability of the measure. The reliability of the PSQ was satisfactory in the Italian sample. Westen & Heim (2003) noted that identity issues were notoriously difficult to measure and so this validation study makes a contribution to the field.

The clinical validity of the PSQ was shown via the evidence that meeting diagnostic criteria for a mental health problem significantly predicted global PSQ scores. Global PSQ scores above 26 and above 28 were shown to be accurate cut-offs for identifying Axis-I and Axis-II disorders respectively. Consistent with the MSSM (Ryle, 1995), the results showed that participants with a personality disorder had greater global PSQ scores, highlighting the accuracy of the PSQ in distinguishing individuals classified in axis-II compared to those that did not receive this diagnosis. A similar pattern was found between participants that were diagnosed as having a severe mental problem (e.g., depression) and those that were not classified in axis-I. The challenge of rapid and accurate clinical diagnosis remains at the centre of good mental health treatment (Kernberg & Yeomans, 2013), with personality disorders particularly prone to misdiagnosis (Barbato & Hafner, 1998). Unrecognised and unformulated state-shifting accounts for much of the everyday felt confusion of patients with identity disturbance issues and also much of the diagnostic uncertainty in the professionals attempting to treat them (Ryle & Kerr, 2002). It has commonly emphasised that clinicians need to have access to appropriate tools for use in routine practice to assess PD patients, due to the significant impact on functioning across all aspects of life (Banerjee, Gibbon & Hubbard, 2009). The brevity of the PSQ (eight items) demonstrates that assessment of identity disturbance can be relatively rapidly achieved, with brief measures having strong clinical appeal (Fernald et al., 2008).

This study has also added new evidence concerning the factorial structure of the PSQ. Using CFA, the study has demonstrated that the model with 3 latent factors and a single second order factor provided the best fit to the data. The study suggests that identity disturbance (as measured by the PSQ) is made up of three components of the presence and awareness of differing self-states, instability and variability of mood and loss of behavioural control. Theoretically, the subscales of the PSQ appear to map onto the Wilkinson-Ryan and Wesen (2000) identity disturbance typologies of role absorption (PSQ state-shifting), painful incoherence (PSQ mood variability) and inconsistency of thought, feeling and actions (PSQ loss of behavioural control). Findings demonstrated that meeting diagnostic criteria was much better accounted by global scores on the PSQ and the identified sub-scales of the PSQ were not predicted by classification of Axis-I, nor axis-II disorders. Clinicians should therefore better consider global PSQ scores when using the PSQ to support the diagnostic process.

Accurate quantitative measurement initiates further detailed assessment creating a nuanced and patient-centred formulation of self-states and state-switches, which provides a platform for therapy directed at personality integration (Ryle & Kerr, 2002).

The application of the MSSM and reduced personality fragmentation due to treatment has been shown in therapy of BPD with CAT. PSQ scores were shown to reduce later on during therapy, on a platform of reduced psychological distress (Kellett, Bennett, Ryle & Thake, 2013). Whilst the PSQ has been developed alongside the evolution of the CAT model, the measurement of identity disturbance is something that also concerns other psychotherapies. For example, mapping of states of mind is a core assessment feature of schema therapy (Arntz & Genderen, 2009). In schema theory, a schema mode is a facet of the self, involving distinct beliefs and behavioural styles that have not been fully or sufficiently integrated into the other facets (Bedford, Davies & Tibbles, 2006). Depth of identity disturbance would be indexed by the extent to which any particular schema mode is dissociated (i.e. cut-off and separate to) other modes (Young, Klosco & Weishaar, 2003). Therefore the PSQ could be used as an assessment measure of identity disturbance regardless of intervention type.

There are a number of limitations to the current study that also act as a prompt for future PSQ research; (a) the sample sizes could have been larger to create larger diagnostic groupings, (b) it would have been useful to have a DID sample, (c) the data was cross-sectional and therefore longitudinal data could have assessed factorial invariance over time, (d) a measure of dissociation could have been taken at the same time of the PSQ to explore the manner in which the PSQ performs when there is comorbid dissociation, (e) the diagnostic interviewing was not routinely supported by a validated tool such as the SCID (First, Spitzer, Gibbon & Williams (2002) and (f) the sample was limited to Italy and so wider cross-cultural validity of the PSQ was impossible to ascertain. Further studies particularly need to explore differences between mental health disorders on the PSQ, index the psychophysiological ramifications of identity disturbance, use intensive diary and time sampling studies to capture and model state-shifting and also develop an adolescent PSQ version (Westen, Betan & DeFife, 2011).

In conclusion, the current study has advanced the evidence for the utility of the PSQ as an assessment measure of identity confusion in Italian samples. The CFA completed supplements previous exploratory factor analytic evidence, which has debated whether the measure has a single or tripartite structure. The current evidence using sophisticated modelling procedures evidences that the PSQ is best understood as containing three sub-factors and a single second order latent factor. This means that the PSQ can now be confidently used as a single full score to assess degree of identity disturbance and that the sub-scale scores can be used to index differing aspects of identity disturbance. Overall, it is possible to state that the PSQ can make a useful contribution in the accurate diagnosis of Axis I (such as major depression) and Axis II disorders (such as PD). The PSQ also makes a contribution in identifying the needs of patients with marked identify disturbance at the heart of their chronic emotional deregulation. Nevertheless, future detailed theoretical and empirical work is required regarding identity disturbance, as it has been recognised that this is a particularly under researched area of mental health (Adler, Chin, Kolisetty & Oltmanns, 2012).

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Table 1. Presenting problems in the clinical sample (N = 237).

Presenting Problem	Frequency	Percentage
Obesity and metabolic disorders	87	36.7%
Eating disorders	86	36.3%
Personality disorders	15	6.3%
Anxiety-related disorders	12	5.1%
Depression and bipolar depression	8	3.4%
Antisocial behaviour	8	3.4%
Obsessive compulsive disorder	6	2.5%
Movement disorders	4	1.7%
Substance use disorder	3	1.3%
Other emotional disorders	3	1.3%
Schizophrenia	2	0.8%
Dyslexia	2	0.8%
Suicide behaviour	1	0.4%
Total classified in axis-I	115	49%
Total classified in axis-II	27	11%
Total classified in axis-III	111	47%

Note: The proportion of cases with the corresponding pathologies does not reflect the presence of comorbidity. Cases where a medical condition (e.g., obesity) was accompanied by a mental-related problem were coded in the respective psychopathological condition; whereas, when two or more mental-related problem were present (e.g., phobia and depression), the severity of the psychopathological condition was taken as the primary guideline for the classification in the table.

Table 2. Descriptive statistics and simple correlations among the items, sub-scales and full scale of the PSQ (N=533).

	M	SD	i1	i2	i3	i4	i5	i6	i7	i8	DS	CM	BC	PSQ-$_{total}$
i1	2.85	1.20	-											
i2	2.68	1.23	.47**	-										
i3	2.70	1.21	.51**	.53**	-									
i4	2.84	1.18	.43**	.39**	.48**	-								
i5	2.93	1.26	.49**	.36**	.49**	.42**	-							
i6	2.81	1.29	.33**	.28**	.47**	.40**	.53**	-						
i7	3.08	1.15	.37**	.38**	.44**	.34**	.40**	.39**	-					
i8	3.28	1.26	.34**	.28**	.45**	.40**	.44**	.47**	.45**	-				
DS	11.08	3.74	.78**	.77**	.81**	.74**	.57**	.48**	.49**	.47**	-			
CM	5.74	2.28	.47**	.37**	.55**	.47**	.87**	.88**	.45**	.52**	.60**	-		
BC	6.35	2.05	.41**	.37**	.52**	.44**	.49**	.50**	.84**	.87**	.56**	.57**	-	
PSQ-$_{total}$	23.23	6.92	.69**	.64**	.77**	.68**	.74**	.69**	.66**	.67**	.90**	.82**	.78**	-

Note: The letter “i” followed by a number indicates the observed items and the order in the administered scale, respectively. DS = differing self-states sub-factor; CM = changeability in moods sub-factor; BC = behavioral control sub-factor. Sub-factors and PSQ total score were computed summing the values for the corresponding items. ** p < .001.

Table 3. Measurement invariance models across sex (males N = 169; females N = 364) and clinical condition (clinical sample N = 237; community sample N = 296).

	χ^2(df)	Reference model No.	$\Delta\chi^2(\Delta df)$	CFI	RMSEA	SRMR	ΔCFI	ΔRMSEA	ΔSRMR
MI across sex									
0. Configural invariance	79.99 (36)**			0.969	0.068	0.040			
1. Metric invariance	70.69 (39)**	0	-9.31 (3)	0.977	0.055	0.037	-0.008	-0.013	-0.003
2. Scalar invariance	90.48 (42)**	1	19.79 (3)**	0.965	0.066	0.047	-0.012	0.011	0.010
3. Strong invariance	93.32 (47)**	2	2.85 (5)	0.967	0.061	0.047	0.002	-0.005	-0.003
MI across clinical condition									
0. Configural invariance	83.88 (36)**			0.965	0.071	0.047			
1. Metric invariance	75.47 (39)**	0	-8.41 (3)	0.973	0.059	0.039	-0.008	-0.012	-0.008
2. Scalar invariance	102.40 (42)**	1	26.96 (3)**	0.955	0.073	0.064	-0.018	0.014	0.025
3. Strong invariance	106.92 (47)**	2	-9.21 (4)	0.956	0.069	0.069	0.001	-0.004	0.005

Note: MI = measurement invariance. χ2 = chi-square test; df = degrees of freedom. Δχ2 = difference chi-square test; Δdf = difference degrees of freedom. ΔCFI scores smaller than or equal to .01 indicates that the null hypothesis of invariance should not be rejected (Cheung & Rensvold, 2002). ΔRMSEA scores smaller than or equal to .015, and ΔSRMR scores smaller than or equal to .030 (for loading invariance) or .015 (for intercept or residual invariance) would indicate noninvariance (Chen, 2007). **: p <.001

Table 4. Schmid and Leiman transformation of the second-order CFA model estimates.

Item	First-order factor loading	Second-order factor loading	Item variance explained by second-order factor	Item variance explained by second-order factor	Total item variance explained by factors	Item variance not explained by factors
USE						
i1	0.672	0.885	0.353	0.097	0.452	0.548
i2	0.632	0.885	0.312	0.086	0.400	0.600
i3	0.787	0.885	0.485	0.134	0.620	0.380
i4	0.638	0.885	0.318	0.088	0.408	0.592
CMO						
i5	0.761	0.932	0.503	0.076	0.579	0.421
i6	0.698	0.932	0.423	0.064	0.488	0.512
BCL						
i7	0.654	0.918	0.360	0.067	0.428	0.572
i8	0.691	0.918	0.402	0.075	0.477	0.523

Note: Results are based on complete standardized solution.

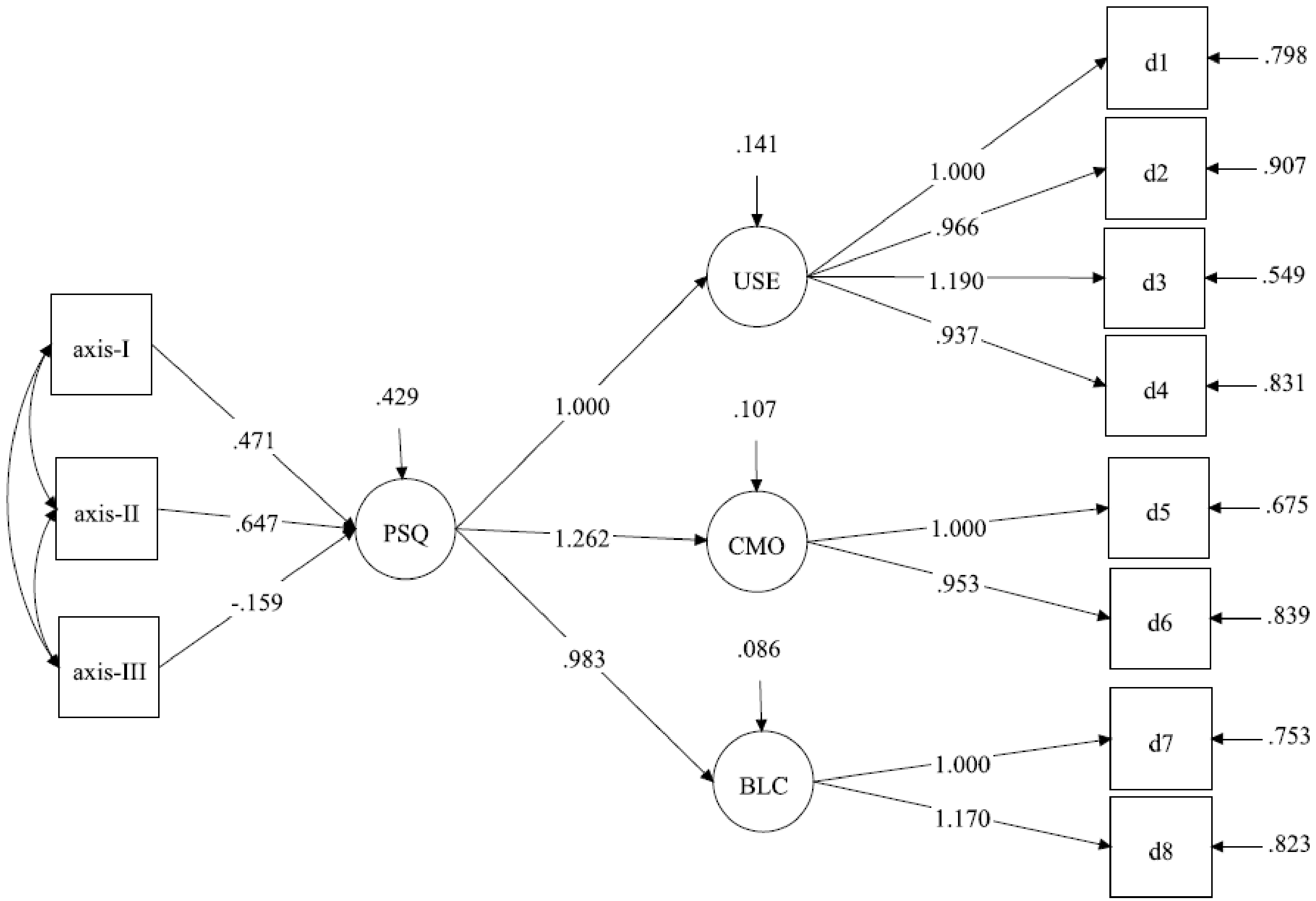

Figure 1. CFA model for the PSQ scale using the DSM-IV multiaxial classsification system as covariate. Factor loadings represent unstandardised parameters estimates. First-order factors associations with the DSM-IV multiaxial classification are not displayed as were not significant.