

Viersprong Institute for Studies on Personality Disorders (VISPD)
Medical Psychology and Psychotherapy

2007 Report 005





Measuring the Core Components of Maladaptive Personality: Severity Indices of Personality Problems (SIPP-118)

The first technical report

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Disclaimer

This report is the first document to describe the development of the self-report questionnaire SIPP-118: Severity Indices of Personality Problems, 118 items. It provides details about the item development and selection, and provides information about validation and reliability studies. The report also describes how facet (subscales) and higher-order domain scores can be computed, and how these scores can be compared to norm values (by means of standardised T-scores). The report is meant as a detailed description of our investigation and was made directly after the data collection, in order to allow fast communication between researchers and/or clinicians.

Although the report will probably remain the most detailed description of our research effort, it must not be seen as the final interpretation of the results. The report now serves as an easy accessible collection of research data, on which basis we hope to write peer-reviewed articles. This original report will remain available on request, for those researchers who would like to have a detailed description of the first research steps with the SIPP-118, and the accompanying data. Note that parts of the report still reveal our early thoughts and interpretations, which are characteristic for a first report written just after finishing the data collection.

Up-to-date information, norm scores, and translations of the SIPP-118 (and its accompanying 60-item short-form version, the SIPP-SF) in Dutch, English, Norwegian, Argentinean/Spanish, and Italian language, are freely available at www.vispd.nl/sipp.htm.

On behalf of the researchers,

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Acknowledgements

The authors are grateful for the generous and conscientious support of Dr. Dick van Kampen (Vrije Universiteit, Amsterdam) and Ms Els Havermans with the data collection.

Abstract

This report describes a series of studies among 2231 subjects on the development of the 118-item Severity Indices for Personality Problems (SIPP-118), a self-report questionnaire measuring the core components of (mal)adaptive personality functioning. Results show that the 16 facets (subscales) have good psychometric properties and test-retest reliability, are generic across various types of personality disorders, and have good discriminative validity between various populations. The facets fit well into a common factor model with five higher-order domains (i.e., self-control, identity integration, responsibility, relational capacities, and social concordance) that are eminently interpretable, and replicable across various populations. Domain scores are strongly associated with interview ratings of the severity of personality pathology. In conclusion, the five higher-order domains of the SIPP represent reliable, robust and valid indices of personality problems.

Key words

Core components of (mal)adaptive personality functioning
Adaptive capacities
Severity of personality disorder
Changeability of personality disorder

Introduction

Human personality development includes the development of adaptive capacities, such as the capacity to exert control over impulses and emotions, to respect and value oneself and others, and to develop and maintain intimate relationships. The development of these capacities starts in early childhood, and continues well into adulthood. Furthermore, many strive after strengthening these capacities throughout adulthood. For example, of those who are characterized by maladaptive personality functioning, some seek psychotherapeutic treatment aiming to improve these capacities. Such treatment is often beneficial, as many patients learn to think, feel, and behave more adaptively. The extent to which personality functioning is adaptive or maladaptive is a relatively new area of research that still lacks reliable, valid and efficient measures. The primary aim of this paper is to fill in this gap by the development and study of a self-report questionnaire.

Changeability of personality and personality disorders

A growing body of evidence supports the notion that human personality is characterized by relative plasticity and changeability. Many cross-sectional (Srivastava et al., 2003; Harpur & Hare, 1994; Cloninger et al., 1993) and longitudinal studies (Jones et al., 2003; Helson, Jones & Kwan, 2002; Helson, Kwan, John & Jones, 2002; Vaidya et al., 2002; Roberts et al., 2001; Robins et al., 2001; Cramer, 2003) have demonstrated substantial mean-level changes, even at the most fundamental level of traits and at advanced ages. Discontinuity has also been observed in personality disorders. Substantial evidence indicates that untreated borderline personality disorder, for example, may show spontaneous gradual recovery over time (Perry, 1993). However, with treatment, the same levels of recovery are achieved in a much shorter time (Perry et al., 1999). With respect to other personality disorders, we know that the diagnostic stability is relatively high in the short term (Tyrer et al., 1988), but relatively low in the long run (Seivewright et al., 2002).

The findings on the changeability of personality are consistent with contextual and transactional theories that predict different changes in personality during different life periods (Caspi & Roberts, 1999; Rothbart, Ahadi & Evans, 2000; Shiner, Masten & Tellegen, 2002; Srivastava et al., 2003; Helson, Mitchell & Moane, 1984). In the transactional theory, for example, individuals are seen as active agents, who play an important role in selecting and shaping their environments, and these environments in turn affect their personalities (Caspi & Moffitt, 1993).

At the same time, these findings contradict theories of personality and personality disorders which postulate that personality develops in childhood and adolescence, and is stable throughout adulthood. A commonly used metaphor for this pattern of personality development, based on a passage from James (1890), is that personality becomes “set like plaster” by age 30 (see Srivastava et al., 2003). This notion has been spread widely and is common knowledge among many. Yet the notion of stable personality should be viewed as a hypothesis. The idea of stability finds its origin in clinical observations, and in the circular reasoning that personality is stable because it is defined as such. Empirical studies, as mentioned, suggest instead that personality is quite variable.

One explanation of the apparently contradicting perspectives is offered by the Five-Factor Theory of personality, in which biologically based tendencies (or traits) and culturally conditioned characteristic adaptations are explicitly distinguished (McCrae & Costa, 1999; McCrae et al., 2000). According to this theory, traits comprise abstract potentials and endogenous dispositions,

as delineated by the Big Five taxonomy, whereas adaptations include acquired skills, coping strategies, and self-concepts. It is primarily the trait profile that determines the style of adaptation, whereas the adaptations themselves determine the level of (mal)adjustment to the environment (McCrae & Costa, 1999). The changeability of personality is likely to be more pronounced for the adaptations than for the traits. McCrae and colleagues (2000, p.184) put it very aptly:

“Basic tendencies [traits] follow a pattern of intrinsic maturation, whereas characteristic adaptations respond to the opportunities and incentives of the social environment. To the extent that the theory is correct, psychologists, educators, and parents will have relatively little impact on the long-term development of personality traits, but they can have an influence on characteristic adaptations (...). Traits can be channeled even if they cannot be changed.”

Consistent with this, Magai (1999) demonstrated little mean-level changes and high stability coefficients for ‘dispositional tendencies’ or ‘emotion traits’ (e.g., trait anxiety and trait aggression) over eight years in a sample of older adults, whereas the respondents reported moderate changes in characteristic adaptations (i.e., five sectors of their identity, including their perspective on life, their goals, and the way in which they relate to others).

The core elements of personality pathology

In clinical psychology and psychiatry, a similar distinction is made between specific traits or styles (i.e., that delineate the various types of personality disorder) and general characteristics of adaptational level (i.e., that describe the core elements of personality disorder). For example, Parker and colleagues (2002) noted that the descriptors of the personality disorders, as listed in DSM-IV and ICD-10, provide an amalgam of descriptors for personality style as well as characteristics of impaired functioning (Parker et al., 2002, p. 503). Several authors have argued that it would be better to measure these two independently (Henry, 1997; Livesley, 1998; Parker, 1997). Livesley & Jang (2000) have gone one step further by arguing that personality disorder should be diagnosed by its ‘core pathology’ alone, and coded on Axis I. They propose that personality style, as measured by trait markers, should still be noted on Axis II. The remainder of this article will focus on the ‘core pathology’ or characteristic adaptations.

Over the past decades, several definitions of the core pathology of personality disorder have been suggested. Early work by Schneider (1958) emphasized the burden of the illness: a personality disorder can only be a disease if either the individual or society suffers from it. Lake (1985) referred to the core component of personality disorder when defining ‘ego strength’ as the relative lack of pervasive and persistent abnormalities in personal and social competence. Millon (1986) argued for the importance of three core components, i.e., functional inflexibility, self-defeating circles, and tenuous stability under stress, as expressed in intimate, peer, family, and work relationships. Similarly, Hill, Harrington, Fudge, Rutter, and Pickles (1989) argued for six domains of functioning, i.e., work, love relationships, friendships, non-intimate social contacts, negotiation, and everyday coping. Livesley (1998) argued that the definition of disordered personality functioning should be based on the definition of normal personality functioning. He referenced Cantor’s (1990) view that “what personality does is best understood in terms of the solution of major life tasks” (Livesley, 1998, p. 140), and defined personality disorder as a tripartite failure of the following interrelated systems: (a) the adaptive self-system (to establish stable and integrated representations of self and others), (b) the capacity for intimacy, and (c) the ability to function effectively at a societal level (Livesley, 2003; Livesley & Jang, 2000). Livesley’s perspective is quite similar to that of Rutter, who wrote that “personality refers to the coherence of functioning that derives from how people react to their given attributes, how they think about themselves, and how they put these together into some form of conceptual whole,”

and that personality disorders are underpinned by “a persistent, pervasive abnormality in social relationships” (Rutter, 1987, p.454).

The theoretical importance of the distinction between specific traits and general level of adaptation is recognized in the DSM-IV, which includes specifications for each of the 10 formal personality disorders (American Psychiatric Association, 1994). For example, it is stated that “Many highly successful individuals display personality traits that might be considered narcissistic” (p. 679), and “Obsessive-compulsive personality traits in moderation may be especially adaptive, particularly in situations that reward high performance” (p. 691). These remarks are followed by the recurrent formulation: “Only when these traits are inflexible, maladaptive, and persisting, and cause significant functional impairment or subjective distress do they constitute a [narcissistic or obsessive-compulsive] personality disorder.”

The severity dimension of personality pathology

Severity has been recognized as a dimension of personality disorder that cuts across the various types of personality disorder (Tyrer, 2005). Accumulating evidence indicates that the severity dimension of personality pathology has important clinical implications. For example, Tyrer and Johnson (1996) recorded severity of personality disorder using a 5-point scale, i.e., a measure that can be derived from scores on the Personality Assessment Schedule (PAS; Tyrer & Alexander, 1979): no personality disorder, personality difficulty, simple personality disorder, complex (diffuse) personality disorder, and severe personality disorder. Several prospective clinical studies have now shown this severity dimension (and particularly the level of complex personality disorder) a remarkably robust predictor of treatment outcome in anxiety and depressive disorders (Seivewright et al., 2004; Tyrer et al., 2004a), recurrent psychotic disorders (Gandhi et al., 2001; Tyrer & Seivewright, 2000), and patients with self-harm (Tyrer et al., 2004b).

It can be argued that the severity of personality disorder is inversely associated with the general level of adaptation or adaptive capacities. Indeed, substantial evidence indicates that measures of adaptive capacities are positively associated with personality disorder, irrespective of style or type of disorder. For example, Svrakic et al. (1993) provided evidence for this by showing that acquired capacities (or character traits), such as self-directedness and cooperativeness, were correlated with personality disorders, irrespective of their type. Quite similarly, Parker and colleagues identified 11 general markers of disordered personality functioning (i.e., disagreeableness, inflexibility, uncaring to others, non-empathic, ineffectiveness, self-defeating, failure to learn from experience, impulsivity, pessimism, instability under stress, lacking self-direction) that could be summarized into the two higher-order factors, designated ‘non-coping’ and ‘non-cooperativeness’ (Parker et al., 2002; Parker et al., 2004).

Threshold between adaptive and maladaptive personality functioning

It can be concluded from the above that the severity of personality pathology is a clinically relevant dimension that is not sufficiently captured by type-based taxonomies such as the DSM-IV-TR. A challenging question is then how to determine the threshold between adaptive and maladaptive functioning, i.e. whether a “disorder” of personality is present (Trull, 2005). It is widely recognized that personality trait elevation (i.e., statistical deviance alone) is neither a necessary, nor a sufficient criterion for disorder (Wakefield, 1992; Livesley & Jang, 2000; Verheul, 2005). The most common approaches recommend an independent evaluation of distress or impairment to determine the presence or absence of maladaptiveness in personality (Trull, 2005; Wakefield & Spitzer, 2002; Wakefield & First, 2003). This recommendation is consistent with the finding that there are maladaptive manifestations at both poles of major

personality dimensions, as is true for each of the five domains of the Big Five. According to Widiger (1993, p.86):

“It would be inconsistent with a dimensional model of personality disorder pathology to provide a single cutoff point to demarcate the presence–absence of clinically significant impairment in social or occupational functioning or subjective distress (APA, 1987, p.335), but it should be assessed relative to the person’s personal, social, cultural, and occupational environments. The level of antagonism that would be maladaptive for a pastoral counselor might not be maladaptive for a police officer (..)”.

Since personality disorders were introduced in DSM-III (APA, 1980), the DSM-IV (American Psychiatric Association, 1994) advanced through providing a definition of general personality disorder, which includes the notion of clinically significant distress or impairment in social, occupational, or other important areas of functioning (American Psychiatric Association, 1994, p.651). However, this definition has been judged as to be too vague to translate into reliable measures or to be helpful in establishing a diagnosis (Livesley, 1998; Livesley, 2003; Svanborg et al., 1999; Parker et al., 2002). As a consequence, the existing semi-structured interview schedules for the assessment of personality disorders typically employ the more explicitly defined criteria of the specific diagnoses as a starting point for diagnosis, and are inconsistent and incomplete in their coverage of the general diagnostic criteria (Verheul & Widiger, 2004).

Probably the most elaborate system proposed to independently determine the presence of maladaptiveness in personality, is that of the Five-Factor Model (FFM) of personality. Widiger, Costa and McCrae (2002) proposed to start with the examination of the person’s personality traits according to the NEO-PI-R. Subsequently, the problems, difficulties, and impairments that are secondary to each trait are identified, and it is determined whether these impairments are clinically significant. The authors provide a list of impairments commonly associated with each of the 60 poles of the 30 facets of the NEO-PI-R (Widiger et al., 2002, pp. 438-442). However, the proposed procedure has yet to be studied. Like the other proposals, as mentioned above, this procedure does not define the term ‘clinically significant’, other than by suggesting that Global Assessment of Functioning (GAF) scale (i.e., Axis V of DSM-IV) scores might be used to determine clinical significance. However, as GAF scores are strongly dependent on psychiatric symptoms, which may well be accounted for by conditions other than personality pathology, it is unlikely that this strategy will solve the problem. Instead, Wakefield and First (2003) argue that – in the case of personality pathology – extreme trait levels must also be accompanied by dysfunction of one or more psychological processes (e.g., cognitive, motivational, behavioral, emotional, or some other psychological mechanism). However, they do not specify how to reliably and validly assess such a dysfunction in psychological processes.

In sum, we are not aware of any feasible strategy for the independent evaluation of the general level of adaptation that can be applied to current (dimensional) models of personality or personality disorder.

Measuring change in the core components of maladaptive personality functioning

The changeability of (mal)adaptive personality is an area of research that still lacks specific and efficient measures which are both reliable and valid (Turner & Dudek, 1997). Ideally, such a measure would meet several requirements. First, assuming that the changeability of personality is likely to be more pronounced for the level of characteristic adaptations or the core components of personality pathology than for basic tendencies or individual differences (McCrae et al., 2000), a change measure should focus on the former (i.e., severity/maladaptiveness), and exclude the latter (i.e., style/type). By definition, these core components should be present

across various types of personality disorder; this requirement is designated 'genericity'. Second, the measure should be sensitive to change and, therefore, adopt an appropriate reference period or time-frame for evaluation. Third, repeated measurement and inclusion in follow-up batteries require a relatively brief administration time and, preferably, a self-report format. Below we evaluate the extent to which existing models and techniques for measuring change in (mal)adaptive personality functioning meet these requirements of genericity, sensitivity to change, and brevity.

Normal and abnormal personality models have traditionally focused on stable individual differences rather than on the malleable core components of personality. Actually, most of the current proposals for a dimensional model of personality disorder emphasize individual differences, including models providing dimensional profiles of existing or modified categories within DSM-IV (e.g., Oldham & Skodol, 2000; Westen & Shedler, 2000), models providing a dimensional reorganization of personality disorder symptoms (e.g., Livesley, Jackson & Schroeder, 1992; Clark, 2003; Harkness & McNulty, 1994; Westen & Shedler, 2000), clinical spectra models (e.g., Siever & Davis, 1991; Krueger, 1999), and general personality models (i.e., Eysenck & Eysenck, 1985; Zuckerman, 1991; Millon, 1981; Patrick, Curtin & Tellegen, 1999; Costa & McCrae, 1992; Kiesler, 1996). The majority of these models aim to provide a dimensional representation of various characteristics of personality disorders rather than to capture the commonalities or core components of these disorders.

Besides focusing on individual differences, most personality measurement techniques stem from the view that personality is a rather unchangeable entity, and are not specifically developed for picking up changes. Instead, some measures encourage users to adopt a broad time frame in evaluating personality. For example, the Personality Diagnostic Questionnaire-4+ (PDQ-4+; Hyler & Rieder, 1994) emphasizes that answers should be based on the past two years. Several interview instruments require traits to be present for most of the adult life (e.g., Structured Interview for DSM-IV Personality Disorders [SIDP-IV], Pfohl et al., 1995; and Structured Clinical Interview for DSM-IV Axis II personality disorders [SCID-II], First et al., 1997). Such requirements are meant to prevent confusing symptoms with personality (i.e., trait-state artefacts), but also result in insensitivity to change in the short and medium run.

Various approaches proposed in the clinical literature can be regarded as attempts to capture the changeable aspects of personality. These include theory-related instruments for measuring dynamic changes (e.g., Karush et al., 1964; Kernberg et al., 1972; Semrad et al., 1973), idiographic (individualized) methods (e.g., Luborsky, 1977; Horowitz, 1987; Perry, 1989), batteries of dynamic scales (e.g., Kaltreider et al., 1981; Huber et al., 2004; Weinryb et al., 1991; Høglend et al., 2000), lists of items for personal and social competence (e.g., Lake, 1985), and self-report rating scales (e.g., Zuroff et al., 2003). These measures for personality change have been developed primarily from a psychodynamic clinical perspective, or have psychometric properties of mixed quality. Another important limitation of these measures is that most are quite comprehensive and time-consuming to administer.

Design of the present investigation

The current investigation reports on the development of the Severity Indices for Personality Problems (SIPP), a self-report questionnaire covering the core components of maladaptive personality functioning that clinicians consider to be changeable. First, a conceptual model underlying the instrument is proposed. Second, facets and items are generated, and basic psychometric properties of the facet scales are provided. Third, a confirmative factor analysis is conducted to establish the factor structure. Fourth, replicability of this factor structure across normal and clinical samples is tested. Fifth, test-retest reliability is explored among university

students. Finally, the associations of the SIPP domains with the number of diagnosable personality disorders are investigated.

Method

Subjects

This report comprises a series of studies involving six samples and a total of 2231 subjects. Table 1 provides an overview over the samples. The first three samples consisted of 555, 309, and 700 admissions to six mental health care institutes in the Netherlands (i.e., Center of Psychotherapy De Viersprong, Halsteren; Altrecht, Utrecht; Zaans Medisch Centrum De Heel, Zaandam; Center of Psychotherapy De Gelderse Roos, Lunteren; GGZWNB, Bergen op Zoom; Center of Psychotherapy Mentrum, Amsterdam). These institutes offer outpatient, day hospital and/or inpatient psychotherapy for patients with personality pathology and/or personality disorders. As part of the standard intake procedure in these institutions, all admissions underwent a routinely distributed assessment battery including self-report questionnaires and a semi-structured interview to measure psychopathology, personality, functional impairments, and treatment history.

The first sample (n=555) included admissions from June 2003 through April 2004. Of these patients, 40.0% were males. The mean age was 33.9 years (SD 10.4, range 16-66). Educational level was low in 13.0%, intermediate in 59.5% and high in 27.5%. The second sample (n=309) included admissions from May 2004 through October 2004, and the third sample (n=659) included admissions from November 2004 through June 2005. Demographics in the latter two samples were not significantly different as compared to the first sample.

The fourth sample consisted of 157 psychiatric outpatients. These patients were randomly selected from the caseloads of 10 psychiatrists and 10 psychotherapists throughout the Netherlands. Of these patients, 22.4% were males. The mean age was 29.1 years (SD 10.4, range 15-57). Educational level was low in 19.9%, intermediate in 49.3% and high in 30.8%.

The fifth sample consisted of 478 individuals from the general population, who participated in a postal personality survey. In total, 1520 general community subjects (50% females) from four age groups (15-24; 25-34; 35-44; and 45-54 years) were randomly drawn from the patient files of 15 general practitioners from the Dutch cities and villages Amsterdam (735,500 inhabitants), The Hague (457,700), Tilburg (197,400), Groningen (175,600), Leiden (117,200), Heerlen (95,000), Kerkrade (50,700), Waddinxveen (26,900), Ermelo (26,800), Reusel (12,400), and Laren (11,900). These subjects received by mail several self-report questionnaires including the Severity Indices of Personality Problems (SIPP). Taking into account 35 booklets that were undeliverable, the response rate was 32.2%. Respondents were mostly female (67.6%), and had a mean age of 36.0 years with a standard deviation of 11.6. Educational level was low in 19.3%, intermediate in 49.1%, and high in 31.6%.

The sixth sample consisted of 32 subjects who completed the questionnaire twice with a 14-21 day interval. Subjects were university students in Amsterdam, and were given a monetary incentive to participate in this study.

Development of the SIPP

To identify the core components of (mal)adaptive personality functioning that are regarded changeable by clinicians, we organized consensus meetings of 10 clinical experts in the field of personality and personality disorder, including three of the authors (RV, JB, AB). In general, the

experts subscribed to the notion that the concept of core components of (mal)adaptive personality functioning is similar to that of adaptive capacities or, in other words, that personality disorders are characterized by deficient levels of adaptive capacities. The experts were requested to identify as many specific adaptive capacities as possible. Initially, 25 facets of adaptive functioning were identified. These were frustration tolerance, effortful control, emotion regulation, aggression regulation, autonomy, assertiveness, flexibility, stable self image, self-reflective functioning, self respect, empathy, feeling recognized, realistic appraisal of others, respect, purposefulness, enjoyment, cooperation, intimacy, enduring relationships, responsible industry, trustworthiness, modesty, consideration, unselfishness, and helpfulness.

Three investigators (PK, AB, and RV) generated a total of 277 items in the English language, which covered all 25 facets. In view of the ultimate aim to develop an internationally adaptable questionnaire, items were formulated such as to facilitate later translation. For instance, idiomatic English expressions and overly long and complicated items were avoided. The time-frame of the questions was the “last three months”. The response format of each item was a 4-point Likert scale: I fully agree; I partly agree; I partly disagree; and I fully disagree. Furthermore, statements like ‘never’ and ‘always’ were avoided in order to avoid response tendencies such as denial, and the use of multiple descriptors (e.g., “I am known as hot-blooded and quick-tempered”) was avoided in order to overcome interpretational problems.

The research reported in this paper was conducted using the Dutch version of the instrument. Two bilingual native Dutch speaking persons independently translated the items into Dutch. Subsequently, the two translators and one researcher conferred to arrive at consensus concerning the translations. The translation was then translated backwards by an independent bilingual translator. Discrepancies between forward and backward translations were identified and, if necessary, items were reformulated.

As a first step in the item selection process, the 277 initial items were evaluated on clarity and comprehensibility by 15 patients. Twelve items that were considered incomprehensible were dropped. If the item was unclear or if the formulation was too complicated, suggestions were made for improvement. Ten items were adapted accordingly. As a second step, the remaining 265 items were evaluated on face validity by 8 clinicians and 4 investigators. Sixty-two items were dropped, because they were considered sensitive to social desirability, non-specific with respect to the facet that the item belonged to, insufficiently generic, unchangeable, or part of a basic tendency rather than an adaptive capacity. As a third step, the remaining 203 items were pilot tested in 300 patients of the Center of Psychotherapy De Viersprong. Based on analysis of the number of missing values and the skewness of items and facets, 40 items were dropped including 3 facets (i.e., realistic appraisal of others, assertiveness, and flexibility). The resulting 163-item version served as the preliminary version that was pilot tested in samples 1, 4, and 5. Based on the data with respect to internal consistency, criterion group validity, and genericity, it was decided to discard six facets, i.e., modesty, unselfishness, autonomy, empathy, consideration, and helpfulness.

As a final step in item selection, uni-dimensionality of the remaining 16 facets was established by means of confirmatory factor analyses (CFA) using the LISREL program (Jöreskog & Sörbom, 2001). Items which clearly violated uni-dimensionality were removed. These analyses resulted in the removal of one item from the facet effortful control, one from the facet intimacy, one from the facet purposefulness, one from the facet enjoyment, and three from the facet self-reflective functioning. Furthermore, inspection of the standardized residuals and modification indices identified for a total of 20 correlated residuals. The fit indices χ^2 , χ^2/df ratio, RMSEA,

CFI, NNFI, and SRMR of the final one-factor solutions indicate acceptable to excellent fit, so that we can conclude that the single factor model fits the individual facets well.

The final version of the instrument included 16 facets, and 118 items. Appendix 1 provides scale descriptions and item examples.

Diagnostic procedure

Personality disorders were measured using the Dutch version of the Structured Interview of DSM-IV Personality Disorders (SIDP-IV; Pfohl et al., 1995; translated by Jong et al., 1996). Interviewers were master-level psychologists, who were trained thoroughly by the first author (RV), and who received monthly booster sessions to avoid drift from the interviewer guidelines. Inter-rater reliability was computed in 30 video-taped interviews rated by three observer-raters. Percentage agreement ranged from 84% (avoidant PD) to 100% (schizoid) (median 95%). Intraclass correlation coefficients (ICC) for the sum of DSM-IV personality disorder traits present (i.e., scores '2' or '3') ranged from 0.60 (schizotypal) through 0.92 (antisocial) (median 0.74).

Statistical procedures

The internal consistency of the facets was analyzed in Sample 1. Facets with Cronbach's alpha below 0.65 in at least one of the sub-samples are considered insufficiently internally consistent and will not be included in the final version of the instrument (Nunnally, 1978). To determine the extent to which facets were generic to the broad spectrum of maladaptive personality functioning, facet scores of patients with personality problems (Sample 1) were compared to facet scores of psychiatric outpatients (Sample 4), and normal individuals (Sample 5) using analysis of variance.

Criterion-group validity was tested by comparison of facet scores in Sample 1, Sample 4, and Sample 5, respectively, using analysis of variance and post-hoc comparison tests with Bonferroni correction.

The extent to which facet scores are generic to various specific personality disorders was analyzed using Pearson correlations.

The covariance structure of the facet scores of the SIPP was investigated in Sample 1 (n=555) using a combination of exploratory and multi-group confirmatory factor analysis. In contrast to the facet item scores, the facet sum scores are continuously, and approximately normally distributed. In these analysis normal theory maximum likelihood estimation was used (Jöreskog and Sörbom, 2001). The aim of these analyses was to establish the first-order factor structure of the facet scores, to investigate the second-order factor structure, and, as explained below in more detail, to compare the factor structure in the various samples. The exploratory factor analyses (EFA) were carried out by fitting factor models with an increasing number of factors. The Promax rotation criterion was used to rotate the factor solution to an interpretable simple structure, with correlated common factors. Interpretability served as the most important criterion in determining the number of factors.

In order to examine the model's replicability across different populations, we cross-validated the resulting factor model using multi-group analysis in LISREL (Jöreskog and Sörbom, 2001; Sörbom, 1974). In a series of three replication analyses, the model was simultaneously tested in Sample 1 (n=555) and an independent validation sample, i.e., Samples 2, 4, and 5, respectively. In comparing Sample 1 with these three samples, we fitted a series of increasingly restrictive models. The aims of these analyses is to determine that the same factor model holds in the

other samples, and that the differences between the samples in means and covariance matrices are attributable to differences in the common factors. The latter aim is important as it addresses the question whether the SIPP facet scores represent the same latent variables in the different samples (Meredith, 1993; Horn and McArdle, 1992; Widaman and Reise, 1997). We fitted the following sequence of increasingly restricted models (these are presented in matrix notation in Appendix 2): (1) a common-factor model, with the same pattern of factor loadings, but without any equality constraints over the groups; (2) a common-factor model, in which the factor loadings are constrained to be equal over the groups; (3) a common-factor model in which factor loadings and intercept terms are restricted to be equal over the groups. In this model, the factor mean differences are estimated; and (4) a model which includes the equality constraints of model 3, and add the constraint that the residual error variances are equal over the groups.

Goodness of fit of the factor models was assessed by considering a variety of fit indices (cf., Bollen & Long, 1993; Schermelleh-Engel et al., 2003) (values in parentheses are indicative of acceptable fit): the χ^2/df ratio (range 2.0–3.0), the Comparative Fit Index (CFI; range 0.95–0.97), the Non-normed Fit Index (NNFI; range 0.95–0.97), the Root Mean Square Error of Approximation (RMSEA; range 0.05–0.08; see Browne & Cudeck, 1993), the Standardized Root Mean Square Residual (SRMR; range 0.05–0.10). The actual chi-square statistic was used as a badness of fit measure as suggested by Jöreskog (1993). We assessed misfit by inspecting the standardized residuals, and the modification indices.

Test-retest reliability was explored in Sample 6 ($n=32$) by computing intra-class correlations (ICC) of the repeated measurements.

The association between SIPP-domain scores and the number of diagnosable personality disorders per patients was examined in a combination of the first three samples ($n=1523$) by analysis of variance and post-hoc comparison tests using the Bonferroni correction (SPSS version 12.0.1).

Results

Internal consistency

Table 2 shows that the internal consistency of the 16 facets was good across the three samples: Cronbach's alphas ranged in Sample 1 (personality disorders) between 0.69–0.86 (median 0.75); in Sample 4 (psychiatric outpatients) between 0.75–0.86 (median 0.79); and in Sample 5 (normals) between 0.65–0.83 (median 0.79).

Criterion-group validity

Table 3 shows means and standard deviations for the 16 facet scores in Samples 1 (personality disorders), 4 (psychiatric outpatients), and 5 (normals). It was expected that the normal sample would have the highest mean scores, followed by the psychiatric outpatient sample, and the personality disorder sample. It appears that the facet scores differentiate well between the samples; 9 facets displayed highest scores in the normal sample, intermediate scores in the psychiatric outpatient sample, and lowest scores in the personality disorder sample, whereas 7 facets displayed higher scores in the normal sample, as compared to both the psychiatric outpatient and personality disorder samples.

Genericity across various types of personality disorders

The extent to which facet scores are generic to various types of personality disorder is investigated by inspecting the (Pearson product moment) correlations between SIDP-IV dimensionalized personality disorder scores and SIPP facet scores in the full personality disorder sample (i.e., Samples 1 thru 3, $n=1523$; see Table 4). As expected, most facets are negatively correlated with the majority of specific personality disorders. Table 4 also shows that personality disorders vary with respect to the number of negative and positive correlations. Borderline personality traits correlate negatively to all facets. On the other hand, obsessive-compulsive personality traits are correlated negatively only with frustration tolerance, enjoyment, respect, and cooperation, whereas this disorder is correlated positively with responsible industry ($r=0.19$, $p<0.01$). Other positive correlations are observed between schizoid personality traits and effortful control ($r=0.10$, $p<0.05$), schizotypal personality traits and self respect ($r=0.14$, $p<0.01$), histrionic personality traits and intimacy ($r=0.24$, $p<0.01$), and dependent personality traits and self-reflexive functioning ($r=0.16$, $p<0.01$).

Covariance structure of the facet scores.

Exploratory factor analyses were carried out in the personality disorder sample ($n=555$, see Table 5). Based on the criterion of interpretability, a five common factor model was chosen. These 5 factors accounted for 73% of the variance. Following rotation the explained variance was distributed fairly equally over the 5 factors. Based on the pattern of rotated factor loadings the common factors were interpreted as follows: Factor 1 'Self-control' (with primary loadings of emotion regulation, effortful control, stable self image, and self-reflective functioning), Factor 2 'Social concordance' (with primary loadings of aggression regulation, respect, and cooperation), Factor 3 'Identity integration' (with primary loadings of frustration tolerance, self respect, purposefulness, and enjoyment), Factor 4 'Relational functioning' (with primary loadings of feeling recognized, intimacy, and enduring relationships), and Factor 5 'Responsibility' (with primary loadings of responsible industry and trustworthiness).

As a second step, this 5-factor model including only the primary loadings was tested using CFA in Sample 1 ($n=555$). Based on a combination of theoretical considerations and large secondary loadings in the EFA, it was decided to move the facet 'frustration tolerance' from Factor 3 'Identity integration' to Factor 2 'Social concordance', and to move the facets 'stable self-image' and 'self-reflective functioning' from Factor 1 'Self-control' to Factor 3 'Identity integration'. It appeared that the simple 5-factor model still fitted the data rather poorly (Table 6).

It was decided to attempt to further improve this model by allowing secondary loadings of the facets on the five factors. Nine theoretically plausible secondary loadings were identified, i.e., positive secondary loadings for the facets 'aggression regulation', 'frustration tolerance', 'stable self-image', and 'self-reflective functioning' on Factor 1 'Self-control'; a positive secondary loading for the facet 'feeling recognized' on Factor 2 'Social concordance'; a positive secondary loading for the facet 'cooperation' on Factor 4 'Relational functioning'; positive secondary loadings for the facets 'effortful control' and 'enduring relationships', and a negative secondary loading for 'enjoyment' on Factor 5 'Responsibility'. The model fit of the resulting model (including the nine secondary factor loadings) was substantially better, but remained unsatisfactory. An adequate and well fitting model was arrived at by adding three additional secondary factor loadings (that were identified using the modification indices in the output). These are a negative secondary loading for the facet 'stable self-image' on Factor 2 'Social concordance'; a positive secondary loading for the facet 'frustration tolerance' on Factor 3 'Identity integration'; and a positive secondary loading for the facet 'feeling recognized' on Factor 4 'Self-control'. The final model is reported in Appendix 2.

In Table 7, Pearson correlations between the domain scores are shown. As can be seen, domain scores are only moderately associated, with correlations ranging from 0.25 thru 0.63. Importantly, the domain scores were derived from the factor score regressions as reported in Appendix 2.

Replicability of factor structure across samples

The final model was then cross-validated by comparison of the factor structures in the original sample (n=555) with the three independent Samples 2, 4, and 5 (n=309, n=157, and n=478, respectively), using a series of multi-group analyses (see Table 8; Appendix). The overall fit does not decrease significantly by introducing the restrictions of equal factor loadings and intercepts. Most fit indices stay within the acceptable range in all three multi-group analyses. Only in the analyses of Sample 1 and 5, do we find that the most restrictive model (i.e., Model 4) is associated with an appreciable deterioration in fit. However this is limited to the equality of the residual covariance matrices. The overall conclusion from the multi-group analyses is that the proposed 5-factor model with its original primary and secondary factor loadings and means fits adequately within the other three samples. Thus the factor structure appeared to be replicable across various populations.

Test-retest reliability

Test-retest reliability was good to excellent in the student sample. At the lower-order facet level, intra-class correlations between the two measurements ranged from 0.85 for frustration tolerance to 0.95 for responsible industry and enjoyment (median 0.92). At the higher-order domain level, intra-class correlations ranged from 0.92 for social concordance to 0.97 for identity integration, self-control, and responsibility (median 0.97). These findings suggest that SIPP scores are stable over short time intervals.

Association of SIPP domains with severity of personality problems

Table 9 shows the means and standard deviations of SIPP-domain scores for several severity groups that are distinguished on the basis of the number of diagnosable personality disorders. The results show that, on each of the five domains, patients without an Axis II diagnosis score significantly higher than those with one diagnosable personality disorder; those with one diagnosable personality disorder score significantly higher than those with 2 or 3 diagnosable personality disorders; and those with 2 or 3 diagnosable personality disorders score significantly higher than those with 4 or more diagnosable personality disorders. The differences between groups are most pronounced for scores on the domain of identity integration ($F(3,1525)=128.23$, $p<0.001$) and least pronounced for scores on the domain of responsibility ($F(3,1525)=32.28$, $p<0.001$).

General discussion

The aim of the present paper was to report on the design and development of the SIPP-118, a self-report questionnaire that measures the core components of (mal)adaptive personality functioning that clinicians consider to be changeable. This study has shown that the 16 facets are characterized by good internal consistency, good genericity across various types of personality disorders, and good discriminative validity between various populations. The 16 facets can be summarized into five higher-order domains in a common factor model, which fits the data well, and is eminently interpretable. This factor structure was shown to hold, to reasonable approximation, in both clinical and normal populations. Preliminary results indicate that test-retest reliability is good at the facet level, and excellent at the domain level. Finally, the

domain scores are strongly associated with interview ratings of the severity of personality pathology.

Theoretical significance of the concept of adaptive capacities

The SIPP-118 is consistent with a relatively new line of thinking concerning the importance of the core components of personality pathology (Livesley & Jang, 2000; Parker et al., 2002; Svanborg et al., 1999; Cloninger, 2000), the severity of personality disorder (Tyrer, 2005), and dimensional approaches (Widiger & Simonsen, 2005). It is also consistent with the distinction between basic tendencies and characteristic adaptations in normal psychology (McCrae & Costa, 1999; McCrae et al., 2000). Accordingly, the instrument explicitly focuses on the core components of personality pathology (or characteristic adaptations) that gradually develop over time through learning and maturation, and that help the individual to balance between inner needs/motives and external conditions/requirements, rather than on biologically based tendencies underlying individual differences. Notwithstanding the theoretical importance of this distinction, it is not evident, nor does it follow from the current investigation, that the core components are also empirically separable from the four major dimensions of personality disorders, such as proposed by Widiger and Simonsen (2005), i.e., emotional dysregulation vs. emotional stability, constraint vs. impulsivity, extraversion vs. introversion, and antagonism vs. compliance. For example, it is likely that the SIPP domains 'Self-control', 'Responsibility' and 'Social concordance' are related to Widiger and Simonsen's dimensions of emotional stability, constraint, and compliance, respectively. Similarly, a recent joint factor-analytic study of the NEO Five-Factor Inventory (Costa & McCrae, 1992) and the Temperament and Character Inventory (TCI, including the three 'character' dimensions 'self-directedness', 'self-transcendence', and 'cooperativeness'; Cloninger et al., 1993) produced five higher-order factors similar to the Big Five personality factors of Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness (Ramanaiah et al., 2002). However, the SIPP domains 'Identity integration' and 'Relational functioning' are less easy to be interpreted in terms of the Big Four/Five.

It is expected that low scores on the SIPP domains occur at both extremes of the Big Four/Five dimensions (i.e., non-linear relationship). Consistently, accumulating evidence suggests that normal personality traits include adaptive as well as maladaptive aspects of human behavior (e.g., Soldz et al., 1993; Coker, Samuel & Widiger, 2002). For example, Soldz et al. (1993) examined the correlations between personality disorder symptomatology and the Big Five, and showed that both poles of all five domains displayed at least some correlations with maladaptive personality functioning. For example, surgency was negatively correlated with the schizoid, schizotypal, avoidant, and obsessive-compulsive personality disorders and was positively correlated with the histrionic, narcissistic, and antisocial personality disorders. In addition, several studies have shown that normal personality traits are strongly and in expected directions correlated with maladaptive personality traits (e.g., Saulsman & Page, 2004; Clark, Vorkies & McEwen, 2002; Wiggins & Pincus, 1989). Further research is required to disentangle the core components from the major dimensions of personality pathology.

Comparison with concurrent approaches

As a model for the core components of personality disorder, the SIPP was preceded by approaches of Cloninger and colleagues (TCI; 1993), Parker and colleagues (2004), and Livesley (2000). Cloninger's model has three theory-driven character dimensions (Cloninger et al., 1993), which include subscales that resemble SIPP facets. Specifically, TCI's 'self-acceptance' is similar to SIPP's 'self-respect', TCI and SIPP both include 'purposefulness', TCI's 'responsibility' is similar to SIPP's 'responsible industry', TCI's 'social acceptance' is similar to SIPP's 'feeling recognized', and TCI's 'principles' is similar to SIPP's 'respect'. However,

differences between TCI and SIPP outnumber similarities. In particular, the SIPP has greater coverage of 'Self-control' facets (e.g., emotion regulation and effortful control), 'Social concordance' facets (e.g., aggression regulation, frustration tolerance and cooperation), 'Identity integration' facets (e.g., stable self-image, self-reflective functioning and enjoyment), and 'Relational functioning' facets (e.g., intimacy and enduring relationships). On the other hand, the SIPP excludes subscales such as empathy, helpfulness and compassion (fitting into the 'Cooperativeness' domain), that appeared to have little if any discriminative validity in this study. The SIPP also excludes coverage of the TCI 'Self-transcendence' domain. These differences may explain the differences in factor structure of the SIPP (5 factors) as compared with the TCI (3 factors).

Parker et al.'s (2004) model included 11 disease-oriented aspects of personality disorder, which were derived from their extensive literature review (Parker et al., 2004). Again, there are some resemblances with the SIPP. However, these are outnumbered by the differences. Parker et al.'s constructs of 'disagreeableness', 'ineffectiveness', 'instability under stress' and 'lacking self-direction' are probably inversely associated with the SIPP facets 'cooperation', 'effortful control', 'emotion regulation' and 'purposefulness', respectively. However, the adaptive variants of Parker et al.'s dimensions of 'inflexibility', 'uncaring to others', 'non-empathic', 'self-defeating', 'failure to learn from experience', 'impulsivity' and 'pessimism' were not included in the SIPP, because they were considered too specific to some personality disorder types, particularly antisocial, obsessive-compulsive, self-defeating, and depressive personality disorders, and therefore lack sufficient genericity.

The construct of adaptive capacities, as proposed in this paper, may well be related to the concept of emotional intelligence, which has been defined as an array of emotional and social abilities, competencies and skills that enable individuals to cope with daily demands and be more effective in their personal and social life (Salovey & Mayer, 1990; Bar-On, 1997; Gerits et al., 2004). For example, the Bar-On EQ-i is a self-report measure comprising 133 items that can be used to obtain a total emotional quotient (EQ), and composite scores of intrapersonal EQ (comprising self-regard, emotional awareness, assertiveness, independence, and self-actualization), interpersonal EQ (comprising empathy, social responsibility and interpersonal relationship), stress management EQ (comprising stress tolerance and impulse control), adaptability EQ (comprising reality testing, flexibility and problem solving), and general mood EQ (comprising optimism and happiness) (Bar-On, 1997). Consistently, Leibe and Snell (2004) reported lower scores on emotional clarity, emotion regulation, and emotional attention across a broad range of personality disorders. Interestingly, emotional intelligence has been reported to show substantial conceptual overlap with the Big Five major personality domains (particularly agreeableness and emotional stability; De Raad, 2005), yet it seems to predict unique additional variance over and above the Big Five in such areas as the quality of social interaction (Lopes et al., 2004; Zee & Wabeke, 2004) and life satisfaction (Gannon & Ranzijn, 2005). It would also be interesting to examine the added value of the SIPP domains as compared to other personality measures in predicting future functioning.

Applicability for research purposes

The SIPP-118 was developed primarily for research purposes, in particular the measurement of structural personality changes in natural course or treatment studies. It is widely acknowledged that standard assessment of personality change, for instance to be included in a core outcome battery, is desirable but as yet lacking (Turner and Dudek, 1997). The Inventory of Interpersonal Problems (IPP; Horowitz et al., 1988) is often used in psychotherapy studies and is also frequently mentioned as an instrument that should be included in a core battery (Pilkonis, 1997).

However, its scope is limited to assertiveness, sociability, and interpersonal sensitivity (Gude et al., 2000).

In particular, the breadth and lack of specificity of the personality disorder domain, and the incommensurability of treatment goals in this population, present serious limitations to the realization of a core outcome battery (Messer & Warren, 1990; Turner and Dudek, 1997). In this respect, the SIPP-118, specifically developed to this end, offers an interesting option: it circumvents the specificity problem by measuring the core components of personality disorder, and it comprises a wide range of treatment goals.

In the area of personality disorders, the Schedule for Non-adaptive and Adaptive Personality (SNAP; Clark, 1993) and the Dimensional Assessment of Personality Pathology – Basic Questionnaire (DAPP-BQ; Livesley et al., 1992) are often mentioned as candidates for core batteries of change measurement (Shea, 1997; Pilkonis, 1997). However, the instruments are rather lengthy (250+ items), have unknown sensitivity to change, because they are not specifically designed to measure change, and focus on individual differences rather than changeable core components. Again, the SIPP-118 would provide an efficient alternative to these instruments.

Directions for future research

The present results demonstrate several strengths of the SIPP-118. The final item set was derived by careful and extensive facet and item generation, which was followed by an exhaustive empirical study. The resulting instrument is an efficient self-report measure covering a broad range of core components of personality pathology. It has excellent psychometric properties, a robust and replicable covariance structure, and good discriminative and construct validity. However, various questions and issues remain open to further investigation. First, further research is required to disentangle the core components from the major dimensions of personality pathology (see above). Second, the SIPP's sensitivity to personality change and its insensitivity to state changes have to be established. Third, the added value of these changes, over and above symptomatic improvement, in predicting future social and occupational functioning has yet to be established. These issues will be addressed in a series of future studies within the framework of the ongoing Study on Cost-Effectiveness of Personality Disorder Treatment (Project SCEPTRE).

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Tables

Table 1: Overview of the six samples totalling 2160 subjects

Sample	N	Type of participants	Population
1	555	Patients with personality problems or disorders	Consecutive series of admissions for psychotherapy in six institutions
2	309	Idem	Idem
3	659	Idem	Idem
4	157	Psychiatric outpatients	Randomly selected from the caseloads of 10 psychiatrists and 10 psychotherapists
5	478	Individuals from the general population	Randomly drawn from the patient files of 15 general practitioners throughout The Netherlands
6	32	Students	Non-random sample

Table 2: Internal consistency of the 22 facets

Facet	Number of Items	Cronbach's alpha		
		Sample 1 (n=555)	Sample 4 (n=157)	Sample 5 (n=478)
Frustration tolerance	8	.73	.75	.78
Effortful control	7	.79	.79	.72
Emotion regulation	7	.74	.79	.82
Aggression regulation	8	.86	.86	.79
Autonomy	7	.63	.68	.63
Stable self image	7	.74	.76	.82
Self-reflexive functioning	7	.74	.78	.81
Self respect	8	.81	.86	.83
Empathy	6	.71	.72	.64
Feeling recognized	8	.77	.80	.80
Respect	7	.69	.75	.65
Purposefulness	7	.74	.81	.74
Enjoyment	7	.75	.81	.79
Cooperation	8	.76	.79	.76
Intimacy	7	.80	.81	.83
Enduring relationships	7	.73	.79	.75
Responsible industry	7	.73	.78	.68
Trustworthiness	8	.78	.76	.69
Modesty	5	.56	.71	.62
Consideration	6	.68	.66	.54
Helpfulness	7	.60	.78	.59
Unselfishness	7	.74	.77	.64

Table 3: Mean facet scores of patients with personality pathology, psychiatric outpatients, and individuals from the general population

Facet	Sample 1	Sample 4	Sample 5	Comparison of group means	
	(n=555)	(n=157)	(n=478)	F ^{a,b}	Post-hoc differences ^c
	M (SD)	M (SD)	M (SD)		
Agression regulation	3.30 (0.73)	3.34 (0.66)	3.66 (0.45)	43.10***	1,2<3
Autonomy	2.35 (0.53)	2.53 (0.53)	3.00 (0.50)	202.90***	1<2<3
Frustration tolerance	2.24 (0.56)	2.36 (0.56)	2.96 (0.56)	226.59***	1<2<3
Effortful control	2.53 (0.70)	2.80 (0.71)	3.16 (0.56)	124.78***	1<2<3
Emotion regulation	2.44 (0.69)	2.78 (0.63)	3.30 (0.61)	226.87***	1<2<3
Stable self image	2.21 (0.66)	2.39 (0.63)	3.24 (0.67)	323.97***	1<2<3
Self-reflexive functioning	2.51 (0.57)	2.67 (0.55)	3.20 (0.56)	195.42***	1<2<3
Self respect	2.36 (0.67)	2.35 (0.74)	3.30 (0.59)	308.42***	1,2<3
Empathy	3.23 (0.57)	3.30 (0.51)	3.34 (0.47)	4.78**	1<3
Feeling recognized	2.63 (0.62)	2.84 (0.60)	3.23 (0.56)	127.91***	1<2<3
Respect	3.14 (0.53)	3.11 (0.53)	3.34 (0.45)	25.02***	1,2<3
Purposefulness	2.42 (0.64)	2.71 (0.64)	3.34 (0.49)	315.57***	1<2<3
Enjoyment	2.32 (0.64)	2.55 (0.74)	3.34 (0.62)	324.98***	1<2<3
Cooperation	2.84 (0.58)	2.81 (0.57)	3.28 (0.51)	93.18***	1,2<3
Intimacy	2.68 (0.69)	2.76 (0.63)	3.17 (0.60)	73.70***	1,2<3
Enduring relationships	2.47 (0.67)	2.54 (0.65)	3.31 (0.58)	238.37***	1,2<3
Responsible industry	2.87 (0.67)	3.07 (0.69)	3.44 (0.50)	108.07***	1<2<3
Trustworthiness	3.04 (0.61)	3.14 (0.53)	3.49 (0.42)	90.56***	1,2<3
Modesty	3.00 (0.60)	3.10 (0.59)	3.23 (0.55)	17.59***	1,2<3
Consideration	3.19 (0.57)	3.29 (0.49)	3.28 (0.43)	3.68*	ns
Helpfulness	3.12 (0.49)	3.09 (0.52)	3.22 (0.43)	7.39**	1,2<3
Unselfishness	3.22 (0.57)	3.18 (0.56)	3.41 (0.46)	20.39***	1,2<3

***p<0.001; **p<0.01; *p<0.05

^aDue to missing values in some of the facets in the Sceptre population, the degrees of freedom for the residuals of the model vary between 1159 [thus F(2,1159)] and 1162 [thus F(2,1162)]

^bAfter controlling for gender and age (divided in five age groups: 18-25; 26-35; 36-45; 46-55; 56-65)

^cPost-hoc comparison tested with Bonferroni correction, with p<0.01 unless indicated otherwise

Table 4: Pearson correlations between SIDP-IV dimensionalized personality disorder scores and SIPP facet scores

Personality disorders ¹ Facets	Cluster A			Cluster B				Cluster C			Other			Pearson	
	personality disorders			personality disorders				personality disorders			personality disorders			correlations	
	SCZ	PAR	STY	BOR	ANT	NAR	HST	DEP	AVD	OBS	NEG	DEP	SDF	range ²	media n ²
Aggression regulation	-.02	-.34**	-.22**	-.36**	-.24**	-.20**	-.20**	-.00	.00	.01	-.34**	-.07	-.12**	-.36/.01	-.12
Emotion regulation	.06	-.17**	-.06	-.45**	-.09*	-.08	-.21**	-.22**	-.08	-.07	-.21**	-.18**	-.21**	-.45/.06	-.17
Effortful control	.10*	-.19**	-.06	-.44**	-.20**	-.11*	-.29**	-.15**	.06	.07	-.24**	-.06	-.17**	-.44/.10	-.15
Frustration tolerance	-.02	-.22**	-.08	-.32**	-.09*	-.07	-.17**	-.22**	-.21**	-.11*	-.29**	-.32**	-.16**	-.32/-.02	-.17
Responsible industry	.06	-.07	-.05	-.22**	-.28**	-.14**	-.13**	-.16**	-.06	.19**	-.20**	-.03	-.13**	-.28/.19	-.13
Trustworthiness	.05	-.08	-.07	-.26**	-.36**	-.18**	-.14**	-.09	-.03	.07	-.18**	.02	-.17**	-.26/.07	-.09
Stable self image	.02	-.15**	-.09	-.43**	-.13**	-.01	-.28**	-.23**	-.05	.07	-.16**	-.14**	-.32**	-.43/.07	-.14
Self respect	-.13**	-.12**	.14**	-.30**	-.03	.09	-.05	-.34**	-.36**	-.08	-.04	-.40**	-.36**	-.40/.14	-.12
Self-reflexive functioning	-.11*	-.16**	-.10*	-.29**	-.14**	.03	-.05	.16**	-.12**	.03	.01	-.15**	-.31**	-.31/.16	-.11
Purposefulness	-.12**	-.12**	-.09	-.30**	-.12**	-.03	-.08	-.25**	-.17**	-.01	-.12**	-.31**	-.30**	-.31/.01	-.12
Enjoyment	-.16**	-.11**	-.13**	-.18**	.05	.01	.03	-.17**	-.20**	-.16**	-.01	-.32**	-.37**	-.37/.05	-.16
Autonomy	.10	.05	.11	-.11*	.06	.10	-.11*	-.45**	-.23**	-.01	.06	-.18**	-.15**	-.45/.11	-.01
Feeling recognized	-.22**	-.29**	-.19**	-.26**	-.06	-.09	-.10*	-.13**	-.25**	-.01	-.18**	-.20**	-.23**	-.29/-.01	-.19
Empathy	-.11**	-.16**	-.12**	-.10*	-.20**	-.28**	-.06	.12**	-.05	.07	-.21**	.09	.10	-.28/.12	-.10
Intimacy	-.36**	-.19**	-.21**	-.09*	.00	.04	.24	-.05	-.37**	-.08	.08	-.21**	-.23**	-.37/.24	-.09
Enduring relationships	-.29**	-.20**	-.22**	-.23**	-.06	-.05	-.02	-.12**	-.33**	-.03	-.05	-.26**	-.30**	-.33/-.02	-.20
Respect	-.01	-.26**	-.12*	-.15**	-.10*	-.35**	-.20**	.06	-.04	-.11*	-.35**	-.07	.02	-.35/.06	-.11
Cooperation	-.21**	-.21**	-.18**	-.09*	-.08	-.14**	-.01	.02	-.26**	-.13**	-.13**	-.14**	-.06	-.26/.02	-.13
Modesty	-.02	-.25**	-.08	-.13**	-.14**	-.38**	-.19**	.02	-.03	-.09	-.28**	.00	.07	-.38/.07	-.09
Consideration	.01	-.15**	-.08	-.21**	-.28**	-.23**	-.17**	.14**	.16**	.12**	-.22**	.14**	.03	-.28/.16	.01
Helpfulness	-.10*	-.08	-.08	-.00	-.06	-.18**	.00	.08	.11*	.05	-.13**	.00	.17	-.18/.17	.00
Unselfishness	-.08	-.16**	-.14**	-.13**	-.19**	-.29**	-.14**	.07	-.02	.02	-.22	.09	.06	-.29/.09	-.13
# correlations neg/pos	10/0	18/0	10/0	21/0	14/0	11/0	13/1	12/2	10/2	4/2	14/0	12/1	15/0		

* p<0.05, ** p<0.01

¹SCZ=schizoid, PAR=paranoid, STY=schizotypal, BOR=borderline, ANT=antisocial, NAR=narcissistic, HST=histrionic, DEP=dependent, AVD=avoidant, OBS=obsessive-compulsive, NEG=negativistic, DEP=depressive, SDF=self-defeating

²Range and median of Pearson correlations per facet as an indicator of the extent to which the facets are generic across various personality disorders

Table 5: Goodness-of-fit indices of one-factor models for each of the 16 facets

Model ¹	χ^2	χ^2/df	RMSEA	CFI	NNFI	SRMR
Aggression regulation	50.3	2.65	0.055	0.989	0.984	0.056
Emotion regulation	36.1	3.01	0.060	0.973	0.953	0.057
Effortful control	29.3	2.25	0.048	0.983	0.972	0.038
Frustration tolerance	35.4	1.86	0.039	0.979	0.969	0.050
Responsible industry	28.3	2.18	0.046	0.983	0.973	0.054
Trustworthiness	45.7	2.54	0.053	0.969	0.952	0.057
Stable self image	46.0	3.54	0.068	0.971	0.953	0.073
Self-respect	44.9	2.25	0.047	0.978	0.969	0.055
Self-reflexive functioning	27.1	2.08	0.044	0.976	0.961	0.046
Purposefulness	39.0	3.25	0.064	0.987	0.978	0.063
Enjoyment	47.0	3.62	0.069	0.971	0.954	0.060
Feeling recognized	56.4	2.97	0.060	0.941	0.913	0.063
Intimacy	59.6	4.97	0.085	0.968	0.944	0.071
Enduring relationships	36.3	2.79	0.057	0.963	0.936	0.061
Respect	36.3	2.79	0.057	0.941	0.905	0.059
Cooperation	53.7	2.98	0.060	0.948	0.919	0.065

¹The fit indices presented refer to the final models, after deleting seven items and allowing correlated error terms for 20 specific pairs of items

Table 6: Promax-Rotated Factor Loadings

	Factor loadings ¹				
	I	II	III	IV	V
Eigen values	6.259	1.103	2.103	1.442	0.795
% Explained variance	39.117	6.892	13.146	9.014	4.969
Factor 1: Self-control					
Emotion regulation	.85	.21			
Effortful control	.77				
Stable self image	.51		.31		
Self-reflexive functioning	.43			.26	
Factor 2: Social concordance					
Aggression regulation	.48	.49			
Respect		.70			
Cooperation		.56		.31	
Factor 3: Identity integration					
Frustration tolerance	.22	.47	.49	-.21	
Self-respect			.55		
Purposefulness			.71		.20
Enjoyment			.69		
Factor 4: Relational functioning					
Feeling recognized		.23		.38	
Intimacy				.77	
Enduring relationships				.74	
Factor 5: Responsibility					
Responsible industry					.85
Trustworthiness					.81

Table 7: Fit indices for Confirmatory Factor Analyses

	χ^2	χ^2/df	RMSEA	NNFI	CFI	SRMR
5-factor model, primary loadings only	756	9.57	0.121	0.804	0.847	0.082
5-factor model, including secondary loadings	218.8	2.77	0.056	0.951	0.968	0.030

Table 8: Pearson correlations between the higher-order domain scores

	Self-control	Social concordance	Identity integration	Relational functioning	Responsibility
Self-control	1				
Social concordance	.59	1			
Identity integration	.60	.38	1		
Relational functioning	.36	.44	.63	1	
Responsibility	.53	.39	.42	.25	1

Table 9: Replicability of latent factor structure: fit indices for multi-group analyses

Model ¹	χ^2	χ^2/df	RMSEA	NNFI	CFI	SRMR
Sample 1 & Sample 2						
Model 1	378.9	2.40	0.057	0.951	0.968	0.036
Model 2	418.0	2.30	0.055	0.955	0.966	0.041
Model 3	450.6	2.34	0.055	0.953	0.963	0.041
Model 4	472.7	2.22	0.053	0.958	0.962	0.050
Sample 1 & Sample 4						
Model 1	402.9	2.55	0.065	0.937	0.959	0.051
Model 2	442.7	2.43	0.062	0.942	0.956	0.065
Model 3	504.4	2.61	0.067	0.935	0.947	0.066
Model 4	568.2	2.67	0.068	0.932	0.940	0.112
Sample 1 & Sample 5						
Model 1	484.1	3.06	0.063	0.950	0.967	0.031
Model 2	571.6	3.14	0.064	0.948	0.961	0.049
Model 3	624.1	3.23	0.065	0.946	0.956	0.051
Model 4	1519.2	7.13	0.098	0.851	0.868	0.082

¹See appendix

Table 10: The association between SIPP-domain scores and the number of diagnosable personality disorders per patient (n=1564)

Number of personality disorder diagnoses	Self-control	Social concordance	Identity Integration	Relational Functioning	Responsibility
	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)
0 (n=286)	5.07 (0.83)	6.04 (0.70)	4.03 (0.69)	4.47 (0.75)	4.84 (0.82)
1 (n=430)	4.72 (0.92)	5.80 (0.81)	3.65 (0.69)	4.10 (0.83)	4.59 (0.86)
2-3 (n=576)	4.32 (0.92)	5.45 (0.84)	3.29 (0.67)	3.74 (0.77)	4.34(0.92)
≥4 (n=272)	3.87 (0.94)	5.13 (0.90)	2.98 (0.61)	3.43 (0.70)	4.18 (0.84)
F (3,1525) ^{a,b}	88.67***	75.85***	128.23***	100.68***	32.28***

^aDue to missing values in the SIPP-domains, the degrees of freedom for the residuals of the model is n=1525

^bAfter controlling for gender and age (divided in five age groups: 18-25; 26-35; 36-45; 46-55; 56-65)

*** p<0.001, and all post-hoc comparisons (with Bonferroni correction) were statistically significant

Appendix 1: Multi-group factor models

In the present Appendix, we present the multi-group models discussed in table 9 in matrix notation of the LISREL program (Jöreskog & Sörbom, 2001). Let \mathbf{y}_{ij} denote the observed r -dimensional random column vector containing the observed facet scores of subject j in population i . The following common factor model is assumed to hold for observation y_{ij} :

$$\mathbf{y}_{ij} = \mathbf{v}_{yi} + \Lambda_i \boldsymbol{\eta}_{ij} + \boldsymbol{\varepsilon}_{ij},$$

where $\boldsymbol{\eta}_{ij}$ is a p -dimensional vector of first-order factors, and $\boldsymbol{\varepsilon}_{ij}$ is a r -dimensional vector of residuals (uncorrelated with $\boldsymbol{\varepsilon}_{ij}$). Λ_i is a $r \times p$ dimensional matrix of first-order factor loadings, which can be interpreted as regression coefficients, in the regression of the subtest scores \mathbf{y}_{ij} on the first-order factors $\boldsymbol{\eta}_{ij}$. \mathbf{v}_{yi} is a r -dimensional vector of intercepts in this same regression. The implied covariance matrix and mean vector are:

$$\Sigma_i = \Lambda_i \Psi_i \Lambda_i^t + \Theta_i, \text{ and } \boldsymbol{\mu}_i = \mathbf{v}_i + \Lambda_i \boldsymbol{\alpha}_i,$$

where Ψ_i is the ($p \times p$) covariance matrix of the common factors, and $\boldsymbol{\alpha}_i$ is the ($p \times 1$) vector of factor means. Often means are not explicitly included in factor analyses. In multi-group factor analysis aimed at establishing that the same factor model holds over populations, means are indispensable (Meredith, 1993). We fitted the following sequence of factor two-group factor models (see Widaman and Reise, 1997; Horn and McArdle, 1992). Model 1:

$$\Sigma_i = \Lambda_i \Psi_i \Lambda_i^t + \Theta_i, \text{ and } \boldsymbol{\mu}_i = \mathbf{v}_i, \quad i=1,2.$$

In this model the configuration of factor loadings is identical, but the model includes no equality constraints over the groups. The means in the two groups are simply estimated, without imposing any structure.

In model 2, we constrain the factor loadings to be identical. To express this we drop the group index on the matrix of factor loadings:

$$\Sigma_i = \Lambda \Psi_i \Lambda^t + \Theta_i, \text{ and } \boldsymbol{\mu}_i = \mathbf{v}_i, \quad i=1,2.$$

This model states that the regression coefficients (in the regression of the observed y_{ij} on the latent h_{ij}) are equal over the groups.

In model 3, we introduce the mean structure, by equating the intercepts over the groups. With these constraints in place, we can estimate the common factor means:

$$\Sigma_i = \Lambda \Psi_i \Lambda^t + \Theta_i, \text{ and } \mu_i = \nu + \Lambda \alpha_i, \quad i=1,2.$$

However, as explained by Sorbom (1974), it is not possible to estimate the factor means in both groups. It is therefore common practice to fix the factor means to zero in one groups and estimate the common factor mean differences in the other:

$$\Sigma_i = \Lambda \Psi_i \Lambda^t + \Theta_i, \text{ and } \mu_1 = \nu, \text{ and } \mu_2 = \nu + \Lambda [\alpha_2 - \alpha_1] \quad i=1,2.$$

This is an important model, because it states that the observed mean differences are attributable to the common factor mean differences.

Finally, in model 4, we impose the constraints that the residual variances are equal:

$$\Sigma_i = \Lambda \Psi_i \Lambda^t + \Theta, \text{ and } \mu_1 = \nu, \text{ and } \mu_2 = \nu + \Lambda [\alpha_2 - \alpha_1] \quad i=1,2.$$

Appendix 2: Overview of relations between the 16 facets and five domains

Facet	Primary loading		Secondary loading	
	<i>Factor score</i>	<i>Domain</i>	<i>Factor score</i>	<i>Domain</i>
Emotion regulation	.73	Self-control		
Effortful control	.43	"	.14	Responsibility
Purposefulness	.39	Identity integration		
Enjoyment	.33	"	-.08	Responsibility
Self-respect	.30	"		
Stable self-image	.23	"	-.16	Social concordance
Self-reflexive functioning	.08	"	.06	Self-control
Respect	.94	Social concordance		
Cooperation	.38	"	.18	Relational functioning
Aggression regulation	.32	"	.18	Self-control
Frustration tolerance	.27	"	.16	Self-control
				(& .14 Identity integration)
Enduring relationships	.72	Relational functioning	.06	Responsibility
Intimacy	.36	"		
Responsible industry	.73	Responsibility		
Trustworthiness	.69	"		

Appendix 3: Descriptions of the 16 facets and five domains

Description facets (subscales)

<p><i>Emotion regulation:</i> The capacity to tolerate and manage the emotions you have and to control their intensity, course, and expression</p>
<p><i>Aggression regulation:</i> The ability to withhold aggressive impulses towards others</p>
<p><i>Effortful control:</i> The ability to focus concentration and direct impulses through conscious effort</p>
<p><i>Frustration tolerance:</i> The capacity to cope with disappointments and setbacks</p>
<p><i>Self respect:</i> The capacity to feel that you are worthy, and to know that others or yourself have no right to harm you physically or emotionally</p>
<p><i>Stable self image:</i> To experience an inner sense of continuity/sameness of self across time and situations</p>
<p><i>Self-reflexive functioning:</i> The capacity to understand the possible meanings of and causal connections between internal and external experiences, as well as the ability to identify reasons for things happening within yourself rather than constantly trying to find answers in the world outside</p>
<p><i>Enjoyment:</i> The capacity to enjoy without feeling guilty</p>
<p><i>Purposefulness:</i> The capacity to make life meaningful by creating the means as well as the opportunities for achievement and organising time in line with one's goals</p>
<p><i>Responsible industry:</i> The capacity to set realistic goals, and to achieve these through effective and responsible constructive actions</p>
<p><i>Trustworthiness:</i> That one has internalized the values and norms of social collaboration and is normally able to behave in accordance to these</p>
<p><i>Intimacy:</i> The ability to share sensitive personal experiences with other people</p>
<p><i>Enduring relationships:</i> The capacity to love and feel loved in order to form and maintain long-term, intimate relationships; also referred to as the capacity for "healthy attachment"</p>
<p><i>Feeling recognized:</i> The experience that others understand what you feel and believe</p>
<p><i>Co-operation:</i> The ability to work constructively with others, to be aware of needs and ideas and others, and to establish mutual goals</p>
<p><i>Respect:</i> The capacity to value someone's individual needs and personal identity</p>

These facets are clustered into five domains (only primary loadings of facets on domains are taken into account, see also appendix 2):

Facet	Domain
Emotion regulation	Self control
Effortful control	
Self respect	Identity integration
Stable self-image	
Self-reflexive functioning	
Enjoyment	
Purposefulness	
Responsible industry	Responsibility
Trustworthiness	
Intimacy	Relational functioning
Enduring relationships	
Feeling recognized	
Aggression regulation	Social concordance
Frustration tolerance	
Cooperation	
Respect	

Description domains

<i>Self control:</i> The capacity to tolerate, use and control one's own emotions and impulses
<i>Identity integration:</i> Coherence of identity; the ability to see oneself and one's own life as stable, integrated and purposive
<i>Responsibility:</i> The capacity to set realistic goals and to achieve these goals in line with the expectations you have generated in others
<i>Relational functioning:</i> The capacity to genuinely care about others as well as feeling cared about them, to be able to communicate personal experiences, and to hear and engage with the experiences of others often but not necessarily in the context of a long-term, intimate relationship
<i>Social concordance:</i> The ability to value someone's identity, withhold aggressive impulses towards others and to work together with others

SCORING THE SIPP:

Appendix 4: Computing facets and domain scores from raw item-scores

* See <http://www.vispd.nl/scoringsipp.htm> for the most actual electronic version (spss-syntax).

* **SPSS-syntax SIPP-118.**

* NECESSARY PREPARATIONS: name first sipp item sipp001, second sipp item sipp002, etc.

* Values (and value label) for each item: 1 (fully disagree), 2 (partly disagree), 3 (partly agree)

* and (fully agree).

* After recoding, lower levels refer to more maladaptive functioning (thus more 'pathological'

* scores), while higher levels refer to more adaptive functioning (thus more 'healthy' scores).

*-----.

```
RENAME VARIABLES (sipp001 to sipp118 = sippft1, sippec1, sippar1, sippssi1, sippsrf1, sippsr1, sippti1, sippre1, sipppu1, sippen1, sipcco1, sippin1, sippat1, sippri1, sipptr1, sippft2, sipper2, sippar2, sippsrf2, sippsr2, sippti2, sippre2, sipppu2, sippen2, sipcco2, sippin2, sippat2, sipptr2, sippft3, sipper3, sippec3, sippar3, sippsr3, sippti3, sipppu3, sippin3, sippat3, sippri3, sipptr3, sippft4, sippec4, sippar4, sippssi4, sippti4, sippre4, sipppu4, sippen4, sipcco4, sippin4, sippri4, sippft5, sipper5, sippec5, sippar5, sippssi5, sippsrf5, sippsr5, sippti5, sippre5, sipppu5, sippen5, sipcco5, sippin5, sippri5, sipptr5, sippft6, sipper6, sippec6, sippssi6, sippsr6, sippti6, sipppu6, sippen6, sipcco6, sippat6, sippri6, sipptr6, sippft7, sipper7, sippec7, sippar7, sippssi7, sippsrf7, sippsr7, sippre7, sippen7, sippin7, sippat7, sipcco7, sippri7, sipptr7, sipper8, sippar8, sippssi8, sippsrf8, sippsr8, sippti8, sippre8, sippin8, sippen8, sipcco8, sippat8, sippri8, sipptr8, sippft9, sipper9, sippec9, sippar9, sippssi9, sippsrf9, sippsr9, sippti9, sippre9, sipppu9, sipcco9, sippat9, sipptr9, sippsrf0).
```

```

RECODE sippft2 sippft4 sippft5 sippft6 sippft7 sippft9
  sipper5 sipper6 sipper7 sipper8 sipper9
  sippec1 sippec4 sippec5 sippec6 sippec7 sippec9
  sippar1 sippar2 sippar3 sippar4 sippar5 sippar7 sippar8 sippar9
  sippssi4 sippssi5 sippssi6 sippssi7 sippssi8 sippssi9
  sippsr5 sippsr7 sippsr8 sippsr9 sippsr0
  sippr1 sippr2 sippr5 sippr6 sippr8 sippr9
  sippti1 sippti2 sippti3 sippti5 sippti6 sippti8
  sippre2 sippre4 sippre5 sippre8 sippre9
  sipppu2 sipppu4 sipppu5 sipppu6 sipppu9
  sippen2 sippen4 sippen5 sippen6 sippen7 sippen8
  sipcco2 sipcco4 sipcco5 sipcco6 sipcco8 sipcco9
  sippin1 sippin2 sippin4 sippin8
  sippat2 sippat3 sippat6 sippat7 sippat8
  sippr1 sippr3 sippr4 sippr5 sippr7 sippr8
  sippr2 sippr3 sippr5 sippr6 sippr8 sippr9
(MISSING=SYSMIS) (1=4) (2=3) (3=2) (4=1) (1.50=3.50) (2.50=2.50) (3.50=1.50) INTO
sippft2 sippft4 sippft5 sippft6 sippft7 sippft9
  sipper5 sipper6 sipper7 sipper8 sipper9
  sipprec1 sipprec4 sipprec5 sipprec6 sipprec7 sipprec9
  sipprar1 sipprar2 sipprar3 sipprar4 sipprar5 sipprar7 sipprar8 sipprar9
  sipprssi4 sipprssi5 sipprssi6 sipprssi7 sipprssi8 sipprssi9
  sipprsr5 sipprsr7 sipprsr8 sipprsr9 sipprsr0
  sippr1 sippr2 sippr5 sippr6 sippr8 sippr9
  sippti1 sippti2 sippti3 sippti5 sippti6 sippti8
  sippre2 sippre4 sippre5 sippre8 sippre9
  sipprpu2 sipprpu4 sipprpu5 sipprpu6 sipprpu9
  sipren2 sipren4 sipren5 sipren6 sipren7 sipren8
  sipprco2 sipprco4 sipprco5 sipprco6 sipprco8 sipprco9
  sipprin1 sipprin2 sipprin4 sipprin8
  sipprat2 sipprat3 sipprat6 sipprat7 sipprat8
  sippr1 sippr3 sippr4 sippr5 sippr7 sippr8
  sippr2 sippr3 sippr5 sippr6 sippr8 sippr9.
EXECUTE.

```

* Allowing a maximum of 33% missing values for each facet (subscale).

```

COMPUTE f_ft = MEAN.5(sippft1, sippft2, sippft3, sippft4, sippft5, sippft6, sippft7, sippft9).
COMPUTE f_er = MEAN.5(sipper2, sipper3, sipper5, sipper6, sipper7, sipper8, sipper9).
COMPUTE f_ec = MEAN.5(sippec1, sippec3, sippec4, sippec5, sippec6, sippec7, sippec9).
COMPUTE f_ar = MEAN.5(sippar1, sippar2, sippar3, sippar4, sippar5, sippar7, sippar8, sippar9).
COMPUTE f_ssi = MEAN.5(sippssi1, sipprssi4, sipprssi5, sipprssi6, sipprssi7, sipprssi8, sipprssi9).
COMPUTE f_srf = MEAN.5(sippsr1, sippsr2, sippsr3, sippsr5, sippsr6, sippsr7, sippsr8, sippsr9).
COMPUTE f_sr = MEAN.5(sippr1, sippr2, sippr3, sippr5, sippr6, sippr7, sippr8, sippr9).
COMPUTE f_fr = MEAN.5(sippti1, sippti2, sippti3, sippti4, sippti5, sippti6, sippti8, sippti9).
COMPUTE f_re = MEAN.5(sippre1, sippre2, sippre4, sippre5, sippre7, sippre8, sippre9).
COMPUTE f_pu = MEAN.5(sipppu1, sipprpu2, sipppu3, sipprpu4, sipprpu5, sipprpu6, sipprpu9).
COMPUTE f_en = MEAN.5(sippen1, sipren2, sipren4, sipren5, sipren6, sipren7, sipren8).
COMPUTE f_co = MEAN.5(sipcco1, sipprco2, sipprco4, sipprco5, sipprco6, sipcco7, sipprco8, sipprco9).
COMPUTE f_in = MEAN.5(sipprin1, sipprin2, sippin3, sipprin4, sippin5, sippin7, sippin8).
COMPUTE f_ed = MEAN.5(sippat1, sipprat2, sipprat3, sipprat6, sipprat7, sipprat8, sipprat9).
COMPUTE f_ri = MEAN.5(sippr1, sippr3, sippr4, sippr5, sippr6, sippr7, sippr8).
COMPUTE f_tr = MEAN.5(sippr1, sippr2, sippr3, sippr5, sippr6, sippr7, sippr8, sippr9).

```

*Labelling facets.

```
VARIABLE LABELS f_ft 'Frustration tolerance'  
  /f_er 'Emotion regulation'  
  /f_ec 'Effortful control (zelfbeheersing)'  
  /f_ar 'Agression regulation'  
  /f_ssi 'Stable self image'  
  /f_srf 'Self-reflexive functioning (zelf-reflexief vermogen)'  
  /f_sr 'Self respect'  
  /f_fr 'Feeling recognized (gewaardeerd voelen)'  
  /f_re 'Respect'  
  /f_pu 'Purposefulness (zingeving)'  
  /f_en 'Enjoyment (plezier)'  
  /f_co 'Cooperation (samenwerking)'  
  /f_in 'Intimacy (intimiteit)'  
  /f_ed 'Enduring relationships (duurzame relaties)'  
  /f_ri 'Responsible industry (verantwoord presteren)'  
  /f_tr 'Trustworthiness (betrouwbaarheid)'.
```

* Computing 5 (higher order) domains (partly overlapping + facets are weighed).

```
COMPUTE d_slfc=0.16*f_ft + 0.73*f_er + 0.43*f_ec + 0.18*f_ar + 0.16*f_ssi + 0.06*f_srf + 0.05*f_fr.  
COMPUTE d_soc=0.27*f_ft + 0.32*f_ar + 0.94*f_re + 0.38*f_co - 0.16*f_ssi + 0.11*f_fr.  
COMPUTE d_ii=0.14*f_ft + 0.23*f_ssi + 0.08*f_srf + 0.30*f_sr + 0.39*f_pu + 0.33*f_en.  
COMPUTE d_rel=0.18*f_co + 0.26*f_fr + 0.36*f_in + 0.72*f_ed.  
COMPUTE d_resp=0.14*f_ec -0.08*f_en + 0.06*f_ed + 0.73*f_ri + 0.69*f_tr.
```

*Labelling higher order domains.

```
VARIABLE LABELS d_slfc 'Selfcontrol-domain-SIPP118'  
  /d_soc 'Social concordance-domain-SIPP118'  
  /d_ii 'Identity-domain-SIPP118'  
  /d_rel 'Relation-domain-SIPP118'  
  /d_resp 'Responsibility-domain-SIPP118'.
```

EXECUTE.

Appendix 5: Computing norm scores from facet and domain scores

* SPSS-syntax for computing STANDARDISED SCORES (T-scores) for the facets and higher-order domains of the SIPP-118.

* Derived from NORMSCORES...

* ...1. From a PD Patient population n=1483: 65% female, mean age 33.2, sd 9.6.

* Patients = from intake SCEPTRE study, and with at least 1 personality disorder (SIDP-IV diagnoses).

* ...2. from the General population (n=478, 70% female, mean age 36.3, sd 11.4).

* Used formula: T-score= 50 + [10(x-mean/sd)].

*** NECESSARY PREPARATION: LABELLING FACETS AND HIGHER-ORDER DOMAINS AS DESCRIBED IN "SPSS-SYNTAX SIPP-118".**

* (See appendix 4, or for the most actual electronic version see <http://www.vispd.nl/scoringsipp.htm>).

*-----

*Computing t-scores facets in relation to patient population (pf..) and to normal population (nf..).

```
COMPUTE pf_ft=50+(10*(f_ft-2.18)/0.53).
COMPUTE nf_ft=50+(10*(f_ft-2.97)/0.58).
COMPUTE pf_er=50+(10*(f_er-2.39)/0.67).
COMPUTE nf_er=50+(10*(f_er-3.29)/0.63).
COMPUTE pf_ec=50+(10*(f_ec-2.48)/0.72).
COMPUTE nf_ec=50+(10*(f_ec-3.14)/0.57).
COMPUTE pf_ar=50+(10*(f_ar-3.24)/0.71).
COMPUTE nf_ar=50+(10*(f_ar-3.67)/0.46).
COMPUTE pf_ssi=50+(10*(f_ssi-2.16)/0.63).
COMPUTE nf_ssi=50+(10*(f_ssi-3.22)/0.68).
COMPUTE pf_srf=50+(10*(f_srf-2.33)/0.64).
COMPUTE nf_srf=50+(10*(f_srf-3.17)/0.58).
COMPUTE pf_sr=50+(10*(f_sr-2.28)/0.64).
COMPUTE nf_sr=50+(10*(f_sr-3.28)/0.60).
COMPUTE pf_fr=50+(10*(f_fr-2.53)/0.58).
COMPUTE nf_fr=50+(10*(f_fr-3.22)/0.58).
COMPUTE pf_re=50+(10*(f_re-3.08)/0.54).
COMPUTE nf_re=50+(10*(f_re-3.38)/0.44).
COMPUTE pf_pu=50+(10*(f_pu-2.41)/0.66).
COMPUTE nf_pu=50+(10*(f_pu-3.32)/0.51).
COMPUTE pf_en=50+(10*(f_en-2.26)/0.64).
COMPUTE nf_en=50+(10*(f_en-3.32)/0.62).
COMPUTE pf_co=50+(10*(f_co-2.77)/0.59).
COMPUTE nf_co=50+(10*(f_co-3.28)/0.53).
COMPUTE pf_in=50+(10*(f_in-2.51)/0.72).
COMPUTE nf_in=50+(10*(f_in-3.14)/0.63).
COMPUTE pf_ed=50+(10*(f_ed-2.40)/0.65).
COMPUTE nf_ed=50+(10*(f_ed-2.77)/0.65).
COMPUTE pf_ri=50+(10*(f_ri-2.76)/0.66).
COMPUTE nf_ri=50+(10*(f_ri-3.01)/0.62).
COMPUTE pf_tr=50+(10*(f_tr-3.00)/0.61).
COMPUTE nf_tr=50+(10*(f_tr-3.49)/0.44).
```

*Computing t-scores domains in relation to patient population (pd..) and to normal population (nd..).

```
COMPUTE pd_slfc=50+(10*(d_slfc-4.35)/0.97).
COMPUTE nd_slfc=50+(10*(d_slfc-5.78)/0.89).
COMPUTE pd_resp=50+(10*(d_resp-4.40)/0.90).
COMPUTE nd_resp=50+(10*(d_resp-5.22)/0.64).
COMPUTE pd_ii=50+(10*(d_ii-3.35)/0.70).
COMPUTE nd_ii=50+(10*(d_ii-4.83)/0.74).
COMPUTE pd_rel=50+(10*(d_rel-3.79)/0.81).
COMPUTE nd_rel=50+(10*(d_rel-4.94)/0.78).
COMPUTE pd_soc=50+(10*(d_soc-5.51)/0.87).
COMPUTE nd_soc=50+(10*(d_soc-6.20)/0.73).
```

VARIABLE LABELS

```
pf_ft 'Frustrationtolerance T-score pt.pop' nf_ft 'Frustrationtolerance T-score norm.pop'
/pf_er 'Emotion regulation T-score pt.pop' nf_er 'Emotion regulation T-score norm.pop'
/pf_ec 'Effortful control T-score pt.pop' nf_ec 'Effortful control T-score norm.pop'
/pf_ar 'Agression regulation T-score pt.pop' nf_ar 'Agression regulation T-score norm.pop'
/pf_ssi 'Stable self image T-score pt.pop' nf_ssi 'Stable self image T-score norm.pop'
/pf_srf 'Self-refl.funct. T-score pt.pop' nf_srf 'Self-refl.funct.T-score norm.pop.'
/pf_sr 'Self respect T-score pt.pop' nf_sr 'Self respect T-score norm.pop'
/pf_fr 'Feel.recogn. T-score pt.pop' nf_fr 'Feel.recogn. T-score norm.pop'
/pf_re 'Respect T-score pt.pop' nf_re 'Respect T-score norm.pop'
/pf_pu 'Purposefuln. T-score pt.pop' nf_pu 'Purposefuln. T-score norm.pop'
/pf_en 'Enjoyment T-score pt.pop' nf_en 'Enjoyment T-score norm.pop'
/pf_co 'Cooperation T-score pt.pop' nf_co 'Cooperation T-score norm.pop'
/pf_in 'Intimacy T-score pt.pop' nf_in 'Intimacy T-score norm.pop'
/pf_ed 'End.relationships T-score pt.pop' nf_ed 'End.relationships T-score norm.pop'
/pf_ri 'Respons.industry T-score pt.pop' nf_ri 'Respons.industry T-score norm.pop'
/pf_tr 'Trustworthiness T-score pt.pop' nf_tr 'Trustworthiness T-score norm.pop'
/pd_slfc 'T-score pt.pop domain Selfcontrol' nd_slfc T-score norm.pop domain Selfcontrol'
/pd_soc 'T-score pt.pop domain Soc.concord.' nd_soc T-score norm.pop domain Soc.concord.'
/pd_ii 'T-score pt.pop domain Identity' nd_ii T-score norm.pop domain Identity'
/pd_rel 'T-score pt.pop domain Relation.funct.' nd_rel T-score norm.pop domain Relation.funct.'
/pd_resp 'T-score pt.pop domain Responsibility' nd_resp T-score norm.pop Responsibility'.
```

EXECUTE.