Personality Disorders: Theory, Research, and Treatment

Cross-Cultural Validity of the Five-Factor Personality Inventory for ICD-11 Across Nine Countries and Validation of a French Translation

Yann Le Corff, Anton Aluja, Kokou A. Atitsogbe, Robert Courtois, Donatien Dahourou, Karine Forget, Michel Hansenne, Durairaj Kavitha, Kossi B. Kounou, Mélanie Lapalme, Joshua R. Oltmanns, Jérôme Rossier, Arun Tipandjan, Thomas A. Widiger, and Jean-Pierre Rolland

Online First Publication, January 30, 2025. https://dx.doi.org/10.1037/per0000711

AMERICAN PSYCHOLOGICAL ASSOCIATION

Personality Disorders: Theory, Research, and Treatment

ISSN: 1949-2715

https://doi.org/10.1037/per0000711

Cross-Cultural Validity of the Five-Factor Personality Inventory for *ICD-11* Across Nine Countries and Validation of a French Translation

Yann Le Corff[1], Anton Aluja[2], Kokou A. Atitsogbe[3], Robert Courtois[4], Donatien Dahourou[5], Karine Forget[6], Michel Hansenne[7], Durairaj Kavitha[8], Kossi B. Kounou[9], Mélanie Lapalme[10], Joshua R. Oltmanns[11], Jérôme Rossier[12], Arun Tipandjan[13], Thomas A. Widiger[14], and Jean-Pierre Rolland[15]

[1] Group for Research and Intervention on Children's Social Adjustment (GRISE), Département d'orientation Professionnelle, Faculté d'éducation, Université de Sherbrooke

[2] Human Behavior Laboratory, Department of Psychology, Lleida Institute for Biomedical Research Dr. Pifarré Foundation, University of Lleida

[3] Research Center in Vocational Psychology and Career Counseling (CePCO), Institut de Psychologie, Université de Lausanne

[4] Département de Psychologie, UFR d'arts et Sciences Humaines, Université de Tours

[5] Département de Philosophie et de Psychologie, UFR des Sciences Humaines, Université Joseph KI-ZERBO

[6] Group for Research and Intervention on Children's Social Adjustment (GRISE), Département de Psychiatrie, Faculté de Médecine, Université de Sherbrooke

[7] Département de Psychologie, Faculté de Psychologie, Logopédie et Sciences de l'éducation, Université de Liège

[8] Mother Theresa Post Graduate and Research Institute of Health Sciences, Pondicherry University

[9] Département de Psychologie Appliquée, Faculté des Sciences de l'homme et de la Société, Université de Lomé

[10] Group for Research and Intervention on Children's Social Adjustment (GRISE), Département de Psychoéducation, Faculté d'Éducation, Université de Sherbrooke

[11] Department of Psychological & Brain Sciences, Washington University in St. Louis

[12] Institut de Psychologie, Université de Lausanne

[13] International Center for Psychological Counselling and Social Research, Pondicherry, India

[14] Department of Psychology, College of Arts & Sciences, University of Kentucky

[15] Laboratoire sur les Interactions Cognition, Action, Émotion (LICAÉ), UFR STAPS, Université Paris-Nanterre

Josh Miller served as action editor.

Yann Le Corff https://orcid.org/0000-0002-0483-2969

This study was partially funded (Canadian data only) by the Canadian Institutes of Health Reseach (CIHR).

Anton Aluja, Kokou A. Atitsogbe, Robert Courtois, Donatien Dahourou, Karine Forget, Michel Hansenne, Durairaj Kavitha, Kossi B. Kounou, Mélanie Lapalme, Joshua R. Oltmanns, Jérôme Rossier, Arun Tipandjan, and Thomas A. Widiger, listed alphabetically, contributed equally to the article, and should all be considered as second authors. The authors declare that they have no conflicts of interest. The additional online materials in the Open Science Framework are available at https://osf.io/e5qvp/?view_only=f8a4f98afe244c9a92d0eb8f775f9a13.

Yann Le Corff served as lead for conceptualization, data curation, formal analysis, investigation, methodology, validation, writing–original draft, and writing–review and editing and contributed equally to funding acquisition and resources. Anton Aluja served in a supporting role for methodology, writing–original draft, and writing–review and editing. Kokou A. Atitsogbe served in a supporting role for investigation, methodology, validation, writing–original draft, and writing–review and editing. Robert Courtois served in a supporting role for methodology, writing–original draft, and writing–review and editing. Donatien Dahourou served in a supporting role for methodology, writing–original draft, and writing–review and editing. Karine Forget served in a supporting role for data curation, funding acquisition, investigation, methodology, writing–original draft, and writing–review and editing. Michel Hansenne served in a supporting role for methodology, writing–original draft, and writing–review and editing. Durairaj Kavitha served in a supporting role for writing–original draft and writing–review and editing. Kossi B. Kounou served in a supporting role for methodology, writing–original draft, and writing–review and editing. Mélanie Lapalme served as lead for funding acquisition and served in a supporting role for conceptualization, data curation, methodology, writing–original draft, and writing–review and editing. Joshua R. Oltmanns served in a supporting role for formal analysis, writing–original draft, and writing–review and editing. Jérôme Rossier served in a supporting role for formal analysis, methodology, writing–original draft, and writing–review and editing. Arun Tipandjan served in a supporting role for writing–original draft and writing–review and editing. Jean-Pierre Rolland contributed equally to conceptualization and methodology and served in a supporting role for formal analysis, writing–original draft, and writing–review and editing. Yann Le Corff and Mélanie Lapalme contributed equally to project administration. Anton Aluja, Robert Courtois, Donatien Dahourou, Michel Hansenne, Durairaj Kavitha, Kossi B. Kounou, Mélanie Lapalme, Joshua R. Oltmanns, Jérôme Rossier, Arun Tipandjan, and Thomas A. Widiger contributed equally to investigation. Anton Aluja, Kokou A. Atitsogbe, Robert Courtois, Donatien Dahourou, Michel Hansenne, Durairaj Kavitha, Kossi B. Kounou, Joshua R. Oltmanns, Jérôme Rossier, Arun Tipandjan, and Thomas A. Widiger contributed equally to data curation.

Correspondence concerning this article should be addressed to Yann Le Corff, Group for Research and Intervention on Children's Social Adjustment (GRISE), Département d'orientation Professionnelle, Faculté d'éducation, Université de Sherbrooke, 2500 Boulevard de l'Université, Sherbrooke, Québec J1K 2R1, Canada. Email: Yann.Le.Corff@USherbrooke.ca

This study aimed to assess measurement invariance for the Five-Factor Inventory for *ICD-11* (Oltmanns & Widiger, 2020) across nine national samples from four continents ($n = 6,342$), and to validate a French translation in seven French-speaking national samples. All were convenience samples of adults. Exploratory factor analyses supported a four-factor structure in the French-speaking Western samples (Belgium, Canada, France, and Switzerland) while a three-factor structure was preferred in the French-speaking African samples (Burkina Faso and Togo), and no adequate structure was found in the Indian sample. Factor congruence with the original American sample was excellent for the Western samples but not for the non-Western samples. Exploratory bifactor analyses led to similar results, with the g-factor essentially reflecting one of the first-order factors observed in the exploratory factor analyses. Support for configural, metric, scalar (partial), and strict invariance was obtained across the six Western samples, as well as across the two African samples. Support for criterion validity of the Five-Factor Inventory for *ICD-11* scales was also obtained, with relevant associations between scale scores and the presence of a mental health diagnosis and consulting a mental health professional, but validity was lower in the non-Western samples.

Keywords: Five-Factor Personality Inventory for *ICD-11*, personality disorders, alternative model of personality disorders, measurement invariance, cross-cultural validity

Supplemental materials: https://doi.org/10.1037/per0000711.supp

With the publication of the 11th edition of the *International Classification of Diseases* (*ICD-11*; World Health Organization [WHO], 2019), a new conceptualization and operationalization of personality disorders (PDs) were introduced, after roughly three decades of scientific debate. In the *ICD-11*, PDs are now assessed as dimensional constructs, which is a major paradigm shift from the categorical conceptualization found in the *ICD-10* (Krueger, 2016; Tyrer, 2014). This new dimensional model entirely replaces the previous categorical model of the *ICD-10* and is now the official PDs model for all WHO member states.

In the *ICD-11*, the diagnosis of PDs is based on the general PD severity rating, which is conceptualized as the degree of disturbance in self and interpersonal functioning (Mulder, 2021; WHO, 2019). It was designed as a generalized severity continuum of personality pathology that captures the core impairments in functioning that are common to all PDs (Bach et al., 2023; Bender et al., 2011; Sleep et al., 2019; Waugh et al., 2017).

The *ICD-11* PD model also includes five maladaptive personality trait domain qualifiers that are not required criteria but that can be used to further describe how PDs manifest. These five trait domains are negative affectivity (tendency to experience a wide variety of disproportionate negative emotions, such as anger and anxiety, accompanied with poor emotion regulation and self-depreciation), detachment (emotional detachment, social withdrawal, low assertiveness, and anhedonia), dissociality (disregard for the rights and feelings of others, self-centeredness, lack of empathy, and aggressiveness), disinhibition (tendency to seek excitement and to act impulsively and irresponsibly without concern of outcomes, and to be disorderly), and anankastic (high need for control over own and others' behavior with rigid standards, inflexibility, rigid perfectionism, perseveration) (Mulder et al., 2016). These five domains, which "represent the different stylistic differences in the expression of PDs" (Zimmermann et al., 2019, p.91), are closely related to dimensions of the Big Five model of personality (Stricker et al., 2022). Of note, the *ICD-11* model includes a borderline pattern specifier, which is based on the *ICD-10* criteria for this disorder. However, it was shown that this specifier cannot be uncoupled from the negative affectivity domain and that it has poor incremental validity over the five maladaptive trait domains in predicting PD severity (Gutiérrez et al., 2023).

It is noteworthy that a similar model was also introduced in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*; American Psychiatric Association, 2013), but as an alternative to the still official symptom-based categorical model (namely, the alternative model of PDs [AMPD]). While the general PD severity rating of the *ICD-11* is largely consistent with its *DSM-5* counterpart (Bach & Mulder, 2022), there are two notable differences between their trait models. First, four of the five dimensions have a very high degree of convergence across the two models (García et al., 2024), but the AMPD features a psychoticism dimension (unusual beliefs and experiences, eccentricity, and cognitive and perceptual dysregulation) instead of an anankastic dimension in the *ICD-11* model (Oltmanns & Widiger, 2018). Second, in the *DSM-5*, the five domains are an overarching structure for organizing a set of 25 maladaptive personality facets, and the assessment of PDs is primarily based on these 25 "narrow" traits (e.g., grandiosity, impulsivity). Conversely, the *ICD-11* model does not include narrow traits.

Assessment of Maladaptive Personality Traits

While the Personality Inventory for *DSM-5* (PID-5; Krueger et al., 2012) was developed by the American Psychological Association AMPD workgroup to immediately provide an assessment questionnaire for the maladaptive traits presented in the *DSM-5*, no such instrument was initiated by the WHO. However, researchers rapidly developed instruments for the assessment of the *ICD-11* maladaptive traits model, such as the Five-Factor Personality Inventory for *ICD-11* (FFiCD; Oltmanns & Widiger, 2020), the Personality Inventory of *ICD-11* (PiCD; Oltmanns & Widiger, 2018), the Personality Assessment Questionnaire for *ICD-11* (PAQ-11; Kim et al., 2021), and "Preliminary Scales for *ICD-11* Personality Disorder" (Clark et al., 2021). Authors have also adapted the PID-5 to assess the *ICD-11* model, leading to the Personality Inventory for *DSM-5* and *ICD-11*—brief form plus (PID5BF+; Bach, Kerber, et al., 2020) and its modified version (PID5BF+M; Kerber et al., 2022). Among these instruments, only the FFiCD ($n = 20$), the PID5BF+ ($n = 17$), and the PID5BF+M ($n = 18$) include facet (narrow trait) scales.

The FFiCD

The FFiCD was developed with the aim of providing clinicians and researchers with a facet-level instrument to assess the *ICD-11* maladaptive personality traits domains, since it was thought that

assessing narrow traits that fall below the five broad domains would provide a more accurate and clinically informative assessment (Oltmanns & Widiger, 2020). Indeed, several studies have shown that narrow traits have more predicting power than broad personality dimensions for a variety of outcomes (e.g., Anglim et al., 2020; Kemp et al., 2022; Samuel & Widiger, 2008; Steel et al., 2019). The FFiCD scales were developed using items from the FFMPD (Widiger et al., 2012) and validated based on their convergence with the PiCD (Oltmanns & Widiger, 2018) and other FFM measures (Oltmanns & Widiger, 2020). Thus, the FFiCD includes 20 facet scales, which are listed in Table 1. EFA, however, suggested that a four-factor structure best represented the factor structure of the 20 facet scales (Oltmanns & Widiger, 2020; Sorrel et al., 2022). This structure yielded clear detachment and dissociality factors, plus an anankastia/low disinhibition and a negative affectivity/disinhibition factor (disinhibition facets spread on both these factors). This four-factor structure—in which anankastia and (low) disinhibition merge into a single dimension—is not unique to the FFiCD and was also observed using other self-report instruments, such as the PiCD (Carnovale et al., 2020; Somma et al., 2020; Stricker et al., 2022), PID-5-BF (Bach & Zine El Abiddine, 2020), and the PAQ-11 (Sellbom et al., 2023), as well as clinician ratings (Bach, Christensen, et al., 2020).

Furthermore, since it was suggested that maladaptive traits may be better modelized using a bifactor model (with a general factor of personality pathology accounting for the shared variance between all traits of the model), Oltmanns and Widiger (2020) ran exploratory bifactor analyses which revealed that a structure with four specific factors was the best fitting parsimonious solution, with clear detachment, dissociality, negative affectivity, and anankastia/disinhibition factors. Of note, the bifactor analysis was conducted using not only the FFiCD facet scales as indicators, but also the scales from two other PD measures (PID-5 and PiCD) and scales measuring the Big Five dimensions. This bifactor model, however, was only partially replicated in Spanish samples (again, combining the FFiCD, PiCD, and PID-5 scales); in that case, the general factor corresponded essentially to the negative affectivity domain (Sorrel et al., 2022). Thus, it remains unclear whether the FFiCD structure is best modelized by a first-order or bifactor model.

Cross-Cultural Validity of the FFiCD

The cross-cultural validity of the FFiCD, and more generally of the *ICD-11* maladaptive traits model, is a fundamental issue because of the international scope of the *ICD-11* and to the context of increased immigration. Indeed, mental health professionals are frequently called upon to work with immigrant patients and need to have valid models and instruments for these patients. While a few studies have reported on the validity of the FFiCD in a single culture (Aluja et al., 2022; Oltmanns & Widiger, 2020; Samylkin et al., 2023; Sorrel et al., 2022), to our knowledge, no study has assessed its validity and equivalence across cultures, that is, using measurement invariance analysis. Of note, however, Sorrel et al. (2022) reported that the exploratory factor solution in their Spanish sample

Table 1
Cronbach Alphas for the Facet and Domain Scales of the FFiCD

Scale	Belgium	Canada	Spain	France	Switzerland	Burkina Faso	Togo	India
Facet scales								
Aggression	.69	.75	.69	.68	.68	.57	.53	.63
Lack of empathy	.75	.80	.70	.78	.73	.70	.64	.70
Self-centeredness	.63	.72	.67	.68	.68	.62	.61	.77
Anger	.77	.76	.79	.79	.78	.69	.55	.68
Anxiousness	.78	.83	.77	.80	.79	.61	.54	.68
Depressiveness	.85	.85	.85	.85	.83	.72	.61	.76
Emotional lability	.89	.89	.86	.89	.89	.73	.71	.71
Mistrust	.74	.71	.67	.74	.73	.51	.42	.47
Shame	.79	.77	.69	.78	.79	.71	.58	.58
Vulnerability	.70	.75	.73	.71	.72	.44	.48	.52
Disorderliness	.76	.79	.75	.76	.73	.66	.62	.63
Irresponsibility	.83	.86	.84	.85	.85	.71	.69	.78
Rashness	.76	.79	.75	.77	.79	.68	.59	.59
Thrill-seeking	.59	.58	.64	.62	.60	.46	.31	.41
Emotional detachment	.72	.77	.73	.78	.77	.53	.51	.58
Social detachment	.73	.74	.77	.74	.73	.51	.49	.44
Unassertiveness	.57	.66	.51	.67	.60	.33	.31	.52
Inflexibility	.72	.72	.73	.72	.72	.46	.59	.67
Perfectionism	.72	.63	.70	.69	.69	.54	.50	.57
Workaholism	.72	.56	.67	.70	.66	.42	.52	.58
Average	.74	.75	.73	.75	.74	.58	.54	.61
Domain scales								
Dissociality	.84	.89	.85	.85	.85	.83	.81	.87
Negative affectivity	.95	.95	.95	.95	.95	.91	.88	.92
Disinhibition	.88	.91	.89	.89	.89	.85	.82	.87
Detachment	.80	.83	.80	.83	.82	.65	.67	.71
Anankastia	.84	.80	.84	.83	.83	.69	.76	.82

Note. $\alpha < .70$ are underlined. N (Belgium) = 569; N (Burkina Faso) = 429; N (Canada) = 945; N (India) = 176; N (France) = 780; N (Spain) = 1,903; N (Switzerland) = 729; N (Togo) = 506. FFiCD = Five-Factor Personality Inventory for *ICD-11*; *ICD-11* = 11th edition of the *International Classification of Diseases*.

showed good factor congruence with the original American solution. What's more, to our knowledge, the cross-cultural invariance of the *ICD-11* PD trait dimensions model has never been tested, regardless of the assessment instrument. Nevertheless, invariance analyses are needed to ascertain that, across cultures, the same personality dimensions are observed, that these dimensions are defined by the same indicators (facets), and that the same scores indicate similar levels personality pathology (comparability of scores). Practically, since clinicians work with patients coming from different cultural backgrounds, the theoretical models and the assessment instruments they use should be as much as possible free of cultural bias, otherwise their evaluations could be inaccurate or even discriminatory in some cases (Schwabe et al., 2016). Additionally, culturally invariant instruments are required for results from culturally and linguistically diverse samples to be comparable (Byrne, 2016; Iliescu, 2017).

It is worth mentioning that a few recent studies have investigated the cross-cultural invariance of the PID-5, and thus of the *DSM-5* AMPD trait model. Configural and metric invariance were supported across five European cultures (Sorrel et al., 2021) and across East Asians, Southeast Asians, and White young adults living in Hawaii (Hricovec et al., 2024), but only partial scalar invariance was reached in both studies. Meanwhile, only configural invariance was supported across Nigerians and White Americans (Orjiakor et al., 2023), and different factor structures were observed in White and Black American university students (Bagby et al., 2022). Furthermore, Coelho et al. (2022) reported a high level of factor congruence for the five-factor structure of the PID-5 between Portuguese and Emirati samples. It thus appears that there could also be cross-cultural differences in the measurement model of the FFiCD, since the *ICD-11* and the AMPD share substantial similarities.

The Present Study[1]

The primary objective of this study was to assess the cross-cultural validity of the FFiCD by examining its measurement invariance across nine countries from four continents: Belgium, Burkina Faso, Canada, France, India, Spain, Switzerland, Togo, and the United States. Specifically, we aimed to test whether (a) the FFiCD factor structure is equivalent across countries (configural invariance), (b) its latent factors are defined by the same narrow traits equally across countries (metric invariance), and (c) identical test scores for individuals from different cultures indicate equal levels of maladaptive personality pathology (scalar and strict invariance). Preliminary to the invariance analyses, the FFiCD factor structure had to be established in each culture (i.e., baseline models for the invariance analyses to be conducted on). In line with previous studies, we aimed to test both first-order and bifactor models. Additionally, factor congruence between the four-factor solution in the original American sample and in the eight new national samples was also assessed.

The FFiCD was initially developed in English and has since been translated in Spanish (Aluja et al., 2022; Sorrel et al., 2022) and Russian (Samylkin et al., 2023), but not French. Therefore, a complementary aim of this study was to produce and validate a French translation of the FFiCD.

Finally, we also wished to provide additional criterion validity evidence for the FFiCD by examining its associations with self-reported mental disorder diagnoses and consulting, since PDs are known to be associated with greater use of mental health care (Bender et al., 2001; Hastrup et al., 2019; Tomko et al., 2014).

Method

Data Validity Screening

This study includes seven original samples (Belgian, Burkinabe, Canadian, French, Indian, Swiss, and Togolese), while the American (Oltmanns & Widiger, 2020) and Spanish samples (Aluja et al., 2022, 2024; Sorrel et al., 2022) come from previous published studies. Since in all cases, participation was voluntary and took place without or with limited human proctoring, it is possible that some participants responded carelessly. To detect invalid response profiles, long strings analyses were conducted (Huang et al., 2012; Meade & Craig, 2012). Participants with more than 23 or more consecutive identical responses to the FFiCD were removed from samples because of probable careless responding. Although cutoffs for long strings analysis are ultimately arbitrary (Curran, 2016), the cutoff in the present study was set based on the distribution of participants' consecutive identical responses count in the samples and on the fact that FFiCD items vary considerably in content, thus making it unlikely for valid profiles to include long strings of identical responses. Long strings analysis was not computed in the American sample since data validity screening had already been applied by the original authors (see the sample description below). Additionally, since the seven original samples were assessed with our French translation of the FFiCD, participants were asked to rate their level of understanding of the French language on a 4-point Likert type scale (ranging from *very poor* to *very good*) and those who indicated *very poor* were excluded.

Participants and Procedure

American (United States) Sample

The American sample included 301 American adults who were currently or had been in mental health treatment in their lifetime. They were recruited through a TurkPrime online survey. The initial sample consisted of 343 respondents, but 42 were eliminated because of noncontent-based responding. Mean age was 36.5 years ($SD = 10.7$ years), 61% were female, and 85% were white. Complete description of this sample can be found in Oltmanns and Widiger (2020).

Belgian Sample

Belgian participants were recruited via an email invitation sent to all students and employees of the Université de Liège, and via posts on social medias. The initial sample consisted of 576 Belgian adults who completed the online questionnaire. Data validity screening led to the exclusion of six participants: one with a "very poor" understanding of the French language and five because of the long strings analysis. The study sample thus included 570 participants (76.0% women) aged between 18 and 73 years ($M = 30.3$; $SD = 13.0$).

Burkinabe Sample

The initial sample consisted of 454 Burkinabe recruited through posters on bulletin boards in various universities and higher education schools in Burkina Faso. Voluntary participants were met by research assistants (who were master's students in psychology)

[1] The present study was not preregistered.

and filled the questionnaires in article-and-pencil format. Data validity screening led to the exclusion of 23 participants: two with a "very poor" understanding of the French language and seven who did not rate their understanding of French (missing data), plus 14 probable careless responding profiles identified with the long strings analysis. The study sample thus included 431 participants (33.9% women) aged between 17 and 53 years ($M = 28.8$; $SD = 7.8$).

Canadian Sample

The Canadian sample was recruited via an email invitation sent to a randomized sample of Léger 360's panel of over 200,000 residents from the Province of Québec, Canada (Léger 360 is the largest Survey firm in Canada), and questionnaires were administered online. The initial sample consisted of 1,001 French-speaking Canadians. Participants under 18 years of age or who reported a "very poor" understanding of the French language were excluded from the study (age and knowledge of the French language were filter questions). From the initial sample, 56 participants were excluded following the long strings analysis. The study sample thus included 945 participants (54.6% women) aged between 18 and 85 years ($M = 39.8$; $SD = 18.4$).

French Sample

Psychology students from the Université de Tours received an email invitation to participate in this online study and were also asked to forward the invitation to friends and relatives (snowball sampling). The initial sample included 784 participants, among which only four had to be excluded for probable careless responding. The study sample thus included 780 participants (82.7% women) aged between 15 and 88 years ($M = 28.8$; $SD = 11.1$).

Indian Sample

The initial sample consisted of 205 participants from Pondicherry, recruited through a civil association for French people and by an open invitation (posters on bulletin boards) to French-speaking people in schools and universities. Of note, Pondicherry was under French occupation from roughly 1672 to 1954, and thus many of its inhabitants speak French. Voluntary participants were met in person to fill the questionnaires in a article-and-pencil format. Data validity screening led to the exclusion of two participants with a "very poor" understanding of the French language and 27 because of probable careless responding. The study sample thus included 176 participants (57.4% women) aged between 15 and 78 years ($M = 34.6$; $SD = 15.5$).

Spanish Sample

The Spanish sample in the present study results of the merging of three samples that were recruited in previous studies on personality. The first sample (see Aluja et al., 2022) included 803 Spanish adults (53.4% women), among whom 54.9% were from the general population and 45.1% were undergraduate students with a mean age of 35.3 years ($SD = 16.9$). The second sample (see Sorrel et al., 2022) included 606 Spanish adults from the general population (50.3% women) with a mean age of 43.7 years ($SD = 16.9$). The third sample (Aluja et al., 2024) included 504 unpaid community volunteers (51.4% women) with a mean age of 45.2 years ($SD = 17.9$). For the three samples, participants from the general Spanish population were recruited by undergraduate students taking part in a personality research and practice program. Respectively two, five and three participants were excluded from these samples for the present study following the long strings analysis. The Spanish sample thus included 1,903 participants.

Swiss Sample

The initial sample consisted of 735 Swiss adults recruited by undergraduate students in psychology participating in a research practicum. Each student surveyed eight to 10 French-speaking voluntary participants using snowball sampling. Students were provided with credits as a recognition of their contribution. Six participants had to be excluded following the long string analysis. The study sample included 729 participants (57.1% women) aged between 18 and 92 years ($M = 37.6$; $SD = 15.1$).

Togolese Sample

The initial sample consisted of 540 university students enrolled in various bachelor and master's programs at the Université de Lomé in Togo. Students were invited in class by research assistants to participate in the study. Interested participants were given a article copy of the research questionnaire and were asked to fill it and bring it back the next day. Data validity screening led to the exclusion of 33 participants: 25 with a "very poor" understanding of the French language and two who did not rate their understanding of French (missing data), plus six probable careless responding profiles (long strings). The study sample thus included 507 participants (37.7% women) with a mean age of 26.3 years ($SD = 10.0$).

Instruments

The FFiCD

Originally developed in English, the FFiCD (Oltmanns & Widiger, 2020) includes 121 self-descriptive Likert-type items (e.g., "I sometimes feel very fragile") assessing 20 maladaptive personality traits (listed in Table 4). The items were drawn from preexisting measures of the Five-Factor Model of PDs (Widiger et al., 2012). The 20 maladaptive traits of the FFiCD were designed as indicators of the five broad personality domains of the *ICD-11* PDs model. Higher scores on these scales indicate higher levels of pathological traits.

French Translation. The FFiCD was translated from English to French by five of the authors of the present study (Yann Le Corff, Karine Forget, Michel Hansenne, Mélanie Lapalme, and Jean-Pierre Rolland), who are fluent in both French and English, using guided forward translation by committee (Iliescu, 2017). This method was preferred over the classical back translation method, as it allows for a focus on psychological and cultural equivalence of the items and less on the linguistic equivalence in the target language (Iliescu, 2017). The French version if the FFiCD is available in Section S15 in the online supplemental materials.

Mental Health

In addition, in all but the American and Spanish samples, participants were asked whether in the last 12 months they suffered from a

mental disorder diagnosed by a mental health professional and whether they consulted with a mental health professional for personal problems. In the Belgian sample, participants were asked about lifetime mental health diagnoses and consulting instead of over the last 12 months.

Analyses

Analyses were conducted by using SPSS 29 and with MPlus Version 8.8 (Muthén & Muthén, 1998–2021). Materials (data and code) required for reproducing the study results can be found on the Open Science Framework: https://osf.io/e5qvp/?view_only=f8a4f98afe244c9a92d0eb8f775f9a13 (Le Corff et al., 2024) Structural equation modeling analyses were conducted using the robust maximum likelihood (MLR) estimator, as it provides standard errors and a χ^2 test statistic that are robust to nonnormality (Wang & Wang, 2020), and has, in invariance analysis, lower Type I error rates when ordinal data are asymmetric, as well as greater power to detect scalar invariance (Sass et al., 2014).

Missing Data

There were no missing data on FFiCD items in the American, Canadian, French, Spanish, and Swiss samples. In the Belgian sample, four items had one missing data. In the Burkinabe sample, almost all items had missing values, varying between one and nine, with the exception of item 10 ("I get very annoyed at even minor frustrations") which had 16 missings. The Indian sample had two items with one missing each. The Togolese sample had 32 items with one or two missings. Facet scales scores were computed by calculating the mean for valid items. However, if a participant had more than 40% missing responses on a scale's items, no scale score was computed for that participant. It resulted that there were no missing data on the facet scales in any samples, with the exception of the Burkinabe sample, which had two scales (lack of empathy, irresponsibility) with two missing data each. In that case, these missing data were handled with full information maximum likelihood in the following factor analyses.

Baseline Models

In order to establish baseline models, a series of analyses were conducted to determine the number of factors to extract from the 20 FFiCD facet scales in each of the seven original samples.[2] Horn parallel analyses were calculated based on principal components analysis with varimax rotation, and EFA with geomin rotation with one to six factors were calculated to determine the factor structure that best fitted the data. EFA was preferred over confirmatory factor analysis to better account for the complexity of the factor structure in which significant secondary loadings are expected theoretically (Marsh et al., 2010; Watts et al., 2023); FFiCD facets are known to present secondary loadings in noncorresponding domains (García et al., 2024). EFA models were compared with the Akaike information criterion (AIC), the Bayesian information criterion (BIC), and the sample-size adjusted BIC (sBIC). The number of factors was deemed optimal when either these indices reached their lowest value or when the model with one additional factor did not yield a notable decrease in the indices' values. In order to ascertain that the best fitting model according to these comparative indices had a good fit to the data according to incremental and absolute fit indices, each model was also evaluated for model fit with the comparative fit index (CFI), the Tucker–Lewis index (TLI), and the root-mean-square error of approximation (RMSEA). CFI and TLI values greater than .950 and a RMSEA below .060 are indicative of an excellent fit (Hu & Bentler, 1999), although authors (Marsh et al., 2005) have argued that these criteria are too stringent for more complex models, which is typically the case for personality inventories such as the FFiCD, and they suggested that CFI and TLI values greater than .900 and RMSEA lower than .080 are indicative of adequate fit.

In addition to these first-order EFA models, exploratory bifactor models (with the bi-geomin rotation) with one general factor and one to six orthogonal specific factors were also computed in each sample. Comparative fit indices were used to determine the best fitting model according to the same criteria presented above.

Measurement Invariance

Multigroup invariance analysis was used to assess the cross-cultural validity of the best-fitting baseline model. Configural invariance was tested by fitting an unconstrained multigroup model using the same specifications across samples with similar baseline structures. Metric invariance was tested by placing equality constraints on the factor loadings across samples, and then comparing this constrained model to the unconstrained (configural) model. Scalar invariance was tested by adding equality constraints across samples on the indicators thresholds (intercepts) and comparing this model (scalar) to the metric model. Strict invariance was tested by adding equality constraints across samples on the residuals and comparing this model (strict) to the scalar model. Since the MLR estimation was used, the χ^2 difference test was computed via the DIFFTEST procedure. However, since the χ^2 is dependent on the sample size and can be oversensitive (Marsh et al., 2005), the invariance (null) hypothesis was rejected only if the decrease in CFI is greater than .010 and the increase in RMSEA is greater than .015 (Chen, 2007; Cheung & Rensvold, 2002). Additionally, the *w* coefficient was used to assess the effect-size of the change in the χ^2 statistic at each step. According to Newsom (2015), *w* values lower than .10 are indicative of a small change.

Factor Congruence

Factor congruence was assessed by comparing the exploratory four-factor loadings matrix in each sample to that of the original American sample using Procruste rotations. Congruence coefficient values of .98 or greater were considered excellent (very high degree of similarity between the two factor solutions) while values between .92 and .97 were considered good and those between .82 and .91 borderline (MacCallum et al., 1999). Of note, Lorenzo-Seva and ten Berge (2006) suggest less stringent criteria according to which a congruence of .95 and higher means that the two solutions can be considered equal while values between .85 and .94 indicate a fair degree of similarity.

Criterion Validity

Criterion validity for the FFiCD scales was assessed by comparing scores of participants who reported at least one diagnosed mental

[2] Factor analyses supporting a four-factor structure have already been conducted in the American (Oltmanns & Widiger, 2020) and Spanish (Aluja et al., 2022; Sorrel et al., 2022) samples.

health problem to those of participants who did not report such problems, using independent sample *t* tests and Cohen's *d*. Similar comparison were conducted to compare participants who did and did not report consulting with a mental health professional for personal problems. These data were not available for the American and Spanish samples since these were recruited before the design of the present study. Since the risk for type I error was inflated by the large number of *t* tests conducted, interpretation of results focused on the effect sizes (Cohen's *d*).

Results

Descriptive Analyses

Mean and standard deviation for the 20 facet and five domain scales in each sample can be found in Table S1 in the online supplemental materials, while Cronbach alphas are presented in Table 1. Overall, internal consistency was satisfactory in the Western samples, except for the thrill-seeking and unassertiveness scales for which alphas were below .70 in all samples. Internal consistency was lower in the three non-Western samples, with most scales failing to reach .70 and some falling below .50. Scale scores tended to be slightly higher in the three non-Western samples as compared to the Western samples, except for the original validation American sample (which consisted of participants with an history of mental health treatment).

Baseline Models

EFAs

Horn parallel analysis suggested the presence of four factors in the Western samples assessed with the French version of the FFiCD (Belgium, Canada, France, and Switzerland), of three factors in the African samples (Burkina Faso, Togo), and of two factors in the Indian sample. As shown in Table 2, EFA results also suggested that a four-factor model best fitted the data in the four Western samples, and that this model had an adequate fit to the data (CFI and TLI $>$ .900, RMSEA $<$ .080, but TLI $<$ .900 in the Belgian and French samples).

Meanwhile, fit indices tended to indicate that a three-factor model best fitted the data in the two African samples, and that this model had an adequate (Burkina Faso) to excellent (Togo) fit to the data. Fit indices for a four-factor model were close to that of the three-factor model, but further examination revealed that the model was not adequate. In the Burkinabe sample, it produced a Heywood case, suggesting either poorly defined factors, overextraction, or low indicator-to-factor ratio (Cooperman & Waller, 2022). In the Togolese sample, no facet had its primary loading on the fourth factor (it was only defined by secondary loadings).

In the Indian sample, no adequate factor structure could be obtained. The two-factor model had a poor fit to the data, the three-factor model produced Heywood case, and the four-factor model included a factor on which only one facet had its primary loading (which was thrill-seeking, a scale that had a very poor α of .41 in that sample). It may be that sample size was too low for factor analysis ($<$300 participants and $<$10 participant per variable; Tabachnick et al., 2013). The Indian sample was not included in the subsequent factor analyses.

Geomin-rotated factor loadings for the retained first-order EFA models are presented in Tables S2–S7 of the online supplemental materials. In the four French-speaking Western samples, the four factors were clearly interpretable. There was a clear dissociality factor on which the facets aggression, lack of empathy and self-centeredness had a strong primary loading, and thrill-seeking (from the disinhibition domain) also had its primary loading on the dissociality factor. A second factor aggregated the seven facets from the negative affectivity domain (anger, anxiousness, depressiveness, emotional lability, mistrust, shame, vulnerability), as well as three of the four facets from the disinhibition domain (disorderliness, irresponsibility, rashness). Rashness, however, loaded equally on the dissociality ($\lambda = .43$) and the negative affectivity/disinhibition factor ($\lambda = .42$) in the Swiss sample, while disorderliness loaded equally on the dissociality ($\lambda = .47$) and negative affectivity/disinhibition ($\lambda = .45$) factors. A third factor grouped two facets of the detachment domain (emotional detachment and social detachment) and inflexibility (from the anankastia domain). In the Swiss sample, the perfectionism facet also had its primary loading on this detachment factor. The fourth factor was defined by perfectionism and workaholism, and in the three European samples (Belgium, France, Switzerland), disorderliness and irresponsibility had medium-sized negative loadings on this anankastia/low disinhibition factor (λ varying from $-.44$ to $-.58$). Finally, the unassertiveness facet (from the detachment domain) did not have an homogenous loading pattern across the four Western samples, with a primary loading on the negative affectivity/disinhibition factor in the Belgian, Canadian, and Swiss sample, but with also a negative loading on the dissociality factor in the French ($\lambda = -.57$) and Belgian ($\lambda = -.42$) samples, and a medium-sized cross-loading ($\lambda = .43$) on the detachment factor in the Canadian sample.

In the two African countries, the three-factor structure yielded well-defined factors. In both samples, there was a clear dissociality factor defined by the facets aggression, lack of empathy, and self-centeredness (although rashness had its primary loading on this factor instead of on the disinhibition factor in the Togolese sample), and a clear anankastia factor defined by inflexibility, perfectionism, and workaholism. A third factor was defined by the facets from the negative affectivity (anger, anxiousness, depressiveness, emotional lability, mistrust, shame, vulnerability), disinhibition (disorderliness, irresponsibility, rashness, thrill-seeking [Burkinabe sample only]), and detachment (emotional detachment, social detachment, unassertiveness) domains.

Exploratory Bifactor Analyses

Fit indices for the exploratory bifactor models in each original sample are presented in Table S8 in the online supplemental materials. In all samples, AIC, BIC, and sBIC statistics were highly similar to those observed in the first-order EFA model: In the Western samples, the model with one general and three specific factors best fitted the data, while the model with one general and two specific factors best fitted the data in the African samples. This result was expected since first-order EFA and exploratory bifactor models with a same number of factors include the same number of variables and parameters and have the same log-likelihood value; only small differences in χ^2 values were observed, resulting in trivial or no differences in fit indices.

The main difference in these two types of models reside in factor loadings. Geomin-rotated factor loadings for the retained exploratory bifactor models are presented in Tables S9–S14 of the online

Table 2
Goodness-of-Fit Indices for the Exploratory First-Order Factor Analyses

Model	χ^2	*df*	AIC	BIC	sBIC	CFI	TLI	RMSEA	SRMR
Belgium									
One-factor	2,451.37	170	23,749	24,010	23,819	.545	.492	.153	.138
Two-factor	1,653.67	151	22,824	23,168	22,917	.700	.623	.132	.099
Three-factor	854.52	133	21,989	22,410	22,102	.856	.795	.098	.050
Four-factor	**486.19**	**116**	**21,623**	**21,118**	**21,756**	**.926**	**.879**	**.075**	**.029**
Five-factor	367.51	100	21,507	22,072	21,659	.947	.899	.069	.023
Six-factor	233.38	85	21,400	22,030	21,570	.970	.934	.055	.019
Burkina Faso									
One-factor	1,005.90	170	14,333	14,576	14,386	.746	.716	.107	.086
Two-factor	699.12	151	13,990	14,310	14,060	.834	.791	.092	.063
Three-factor	**328.00**	**133**	**13,639**	**14,033**	**13,725**	**.941**	**.915**	**.058**	**.032**
Four-factor	232.18	116	13,565	14,028	13,666	.965	.942	.048	.024
Five-factor	194.73	100	13,545	14,073	13,660	.971	.945	.047	.021
Six-factor	188.48	85	13,539	14,127	13,667	.969	.930	.053	.018
Canada									
One-factor	4,122.51	170	34,934	35,225	35,034	.623	.579	.157	.122
Two-factor	2,117.19	151	32,664	33,047	32,797	.813	.764	.117	.076
Three-factor	1,402.57	133	31,762	32,233	31,925	.879	.827	.101	.044
Four-factor	**650.18**	**116**	**31,041**	**31,594**	**31,232**	**.949**	**.917**	**.070**	**.022**
Five-factor	532.25	100	30,894	31,525	31,112	.959	.922	.068	.019
Six-factor	334.80	85	30,737	31,441	30,980	.976	.947	.056	.015
France									
One-factor	2,575.55	170	32,107	32,386	32,196	.535	.480	.160	.141
Two-factor	2,378.53	151	30,716	31,084	30,833	.696	.617	.138	.093
Three-factor	1,310.79	133	29,625	30,077	29,769	.839	.770	.107	.053
Four-factor	**661.94**	**116**	**28,994**	**29,526**	**29,164**	**.925**	**.878**	**.078**	**.027**
Five-factor	463.12	100	28,808	29,413	29,001	.950	.906	.068	.022
Six-factor	482.02	85	28,738	29,414	28,953	.946	.879	.077	.019
India									
One-factor	705.53	170	6,201	6,392	6,202	.727	.695	.134	.098
Two-factor	444.20	151	5,943	6,193	5,943	.850	.812	.105	.054
Three-factor	**288.52**	**133**	**5,811**	**6,119**	**5,812**	**.921**	**.887**	**.082**	**.037**
Four-factor	276.58	116	5,784	6,145	5,784	.918	.866	.089	.030
Five-factor	209.71	100	5,754	6,166	5,754	.944	.894	.079	.024
Six-factor		85							
Switzerland									
One-factor	3,248.96	170	28,670	28,946	28,755	.562	.510	.158	.142
Two-factor	1,864.65	151	27,103	27,465	27,215	.756	.693	.125	.089
Three-factor	993.38	133	26,160	26,606	26,298	.877	.825	.094	.045
Four-factor	**544.32**	**116**	**25,698**	**26,221**	**25,859**	**.939**	**.900**	**.071**	**.025**
Five-factor	395.29	100	25,550	26,147	25,734	.958	.920	.064	.021
Six-factor	308.01	85	25,456	26,122	25,661	.968	.929	.060	.016
Togo									
One-factor	1,078.11	170	17,137	17,391	17,200	.760	.732	.103	.087
Two-factor	513.90	151	16,526	16,860	16,610	.904	.879	.069	.045
Three-factor	**239.85**	**133**	**16,253**	**16,663**	**16,355**	**.972**	**.960**	**.040**	**.026**
Four-factor	188.74	116	16,218	16,700	16,338	.981	.968	.035	.021
Five-factor	140.66	100	16,200	16,749	16,337	.989	.980	.028	.018
Six-factor	128.22	85	16,198	16,812	16,351	.989	.974	.032	.015

Note. Best-fitting models are in bold. AIC = Akaike information criterion; BIC = Bayesian information criterion; sBIC = sample-size adjusted BIC; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; SRMR = standardized root-mean-square residual.

supplemental materials. In the four French-speaking Western samples, the general factor was defined by the seven facets of the negative affectivity domain and by three of the four facets of disinhibition (disorderliness, irresponsibility, rashness). Emotional detachment and unassertiveness also had medium to large loadings on the general factor. The three specific factors were detachment (social and emotional), dissociality plus thrill-seeking (from the disinhibition domain), and anankastia with low disinhibition. In the Canadian sample, disinhibition facets had stronger loadings on the general factor (as compared to the other samples) and were less strongly associated to the anankastia factor. Thus, similarly to what was observed in the Spanish data (Sorrel et al., 2022), the general factor was mostly defined by the negative affectivity facets and the exploratory bifactor did not substantially differ from the first-order EFA model.

In the two African samples, all facets had moderate-to-strong loadings on the general factor, except for the three facets from the Anankastia domain which loaded primarily on a specific factor. Meanwhile, the three facets from the dissociality domain had moderate-to-strong loadings on both the general factor and a second

specific factor. Again, the bifactor model did not substantially differ from the first-order model.

Measurement Invariance Across Cultures

The primary objective of this study was to examine measurement invariance of the FFiCD across nine countries. Given that the first-order EFA and exploratory bifactor models were substantively similar, invariance analyses were conducted on the first-order models only. As shown in the previous section, while a four-factor model best fitted the data in the six Western countries, a three-factor structure had a better fit in the two African countries. Consequently, invariance analyses were conducted separately for the two groups of countries.

As shown in Table 3, configural and metric invariance for the four-factor first-order EFA model were supported across the six Western samples but full scalar invariance was not, suggesting that some of the intercepts were not equal across samples. Partial scalar invariance was reached after iteratively freeing the intercepts with the highest modifications indices for eight facets in the Spanish sample (social detachment, rashness, emotional detachment, emotional lability, shame, perfectionism, workaholism, unassertiveness) and two facets in the Canadian sample (aggression, rashness). Reaching partial scalar invariance allowed testing for strict invariance, which was supported (ΔRMSEA = .001; w = .04; albeit ΔCFI = .011).

Configural and metric invariance for the three-factor first-order EFA model were also supported across the Burkinabe and Togolese samples, while full scalar invariance was not. Partial scalar invariance was reached after iteratively freeing the intercepts for the two facets with the highest modifications indices (unassertiveness, disorderliness). Strict invariance was supported.

Factor Congruence

Congruence coefficients between the original four-factor solution in the American sample and the corresponding solution in each other sample are presented in Table S15 of the online supplemental materials. Overall factor congruence was excellent for the five Western sample (varying from .97 to .98), good (.93) in the Burkinabe sample, and borderline (.90) in the Togolese sample. In the two African samples, this lower overall congruence is mainly attributable to the fourth factor (detachment), for which congruence was poor (.78 and .60, respectively). This result is consistent with the fact that a three-factor solution best fitted the data in these samples, where detachment facets loaded on the negative affectivity/disinhibition factor.

Criterion Validity

A series of *t* tests and Cohen's *d*s were calculated to compare scores of participants who reported at least one versus no diagnosed mental health problem in the last 12 months (lifetime in the Belgian sample) on each of the 20 facet scales and five domain scales of the FFiCD (see Table 4).[3] In six of the seven samples (with the exception of India) in which these data were available, the results yielded theoretically relevant differences. The patterns of differences were similar across the Western samples, with the negative affectivity facet and domain scales showing the largest effect sizes (varying from moderate to large), while the anankastia facets and domain showed the lowest effect sizes (varying from small to null). The African samples did not show the same consistence and differences between participants with and without a mental health disorder tended to be smaller than in the Western samples. In the Burkinabe sample, dissociality and negative affectivity facets and domains tended to show the largest differences (varying from small to moderate), while in the Togolese sample only depressiveness reached a moderate effect size. In the Indian sample, all effect sizes were small, except for the perfectionism facet which was higher in the no-diagnosis group with a moderate effect size.

Participants who reported consulting with a mental health professional for personal problems in the last 12 months (at least once in their lifetime for the Belgian sample) were compared to those who did not (see Table 5). The Burkinabe and Indian sample were excluded from this analysis since the consulting group included only 12 and eight participants respectively. Again, theoretically relevant differences emerged, and results were similar across the Western samples, while Togolese results differed. In the Western samples, facets pertaining to internalizing problems (anxiousness, depressiveness, emotional lability, vulnerability) and irresponsibility showed the largest differences (moderate effect sizes) while all the other facets showed small to null effect sizes. In the Togolese sample, dissociality domain and facets showed the largest differences (moderate effect sizes), along with depressiveness, irresponsibility, and emotional detachment.

Discussion

In the aim of allowing for intercultural use of the FFiCD in research and clinical practice, this study investigated its cross-cultural validity across nine culturally diverse countries (Belgium, Burkina Faso, Canada, France, India, Spain, Switzerland, Togo, and the United States). The FFiCD is one of the few instruments assessing the five maladaptive personality traits domains of the new model of PDs that was introduced in the *ICD-11*. At the same time, this study proposed a French translation of the FFiCD and allowed examining its validity in seven countries. This French translation was used in all samples with the exception of the American (original English version) and Spanish (Spanish translation) samples. Additionally, evidence for criterion validity was provided for the FFiCD facet and domain scales.

Factor Structure of the FFiCD

Preliminary to the measurement invariance analyses, this study examined the factor structure of the French translation of the FFiCD separately in seven countries, using the 20 facet scales as indicators. EFA results showed that a four-factor structure best fitted the data in the Western countries (Belgium, Canada, France, Switzerland) and that this structure was highly congruent with the original four-factor structure previously reported for the American sample (Oltmanns & Widiger, 2020). This structure also paralleled what was observed with other instruments assessing the *ICD-11* PD traits model (Bach & Zine El Abiddine, 2020; Bach, Christensen, et al., 2020; Carnovale et al., 2020; Sellbom et al.,

[3] Prior to these analyses, we conducted measurement invariance between participants with and without diagnosed mental heath problems, to ascertain comparability of raw scores. Strict invariance was supported in each sample.

Table 3
Measurement Invariance of the First-Order EFA Models

Model	χ^2	*Df*	CFI	RMSEA	ΔCFI	ΔRMSEA	$\Delta\chi^2$	Δ*df*	*p*	*w*
Western samples										
Configural	4,059.63	696	.935	.074						
Metric	4,903.38	1,016	.925	.066	−.010	−.008	843.75	320	<.001	.02
Scalar	6,972.73	1,096	.887	.078	−.038	.012	2,069.35	20	<.001	.14
Partial scalar	5,493.36	1,086	.915	.068	−.010	.002	589.98	30	<.001	.06
Strict	6,149.23	1,186	.904	.069	−.011	.001	655.87	100	<.001	.04
African samples										
Configural	565.54	266	.958	.049						
Metric	645.61	317	.954	.047	−.004	−.002	80.07	51	<.001	.04
Scalar	773.99	334	.938	.053	−.016	.006	128.38	17	<.001	.09
Partial scalar	716.16	332	.946	.050	−.008	−.003	70.55	15	<.001	.07
Strict	759.52	352	.942	.050	−.004	.000	43.36	20	.002	.14

Note. *N* (Belgium) = 570; *N* (Burkina Faso) = 431; *N* (Canada) = 945; *N* (France) = 780; *N* (Spain) = 1,903; *N* (Switzerland) = 729; *N* (Togo) = 507; *N* (United States) = 301; EFA = exploratory factor analysis; CFI = comparative fit index; RMSEA = root-mean-square error of approximation; *w* = effect-size of the change in the chi-square statistic.

2023; Somma et al., 2020; Stricker et al., 2022). Overall, there were clear anankastia, dissocial, detachment, and negative affectivity factors, but the facets from the disinhibition domain merged with anankastia (negatively, producing an anankastia/low disinhibtion factor) and negative affectivity (positively, producing a negative affectivity/disinhibition factor). Of note, in the Canadian data, disinhibition facets loaded primarily on the dissocial and negative affectivity factors, yielding a "pure" anankastia factor.

In the two African countries (Burkina Faso and Togo), factor congruence of the four-factor structure with the original American factor solution was not excellent, with a very low congruence for the detachment factor. In fact, EFA showed that a three-factor structure best fitted the data. There were clear dissocial and anankastia factors, with the latter being "purer" than in the Western samples since the disinhibition facets did not primarily load on this factor. The other factor was defined by the facets from the negative affectivity, detachment, and

Table 4
Cohen's d Comparing FFiCD Scores for Participants With and Without a Mental Health Disorder Diagnosis

Scale	Belgium	Canada	France	Switzerland	Burkina Faso	Togo	India
Facet scales							
Aggression	**.52**	**.32**	**.22**	**.33**	**.61**	**.26**	.36
Lack of empathy	**.45**	.14	.13	.11	**.56**	**.30**	.13
Self-centeredness	.15	**.23**	**.26**	.15	**.46**	.23	.15
Anger	**.48**	**.50**	**.57**	**.57**	**.53**	**.28**	.00
Anxiousness	**.56**	**.71**	**.72**	**.81**	**.46**	.16	.03
Depressiveness	**.67**	**.78**	**.89**	**.92**	**.60**	**.53**	.04
Emotional lability	**.73**	**.77**	**.71**	**.75**	**.46**	**.28**	−.01
Mistrust	**.59**	**.51**	**.70**	**.69**	**.56**	**.29**	.07
Shame	**.49**	**.56**	**.62**	**.81**	**.42**	.11	−.16
Vulnerability	**.49**	**.75**	**.76**	**.88**	.18	.21	.12
Disorderliness	**.38**	**.47**	**.34**	**.38**	**.38**	**.25**	.08
Irresponsibility	**.54**	**.61**	**.62**	**.78**	**.56**	**.42**	.05
Rashness	**.46**	**.48**	**.45**	**.39**	.17	**.45**	.10
Thrill-seeking	**.31**	**.25**	.20	.21	**.47**	**.29**	.16
Emotional detachment	**.65**	**.35**	**.52**	**.52**	**.51**	**.37**	.14
Social detachment	**.34**	.13	**.26**	**.34**	.11	.17	.35
Unassertiveness	.11	**.38**	**.29**	**.37**	.30	**.38**	.19
Inflexibility	.22	.09	**.36**	**.32**	.00	−.09	−.11
Perfectionism	.16	.02	**.23**	.09	.05	−.01	−.47
Workaholism	.02	.07	.10	−.11	.15	.02	−.04
Domain scales							
Dissociality	**.36**	**.25**	**.24**	**.23**	**.65**	**.31**	.23
Negative affectivity	**.74**	**.82**	**.92**	**.99**	**.61**	**.38**	.01
Disinhibition	**.59**	**.61**	**.59**	**.66**	**.51**	**.48**	.10
Detachment	**.53**	**.36**	**.49**	**.54**	**.44**	**.41**	.28
Anankastia	.17	.08	**.30**	.16	.07	−.04	−.23

Note. Significant differences (*t* test) at $p < .01$ are in bold. *N* (Belgium) = 569; *N* (Burkina Faso) = 429; *N* (Canada) = 945; *N* (India) = 176; *N* (France) = 780; *N* (Switzerland) = 729; *N* (Togo) = 506. FFiCD = Five-Factor Personality Inventory for *ICD-11*; *ICD-11* = 11th edition of the *International Classification of Diseases*.

Table 5

Cohen's d Comparing FFiCD Scores for Participants Who Did and Did Not Consult With a Mental Health Professional for Personal Problems

Scale	Belgium	Canada	France	Switzerland	Togo
Facet scales					
Aggression	.14	**.35**	.12	.15	**.47**
Lack of empathy	−.06	.05	−.14	−.11	**.52**
Self-centeredness	.07	**.21**	**.21**	.11	**.46**
Anger	**.31**	**.52**	**.27**	**.45**	.36
Anxiousness	**.58**	**.52**	**.49**	**.64**	.05
Depressiveness	**.70**	**.74**	**.58**	**.75**	**.71**
Emotional lability	**.64**	**.61**	**.56**	**.60**	.15
Mistrust	**.64**	**.38**	**.37**	**.49**	.24
Shame	**.43**	**.41**	**.28**	**.61**	.26
Vulnerability	**.60**	**.58**	**.55**	**.75**	.14
Disorderliness	**.24**	**.36**	.17	.16	.31
Irresponsibility	**.52**	**.48**	**.40**	**.49**	**.56**
Rashness	.18	**.33**	**.31**	.19	.26
Thrill-seeking	.16	**.30**	.18	.19	.32
Emotional detachment	.20	.18	**.26**	**.30**	**.58**
Social detachment	.11	−.10	.12	**.24**	.01
Unassertiveness	**.28**	.19	.08	**.32**	.32
Inflexibility	−.07	−.08	.14	.10	.24
Perfectionism	.08	.05	.13	.09	−.14
Workaholism	−.13	.00	−.04	.02	.02
Domain scales					
Dissociality	.06	.22	.06	.05	**.57**
Negative affectivity	**.69**	**.67**	**.57**	**.78**	**.40**
Disinhibition	**.41**	**.48**	**.38**	**.38**	**.51**
Detachment	**.24**	.12	**.22**	**.36**	**.44**
Anankastia	−.05	−.02	.11	.09	.08

Note. Significant differences (*t* test) at $p < .01$ are in bold. N (Belgium) = 570; N (Canada) = 945; N (France) = 780; N (Switzerland) = 729; N (Togo) = 501. FFiCD = Five-Factor Personality Inventory for *ICD-11*; *ICD-11* = 11th edition of the *International Classification of Diseases*.

disinhibition domains, producing a broad factor of general emotional disturbance. These results appear in contradiction with a previous study which reported similar factor structures in Swiss and African samples using a questionnaire assessing the *DSM-4* categorical PD model (Rigozzi et al., 2009) and with a study supporting the four-factor structure of the *ICD-11* model in an Algerian sample (Bach & Zine El Abiddine, 2020). The low internal consistency for facet scales in the African samples ($\alpha < .70$ in most cases) may explain why a less differentiated factor structure was observed in the present study. This low reliability for facet scales could suggest that items would need to undergo a cultural adaptation to better capture the specific contextual expression of maladaptive traits in French-speaking African cultures (Rossier et al., 2017). Further studies using the FFiCD in French-speaking African countries should investigate whether the present results are sample specific or if they indicate that the instrument fails to yield a four-factor structure.

The Indian data failed to yield an adequate factor structure. This could suggest that Indian participant in this study may understand FFiCD items differently (either because of cultural differences, of the validity of the French translation in India, or of sample-specific characteristics), that the FFiCD does not adequately assess the *ICD-11* domains in the Indian culture, or that the *ICD-11* model itself has low validity in that culture. However, definitive conclusions should be withheld until further replication because of the small size and limited representativity of the sample.

Exploratory bifactor analyses yielded structures that were very similar to the first-order structures. The specific factors observed in the bifactor models correspond to factors from the first-order model, while the general factor appears to essentially replace one of the first-order factors. Similar results were observed in a Spanish sample (Sorrel et al., 2022). It is important to note, though, that the bifactor model led to an increased prominence of the anankastia/low disinhibtion factor as compared to the first-order model (see Oltmanns & Widiger, 2020 for a discussion).

Cross-Cultural Validity of the FFiCD

Given that different factor structures were supported across the national samples under study, measurement invariance was tested separately for the Western and for the African countries. Configural, metric, partial scalar, and strict invariance were supported across all six Western samples as well as across the Burkinabe and Togolese samples. In the Western samples, constraints on intercepts for eight facets in the Spanish sample and for two facets in the Canadian sample needed be freed to reach partial scalar invariance. Meanwhile, two intercepts were freed across the African samples to reach partial scalar invariance.

Configural invariance indicates that respondents conceptualized the constructs in the same way in all compared countries (factors were defined by the same facets), and so the broad factor structure of the FFiCD remained universal despite cultural or linguistic differences between the compared samples. Metric invariance indicates that the strength of the associations between facets and factors (factor loadings) is similar across countries, so differences in facet scores will indicate differences in the latent construct rather than being attributable to linguistic or cultural nonequivalence (Byrne, 2016; Milfont & Fisher, 2010). This also means that the factors have the same meaning in the compared cultures. These results thus lend support to the validity of the French translation of the FFiCD presented in this study, at least in the Western samples. Scalar and strict invariance indicates that participants with a same latent score on a domain would obtain the same observed score on the corresponding domain scale regardless of their culture or language of assessment (Milfont & Fisher, 2010). Scalar invariance was supported across the American, Belgian, French, and Swiss samples, while eight intercepts in the Spanish sample and two in the Canadian sample were not invariant. This means that in the four counties where the intercepts and residuals were invariant, participants with a same "true" score (i.e., latent score) on a FFiCD domain would have a same observed score on the corresponding scale, while it would not be the case for the Spanish and Canadian participants, nor for Togolese and Burkinabe participants. This also means that eventual differences in factor scores across some countries could be because of cultural differences in the measurement of these constructs instead of to "true" differences in the latent constructs across these cultures. For example, it is possible that perception of severity of a symptom or maladaptive behavior vary in the Spanish culture (or that this is attributable to a language difference). However, since convenience samples were used in this study, it is possible that failure to reach full scalar invariance is because of sample-specific nonequivalence that would not generalize to population representative samples. Also, these results are in line with a previous study in which configural and metric invariance of the NEO Personality Inventory-revised and the International Personality Disorders Examination were supported across regions

of Burkina Faso (there are over 60 different ethnocultural subgroups in Burkina Faso; Rossier et al., 2017) in a sample of rural and preliterate Burkinabe (Rossier et al., 2013).

Practically, these results suggest that in intercultural research, direct comparison of FFiCD scale scores across culturally different samples may not allow to reliably study true differences in regard to severity of maladaptive traits. In clinical practice, national/cultural norms would be required to reliably assess patients, and eventual cutoff scores for the FFiCD would not be equally valid across the countries. Maladaptive traits should be assessed and interpreted considering the cultural context of their expression. Nonetheless, it is important to underline that despite these cultural differences, criterion validity findings (see below) remain valid.

Criterion Validity

Evidence for criterion validity was obtained in the seven original samples under study which were assessed with the French translation of the FFiCD. In all French-speaking samples but the Indian, there were theoretically sound differences between participants who did and did not report one or more mental disorder diagnostic in the last 12 months (lifetime for the Belgian sample). In the Western samples, negative affectivity domain and facets had the strongest associations with mental health problems (with moderate-to-large effect sizes), followed by disinhibition domain and facets. These results are coherent with the well-known association between neuroticism and mental health problems (Jeronimus et al., 2016) and support the criterion validity of the FFiCD. In the Burkinabe sample, the largest differences were of moderate effect sizes and were spread across all domains except anankastia, with dissociality and negative affectivity showing the largest differences overall. The importance given to social cohesion and agreeableness in the Burkinabe culture (Rossier et al., 2017) may explain this stronger association between dissocial traits and mental health problems. Criterion validity appeared to be lower in the Togolese sample and poor in the Indian sample. Regarding the latter sample, cultural differences, a lower validity of the FFiCD or of our French translation in this population, or sample-specific characteristics could explain the lower validity. Additionally, the fact that perfectionism scores were notably higher in the no-diagnosis group, along with the idiosyncratic factor structure, suggests that Indian participants may understand FFiCD items differently than the other participants.

Likewise, criterion validity appeared similar across the Western samples when comparing participants who did and did not consult with a mental health professional for personal problems in the last 12 months (lifetime for the Belgian sample). Facets pertaining to internalizing problems showed the largest differences, that is, anxiousness, depressiveness, emotional lability, and vulnerability, with the addition of irresponsibility from the disinhibition domain. This result is in line with other results showing that neuroticism and low conscientiousness predict mental health service utilization (Goodwin et al., 2002; ten Have et al., 2005) and support the criterion validity of the FFiCD. In the Togolese sample, depressiveness, irresponsibility, emotional detachment, and the three facets from the dissociality domain significantly differed between participants who did and did not consult. It is important to note, however, that access to a mental health professional may vary greatly across countries and may be lower in African and Indian samples, thus explaining at least in part the lower criterion validity.

Interestingly, in general, the magnitude of effect sizes varied notably between facets of a same domain. This underlines the relevance of the FFiCD in assessing facets under the five domains, thus providing a more specific and informative assessment of personality pathology.

Limitations

Perhaps the main limitation of the present study is the use of convenience samples. As such, results may not generalize to the general populations of their respective countries, and samples differences may explain why only partial scalar invariance was reached. Notably, mean age varied across samples, a difference that could have negatively impacted the invariance analyses, since PDs and maladaptive traits are known to be more prevalent and severe in younger than in older adults (Le Corff et al., 2023). In the same manner, since samples were drawn from the community, results may not generalize to clinical samples. Another main limitation is that the approach used to screen for response validity was relatively meager since measures of, for example, inconsistent responding, faking good or bad, or completion in improbable times were not available. The sole use of long strings and self-reported understanding of the French language as screening measures led to filtering out fewer participants than one would expect if a more comprehensive approach was used. Thus, the possible inclusion of poorer quality data (and the possible differential amounts of insufficiently high-quality data across samples) could be partially responsible for some of the differences in factor structures. An additional limitation is the lower internal consistency for facet scales in the non-Western sample, which may have impacted on the factor analyses and negatively impacted criterion validity. Also, the Indian sample was limited in size, which may have hampered reaching a viable factor structure. Finally, the study design did not allow identifying precise causes for partial scalar noninvariance, since it was not possible to distinguish between the effects of sample composition, cultural differences, and linguistic differences.

Future Studies

Future studies should investigate cultural differences across Western and non-Western cultures in the assessment of the *ICD-11* PD model. Indeed, since the *ICD-11* was designed to be used worldwide, it is crucial for its PD model to be valid across all cultures, and even more so in the current context of increased immigration across the world. It is important to note, however, that it is possible that the nonequivalence across cultures observed in the present study is attributable to the FFiCD and not to the *ICD-11* PD model itself, and thus, future studies should investigate the cross-cultural validity of this model using different instruments. Additionally, future studies could try new items or new facets for the FFiCD with the aim of reaching a clear five-factor structure with an independent disinhibition factor.

References

Aluja, A., Balada, F., Atitsogbe, K. A., Rossier, J., & García, L. F. (2024). Convergence of the dimensional assessment of personality pathology (DAPP-BQ) and the Five-Factor Personality Inventory for the *International Classification of Diseases* 11th edition (FFiCD) in the context

of the five-factor model and personality disorders. *BMC Psychiatry*, *24*(1), Article 386. https://doi.org/10.1186/s12888-024-05835-8

Aluja, A., Sorrel, M. A., García, L. F., García, O., & Gutierrez, F. (2022). Factor convergence and predictive analysis of the five factor and alternative five factor personality models with the Five-Factor Personality Inventory for ICD-11 (FFiCD). *Journal of Personality Disorders*, *36*(3), 296–319. https://doi.org/10.1521/pedi_2012_35_542

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5* (5th ed.). American Psychiatric Association.

Anglim, J., Horwood, S., Smillie, L. D., Marrero, R. J., & Wood, J. K. (2020). Predicting psychological and subjective well-being from personality: A meta-analysis. *Psychological Bulletin*, *146*(4), 279–323. https://doi.org/10.1037/bul0000226

Bach, B., Christensen, S., Kongerslev, M. T., Sellbom, M., & Simonsen, E. (2020). Structure of clinician-reported ICD-11 personality disorder trait qualifiers. *Psychological Assessment*, *32*(1), 50–59. https://doi.org/10.1037/pas0000747

Bach, B., Kerber, A., Aluja, A., Bastiaens, T., Keeley, J. W., Claes, L., Fossati, A., Gutierrez, F., Oliveira, S. E. S., Pires, R., Riegel, K. D., Rolland, J. P., Roskam, I., Sellbom, M., Somma, A., Spanemberg, L., Strus, W., Thimm, J. C., Wright, A. G. C., & Zimmermann, J. (2020). International assessment of DSM-5 and ICD-11 personality disorder traits: Toward a common nosology in DSM-5.1. *Psychopathology*, *53*(3–4), 179–188. https://doi.org/10.1159/000507589

Bach, B., & Mulder, R. T. (2022). Empirical foundation of the ICD-11 classification of personality disorders. In S. K. Huprich (Ed.), *Personality disorders and pathology: Integrating clinical assessment and practice in the DSM-5 and ICD-11 era* (pp. 27–52). American Psychological Association. https://doi.org/10.1037/0000310-003

Bach, B., Simonsen, E., Kongerslev, M. T., Bo, S., Hastrup, L. H., Simonsen, S., & Sellbom, M. (2023). ICD-11 personality disorder features in the Danish general population: Cut-offs and prevalence rates for severity levels. *Psychiatry Research*, *328*, Article 115484. https://doi.org/10.1016/j.psychres.2023.115484

Bach, B., & Zine El Abiddine, F. (2020). Empirical structure of DSM-5 and ICD-11 personality disorder traits in Arabic-speaking Algerian culture. *International Journal of Mental Health*, *49*(2), 186–200. https://doi.org/10.1080/00207411.2020.1732624

Bagby, R. M., Keeley, J. W., Williams, C. C., Mortezaei, A., Ryder, A. G., & Sellbom, M. (2022). Evaluating the measurement invariance of the Personality Inventory for *DSM*-5 (PID-5) in Black Americans and White Americans. *Psychological Assessment*, *34*(1), 82–90. https://doi.org/10.1037/pas0001085

Bender, D. S., Dolan, R. T., Skodol, A. E., Sanislow, C. A., Dyck, I. R., McGlashan, T. H., Shea, M. T., Zanarini, M. C., Oldham, J. M., & Gunderson, J. G. (2001). Treatment utilization by patients with personality disorders. *American Journal of Psychiatry*, *158*(2), 295–302. https://doi.org/10.1176/appi.ajp.158.2.295

Bender, D. S., Morey, L. S., & Skodol, A. E. (2011). Toward a model for assessing level of personality functioning in DSM-5, Part I: A review of theory and methods. *Journal of Personality Assessment*, *93*(4), 332–346. https://doi.org/10.1080/00223891.2011.583808

Byrne, B. M. (2016). Multigroup comparisons. Testing for measurement, structural, and latent mean equivalence. In F. T. L. Leong, D. Bartram, F. M. Cheung, K. F. Geisinger, & D. Iliescu (Eds.), *The ITC international handbook of testing and assessment* (pp. 377–394). Oxford University Press.

Carnovale, M., Sellbom, M., & Bagby, R. M. (2020). The Personality Inventory for ICD-11: Investigating reliability, structural and concurrent validity, and method variance. *Psychological Assessment*, *32*(1), 8–17. https://doi.org/10.1037/pas0000776

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling*, *14*(3), 464–504. https://doi.org/10.1080/10705510701301834

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, *9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Clark, L. A., Corona-Espinosa, A., Khoo, S., Kotelnikova, Y., Levin-Aspenson, H. F., Serapio-García, G., & Watson, D. (2021). Preliminary scales for ICD-11 personality disorder: Self and interpersonal dysfunction plus five personality disorder trait domains. *Frontiers in Psychology*, *12*, Article 668724. https://doi.org/10.3389/fpsyg.2021.668724

Coelho, O., Pires, R., Ferreira, A. S., Gonçalves, B., Alkhoori, S. A., Sayed, M., ElRasheed, A., AlJassmi, M., Henriques-Calado, J., & Stocker, J. (2022). Cross-cultural Study of the Personality Inventory for the DSM-5 (PID-5) across the Portuguese and the United Arab Emirates (UAE) Community and Clinical Populations. *Clinical Practice and Epidemiology in Mental Health*, *18*(1), Article e174501792207130. https://doi.org/10.2174/17450179-v18-e2207130

Cooperman, A. W., & Waller, N. G. (2022). Heywood you go away! Examining causes, effects, and treatments for Heywood cases in exploratory factor analysis. *Psychological Methods*, *27*(2), 156–176. https://doi.org/10.1037/met0000384

Curran, P. G. (2016). Methods for the detection of carelessly invalid responses in survey data. *Journal of Experimental Social Psychology*, *66*, 4–19. https://doi.org/10.1016/j.jesp.2015.07.006

García, L. F., Gutiérrez, F., García, O., & Aluja, A. (2024). The alternative model of personality disorders: assessment, convergent and discriminant validity, and a look to the future. *Annual Review of Clinical Psychology*, *20*(1), 431–455. https://doi.org/10.1146/annurev-clinpsy-081122-010709

Goodwin, R., Hoven, C., Lyons, J., & Stein, M. B. (2002). Mental health service utilization in the United States: The role of personality factors. *Social Psychiatry and Psychiatric Epidemiology*, *37*(12), 561–566. https://doi.org/10.1007/s00127-002-0563-6

Gutiérrez, F., Aluja, A., Ruiz Rodríguez, J., Peri, J. M., Gárriz, M., Garcia, L. F., Sorrel, M. A., Sureda, B., Vall, G., Ferrer, M., & Calvo, N. (2023). Borderline, where are you? A psychometric approach to the personality domains in the *International Classification of Diseases*, 11th Revision (ICD-11). *Personality Disorders: Theory, Research, and Treatment*, *14*(3), 355–359. https://doi.org/10.1037/per0000592

Hastrup, L. H., Jennum, P., Ibsen, R., Kjellberg, J., & Simonsen, E. (2019). Societal costs of Borderline Personality Disorders: A matched-controlled nationwide study of patients and spouses. *Acta Psychiatrica Scandinavica*, *140*(5), 458–467. https://doi.org/10.1111/acps.13094

Hricovec, M. M., Su, C. C., Bart, T. A., Marsh, K. F., Alsup, C. K., & Cicero, D. C. (2024). Measurement invariance of the Personality Inventory for the DSM-5 across U.S. East Asian, Southeast Asian, and White participants. *Personality Disorders: Theory, Research, and Treatment*, *15*(1), 1–10. https://doi.org/10.1037/per0000647

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Huang, J. L., Curran, P. G., Keeney, J., Poposki, E. M., & DeShon, R. P. (2012). Detecting and deterring insufficient effort responding to surveys. *Journal of Business and Psychology*, *27*(1), 99–114. https://doi.org/10.1007/s10869-011-9231-8

Iliescu, D. (2017). *Adapting tests in linguistic and cultural situations*. Cambridge University Press. https://doi.org/10.1017/9781316273203

Jeronimus, B. F., Kotov, R., Riese, H., & Ormel, J. (2016). Neuroticism's prospective association with mental disorders halves after adjustment for baseline symptoms and psychiatric history, but the adjusted association hardly decays with time: A meta-analysis on 59 longitudinal/prospective studies with 443 313 participants. *Psychological Medicine*, *46*(14), 2883–2906. https://doi.org/10.1017/S0033291716001653

Kemp, K. C., Kaczorowski, J. A., Burgin, C. J., Raulin, M. L., Lynam, D. R., Sleep, C., Miller, J. D., Barrantes-Vidal, N., & Kwapil, T. R. (2022). Association of Multidimensional Schizotypy with PID-5 domains and

facets. *Journal of Personality Disorders*, *36*(6), 680–700. https://doi.org/10.1521/pedi.2022.36.6.680

Kerber, A., Schultze, M., Müller, S., Rühling, R. M., Wright, A. G. C., Spitzer, C., Krueger, R. F., Knaevelsrud, C., & Zimmermann, J. (2022). Development of a short and ICD-11 compatible measure for DSM-5 maladaptive personality traits using ant colony optimization algorithms. *Assessment*, *29*(3), 467–487. https://doi.org/10.1177/1073191120971848

Kim, Y. R., Tyrer, P., & Hwang, S. T. (2021). Personality Assessment Questionnaire for ICD-11 personality trait domains: Development and testing. *Personality and Mental Health*, *15*(1), 58–71. https://doi.org/10.1002/pmh.1493

Krueger, R. F. (2016). The future is now: Personality disorder and the ICD-11. *Personality and Mental Health*, *10*(2), 118–119. https://doi.org/10.1002/pmh.1340

Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine*, *42*(9), 1879–1890. https://doi.org/10.1017/S0033291711002674

Le Corff, Y., Aluja, A., Atitsogbe, K. A., Courtois, R., Dahourou, D., Forget, K., Hansenne, M., Kavitha, D., Kounou, K. B., Lapalme, M., Oltmanns, J. R., Rossier, J., Tipandjan, A., Widiger, T. A., & Rolland, J.-P. (2024, October 17). *FFiCD across cultures*. https://osf.io/e5qvp

Le Corff, Y., Lapalme, M., Rivard, G., L'Ecuyer, G., Morin, R., Forget, K., & Rolland, J. P. (2023). Prevalence of the alternative model of personality disorders diagnoses in populational and at-risk samples, gender and age groups comparisons, and normative data for the LPFS-SR and PID-5. *Personality Disorders: Theory, Research, and Treatment*, *14*(6), 591–602. https://doi.org/10.1037/per0000632

Lorenzo-Seva, U., & ten Berge, J. M. (2006). Tucker's congruence coefficient as a meaningful index of factor similarity. *Methodology*, *2*(2), 57–64. https://doi.org/10.1027/1614-2241.2.2.57

MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods*, *4*(1), 84–99. https://doi.org/10.1037/1082-989X.4.1.84

Marsh, H. W., Hau, K. T., & Grayson, D. (2005). Goodness of fit in structural equation models. In A. Maydeu-Olivares & J. J. McArdle (Eds.), *Multivariate applications book series. Contemporary psychometrics: A festschrift for Roderick P. McDonald* (pp. 275–340). Lawrence Erlbaum Associates.

Marsh, H. W., Lüdtke, O., Muthén, B., Asparouhov, T., Morin, A. J. S., Trautwein, U., & Nagengast, B. (2010). A new look at the Big Five factor structure through exploratory structural equation modeling. *Psychological Assessment*, *22*(3), 471–491. https://doi.org/10.1037/a0019227

Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. *Psychological Methods*, *17*(3), 437–455. https://doi.org/10.1037/a0028085

Milfont, T. L., & Fisher, R. (2010). Testing measurement invariance across groups. Applications in cross-cultural research. *International Journal of Psychological Research*, *3*(1), 111–130. https://hdl.handle.net/10819/6503 https://doi.org/10.21500/20112084.857

Mulder, R. T. (2021). ICD-11 personality disorders: Utility and implications of the new model. *Frontiers in Psychiatry*, *12*, Article 655548. https://doi.org/10.3389/fpsyt.2021.655548

Mulder, R. T., Horwood, J., Tyrer, P., Carter, J., & Joyce, P. R. (2016). Validating the proposed ICD-11 domains. *Personality and Mental Health*, *10*(2), 84–95. https://doi.org/10.1002/pmh.1336

Muthén, L. K., & Muthén, B. O. (1998–2021). *Mplus user's guide* (8th ed.). Muthén & Muthén.

Newsom, J. T. (2015). *Longitudinal structural equation modeling: A comprehensive introduction*. Routledge.

Oltmanns, J. R., & Widiger, T. A. (2018). A self-report measure for the ICD-11 dimensional trait model proposal: The Personality Inventory for ICD-11. *Psychological Assessment*, *30*(2), 154–169. https://doi.org/10.1037/pas0000459

Oltmanns, J. R., & Widiger, T. A. (2020). The Five-Factor Personality Inventory for ICD-11: A facet-level assessment of the ICD-11 trait model. *Psychological Assessment*, *32*(1), 60–71. https://doi.org/10.1037/pas0000763

Orjiakor, C. T., Sellbom, M., Keeley, J. W., & Bagby, R. M. (2023). Measurement invariance of the Personality Inventory for the *DSM*-5 (PID-5) for Nigerian and White American university students. *Psychological Assessment*, *35*(8), 715–720. https://doi.org/10.1037/pas0001251

Rigozzi, C., Rossier, J., Dahourou, D., Adjahouisso, M., Ah-Kion, J., Amoussou-Yeye, D., Barry, O., Bhowon, U., Bouatta, C., Cissé, D. D., Mbodji, M., de Stadelhofen, F. M., Minga, D. M., Tseung, C. N., Ondongo, F., Romdhane, M. N., Sfayhi, N., Tsokini, D., & Verardi, S. (2009). A cross-cultural study of the higher-order structures underlying personality disorders in French-speaking Africa and Switzerland. *Journal of Personality Disorders*, *23*(2), 175–86. https://doi.org/10.1521/pedi.2009.23.2.175

Rossier, J., Ouedraogo, A., & Dahourou, D. (2017). Personality structure and assessment in French-speaking African cultures. In A. T. Church (Ed.), *The Praeger handbook of personality across cultures* (pp. 73–103). Praeger.

Rossier, J., Ouedraogo, A., Dahourou, D., Verardi, S., & de Stadelhofen, F. M. (2013). Personality and personality disorders in urban and rural Africa: Results from a field trial in Burkina Faso. *Frontiers in Psychology*, *4*, Article 79. https://doi.org/10.3389/fpsyg.2013.00079

Samuel, D. B., & Widiger, T. A. (2008). A meta-analytic review of the relationships between the five-factor model and DSM-IV-TR personality disorders: A facet level analysis. *Clinical Psychology Review*, *28*(8), 1326–1342. https://doi.org/10.1016/j.cpr.2008.07.002

Samylkin, D. V., Demidova, L. Y., Gadisov, T. G., Nikitsky, I. S., & Tkachenko, A. A. (2023). Preliminary adaptation and validation of psychometric methods for the dimensional assessment of personality disorders as part of the transition to the ICD-11. *Russian Journal of Psychiatry*, *1*, 51–59.

Sass, D. A., Schmitt, T. A., & Marsh, H. W. (2014). Evaluating model fit with ordered categorical data within a measurement invariance framework: A comparison of estimators. *Structural Equation Modeling*, *21*(2), 167–180. https://doi.org/10.1080/10705511.2014.882658

Schwabe, F., Von Davier, A. A., & Chalhoub-Deville, M. (2016). Language and culture in testing. In F. T. L. Leong, D. Bartram, F. M. Cheung, K. F. Geisinger, & D. Iliescu (Eds.), *The ITC international handbook of testing and assessment* (pp. 300–317). Oxford University Press.

Sellbom, M., Chiasson, P. M., Brown, T. A., & Bach, B. (2023). Examining the construct validity of the Personality Assessment Questionnaire for ICD-11 (PAQ-11) personality trait domains in a community sample. *Personality and Mental Health*, *17*(3), 197–207. https://doi.org/10.1002/pmh.1573

Sleep, C. E., Lynam, D. R., Widiger, T. A., Crowe, M. L., & Miller, J. D. (2019). An evaluation of DSM-5 section III personality disorder criterion A (Impairment) in accounting for psychopathology. *Psychological Assessment*, *31*(10), 1181–1191. https://doi.org/10.1037/pas0000620

Somma, A., Gialdi, G., & Fossati, A. (2020). Reliability and construct validity of the Personality Inventory for ICD-11 (PiCD) in Italian adult participants. *Psychological Assessment*, *32*(1), 29–39. https://doi.org/10.1037/pas0000766

Sorrel, M. A., Aluja, A., García, L. F., & Gutiérrez, F. (2022). Psychometric properties of the Five-Factor Personality Inventory for *ICD*-11 (FFiCD) in Spanish community samples. *Psychological Assessment*, *34*(3), 281–293. https://doi.org/10.1037/pas0001084

Sorrel, M. A., García, L. F., Aluja, A., Rolland, J. P., Rossier, J., Roskam, I., & Abad, F. J. (2021). Cross-cultural measurement invariance in the Personality Inventory for DSM-5. *Psychiatry Research*, *304*, Article 114134. https://doi.org/10.1016/j.psychres.2021.114134

Steel, P., Schmidt, J., Bosco, F., & Uggerslev, K. (2019). The effects of personality on job satisfaction and life satisfaction: A meta-analytic

investigation accounting for bandwidth–fidelity and commensurability. *Human Relations*, *72*(2), 217–247. https://doi.org/10.1177/0018726718771465

Stricker, J., Buecker, S., & Pietrowsky, R. (2022). Alignment of the personality inventory for ICD-11 with the five-factor model of personality. *Psychological Assessment*, *34*(7), 711–716. https://doi.org/10.1037/pas0001141

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2013). *Using multivariate statistics* (Vol. 6, pp. 497–516). Pearson.

ten Have, M. T., Oldehinkel, A., Vollebergh, W., & Ormel, J. (2005). Does neuroticism explain variations in care service use for mental health problems in the general population? *Social Psychiatry and Psychiatric Epidemiology*, *40*(6), 425–431. https://doi.org/10.1007/s00127-005-0916-z

Tomko, R. L., Trull, T. J., Wood, P. K., & Sher, K. J. (2014). Characteristics of borderline personality disorder in a community sample: Comorbidity, treatment utilization, and general functioning. *Journal of Personality Disorders*, *28*(5), 734–750. https://doi.org/10.1521/pedi_2012_26_093

Tyrer, P. (2014). Time to choose—DSM–5, ICD-11, or both? *Archives of Psychiatry and Psychotherapy*, *16*(3), 5–8. https://doi.org/10.12740/APP/28380

Wang, J., & Wang, X. (2020). *Structural equation modeling. Applications using MPlus*. Wiley.

Watts, A. L., Greene, A. L., Ringwald, W., Forbes, M. K., Brandes, C. M., Levin-Aspenson, H. F., & Delawalla, C. (2023). Factor analysis in personality disorders research: Modern issues and illustrations of practical recommendations. *Personality Disorders: Theory, Research, and Treatment*, *14*(1), 105–117. https://doi.org/10.1037/per0000581

Waugh, M. H., Hopwood, C. J., Krueger, R. F., Morey, L. C., Pincus, A. L., & Wright, A. G. C. (2017). Psychological assessment with the DSM-5 alternative model for personality disorders: Tradition and innovation. *Professional Psychology: Research and Practice*, *48*(2), 79–89. https://doi.org/10.1037/pro0000071

Widiger, T. A., Lynam, D. R., Miller, J. D., & Oltmanns, T. F. (2012). Measures to assess maladaptive variants of the five-factor model. *Journal of Personality Assessment*, *94*(5), 450–455. https://doi.org/10.1080/00223891.2012.677887

World Health Organization (WHO). (2019). *International classification of diseases for mortality and morbidity statistics (11th Revision)*. World Health Organization.

Zimmermann, J., Kerber, A., Rek, K., Hopwood, C. J., & Krueger, R. F. (2019). A brief but comprehensive review of research on the Alternative Model for Personality Disorders. *Current Psychiatric Reports*, *21*(9), Article 92. https://doi.org/10.1007/s11920-019-1079-z