

Psychometric properties of a culture-adapted Italian version of AIDA (Assessment of Identity Development in Adolescence)

Alessandro Musetti^{1*}, Giuseppina Giammarresi^{2*}, Kirstin Goth³, Antonino Petralia⁴, Rita Barone⁵,
Renata Rizzo⁵, Ilaria Concas⁴, Arianna Terrinoni⁶, Consuelo Basile⁶, Chiara Di Maggio⁶, Felipe
Lopez⁷, Grazia Terrone⁸, Alessia Alessandra⁹, Mattia Messina¹, Chiara Imperato¹, Federica
Sibilla¹, Luca Caricati¹, Tiziana Mancini¹, Paola Corsano¹, and Eugenio Aguglia⁴

1 Department of Humanities, Social Sciences and Cultural Industries, University of Parma, Borgo
Carissimi, 10- 43121 Parma, Italy, alessandro.musetti@unipr.it (corresponding author).

<http://orcid.org/0000-0003-4125-0068>

2 Psychiatrist at the Infectious diseases Center, ULSS9, Verona, Italy,
giosi.giammarresi@aulss9.veneto.it (corresponding author).

3 Department of Child and Adolescent Psychiatry, Psychiatric University Clinics, Basel,
Switzerland

4 Department of Clinical and Experimental Medicine, Section of Psychiatry, University of Catania,
Italy

5 Department of Clinical and Experimental Medicine, Section of Child Neurology and Psychiatry –
University of Catania

6 Department of Human Neuroscience, Section of Child and Adolescent Neuropsychiatry, Sapienza
University, Rome, Italy

7 Associazione Nazionale Assessment e Psicodiagnostica, Rome, Italy

8 Department of Humanities, Literature, and Cultural Heritage, University of Foggia, Foggia, Italy

9 Department of Medicine and Surgery, University of Parma, Parma, Italy

Psychometric properties of a culture-adapted Italian version of the AIDA (Assessment of Identity Development in Adolescence)

Abstract

Identity diffusion is a core element of the borderline personality organization. A valid and reliable assessment tool is needed to identify at-risk adolescents in the Italian context. In this study, we investigated the psychometric properties of the Assessment of Identity Development in Adolescence (AIDA), designed to assess identity diffusion vs. identity integration, in an Italian sample ($N = 1,102$) of clinical and nonclinical adolescents. Explorative structural equation modelling fit the expected bi-factor structure with one pathology-related general factor and 6 specific factors ($CFI = .905$, $RMSEA = 0.036$). Internal consistency Cronbach's alphas were high with .94 for the AIDA total scale and adequate for the six subscales with .68 to .81. Results supported convergent validity with measures of borderline personality features (BPFSC-11), as well as discriminant validity with identity dimensions in ideological and interpersonal domains (UMICS). The AIDA total score Identity Diffusion differed with significance $p < .001$ and with a large effect size of $d = 1.5$ standard deviations between the general population sample and $N = 55$ patients diagnosed with Borderline Personality Disorder. AIDA is a valid and reliable measure to assess adolescents' identity pathology within the Italian context.

Keywords: identity diffusion; personality disorders; borderline personality disorder; assessment

Psychometric properties of a culture-adapted Italian version of the AIDA (Assessment of Identity Development in Adolescence)

Introduction

Borderline Personality Disorder in adolescents

Borderline Personality Disorder (BPD) is a severe and heterogeneous mental disturbance characterized by a range of symptoms, such as identity disturbance, emotion dysregulation, impulsive behaviors, and unstable relationships (American Psychiatric Association, 2013). Literature about BPD in adulthood is wide, being it the most common Personality Disorder (PD) in clinical populations (Leichsenring et al., 2011). Different specialized psychotherapy approaches have been proven effective in treating BDP symptoms and implications (Chakhssi, Zoet, Oostendorp, Noordzij, & Sommers-Spijkerman, 2019), and diverse clinical assessment measures for BPD screening, such as semi-structured or fully structured interviews and self-report questionnaires, are well established in clinical practice (Gunderson, Herpertz, Skodol, Torgersen, & Zanarini, 2018).

Nowadays, there is broad consensus that the BPD has onset during adolescence (Bozzatello, Bellino, Bosia, & Rocca, 2019), but it is still usually diagnosed in young adulthood (Fonagy et al., 2015). In fact, some clinicians are reluctant to diagnose PDs in individuals younger than 18 years old, mainly because of stigma and the notion that personality traits do not form into stable dispositions until adulthood (Sharp & Fonagy, 2015). Nevertheless, several investigations showed the great importance of early detection of and intervention on BPD, also highlighting the positive outcomes that these practices bring (e.g., fewer suicidal behaviors, fewer hospitalizations) (Bozzatello et al., 2019). On the contrary, delayed diagnosis and treatment reinforce functional impairments and disability (Chanen, Sharp, Hoffman, & The Global Alliance for Prevention and Early Intervention for Borderline Personality Disorder, 2017).

ITALIAN VALIDATION OF THE AIDA

As a matter of fact, section II of DSM-5 states that diagnoses of PDs may be applied to children and adolescents when “the individual’s maladaptive personality traits appear to be pervasive, persistent and unlikely to be limited to a particular developmental stage or another mental disorder” (APA, 2013, p. 647). Moreover, as specifically regards BPD, there is now a growing evidence-based consensus that it constitutes a reliable, valid and stable diagnosis in adolescents, similarly as in adults (Chanen et al., 2017).

One of the main problems in the BPD assessment in adolescents attains a form of similarity between borderline functioning features and normal adolescence development features (e.g., emotional fluctuations, feelings of vulnerability, impulsivity, and identity disturbance) (APA, 2013). This could suggest that all adolescents may be “a little borderline” (Paris, 2013). Actually, if this similarity is not taken into account in the diagnostic process, there is a high risk of over-pathologizing adolescents and diagnosing many false positives, with a consequent overestimation of BPD prevalence in the adolescent population (Miller et al., 2008). On the other hand, disregarding this similarity could also lead to false negatives, i.e., to a failure in recognizing the pathology when it actually exists (Paris, 2013). In light of all this, it is urgent to early diagnose BPD, being able to discriminate between normal adolescent features and adolescent features that are symptoms of a PD (Kernberg & Weiner, 2000). In particular, Section III of DSM-5 stresses the importance of severe problems in identity as a crucial criterion in the assessment of BPD (APA, 2013).

Pathological identity

Over the decades, identity has been defined and conceived in different ways from different theoretical perspectives (Mancini, 2010). According to Erikson (1950, 1968), identity is a fundamental organizing principle, and its function is to provide a sense of both intrapsychic and interpersonal continuity within the self during the entire individuals’ life. His epigenetic theory views identity consolidation as a fundamental developmental task to be specifically accomplished during adolescence. In fact, according to the author, the adolescent has to solve an “identity vs role

ITALIAN VALIDATION OF THE AIDA

confusion” crisis. In this developmental stage, if the adolescent fails to integrate their identifications, the outcome of the process will be a fragmented and coreless identity. Marcia’s (1966, 1993) Identity Status Paradigm expanded Erikson’s (1968) ideas on identity formation in different areas through two behavioral indicators: exploration, referring to the active questioning and pondering of various identity alternatives; and commitment, which consists of making a relatively firm choice in an identity domain and engaging in activities oriented toward the implementation of that choice. The combination between high vs low exploration and commitment generate four different identity statuses: Diffusion, Foreclosure, Moratorium and Achievement. Crocetti and Meeus (Crocetti, Schwartz, Fermani, & Meeus, 2010; Crocetti et al., 2008) proposed an expansion of Marcia model, i.e., the Dual Cycle Model of Identity Formation, designed to capture the dynamic process by which identity is formed and revised over time through three processes: commitment, in-depth exploration, and reconsideration of commitment. Studies conducted with early and middle adolescent samples (Crocetti et al., 2008, 2010), found that these three processes contributed to the identification of adolescents as achieved (high on commitment and in-depth exploration, and low on reconsideration of commitment), foreclosed (moderately high on commitment and low on in-depth exploration and reconsideration of commitment), and diffused (low on all the three measures). Literature often considers foreclosure and diffusion states as dysfunctional (e.g., Marcia, 1993), although each of the four states actually implies degrees of health and lack of health (e.g., Meeus, 1996). Nevertheless, longitudinal studies monitoring the identity processes over the course of adolescence evidenced progressive identity changes (see Meeus, 2011, for a review) – i.e., increasing levels of commitment and in-depth exploration and decreasing levels of reconsideration of commitment – thus confirming that the model is useful for detecting “typical” identity development in adolescence.

From a psychodynamic point of view, Kernberg (2006) conceptualized identity as a dimensional construct with a healthy identity integration at the one hand, and identity diffusion at the other. A healthy identity, therefore, corresponds with the subjective experience of a sense of

ITALIAN VALIDATION OF THE AIDA

coherence within the concept of self and a sense of differentiation with the concept of others (Izdebska, 2015). A consolidated identity enable the continuity and stability of the self-concept across time and situations while adolescents experience different roles through relationships with others (Kernberg, 1978). This results in higher well-being, self-esteem, autonomy, self-reflexive functioning, and effective social exchanges (Schwartz & Petrova, 2018). However, when the identity integration fails, the crisis leads to *identity diffusion*, which implies lack of self-definition capacity, of a sense of self-coherence, and of committing to goals or relationships (Jung, Pick, Schlüter-Müller, Schmeck, & Goth, 2013; Penner, Gambin, & Sharp, 2019).

Literature showed that lack of identity integration is linked to several maladaptive behaviors, such as non-suicidal self-injury (Ercegović, Paradžik, Maršanić, & Marčinko, 2018; Nakar et al., 2016) and impairments in social functioning due to the inability to reflect on internal mental states of the self and others (De Meulemeester, Lowyck, Vermote, Verhaest, & Luyten, 2017; Penner et al., 2019). In sum, whether identity integration is considered as the healthy outcome of achieving an identity in various identity domains, identity diffusion and its implications are considered the core of PDs and are particularly characteristic of borderline personality organization (Clarkin, Yeomans, & Kernberg, 1999). In light of all this, in order to correctly diagnose eventual personality disorders (including BPD) in adolescents, it is needed to validate an assessment instrument capable of discriminating between an identity diffusion that is part of the normal adolescence development process and a pathological identity diffusion that is an indicator of a PD.

The “Assessment of Identity Development in Adolescence” scale

The Assessment of Identity Development in Adolescence (AIDA; Goth & Schmeck, 2018) is a valid self-rating clinical scale that allows to assess (pathological) identity diffusion in healthy and disturbed adolescents. The AIDA is a 58-item inventory whose total score reflects the extent of identity disturbance on a dimension from identity diffusion (high scores) to identity integration (low scores). The scale is composed of two primary scales, Discontinuity and Incoherence, and of six

ITALIAN VALIDATION OF THE AIDA

secondary scales, three for each primary scale, which reflect different basic psychosocial functioning areas: self-related, social-related, and mental representations (Fuchs, Riedl, Bock, Rumpold, & Sevecke, 2018; Lind et al., 2019). The sum of the scores obtained in the three secondary scales (self-related, social-related, and mental representations) constitutes the score of the relative primary scale, just as the sum of the scores obtained in the two primary scales (discontinuity and incoherence) constitutes the overall diffusion-integration score of AIDA. In light of this, in AIDA high discontinuity is associated with “a missing self-related perspective, no feeling of belonging and affiliation, and a lack of access to emotional levels of reality and trust in the durability of positive emotions” whereas high incoherence is associated with “being contradictory or ambivalent, suggestible and over-matching, and having poor access to cognitions and motives, accompanied by superficial and diffuse mental representations” (Goth et al., 2012, p. 4). This conceptualization of identity development was elaborated in line with psychodynamic as well as psycho-social identity theories (see previous paragraph).

The scale construction was deductive, focusing on minimal confounding by social desirability and controlling for factors such as culture, socioeconomics, age, and gender (Goth et al. 2012). In the original validation study, AIDA showed excellent total (Diffusion: $\alpha = .94$), scale (Discontinuity: $\alpha = .86$; Incoherence: $\alpha = .92$), and subscale ($\alpha = .73-.86$) reliability scores. In general, AIDA was proven to be a valid instrument to evaluate adolescent identity and to effectively discriminate between adolescents with PDs – especially BPD – and healthy control peers. For example, Sharp, Vanwoerden, Odom, Foelsch (2018) found that Diffusion scores discriminated at a highly significant level and with a relevant effect size of $d = 1.3$ between adolescents with BPD and the general population.

The AIDA scale was constructed with a cross-cultural approach and in a joint international project with expert consensus (Goth et al., 2012). In fact, over time a number of international researchers have developed several culture-adapted translations of the AIDA cooperating with its original authors. At the time, the Spanish-Mexican (Kassin, De Castro, Arango, & Goth, 2013),

ITALIAN VALIDATION OF THE AIDA

German (Goth & Schmeck, 2018), English (Sharp et al., 2018), Croatian (Juretić, Boričević, Maršanić, & Ercegović 2019), and Australian (Timler et al., 2020) versions of the scale have already been validated, and six other ones are in the phase of final validation or finalization (Turkish, Arabic, Serbian, Bulgarian, Lithuanian, Czech versions) (further information can be found at the project website <https://academic-tests.com>). Each of the validated culture-adapted versions showed satisfying psychometric properties: exploratory factor analysis supported a one-factor solution, speaking for a joint factor of identity pathology, and the total score of Identity Diffusion differed significantly between the general population and the clinical sample diagnosed with BPD, with a relevant effect size. Finally, AIDA has proven to be a reliable instrument for evaluating the outcomes of specific treatments for identity disturbance, such as Adolescent Identity Treatment (AIT) (Schlüter-Müller et al., 2015; Zimmermann et al., 2018).

In continuity with the ongoing international project and in order to fill the gap of the Italian literature, the aim of this study was to validate a cultural-adapted Italian version of the AIDA scale, and testing its psychometric properties in two samples of Italian adolescents: a general population sample and a clinical sample of adolescents with BPD.

Methods

Participants and Procedure

In this study, we surveyed a total of 1,102 Italian adolescents aged from 12 to 20 years ($M = 16.02$, $SD = 1.78$; 54.3% females). The sample consisted of two groups: high school students and adolescent patients with BDP. We first presented the study to the local school authorities and to clinical centers directors for approval. Next, the informed consents were delivered to and signed by the adult participants and both parents of each minor participant; only the minors whose parents both signed the consent forms were involved in the study. To the students, the questionnaires were administered in classrooms during regular lesson times and in the presence of teachers; to patients, the questionnaires were administered in clinical settings in the presence of a clinician. At the

ITALIAN VALIDATION OF THE AIDA

beginning of the data collection sessions, we informed the participants about the aims and duration of the study, about their role in the research, that they could ask questions, and that participation was voluntary. Confidentiality and anonymity were rigorously respected. None of the participants received an economic incentive to participate in the study. The study was planned and carried out according to the Ethical Code of the Italian Association of Psychology, the European Code of Conduct for Research Integrity, and the American Psychological Association.

General population sample

The general population sample consisted of 961 subjects (432 males, 45.0%) attending twelve high school located in urban areas in the Northern and Southern Italy. The age ranged from 13 to 20 years and the mean was 16.14 (SD = 1.72). In order to be included in this group, participants were required to speak Italian as their first language to avoid cultural and lexical bias in questionnaire responses.

BPD sample

A total of 144 suspected BPD adolescents were recruited from public services of child and adolescent psychiatry and private clinical centers from all over Italy. Of those, 89 were excluded because their diagnosis has not been confirmed by the structured assessment. The final group was composed by 55 BPD patients (42 males, 76.4%) recruited in Italian private clinical centers which provided a structured assessment for BPD. The age ranged from 12 to 18 years and the mean was 14.53 (SD = 1.96). These patients were interviewed by a psychiatrist and were assessed using the Borderline Personality Disorder scale of the Minnesota Multiphasic Personality Inventory (MBPD; Bornovalova, Hicks, Patrick, Iacono, & McGue, 2011) and the Psychodiagnostic Chart- Adolescent (PDC-A, Malberg, Malone, Midgley, & Speranza, 2017) derived from the Psychodynamic Diagnostic Manual-2 (PDM-2 – Lingiardi & McWilliams, 2017). These assessments led to a diagnosis of BPD.

Materials and Methods

Assessment of Identity Development in Adolescence

The Assessment of Identity Development in Adolescence (AIDA – Goth et al, 2012) is a 58-item self-report measure designed to evaluate identity pathology (identity integration vs. diffusion) in adolescents. It is composed by six subscales: stability in attributes (goals vs. lack of perspectives, e.g. “I could list a few things that I can do very well.”), stability in relationships (roles vs. lack of affiliation, e.g. “I feel like I belong in my family”), stability in emotional self-experience (positive emotional self-reflection vs. distrust in stability of emotion, e.g. “I’m not sure if my friends really like me.”), consistent self (consistency in self concepts, attributes and behaviors vs. contradictions, e.g. “I feel that I have many different faces and they don’t go together very well.”), autonomy (ego-strength vs. over-identification, suggestibility, e.g. “Sometimes I feel that my interests are not really ‘my own’, but I have just copied them from other people.”), and cognitive self-experience (positive cognitive self-reflection vs. superficial, diffuse representations, e.g. “I am confused about what kind of person I really am.”). Of these subscales, the first three compose the scale Continuity and the latter three composed the scale Coherence. Respondents are asked to answer the AIDA items on a 5-point Likert type scale ranging from 0 (*no*) to 4 (*yes*). Conceptual and content equivalence of the cultural adapted Italian version of the questionnaire was reached through translation/backtranslation, under the supervision of the original authors. Based on feedback from the pilot test participants, wording adjustments were made to the items that were not culturally and/or linguistically adequate for Italian-speaking adolescents. The psychometric properties of the culture-adapted Italian version of the AIDA are presented in the result section, as they were evaluated in this study.

ITALIAN VALIDATION OF THE AIDA

The Borderline Personality Features Scale for Children

The Borderline Personality Features Scale for Children-11 (BPFSC-11; Sharp, Steinberg, Temple, & Newlin, 2014) is a self-report questionnaire used to assess borderline features in childhood and adolescence (for ages 9 and older). It consists of 11 items that reflect BPD core features like affective instability, identity problems, and negative relationships, which are rated on a 5-point Likert-type scale ranging from 0 (*not true at all*) to 4 (*always true*). Sample items include “How I feel about myself changes a lot” and “I want to let some people know how much they’ve hurt me.” The total score is a measure of the overall level of borderline characteristics. The Italian version of the scale (Fossati, Sharp, Borroni, & Somma, 2019) proved to be a reliable self-report measure of borderline features in Italian adolescents. In the present study, this scale showed good internal consistency (Cronbach’s α in the present study = 0.79).

The Utrecht-Management of Identity Commitments scale

The Utrecht-Management of Identity Commitments scale (U-MICS; Crocetti, Schwartz, Fermani, & Meeus, 2010) is a self-report measure designed to assess three identity processes (commitment, in-depth exploration, and reconsideration of commitment) in two distinct domains: an ideological domain (education) and an interpersonal domain (best friend). It consists of 13 items rated on a Likert scale ranging from 1 (*Completely untrue*) to 5 (*Completely true*). Each item is presented once for the ideological domain and once for the interpersonal domain, for a total of 26 items. Sample items include: “My education/best friend gives me certainty in life” (commitment; Cronbach’s α in the present study = 0.79 for ideological domain and Cronbach’s α in the present study = 0.80 for the interpersonal domain), “I think a lot about my education/best friend” (in-depth exploration; Cronbach’s α in the present study = 0.71 for ideological domain and Cronbach’s α in the present study = 0.73 for the interpersonal domain), and “I often think it would be better to try to find a different education/best friend” (reconsideration of commitment; Cronbach’s α in the present study = 0.73 for ideological domain and Cronbach’s α in the present study = 0.81 for the

interpersonal domain). The 3-factor model (Crocetti, Rubini, & Meeus, 2008) provided the best fit to the data and applied equally well to boys and girls as well as to early and middle adolescents.

Analysis Strategy

Basic psychometric properties were tested with the combined general population sample and patients. Item analyses were based on the following criteria: percentage of symptomatic answers (p_{it} 5-95%), missing analysis (< 10%), and item-total correlation $r_{it} > .30$. For translated inventories, the criteria can be set to $r_{it} > .20$ as well, but r_{it} should at least not be < .10. We used SPSS 26 for these analyses.

The scale structure was analyzed with explorative structural equation modelling (ESEM; Asparouhov & Muthén, 2009; Marsh et al., 2014) procedure considering a bi-factor structure with six specific factors and one general factor. ESEM was preferred to other approaches such as confirmatory factor analysis (CFA) as it does not impose to set cross-loadings on non-targeted factors to zero and this allows for more precise estimations (e.g., Xiao, Liu, & Hau, 2019). Moreover, given that the theoretical background of the scale suggests that the basic dimensions share some degrees of variance (i.e., second order dimensions and the general factor), we assumed that ESEM was the best way to take into account these patterns of cross-correlations. Accordingly, in the tested model, items loaded both on general factor and their intended factors, whereas cross-loadings were estimated with oblique target rotation procedure and targeted to be as close to zero as possible (e.g., Tóth-Király, Bőthe, Rigó & Orosz, 2017). In this way, it was possible to estimate the extent to which each item loaded on its intended latent dimension and general factor, maintaining however its estimated contribution to all latent factors. ESEM was performed considering maximum-likelihood estimation and the model fit was evaluated considering values of the comparative fit index (CFI), the root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR). We considered values greater than 0.90 and 0.95 as respectively adequate and excellent for CFI, and values smaller than 0.08 and 0.06 as

ITALIAN VALIDATION OF THE AIDA

respectively adequate and excellent for both RMSEA and SRMR (Brown & Cudeck, 1993; Kline, 2005). Chi-squared test was also reported although its level of significance is affected by the large sample size. Finally, we considered also the chi-squared/degree of freedom ratio that should be lower than 3. Structural equation modelling was performed with Mplus 8.1 (Muthén, 2008).

Scale reliabilities were evaluated by Cronbach's α and were supposed to exceed .80 at total scale level, .70 at primary scale level, and .60 at subscale level as appropriate for heterogeneous contents, while homogeneity coefficients $\alpha > .80$ and $>.90$ can be considered very good and excellent, respectively.

Criterion validity was analyzed by comparing the AIDA scores between the BDP and general population sample.

To test for further systematic differences in the levels of identity diffusion, we compared the AIDA scores within the general population sample differentiating by gender and age. Differences concerning age were tested for the full factor age and additionally, distinguishing into the age groups of early-to-middle (12–14 years) and middle-to-late (15–18 years) adolescence, in accordance with the procedure used for the original version of the AIDA.

All group comparisons were performed on the raw scores using ANOVAs. Score differences were examined on the basis of statistical significance (1% level) and effect size. Additionally, we calculated the “Cohen's d ” effect size to deal with big differences in sample size and for a better intuitive interpretation of the results, as $d=1$ corresponds to the familiar unit “1 standard deviation” (Cohen, 1988; Bortz & Doering, 1995). It was supposed to reach a high amount ($>.80$) to avoid over-interpretation and artificial establishing of developmental differences.

Results

Factorial structure and reliabilities

ESEM results showed that the fit of the expected 7-dimension bi-factor structure (6 specific dimensions plus one general dimension) was adequate for CFI and good for RMSEA and SRMR

ITALIAN VALIDATION OF THE AIDA

($\chi^2(1268) = 3122.96$, $\chi^2/df = 2.46$, $p < .001$, CFI = .905, RMSEA = 0.036, $p = .999$, 90% CI[0.035; 0.038], SRMR = .027).

Supplementary Table S1 shows factor-dimension loadings for each of the specific and general latent traits. As indicated, loadings were mostly supportive for the expected structure. It is worth noting that some items appeared to have low loadings on the intended dimensions and significant loadings on unintended dimensions. This is not surprising as the scale tries to tap complex symptomatologies that are composed often by a mixture of signs and, hence, each item can share some variance (i.e., co-occurrence) with several other items. As indicated, however, most of the items had significant loadings on their expected dimension and low or non-significant loadings on unintended dimensions.

Supplementary Table S1

Accordingly, reliabilities of the six dimensions ranged from acceptable to good (with Alpha = .68 to .81) suggesting that the subscales were sufficiently reliable considering the complexity of the measured constructs (see Table 1). Importantly, all items were significantly measured by the general dimension, as expected. All items matched the criteria in the classical item analyses, e.g. regarding item-total correlation.

Table 1

Discriminant and convergent validity

The AIDA total score – supposed to display impaired levels of identity functioning – showed a positive, high, and significant correlation with the BPFSC-11 total score – covering features of Borderline pathology. The AIDA total score showed mostly significant but only small to medium negative correlations with the UMICS scores. Most interestingly, the correlations with

ITALIAN VALIDATION OF THE AIDA

“Friends Reconsideration” are significant and positive. The AIDA subscales showed similar correlational patterns (see Table 2).

Table 2

Criterion validity

To analyze the criterion validity of the AIDA, which is the central psychometric criteria for a pathology-related instrument, we compared the AIDA scale and subscale scores between the general population sample and the clinical subsample with BPD, as identity pathology is seen as especially related to the development of Borderline personality disorder in adolescents. In accordance to our constructional goal, the BPD patient sample showed significantly higher scores (reflecting higher impairment) in all scales and subscales (see Table 3) than the general population sample.

The AIDA total score differed highly significantly (all $ps < .001$) between the BPD sample and the general population sample with a large effect size of $d = 1.5$ standard deviations ($> 0.80 =$ large effect). The AIDA subscales showed similar patterns, with effect sizes d ranging from 0.9 to 1.8.

Compared to the huge score differences in the AIDA scores between a general and the impaired BPD sample, only very small differences were found between girls ($M = 86.8, SD = 34.8$) and boys ($M = 80.6, SD = 31.5$). The differences were significant, but not relevant ($p = 0.004, d = 0.2$). According to the age, no significant differences in the levels of impaired identity were found.

Table 3

Discussion

Our study aimed to examine the psychometric properties of a culture-adapted Italian version of the AIDA in clinical and non-clinical samples. Results indicate that this measure provides a valid

ITALIAN VALIDATION OF THE AIDA

and reliable assessment of pathology-related identity development among healthy and disturbed Italian adolescents.

The 7-dimension bi-factor structure (6 specific dimensions plus 1 general dimension) obtained in this study showed adequate fit indexes and was consistent with the identity pathology construct (identity integration vs. diffusion), that combines relevant aspects in a joint pathology-related general factor, based on six different domains (stability in attributes, stability in relationships, stability in emotional self-experience, consistent self, autonomy, and cognitive self-experience). This finding was consistent with the evidences obtained in the original study conducted in Switzerland and in Germany (Goth et al., 2012), and in the subsequent ones conducted in other countries (Juretić et al, 2019; Kassin et al., 2013; Sharp et al., 2018; Timler et al., 2020) and especially in Chile,(Valdes et al., 2019) where the AIDA model fit was tested with Mplus and the results for a bifactor model with a g-factor Identity Diffusion was good (CFI = .902, RMSEA = .038).

Scale reliabilities were good with Cronbach's alpha .94 on total, .86 and .90 on primary and .68 to .81 on subscale level. Altogether, the observed pattern of AIDA scales and subscales intercorrelation supports the joint representation of the complex Identity Diffusion construct through the different aspects (subscales) and the appropriateness of using the total score as a sum of all the items. Since the scales and subscales showed distinct correlational patterns, and taken together with the sufficient scale reliability coefficients, this justifies the subdivision of the scales and subscales for descriptive purposes and for investigating possible distinct relations with e.g. specific diagnoses and treatment outcomes in future studies.

Correlation analyses showed that AIDA total scale, primary scales, and subscales scores were highly positively associated with borderline features evaluated with the BPFSC-11 (Sharp et al., 2014). In line with theoretical background, this result support the idea that identity diffusion is a core aspect of borderline functioning (Kernberg, 2006). Furthermore, the AIDA scales showed negative but weak magnitude correlation with Commitment and Exploration identity dimensions

ITALIAN VALIDATION OF THE AIDA

both in ideological and interpersonal domains measured by the U-MICS (Crocetti et al., 2010), covering different types of identity processes not clearly assigned to adaptivity or maladaptivity, speaking for the assumption that AIDA is clearly denoting pathological development contrary to UMICS that is developmentally defined. This is in line with Marcia's identity status model (1966), for which identity achievement, the most adaptive of the identity statuses, is characterized by an exploration of alternatives that results in commitment. Specifically, commitment is a sound indicator of healthy identity development related to a clear and stable self-concept (Campbell et al., 1996); in-depth exploration is a tendentially adaptive process that can become problematic if adolescents come to question past choices (Crocetti et al., 2009). In fact, Reconsideration of commitment is an identity dimension was introduced by Crocetti, Rubini and Meeus (2008) and represents the most troubled and controversial aspect of identity formation which indicates a dissatisfaction of adolescents with current commitments.

The analysis of group differences showed that the AIDA total score strongly discriminated between the general population sample and the BDP sample, suggesting that the AIDA identity diffusion dimension truly cover pathological features of identity development. This supports the idea that identity diffusion does not represent a pathologization of a common personality trait, thus encouraging a better definition and understanding of adolescents' PDs would not medicalize otherwise normal developmental patterns but might be useful to provide adolescents who display a severe lack of identity integration with appropriate assessment and treatment. These findings suggest that the AIDA can be a good tool to use in screening procedures in order to detect the possibility/risk of a BPD in adolescents, while any following in-depth assessment procedures would be aimed to accurately determine presence and severity of BPD.

No significant AIDA score differences between younger and older adolescents were found, thus, in line with the original version of the AIDA (Goth et al., 2012), age-differentiations are not necessary for the Italian population. This finding supports the clinical nature of the diffusion of identity measured by AIDA, which goes beyond the more common adolescents' identity crises.

ITALIAN VALIDATION OF THE AIDA

Females showed slightly higher levels of identity problems than males, but the distance to the mean scores of the impaired sample suggest that these differences are of no clinical relevance and should not be interpreted as that.

Some limitations of this study should be acknowledged. First, although the sample used was relatively large, these data may not be representative of all Italian adolescents. Furthermore, important clinical information about BPD patients, such as comorbidities, were not collected. Second, the cross-sectional design used does not allow to evaluate the longitudinal stability of the pathological identity characteristic we have measured. Thus, it is important for future longitudinal studies to confirm the stability of the AIDA scores over time. Third, the present study did not take into account the degree to which other potentially relevant demographic variables (i.e., socioeconomic background) may affect the psychometric properties of the scale. Although previous studies found no particular effects of these variables (Kassin et al, 2013), future studies in the Italian populations might disentangle this issue.

Despite the highlighted limitations, the promising results from the present study support the suitability of the cultural-adapted Italian version of AIDA, inspire future researches and provides applicative cues in a variety of nonclinical and clinical settings. In conclusion, our findings support the importance of assessing identity pathology in the early detection of emerging personality disorders in adolescence.

Ethics approval and consent to participate

Informed consents were delivered to and signed by the adult participants and both parents of each minor participant. Only the minors whose parents both signed the consent forms were involved in the study.

Consent for publication

Not applicable.

Availability of data and materials

ITALIAN VALIDATION OF THE AIDA

The dataset used and analyzed during the current study is available from the corresponding author on reasonable request.

Competing interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Authors' contributions

AM contributes to the design of the study, drafted and revised the manuscript, contributed to data analysis and interpretation, GG conceived the study, contributed to the design of the study and data collection, KG, contributed to the design of the study and data analysis and interpretation, LC contributed to data analysis and interpretation, AA, MM, CI, and FS contributed to draft preparation, PC and TM supervised the manuscript AP, RB, RR, IC, AT, CB, CDM, FL, GT, and EA were involved in drafting and revising the manuscript. All authors read and approved the final manuscript.

Acknowledgements

Not applicable.

References

- Academic-tests. (2020). Retrieved from <https://academic-tests.com>
- American Psychiatric Association [APA] (2013). *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*. Arlington, VA: American Psychiatric Association.
- Asparouhov, T., & Muthén, B. (2009). Exploratory structural equation modeling. *Structural equation*

ITALIAN VALIDATION OF THE AIDA

modeling: a multidisciplinary journal, 16(3), 397-438.

- Bornovalova, M. A., Hicks, B. M., Patrick, C. J., Iacono, W. G., & McGue, M. (2011). Development and validation of the Minnesota Borderline Personality Disorder scale. *Assessment*, 18(2), 234-252.
- Bortz, J. & Doering, N. (1995). *Forschungsmethoden und Evaluation [Research Methods and Evaluation]*. Heidelberg, Germany: Springer.
- Bozzatello, P., Bellino, S., Bosia, M., & Rocca, P. (2019). Early Detection and Outcome in Borderline Personality Disorder. *Frontiers in Psychiatry*, 10, 710. Doi: 10.3389/fpsyt.2019.00710
- Briggs, S. R., & Cheek, J. M. (1986). The role of factor analysis in the development and evaluation of personality scales. *Journal of Personality*, 54(1), 106–148. doi:10.1111/j.1467-6494.1986.tb00391.x
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.
- Campbell, J. D., Trapnell, P. D., Heine, S. J., Katz, I. M., Lavalley, L. F., & Lehman, D. R. (1996). Self-concept clarity: Measurement, personality correlates, and cultural boundaries. *Journal of personality and social psychology*, 70(1), 141-156.
- Chakhssi, F., Zoet, J. M., Oostendorp, J. M., Noordzij, M. L., & Sommers-Spijkerman, M. (2019). Effect of Psychotherapy for Borderline Personality Disorder on Quality of Life: A Systematic Review and Meta-Analysis. *Journal of Personality Disorders*. https://doi.org/10.1521/pedi_2019_33_439
- Chanen, A. M., Sharp, C., Hoffman, P., & The Global Alliance for Prevention and Early Intervention for Borderline Personality Disorder. (2017). Prevention and early intervention for borderline personality disorder: a novel public health priority. *World Psychiatry*, 16(2), 215-6.
- Clarkin, John F., Yeomans, F. E., & Kernberg, O. F. (1999). *Psychotherapy for borderline personality*. *Psychotherapy for borderline personality*. Hoboken, NJ, US: John Wiley & Sons Inc.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioural Sciences*, 2nd edn, 567 pp. Hillsdale, N-J, USA: Lawrence Erlbaum Associates.
- Crocetti, E., Klimstra, T., Keijsers, L., Hale, W. W., & Meeus, W. (2009). Anxiety trajectories and

ITALIAN VALIDATION OF THE AIDA

identity development in adolescence: A five-wave longitudinal study. *Journal of Youth and Adolescence*, 38(6), 839-849.

Crocetti, E., Rubini, M., & Meeus, W. (2008). Capturing the dynamics of identity formation in various ethnic groups: Development and validation of a three-dimensional model. *Journal of Adolescence*. <https://doi.org/10.1016/j.adolescence.2007.09.002>

Crocetti, E., Schwartz, S. J., Fermani, A., & Meeus, W. (2010). The utrecht-management of identity commitments scale (U-MICS) Italian validation and cross-national comparisons. *European Journal of Psychological Assessment*. <https://doi.org/10.1027/1015-5759/a000024>

De Meulemeester, C., Lowyck, B., Vermote, R., Verhaest, Y., & Luyten, P. (2017). Mentalizing and interpersonal problems in borderline personality disorder: The mediating role of identity diffusion. *Psychiatry Research*, 258, 141-144.

Ereçgović, N., Paradžik, L., Boričević Maršanić, V., & Marčinko, D. (2018). Nonsuicidal Self-Injury and Identity Development in Adolescents. *Socijalna psihijatrija*, 46(4), 457-470.

Erikson, E. H. (1950). *Childhood and society*. New York: Norton.

Erikson, E. H. (1968). *Identity: Youth and crisis*. New York: Norton.

Fonagy, P., Speranza, M., Luyten, P., Kaess, M., Hessels, C., & Bohus, M. (2015). ESCAP Expert Article: Borderline personality disorder in adolescence: An expert research review with implications for clinical practice. *European Child & Adolescent Psychiatry*, 24, 1307–1320. Doi: 10.1007/s00787-015-0751-z

Fossati, A., Sharp, C., Borroni, S., & Somma, A. (2019). Psychometric Properties of the Borderline Personality Features Scale for Children-11 (BPFSC-11) in a Sample of Community Dwelling Italian Adolescents. *European Journal of Psychological Assessment*, 35, 70-77.

Fuchs, M., Riedl, D., Bock, A., Rumpold, G., & Sevecke, K. (2018). Pathological Internet Use—An Important Comorbidity in Child and Adolescent Psychiatry: Prevalence and Correlation Patterns in a Naturalistic Sample of Adolescent Inpatients. *BioMed Research International*, 16291, doi: 10.1155/2018/1629147

ITALIAN VALIDATION OF THE AIDA

- Goth, K., Foelsch, P., Schlüter-Müller, S., Birkhölzer, M., Jung, E., Pick, O., & Schmeck, K. (2012). Assessment of identity development and identity diffusion in adolescence-Theoretical basis and psychometric properties of the self-report questionnaire AIDA. *Child and Adolescent Psychiatry and Mental Health*, 6(1), 27.
- Goth, K. & Schmeck, K. (2018). *AIDA (Assessment of Identity Development in Adolescence) German Version: A self-report questionnaire for measuring identity development in adolescence - Short manual*. Offenbach: academic-tests. [German] <https://academic-tests.com>
- Gunderson, J. G., Herpertz, S. C., Skodol, A. E., Torgersen, S., & Zanarini, M. C. (2018). Borderline personality disorder. *Nature Reviews Disease Primers*, 4, 18029. Doi: 10.1038/nrdp.2018.29
- Izdebska, A. (2015). Assessment of personality according to Otto Kernberg's conception. *Current Issues in Personality Psychology*, 3(2), 65–83. <https://doi.org/10.5114/cipp.2015.52105>
- Jung, E., Pick, O., Schlüter-Müller, S., Schmeck, K., & Goth, K. (2013). Identity development in adolescents with mental problems. *Child and adolescent psychiatry and mental health*, 7(1), 26.
- Juretić Z, Boričević Maršanić V, Ercegović N (2019). *Culture-adapted version Croatian of the self-report questionnaire AIDA (Assessment of Identity Development in Adolescence; authors Goth & Schmeck) – Short manual*. Offenbach: academic-tests.
- Kassin, M. (2013). Identity formation and personality disorders in a Mexican sample: A comparative study between adolescents from school, and a juvenile justice system sample. *European Child and Adolescent Psychiatry*, 7, 25.
- Kernberg, O. F. (1978). The diagnosis of borderline conditions in adolescence. *Adolescent Psychiatry*, 6, 298–319.
- Kernberg, O. F. (2006). Identity: Recent findings and clinical implications. *The Psychoanalytic Quarterly*, 75(4), 969-1004.
- Kernberg, P, & Weiner, A. S. W. K. (2000). Personality disorders in children and adolescents. *Nordic Journal of Psychiatry*, 54(4), 292. Doi: 10.1080/080394800448183
- Kline, R. B. (2005). *Principles and practice of structural equation modeling*. New York: The Guilford

ITALIAN VALIDATION OF THE AIDA

Press.

- Leichsenring, F., Leibing, E., Kruse, J., New, A. S., & Leweke, F. (2011). Borderline personality disorder. *The Lancet*, 377(9759), 74-84. Doi: 10.1016/S0140-6736(10)61422-5
- Lind, M., Vanwoerden, S., Penner, F., & Sharp, C. (2019). Inpatient adolescents with borderline personality disorder features: Identity diffusion and narrative incoherence. *Personality Disorders: Theory, Research, and Treatment*, 10(4), 389-393.
- Lingiardi, V., & McWilliams, N. (2017). *Psychodynamic diagnostic manual: PDM-2*. New York: New York: Guilford Press.
- Malberg, N., Malone, J., Midgley, N., & Speranza, M. (2017). Psychodi- agnostic Chart-Adolescent (PDC-A). In V. Lingiardi & N. McWilliams (Eds.), *The psychodynamic diagnostic manual* (2nd ed., pp. 1024 –1027). New York, NY: Guilford Press.
- Mancini, T. (2010). *Psicologia dell'identità [Identity Psychology]*. Bologna: Il Mulino.
- Marcia, J. E. (1966). Development and validation of ego-identity status. *Journal of personality and social psychology*, 3(5), 551-558.
- Marcia, J. E. (1993). The ego identity status approach to ego identity. In *Ego identity* (pp. 3-21). Springer, New York, NY.
- Marsh, H. W., Morin, A. J., Parker, P. D., & Kaur, G. (2014). Exploratory structural equation modeling: An integration of the best features of exploratory and confirmatory factor analysis. *Annual review of clinical psychology*, 10, 85-110.
- Meeus, W. (1996). Toward a Psychosocial Analysis of Adolescent Identity. In K. Hurrelmann & S. F. Hamilton (Eds.), *Social Problems and Social Contexts in Adolescence: Perspectives Across Boundaries* (pp. 83–104). New York, NY: Aldine de Gruyter.
- Meeus, W. (2011). The study of adolescent identity formation 2000–2010: A review of longitudinal research. *Journal of research on adolescence*, 21(1), 75-94.
- Miller, A. L., Muehlenkamp, J. J., & Jacobson, C. M. (2008). Fact or fiction: Diagnosing borderline personality disorder in adolescents. *Clinical psychology review*, 28(6), 969-981.

ITALIAN VALIDATION OF THE AIDA

- Muthén, B. O. (2018). Mplus (Version 8.1)[Computer program]. Los Angeles, CA: Muthén & Muthén.
- Nakar, O., Brunner, R., Schilling, O., Chanen, A., Fischer, G., Parzer, P., ... & Hoven, C. W. (2016). Developmental trajectories of self-injurious behavior, suicidal behavior and substance misuse and their association with adolescent borderline personality pathology. *Journal of affective disorders, 197*, 231-238.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York, NY: McGraw-Hill.
- Paris, J. (2013). Diagnosing borderling personality disorder in adolescence. In L. T. Flaherty (Ed.), *Adolescent Psychiatry: The Annals of the American Society for Adolescent Psychiatry* (pp. 237–248). Hillsdale, NJ: The Analytic Press.
- Penner, F., Gambin, M., & Sharp, C. (2019). Childhood maltreatment and identity diffusion among inpatient adolescents: The role of reflective function. *Journal of adolescence, 76*, 65-74.
- Schlüter-Müller, S., Goth, K., Jung, E., & Schmeck, K. (2015). Assessment and treatment of identity pathology during adolescence. *Scandinavian Journal of Child and Adolescent Psychiatry and Psychology, 3*(1), 63-70.
- Schwartz, S. J., & Petrova, M. (2018). Fostering healthy identity development in adolescence. *Nature Human Behaviour, 2*(2), 110-111.
- Sharp, C., & Fonagy, P. (2015). Practitioner Review: Borderline personality disorder in adolescence - Recent conceptualization, intervention, and implications for clinical practice. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 56*(12), 1266-1288. Doi: 10.1111/jcpp.12449
- Sharp, C., Steinberg, L., Temple, J., & Newlin, E. (2014). An 11-item measure to assess borderline traits in adolescents: Refinement of the BPFSC using IRT. *Personality Disorders: Theory, Research, and Treatment, 5*(1), 70-78.
- Sharp C, Vanwoerden S, Odom A, Foelsch P (2018). Culture-adapted version English USA of the self-report questionnaire AIDA (Assessment of Identity Development in Adolescence; authors Goth & Schmeck) - Short manual. Offenbach: academic-tests. <https://academic-tests.com>.
- Timler, A., McIntyre, F., Bulsara, C., Rose, E., & Hands, B. (2020). The Influence of Motor Competence

ITALIAN VALIDATION OF THE AIDA

on Adolescent Identity Health: A Mixed Method Study. *Research Quarterly for Exercise and Sport*, 91(1), 1-14.

Tóth-Király, I., Bõthe, B., Rigó, A., & Orosz, G. (2017). An illustration of the Exploratory Structural Equation Modeling (ESEM) framework on the Passion Scale. *Frontiers in Psychology*, 8, 19–68,

Valdés, N., Hernández, C., Goth, K., Quevedo, Y., & Borzutzky, A. (2019). Adaptation, validation of the Chilean version of a questionnaire assessing the identity development in adolescents (AIDA).

Clinica Psicológica, 28(5), 610-623.

Xiao, Y., Liu, H., & Hau, K. T. (2019). A comparison of CFA, ESEM, and BSEM in test structure analysis. *Structural Equation Modeling: A Multidisciplinary Journal*, 26(5), 665-677.

Zimmermann R et al. (2018). A design for process-outcome psychotherapy research in adolescents with Borderline Personality Pathology. *Contemporary Clinical Trials Communications*, 12, 182–191.

191. <https://doi.org/10.1016/j.conctc.2018.10.007>