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Research Paper

Validation of the Hungarian Version of the Multidimensional Inventory of Dissociation (MID-HU)–A Multi-Source Data Collection Approach

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ABSTRACT

This article describes the development of the Hungarian version of the Multidimensional Inventory of Dissociation (MID-HU). The MID is a 218-item, self-administered, multi-scale instrument that comprehensively assesses the phenomenological domain of pathological dissociation and is suitable for diagnosing dissociative disorders. We used a multi-source approach to reach participants. We collected data from the psychiatric and addiction wards of two hospitals, private practices, and from online sources. Finally, the results of 323 participants were analyzed. We used the participants' DES and MID-HU results to classify them into five groups: (1) Healthy control group, (2) Dissociative disorder group, (3) Dissociative symptoms group, (4) Psychiatric inpatients group without dissociation and substance use disorder (SUD) and (5) Alcohol dependent inpatients without dissociation. For testing discriminant validity we used several sections of SR-DDIS.

The MID-HU had strong internal consistency, temporal stability and strong structural, convergent and discriminant validity. Factor analysis of the MID-HU extracted a single factor: dissociation. Our results are similar to other international findings. We also found that the mean MID-HU correlated strongly with two SR-DDIS subscales: 'Features associated with DID' (r: 0.79) and the 'Schneiderian first-rank symptoms' (r: 0.62), while only at a moderate level with the other subscales (r: 0.40). The two dissociative groups proved to be significantly more traumatized than the other groups, although we found childhood traumatization in the psychiatric and AD inpatient groups as well, which affected the construct validity results. The DD group proved to be most severely traumatized among the five groups of participants.

1. Introduction

The DSM-5 defines dissociative disorders (DDs) as psychiatric disorders „characterized by a disruption of and/or discontinuity in the normal integration of consciousness, memory, identity, emotion, perception, body representation, motor control and behavior" (DSM-5, American Psychiatric Association (APA), 2013). Dissociative symptoms can potentially disrupt every area of psychological functioning, and are experienced as a) intrusions into awareness and behavior, with losses of continuity in subjective experience (i.e., "positive" dissociative symptoms such as fragmentation of identity, depersonalization, and derealization) and/or b) inability to access information or to control mental functions that normally are readily amenable to access or control (i.e., "negative" dissociative symptoms such as amnesia) (DSM-5, American Psychiatric Association (APA), 2013).

The DSM-5 lists five dissociative diagnoses: dissociative identity disorder (DID), dissociative amnesia, depersonalization/derealization disorder, other specified dissociative disorder, and unspecified dissociative disorder. Dissociative disorders are frequently trauma-related, and many of the symptoms, including intensive shame and confusion about the symptoms or a desire to hide them, are influenced by the proximity to and phobia of trauma(s) (DSM-5, American Psychiatric

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Association (APA), 2013).

The prevalence of dissociative disorders (DD) is similar to that of other, major psychiatric disorders: among healthy individuals it is 1.7–18.3 %. Among psychiatric inpatients it can be 4.3- 40.8 %, while among substance-dependent patients it is 17.2–39 % (Sar, 2011). Despite their high prevalence, their recognition is difficult, as dissociative symptoms are mainly covert. Sar calls dissociative disorders the hidden pandemic (Sar, 2011): they are so hidden, that according to several studies, most individuals who meet the criteria for DID have been treated in the mental healthcare system for 6–12 years before they are correctly diagnosed (Brand et al., 2016). One explanation of this phenomenon is that the switch between dissociative parts, which is a main diagnostic criterion for DID in DSM and BNO is probably the most rarely visible symptom in DID (Dell & O'Neil, 2009). A further difficulty in the recognition of DD is that these patients don't report their dissociative symptoms spontaneously. And even then, because of the severe phobias and shame associated with their symptoms, they are reluctant to talk about them. (Brand et al., 2016).

Dissociative disorders in most cases are trauma-related. In the chronic, more complex and severe cases severe childhood traumatization can be found in the background. According to clinical case series of complex dissociative disorders (Ross et al., 1990a; Martinez-Taboas, 1991; Boon & Draijer, 1993; Sar et al., 1996; cited Sar, 2011), dissociative patients usually report the highest frequency of childhood psychological trauma among all psychiatric disorders, with a high prevalence of childhood sexual (57.1 %–90.2 %), emotional (57.1 %), and physical (62.9 %–82.4 %) abuse and neglect (62.9 %). Disorganized attachment and genetic disposition to dissociation are also common etiological factors (Liotti, 2006).

According to the International Society for the Study of Trauma and Dissociation (ISST) guideline, the comprehensive assessment of dissociation should include (1) information collected during therapy sessions, (2) screening questionnaires (e.g. Dissociative Experiences Scale (DES)), (3) structured interviews (e.g. Structured Clinical Interview for DSM-5 Dissociative Disorders (SCID-D), Dissociative Disorders Interview Schedule (DDIS)), (4) information from previous treatment provider(s), (5) heteroanamnesis (family members, environment) (ISSTD, 2011).

Over the last decades, numerous self-assessment questionnaires have been developed to evaluate various dissociative symptoms. These tools offer a convenient method for screening DDs, saving time in the diagnostic process. However, there is limited or controversial evidence concerning the appropriate cut-off scores for many of these screening questionnaires.

The Multidimensional Inventory of Dissociation (MID) is a complex self-report measure of dissociation that comprehensively assesses the phenomenological domain of pathological dissociation and can discriminate among normal adults, mixed psychiatric patients, patients with depersonalization disorder, patients with dissociative disorder not otherwise specified (DDNOS) and patients with DID (Somer & Dell, 2005). The 218 items profoundly assess patients' dissociative experiences giving a detailed clinical picture of these symptoms. MID is based on the subjective/phenomenological model of dissociation, which means that from a subjective/phenomenological perspective, the phenomena of pathological dissociation are recurrent, jarring intrusions into executive functioning and sense of self, and every aspect of human experience can be subjected to dissociative invasion. Another concept behind MID is that the symptom domain of DID is identical to the phenomenological domain of pathological dissociation (Dell, 2006). Despite its clinical significance, there is a scarcity of validated measures for assessing dissociation in Hungarian-speaking populations: only screening questionnaires such as DISQ-H and DES have been available. The present study aims to address this gap by validating the Hungarian version of the Multidimensional Inventory of Dissociation (MID-HU), a comprehensive tool for assessing dissociative symptoms and experiences. To our best knowledge, this is the first research assessing dissociative disorders in Hungary.

2. Strategy and the goals and steps of the study

The main goal of our research was to validate the Hungarian version of the Multidimensional Inventory of Dissociation (MID-HU) and test its psychometric properties. We used a multi-source approach to reach participants. We examined healthy control people, dissociative outpatients from psychotherapy private practices, inpatients from psychiatry wards and alcohol-dependent inpatients. We aimed to analyse what values the MID-HU scales show in the Hungarian sample and in the different groups, how the MID-HU can differentiate among the groups, and overall to have a more complex view of how the MID-HU works.

3. Method

In our research design we followed the ISSTD guidelines (except heteroanamnesis).

3.1. Participants

Data were collected from multiple sources to ensure diversity in participant characteristics. Our full sample consisted of 1) a nonclinical sample, 2) a mixed psychiatric and addiction inpatients sample and 3) individuals from private psychotherapy practices. We collected data between 03.23.2022 and 09.31.2023 with the ethical permission of the National Scientific and Research Ethic Committee (IV/1459- 3 /2022/EKU).

1) The *nonclinical* snowball sample was recruited online. Our inclusion criteria were: the lack of psychiatric, addiction or psychotherapeutic treatment and no suicide attempts in the person's history. The fulfilment of these criteria was based on the participants' self-reports. 155 people filled out our questionnaire package, but only 88 met our criteria.
2) *Psychiatric and addiction psychiatric wards* of two hospitals provided access to clinical populations: the Adult Psychiatry Department of the Clinical Centre of the University of Debrecen, the Szabolcs Szatmár Bereg County Hospitals and University Teaching Hospital, Sántha Kálmán General Psychiatric Departments (I-II) and the Active Psychiatric and Rehabilitation Unit for Addiction Patients (treating alcohol dependent (AD) patients). Clinical psychologists of the wards assessed inpatients who were willing to participate, using the paper-pencil method.

Inclusion criteria were: age between 18 and 60 years; currently ongoing psychiatric or addiction treatment in the hospital and willingness to participate in the study.

Exclusion criteria were: psychotic disorders, delirium, acute withdrawal syndrome, any form of dementia, intellectual disability (any severity), organic disorders and patients in a locked ward were not eligible for the study.

3) *Individuals receiving psychotherapy in private practice for dissociative disorders* were also invited to participate. We collaborated with the associations of the main psychotherapeutic methods in Hungary (Integrative Hypnotherapy Association, MAKOMP Association, Hungarian EMDR Association, Schema therapy and Training Center (Brainspotting training center), and workgroups of psychotherapists specialized in the treatment of traumatized people (Borderline and Trauma workgroup and Trauma Center). They sent our research call to their members via email. Their patients could participate in our research online. Each patient received a unique code to complete the online questionnaires anonymously. Only the therapist knew the patient's identity, while the diagnoses and questionnaire responses remained confidential. Upon request, detailed feedback regarding the test results was offered to the individual therapists, helping their therapeutic work. The inclusion criteria were: at least 6 months in

psychotherapy (based on the validation process of the French language version of the SCID-D (Piedfort-Marin et al., 2021)), and DD diagnosis (Unspecified DD, OSDD-1a, DID). Exclusion criteria were: other diagnoses (comorbid diagnoses with DD diagnoses were not excluded).

3.1.1. Characteristics of the sample

431 people were involved in our study. 108 subjects were excluded from the analysis due to incomplete responses and non-compliance with predetermined exclusion criteria. Finally, 323 participants' results were analyzed; 198 were female (61.3 %) and 125 were male (38.4 %) The participants' ages ranged from 18 to 60 ($M = 35.9$, SD = 12). 17 % of the sample live in the capital city, 20.1 % in the county seat, 37.5 % in cities, and 25.4 in smaller villages in the countryside. More than a third of the sample were single (36.5 %), 25.4 % were married, 28.2 % lived in a relationship, and 8.9 % were divorced or widowed. Their education level was the following: 40.9 % had graduated secondary school, 33.4 % had higher education (MSc or PhD) and 25 % had lower education (technical or elementary school). More than half of the sample worked (55.7 %), 21.7 % were students and 20.1 % were unemployed or decommissioned at the time of the research.

3.1.2. Creating groups

As there are no available diagnostical interviews for dissociative disorders in Hungarian, we couldn't determine the exact dissociative diagnosis of the participants. Instead, we tried to assess the severity of dissociative symptoms generally and used the following criteria to identify dissociative disorders (DD). Due to the lack of a Hungarian cut-off point for DD in DES, we used the cut-off point >35, found in a meta-analysis study (Lyssenko et al., 2018). This cut-off point is higher than in epidemiology research (Sar, 2011), but we used this to minimize false positive cases. As for MID, we used the cut-off points as offered in the MID manual: mean MID-HU >21, Dissociative Symptoms Scale >9. According to the manual guideline, over these cut-off points, there is a high risk for DD (Coy et al., 2022). According to these criteria, we classified the participants into five groups:

(1) *Healthy control group* (n = 88): participants without former treatment in psychiatry, addictology or psychotherapy; no former suicide attempts, and the lack of dissociation (according to their DES and MID results)
(2) *Dissociative disorder group* (n = 24): those participants who may have DD according to their DES (mean DES>35) and MID (mean MID-HU >21, Dissociative Symptoms Scale >9) results. They probably have some kind of dissociative disorder.
(3) *Dissociative symptoms group* (n = 59): participants who meet only one or two criteria of the DES and/or MID-HU results. They probably have dissociative symptoms.
(4) *Psychiatric inpatients group* (mixed sample, n = 60): without dissociation (according to DES and MID results) and without SUD (according to their diagnoses).
(5) *Alcohol-dependent (AD) inpatient group* (n = 89): without dissociation (according to DES and MID results).

3.2. Materials

The questionnaire package contained the Hungarian version of the Multidimensional Inventory of Dissociation (MID-HU), the Dissociative Experience Scale (DES), four subscales of the Traumatic Antecedents Questionnaire (TAQ), eight subscales of the Self-Report Version of the Dissociative Disorders Interview Schedule (SR-DDIS) and questions about general demographic data, former psychiatric and addiction treatments and their effectiveness, and suicide attempts.

3.2.1. Multidimensional Inventory of Dissociation

The MID is a self-report, multiscale measure of dissociation, developed by Paul Dell (2006), that comprehensively assesses the phenomenological domain of pathological dissociation and diagnoses dissociative disorders. It has 23 dissociation diagnostic scales and 14 facet scales that assess the major facets of pathological dissociation. The 14 facet scales and the 23 dissociation diagnostic scales represent alternative allocations of the Multiscale Dissociation Inventory's (MID) 168 dissociation items. Seven of the 23 dissociation diagnostic scales are the same as identically named facet scales. There is a small degree of item overlap across the remaining 16 dissociation diagnostic scales.

The MID also has validity scales, that assess five response groups, which are often found in patients with dissociative, posttraumatic, and borderline symptoms; Specifically, they help to detect response patterns that may suggest issues like over-reporting, under-reporting, defensiveness, or even malingering. Five validation scales build up from 50 validation items, assessing the following five domains (Coy et al., 2022): (1) Defensiveness scale (a person's tendency to deny or minimize their dissociative symptoms or psychological issues, (2) Rare Symptoms scale (assess the frequency of extremely unusual symptoms, which are rarely encountered even in individuals with severe dissociation), (3) Emotional Suffering scale (measures the extent of emotional distress experienced by the participant), (4) Attention-Seeking Behavior scale (to identify patterns of responses that suggest the participant might be overstating their symptoms in an attempt to gain attention or sympathy), and (5) Factitious Behavior: detect tendencies toward intentionally fabricated or exaggerated symptoms, often associated with conditions like factitious disorder or malingering.

If a participant scores particularly high on any of the validation scales (e.g., Rare Symptoms or Attention-Seeking Behavior), clinicians are alerted that the overall MID scores might need closer scrutiny. Such responses might call for a more in-depth clinical interview or additional psychological assessment to ensure that the dissociative symptoms are genuine and not the result of exaggeration, misunderstanding, or misreporting.

Former research on the MID (Dell, 2006; Somer & Dell, 2005; Gast et al., 2003) found excellent internal consistency ($\alpha = 0.99$) and excellent temporal stability (i.e., four- to eight-week test-retest reliability = 0.97). The MID correlates strongly with five other measures of dissociation: (1) DES ($r = 0.90$), (2) SCID-D-R ($r = 0.78$), (3) Somatoform Dissociation Questionnaire (SDQ-20; $r = 0.75$), (4) Questionnaire of Experiences of Dissociation (QED; $r = 0.75$), (5) Dissociation Questionnaire (DIS-Q; $r = 0.83$).

Studies provided empirical support for the discriminant validity of the MID (Dell, 2006; Gast e tat, 2003; Somer & Dell, 2005). The instrument consistently demonstrates the ability to discriminate effectively among normal adults, heterogeneous psychiatric patients, individuals diagnosed with depersonalization disorder, those with dissociative disorder not otherwise specified (DDNOS), and individuals diagnosed with dissociative identity disorder (DID).

Construct validity of the MID is substantiated by its significant correlations with a history of trauma ($r = 0.63$), symptoms of posttraumatic stress disorder (PTSD) ($r = 0.55$ to 0.72), and impairment in identity ($r = 0.63$) (Dell, 2006). Moreover, the MID has exhibited incremental validity over the Dissociative Experiences Scale (DES) in predicting the history of trauma (Dell, 2006; Somer & Dell, 2005).

3.2.1.1. Translation of the MID into Hungarian. The questionnaire was translated by the first author (who is a qualified translator). Her translation was compared with the translations of two independent translators, and the translations were reviewed by a research team of professionals and translators with expertise in dissociative disorders[1]

[1] Expertise professionals: Kuritárné, Sz.I., Andrejkovics, M., Fekete, Z., Ozvald, G., Ötvös D.

resulting in the final version of the translation. Due to the length of the questionnaire, no reversals were made. Cultural considerations were taken into account to ensure the instrument's relevance and appropriateness for Hungarian-speaking populations.

3.2.2. Dissociative Experiences Scale (DES)

The DES (Bernstein &Putnam, 1986; Carlson&Putnam, 1993) measures the frequency of 28 dissociative experiences. It has 28 items and its internal and construct validity is excellent in several studies (van Ijzendoorn & Schuengel, 1996). The questionnaire is based on the continuum theory of dissociation, according to which dissociative experiences can be placed along a continuum, i.e. healthy people have dissociative experiences (absorption, high-way trance). Each item contains statements about dissociative experiences, which subjects can rate on a 10-point Likert scale from 0 to 100.

In the studies reviewed by Carlson and Putnam (1993), conducted between 1986 and 1992, the mean scale score in a normal population ranged from 3.7 to 7.8. In dissociative disorders, the cut-off point was 30. However, research has continued, with a more recent meta-analysis analyzing 216 publications finding that the mean DES score above 35 is the cut-off point of dissociative disorders (Lyssenko et al., 2018).

The Hungarian version of the Dissociative Experiences Scale proved to be a reliable measure of dissociative experiences (Kocsis-Bogár, 2016). The validity of the scale in their sample was found to be excellent (Cronbach $\alpha = 0.910$), and the test-retest reliability of the questionnaire was excellent ($r = 0.925$, $p < 0.000$). The participants of the research were non-dissociative control and psychiatric patients (with schizophrenia diagnosis). Our study also found strong internal consistency ($\alpha = 0.962$).

3.2.3. Dissociative Disorders Interview Schedule – Self Report Version (SR-DDIS)

The interview was developed by Collin Ross (1989a), and since has been refined several times to reflect diagnostic changes (Ross &Browning, 2016). It is a structural interview which is composed of 16 parts, totaling 131 items. Each part is independent and scored separately, with an average score of DID patients for each part given and no overall score tabulated. The questions ask about symptoms in the DSM-5 disorder categories. 8 of the 16 parts were used in our study as follows: (1) Physical complaints, (2) Schneider's first-order symptoms, (3) Symptoms associated with DID, (4) Borderline personality disorder, (5) Dissociative amnesia, (6) Dissociative fugue, (7) Depersonalisation/derealisation disorder, (8) Dissociative identity disorder.

The interview reliably differentiates DID from eating disorders, panic disorders, schizophrenia (Ross et al., 1989a), partial complex seizures and general neurological disorders (Ross et al., 1989b), multiple sclerosis (Ross et al., 1990b), and from dissociative disorder not otherwise specified (DDNOS) (Ross et al., 1990a), as well as from substance use disorders, schizophrenia, DDNOS, mixed adolescent psychiatric disorders, and gastrointestinal disorders (Ross & Weathersbee Ellason, 2005).

Furthermore, DDIS has good convergent validity with DES ($\chi2=0.81$) and SCID-D ($\chi2=0,74$) (Ross et al., 2014)

Ross and Browning (2016) conducted an investigation illustrating the applicability of the self-report version of the Dissociative Disorders Interview Schedule (SR-DDIS) within clinical environments. Their study showcased a high degree of consistency between the DDIS and SR-DDIS outcomes concerning both DSM-5 diagnoses and symptom categorization. Their findings indicated that the self-report version of the Dissociative Disorders Interview Schedule (SR-DDIS) can be effectively used interchangeably with the standard DDIS within clinical populations.

The SR-DDIS was translated by the first author (who is a qualified translator), and was then blindly back-translated into English by an independent qualified translator. The back-translation was compared to the original version and differences were reconciled.

3.2.4. Traumatic Antecendents Questionnaire (TAQ)

Van der Kolk and Smyth (2010) developed this 42-item questionnaire to assess the severity and frequency of maladaptive and adaptive experiences in childhood. The questionnaire consists of 10 subscales, we used only four for the validation: 1. neglect (5 items), 2. emotional abuse (5 items), 3. physical abuse (3 items), 4. sexual abuse (4 items). The maladaptive experiences are assessed in the questionnaire at four developmental stages: early childhood (0–6 years), latency (7–12 years), adolescence (13–18 years), and adulthood (18 years and older). We used data concerning childhood trauma (0–18 years). Respondents can indicate on a four-point Likert scale the severity or frequency of the event in their life (0-never or not at all, 1-rarely or a little, 2 - occasionally or moderately, 3 - often or very often).

The questionnaire was adapted in Hungarian by Merza et al. (2015). In their study, the scale values were dichotomized to compare their results with those of previous studies that also used dichotomous variables. The cut-off value was set at 2, i.e., values of 0 and 1 were coded as the absence of a given trauma type, and values of 2 and 3 were coded as the presence of a given trauma type. This was done in an attempt to rule out overestimation of traumatization and to ensure that what is termed trauma is above the level of everyday negative, adverse events. In our research we did the same, we set the cut-off value at 2. In validating the MID-HU, we used only four subscales (Neglect, Emotional Abuse, Physical Abuse, and Sexual Abuse) and only examined the prevalence of these subscales in the childhood age range (0–18 years) to compare our results with international research. We also calculated cumulative trauma scores for the three developmental stages (early childhood, latency, and adolescence) and for each type of trauma, i.e. the number of trauma types experienced at each age. Furthermore, we create a cumulative trauma scale according to the results of the four trauma subscales (showing the severity of traumatization).

3.3. Statistical analysis

We used the following statistical analysis during the validation process. The internal consistency of the MID-HU was assessed using Cronbach's alpha (for the 168 dissociation items, the 23 dissociation diagnostic scales and the 14 facet scales) to measure the reliability of the questionnaire. The temporal stability of the MID-HU was tested by re-administering the questionnaire after a period of 4 to 8 weeks. The test-retest reliability was measured using correlation coefficients. Factor analysis was performed to assess the underlying structure of the MID-HU; Principal Axis Factoring (PAF) was used to analyze the 14 facet scales and the 23 dissociation diagnostic scales. Two key metrics assessed the adequacy of the data for factor analysis: Kaiser-Meyer-Olkin (KMO) Measure and Bartlett's Test of Sphericity andConfirmatory Factor Analysis evaluating the one-factor model of the 14 facet and 23 dissociation diagnostic scales of the MID-HU and we also created Correlation Network graphs. We tested of the invariance of the measure as a function of gender and age by performing Independent Sample T-test for the gender and mean value of the 14 facet and 23 dissociation diagnostic scales and analyzing Pearson's correlation between age and these scales. To evaluate convergent validity, the study analyzed the correlation between the MID-HU and other established measures of dissociation (DES and SR-DDIS). Discriminant validity was tested using the SR-DDIS to determine if the MID-HU could differentiate between dissociative and non-dissociative groups. Chi-square tests were used to analyze group differences in the prevalence of dissociative symptoms and One-way ANOVA was used to compare mean values of SR-DDIS subscales among the five groups (healthy control, dissociative disorder, dissociative symptoms, psychiatric inpatient, and alcohol-dependent inpatient groups). We assessed construct validity by correlating MID-HU scores with childhood trauma, measured by the Traumatic Antecedents Questionnaire (TAQ). To further assess the impact of trauma, a Cumulative Trauma Scale (CTS) was created based on the TAQ scores. A K-means cluster analysis was used to categorize participants into four trauma

severity groups (none, mild, moderate, severe), with significant differences in MID-HU scores across these groups.

4. Results

We used IBM SPSS 29.0 and OpenMx (version number: 2.21.13, for CFA) and Wolfram Mathematica (version number: 14.1 for Correlation Network Graphs) for statistical analysis.

4.1. Internal consistency of the MID-HU

To measure the internal consistency of the MID-HU, the 168 dissociation items (MID mean score) were first examined, followed by the reliability of the 23 dissociation diagnostic scales and 14 aspect scales. The MID-HU has a good internal consistency, with Cronbach's alpha values of 0.83 and above for the 14 aspect scales; two are good (above 0.80) and twelve are excellent (above 0.90). The 23 dissociation diagnostic scales have Cronbach's alphas ranging from 0.74 to 0.95; 9 are excellent (0.90 or above), 10 are good (0.80 or above), and 4 are fair (0.70 or above). Typically, the low-item-count scales have lower Cronbach's alphas, but even here, a strong correlation was found. The Cronbach's alpha of the 168 items was excellent (equal to 0.99) (see Table 1).

4.2. Temporal stability of the MID-HU

The questionnaire was re-administered at 4–8 week intervals after the initial completion. In the control group, respondents were allowed to voluntarily complete a questionnaire (MID-HU) from the questionnaire package by providing their e-mail addresses. The test-retest reliability coefficient for the mean MID-HU score was 0.97, showing a strong correlation. The test-retest reliability coefficients of the 23 dissociation diagnostic scales and 14 facet scales ranged from 0.56 - 0.99) (see Table 1).

Table 1
Internal consistency (Cronbach alpha values) and temporal stability coefficients of the Hungarian Multidimensional Inventory of Dissociation (MID-HU).

Scales	No. of Items	MID-HU Cronbach's Alpha	Test-retest (4–8 weeks)
MID-HU	168	0.99	0.97
MID-HU Facet Scales	14	0.97	n/a
MID-HU Dissociation Diagnostic Scales	23	0.98	n/a
Memory problems [a] [b]	12	0.94	0.96
Depersonalization[a] [b]	12	0.93	0.96
Derealization [a] [b]	12	0.94	0.93
Flashbacks [a] [b]	12	0.94	0.96
Somatoform symptoms[a] [b]	12	0.83	0.99
Trance [a] [b]	12	0.91	0.88
Identity confusion [a]	12	0.95	0.97
Voices [a]	12	0.92	0.96
Ego-alien experiences [a]	12	0.93	0.93
Self-alteration [a]	12	0.91	0.98
Self states / alters [a]	12	0.92	0.95
Discontinuities of time [a]	12	0.88	0.97
Disremembered behavior [a]	12	0.92	0.90
Ancillary [a]	12	0.90	0.93
Child voices [b]	3	0.74	0.99
Internal struggle [b]	9	0.91	0.96
Persecutory voices [b]	5	0.88	0.91
Speech insertion [b]	3	0.85	0.92
Thought insertion [b]	5	0.87	0.90
Made/Intrusive emotions [b]	7	0.95	0.97
Made/Intrusive impulses [b]	3	0.76	0.56
Made/Intrusive actions [b]	9	0.92	0.92
Loss of knowledge [b]	5	0.81	0.94
Self-puzzlement [b]	8	0.93	0.96
Time loss [b]	4	0.87	0.95
Coming to [b]	4	0.82	0.92
Fugues [b]	5	0.85	0.77
Being told of actions [b]	4	0.81	0.79
Finding objects [b]	4	0.80	0.93
Finding evidence of actions [b]	5	0.80	0.93

[a] The 14 facet scales
[b] The 23 dissociation diagnostic scales

4.3. Factor structure of the MID-HU's 14 facet scales and 23 dissociation diagnostic scales

Factor analysis was conducted on the scores of the 14 facet scales, using the Principal Axis Factoring method. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) was 0.95, indicating a high level of adequacy for factor analysis. Bartlett's Test of Sphericity is statistically significant ($p < 0.001$), indicating that correlations between variables are sufficiently large for factor analysis to be appropriate. One factor was extracted: dissociation. Most variables have strong positive relationships with the extracted factor (their loadings are between 0.81 and 0.95), this factor had an eigenvalue of 10.6 and accounted for 75.7 % of the variance in the 14 facet scales.

Factor analysis was conducted on the scores of the 23 dissociation diagnostic scales, using the Principal Axis Factoring method. The KMO was 0.962, indicating a high level of adequacy for factor analysis. Bartlett's Test of Sphericity is statistically significant ($p < 0.001$), indicating that correlations between variables are sufficiently large for factor analysis to be appropriate. Two factors were extracted: dissociation and amnesia. Dissociation had an eigenvalue of 16.2 and accounted for 70.5 % of the variance in the 23 dissociation diagnostic scales, while amnesia had an eigenvalue 1.6, and accounted for only 6.9 % of the variance in the 23 diagnostic scales. We used a rotated factor matrix and a factor transformation matrix (varimax with Kaiser Normalization) that showed that the two factors correlated strongly and that the structure matrix was very similar in both factors. These findings suggest that one factor characterizes the 23 dissociation diagnostic scales: dissociation. The limitation of sample size ($n = 323$) hindered the feasibility of conducting a factor analysis on all of the 168 dissociation items encompassed by the Hungarian version of the Multiscale Inventory of Dissociation (MID-HU).

The sample size ($N = 323$) was not sufficient for conducting a factor analysis on the 168 dissociation items, therefore, confirmatory factor analyses for the one-factor model of the MID-HU's 14 facet and 23 dissociation diagnostic scales (CFAs) were performed using scale-scores instead of item scores. When analyzing data of the 14 facet scales and 23 dissociation diagnostic scales, we found similar results as the author (Dell, 2006) in both scales: a poor fit with the data. CFA result of the 14 facet scales: CFI: 0.8658366, RMSEA: 0.1857444 [95 % CI (0.1731378, 0.1985392)], χ^2(df=77) = 935.0737, p = 1.508155e-147, TLI:0.8414433. CFA result of the 23 dissociation diagnostic scales: CFI: 0.7510233, RMSEA: 0.1933185 [95 % CI (0.1860113, 0.2006869)], chi-square: χ^2 (df=230) = 3006.369, $p = 0$, TLI: 0.7261257 (also known as NNFI).

As the confirmatory factor analysis model for the one factor didn't fit well with the data, we tested of the invariance of the measure as a function of gender and age by performing Independent Sample T-test for the gender and mean value of the 14 facet and 23 dissociation diagnostic scales and analyzing Pearson's correlation between age and these scales. The 14 facet scales and 23 dissociation diagnostic scales didn't differed significantly by gender, except the Made/Intrusive emotions scale (p = 0.0024). Correlation between age and the 14 facet scales and 23 dissociation diagnostic scales showed a negative and low level correaltions (r: −0.060 - −0.24), that means that MID-HU scale values decrease with age.

We also created a Correlation Network Graph of the mean values of the 14 facet scales and the 23 dissociation diagnostic scales. The closest two correlations were included in the set of directional relationships to test for the strongest relationships, which thus show the most dominant structure. The proximity of the scales shows the strength of correlation

and the colours of the clusters of these scales suggest latent constructions within the questionnaire.

The graph of the 14 facet scales (see Graph 1.) shows four clusters; (1) red cluster consists of Depersonalization, Derealization, Memory problems, Trance, Somatoform symptoms and Ancillary (mainly Criteria A of the questionnaire), (2) yellow cluster consists of Ego-alien experiences, Flashbacks and Identity confusion (mainly dissociative PTSD symptoms), (3) purple cluster consists of Voices, Self-states/alters and Self-alteration (self-state activity – related scales), and (4) orange cluster consists of only two scales; the Disremembered Behavior and Discontinuities of Time (amnesia – related scales). Depersonalization and Derealization scales cluster together (red cluster) supporting their conceptual relatedness as constructs associated with dissociation. Identity confusion and Ego-alien experiences scale (yellow cluster) also appear central, with numerous incoming and outgoing edges, indicating they are pivotal constructs in the network. This centrality may suggest their potential role as mediators or core factors in the theoretical framework of the questionnaire. The clear community structures and central nodes suggest that the MID-HU captures distinct but interrelated dimensions of dissociation. The presence of meaningful correlations aligns with theoretical expectations, supporting the construct validity of the questionnaire.

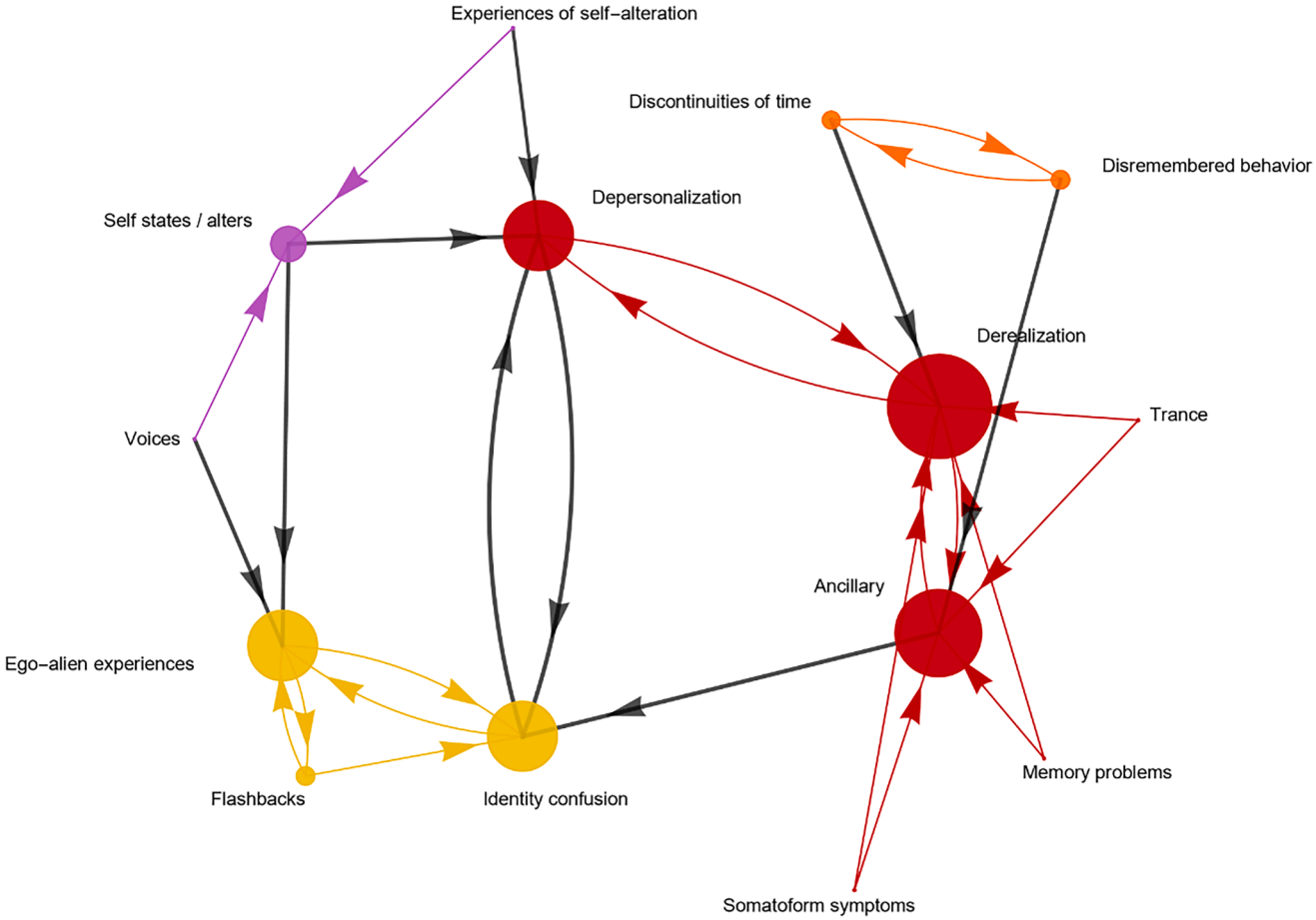
The graph of the 23 dissociation diagnostic scales (see Graph 2.) shows five clusters; (1) red cluster which includes important core dissociative states such as Derealization, Depersonalization, Experience of Self-alteration and Made/intrusive actions., These nodes are densely connected with strong interrelations, indicating that they represent the central dissociative experience. (2) The yellow cluster includes nodes which represents intrusions (e.g. Thought insertion, Flashbacks). The feedback loops suggest cyclic phenomena — where one state leads to another, potentially reinforcing dissociative symptoms. (3) Orange cluster is likely focused on amnesia-related dissociation including dissociative fugue state, finding objects or being told of actions. The tight clustering of these nodes may indicate that they represent a distinct subset of dissociative experiences, focused on memory disturbances. The green (4) and purple (5) clusters that are smaller clusters likely represent more specific dissociative experiences that are still connected to the broader dissociative spectrum.

We found larger (in red) nodes that represents more central and highly correlated variables: the Derealization and Depersonalization scales that are particularly large in the red cluster and connected to multiple others, suggesting their central role in the dissociative experience. The Experiences of Self-alteration also appears to be a crucial node with several outgoing arrows, suggesting that it might influence a range of other dissociative scales.

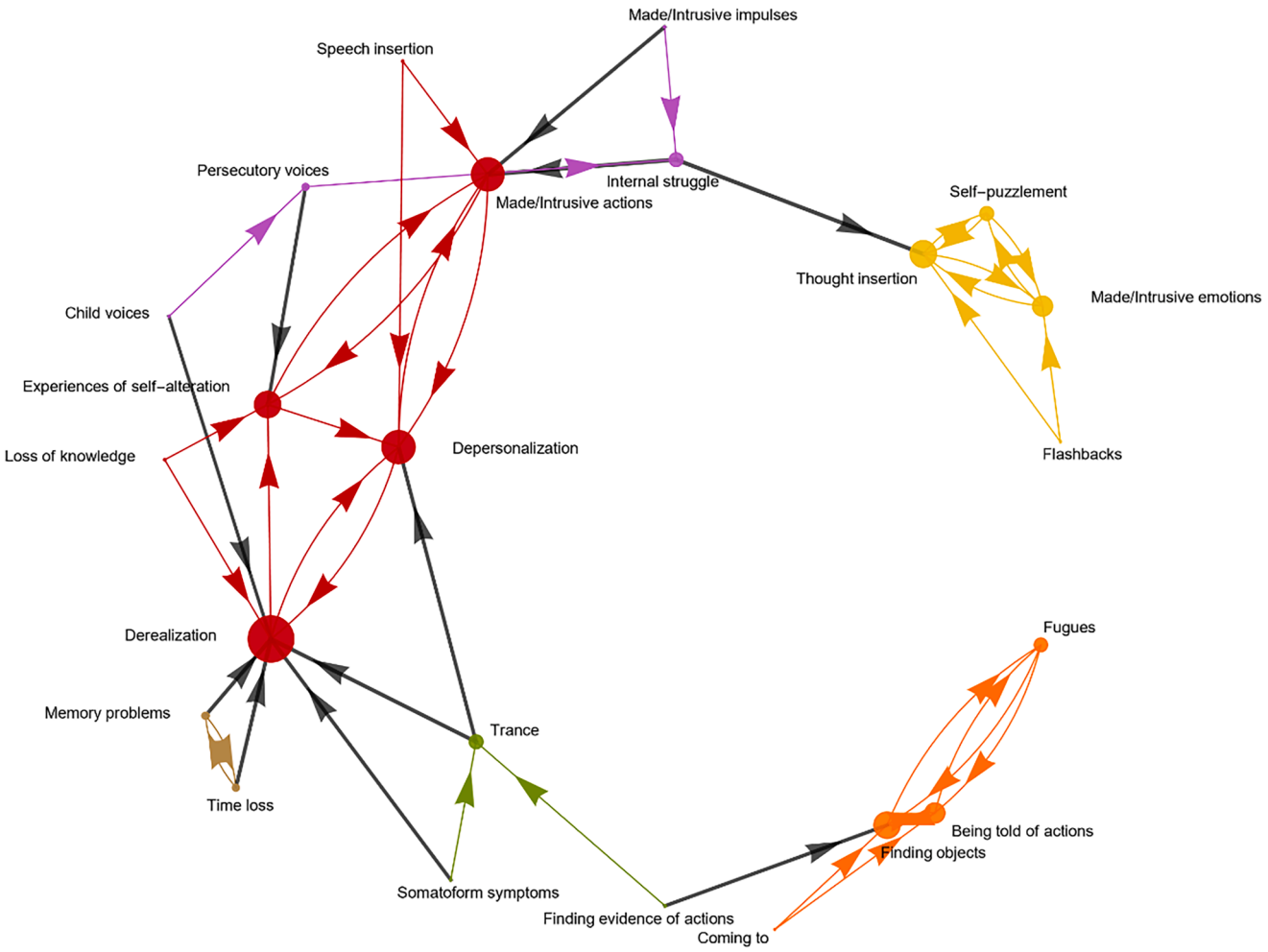
The graph indicates that the MID-HU reflects a multifaceted structure of dissociation, with core dissociative symptoms at the center (red), and more specific ones (instrusions, memory-related, or rare phenomena) orbiting around them.

4.4. *Convergent validity of the MID-HU*

The mean MID-HU scores correlated with the mean DES scores (r: 0.87), indicating a good convergent validity. The mean DES correlated at a medium-high level with the 14 facet scales (r: 0.60- 0.79) and 23 dissociation diagnostic scales of the MID-HU (r: 0.60–0.88), and at a low and medium-high level with the DDIS_SR scales (r: 0.15 - 0.73, $p \leq$ 0,001). The mean MID-HU correlated at a medium and high level with four of the DDIS_SR scales (r: 0.41–0.79, $p \leq$ 0,001) (see in Table 2).



Graph 1. Correlation Network Graph of the mean values of the 14 facet scales.



Graph 2. Correlation Network Graph of the mean values of the 23 dissociation diagnostic scales.

4.5. *Discriminant validity of the MID-HU*

We used the results of SR-DDIS subscales to analyze the discriminant validity of the MID-HU. First, we analyzed how many participants met the criteria of DDs according to the four diagnostic subscales of SR-DDIS in the different groups. The five groups were significantly different ($p \leq$ 0,001) in the SR-DDIS diagnostic scales (except dissociative fugue due to few answers); depersonalization/derealization, DID, and dissociative fugue were only detected in the two dissociative groups. Dissociative amnesia was found in other groups as well, but in significantly higher amounts in the dissociative groups ($p \leq$ 0,001), (see Graph 3).

The chi-square tests indicate significant associations between groups and dissociative amnesia ($\chi 2 =$ 53.2, $p \leq$ 0,001), depersonalization/derealization ($\chi 2 =$ 26.7, $p \leq$ 0,001), and DID ($\chi 2 =$ 46.6, $p \leq$ 0,001), suggesting that the presence or absence of these subscales varies significantly across different groups. The correlations indicate a weak positive correlation between groups and the presence of dissociative amnesia, depersonalization/derealization, and DID ($r = 0.045$ to 0.171), suggesting that in different groups, the presence of dissociative disorders tends to change slightly.

We used One-way ANOVA to discriminate between groups in the other subscales of SR-DDIS: Physical complaints, Schneiderian first-rank symptoms, and Features associated with DID and BPD. We compared the mean of these subscales among groups. The dissociative disorder and the dissociative symptoms groups were significantly ($p \leq$ 0,001) different in each subscale score from other groups (Table 3).

Overall, these findings suggest that there are significant differences in the presence of dissociative disorders and dissociative symptoms among different groups, with the two dissociative groups showing significantly higher levels compared to others.

4.6. *Construct validity of the MID-HU*

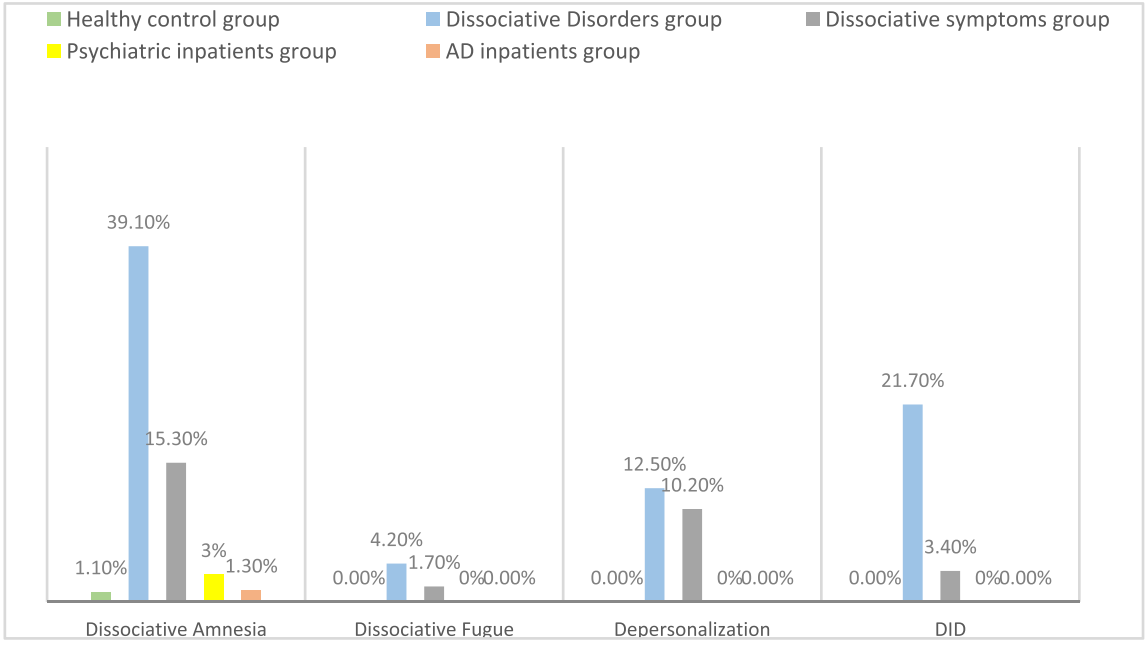
We used the results of the four TAQ subscales to analyze construct validity. We determined cut-off points (2 or more) and generated subscales accordingly in each subscales (Neglect, Emotional, Physical, and Sexual abuse). The mean DES, the mean MID-HU and the MID-HU Dissociative Symptoms Scale correlated only at a low-medium level with the four TAQ scales and the number of traumas (mean DES: r: 0.31–0.46, $p \leq$ 0,001, mean MID-HU: r: 0.40–0.57, $p \leq$ 0,001), MID-HU Dissociative Symptoms Scale : r: 0.39–0.55, $p \leq$ 0,001), (see in Table 4). These findings are below the former MID study results (Dell, 2006; Somer & Dell, 2005), in which the database consisted of only control patients and DD patients. Childhood traumatization is quite common among psychiatric and AD patients, so we hypothesized that traumatization of these groups affected our results (see in Table 4)

Therefore, we analyzed the correlations without the psychiatric and AD inpatients' data. The correlations between mean DES and mean MID-HU the MID-HU Dissociative Symptoms Scale with the four TAQ scales and the number of traumas became higher; to a medium-high level (mean DES: r: 0,45–0,70, $p \leq$ 0,001, mean MID-HU: r: 0,52–0,77, $p \leq$ 0,001), MID-HU Dissociative Symptoms Scale : r: 0.56–0.80, $p \leq$ 0,001). These findings confirmed our hypothesis that the low correlations were due to the traumatization of the psychiatric and AD inpatients (see Table 5).

Table 2
MID-HU correlations with DES and DDIS-SR scales.

MID Scales	No. of Items	mean DES	DDIS_Schneiderian first rank symptoms	DDIS_Features associated with DID	DDIS_Dissociative amnesia	DDIS_DID
mean MID-HU	168	0.87	0.62	0.79	0.44	0.41
Dissociative Symptoms Scale	23	0.72	0.61	0.71	0.40	0.36
Memory problems [a b]	12	0.77	0.49	0.67	0.43	0.31
Depersonalization[a b]	12	0.84	0.60	0.72	0.41	0.35
Derealization [a b]	12	0.88	0.55	0.75	0.43	0.38
Flashbacks [a b]	12	0.72	0.54	0.68	0.40	0.34
Somatoform symptoms[a b]	12	0.72	0.44	0.58	0.39	0.40
Trance [a b]	12	0.80	0.52	0.71	0.48	0.48
Identity confusion [a]	12	0.77	0.55	0.69	0.36	0.29
Voices [a]	12	0.69	0.64	0.76	0.30	0.37
Ego-alien experiences [a]	12	0.78	0.56	0.72	0.39	0.31
Self-alteration [a]	12	0.60	0.47	0.61	0.25	0.29
Self states / alters [a]	12	0.74	0.62	0.77	0.42	0.53
Discontinuities of time [a]	12	0.81	0.53	0.73	0.41	0.39
Disremembered behavior [a]	12	0.70	0.48	0.65	0.34	0.37
Ancillary [a]	12	0.79	0.57	0.74	0.40	0.35
Child voices [b]	3	0.61	0.54	0.68	0.31	0.40
Internal struggle [b]	9	0.75	0.61	0.74	0.39	0.35
Persecutory voices [b]	5	0.64	0.60	0.71	0.27	0.29
Speech insertion [b]	3	0.76	0.48	0.64	0.44	0.33
Thought insertion [b]	5	0.72	0.53	0.67	0.34	0.27
Made/Intrusive emotions [b]	7	0.72	0.48	0.63	0.33	0.21
Made/Intrusive impulses [b]	3	0.66	0.56	0.71	0.39	0.39
Made/Intrusive actions [b]	9	0.80	0.61	0.71	0.42	0.34
Loss of knowledge [b]	5	0.73	0.54	0.67	0.34	0.37
Self-puzzlement [b]	8	0.77	0.54	0.68	0.37	0.27
Time loss [b]	4	0.79	0.50	0.68	0.44	0.40
Coming to [b]	4	0.67	0.46	0.60	0.28	0.33
Fugues [b]	5	0.56	0.41	0.62	0.25	0.36
Being told of actions [b]	4	0.66	0.48	0.63	0.36	0.31
Finding objects [b]	4	0.66	0.41	0.62	0.31	0.39
Finding evidence of actions [b]	5	0.64	0.36	0.58	0.34	0.35

[a] The 14 facet scales
[b] The 23 dissociation diagnostic scales



Graph 3. Differences among groups in SR-DDIS diagnostic subscales.

We also created a cumulative trauma scale (CTS) according to the results of the four TAQ subscales (between 0 and 18 years), that shows the severity of childhood traumatization. The total value of the four TAQ subscales, with 0 being treated separately (i.e., no trauma), was analyzed statistically with KMEANS cluster analysis. The analysis indicated that, in addition to the group with a value of 0, it is worthwhile to distinguish three additional groups. Four trauma severity groups were found: no trauma ($n = 89$, CTS = 0), mild traumatization ($n = 113$, CTS

Table 3
Differences in the mean value of SR-DDIS subscales among groups.

	N	Healthy control group	n	Dissociative disorder group	n	Dissociative symptoms group	n	Psychiatric group	n	AD group	p
DDIS_Psysical complaints	90	4.2	24	19.4	59	13.3	68	11.5	80	9.2	<0,001
DDIS_Schneiderian first-rank symptoms	90	0.1	24	3.2	59	2	65	0.4	76	0.1	<0,001
DDIS_Features associated with DID	90	0.5	24	6.7	59	2.4	68	0.7	80	0.7	<0,001
DDIS_BPD	90	0.5	24	6.9	57	5.1	65	1.8	77	1.3	<0,001

Table 4
Correlations between TAQ subscales and the mean DES, mean MID-HU and MID-HU Dissociative Symptoms Scale in the whole sample.

	mean DES	mean MID	MID Dissociative Symptoms Scale	p
Numbers of trauma	0.45	0.57	0.55	<0,001
TAQ_Neglect	0.31	0.41	0.38	<0,001
TAQ_Emotional abuse	0.34	0.48	0.47	<0,001
TAQ_Phisical abuse	0.42	0.44	0.44	<0,001
TAQ_Sexual abuse	0.32	0.40	0.39	<0,001
TAQ_0–6 years	0.35	0.45	0.42	<0,001
TAQ_7–12 years	0.40	0.51	0.50	<0,001
TAQ_13–18 years	0.46	0.57	0.56	<0,001
TAQ groups	0.42	0.52	0.51	<0,001

Table 5
Correlations between TAQ subscales and the mean DES, mean MID-HU, and MID-HU Dissociative Symptoms Scale in the database without psychiatric and AD inpatients.

	mean DES	mean MID	MID Dissociative Symptoms Scale	p
Numbers of trauma	0.70	0.77	0.80	<0,001
TAQ_Neglect	0.56	0.65	0.66	<0,001
TAQ_Emotional abuse	0.56	0.61	0.63	<0,001
TAQ_Phisical abuse	0.68	0.72	0.73	<0,001
TAQ_Sexual abuse	0.45	0.52	0.56	<0,001
TAQ_0–6 years	0.58	0.64	0.66	<0,001
TAQ_7–12 years	0.63	0.71	0.74	<0,001
TAQ_13–18 years	0.70	0.76	0.79	<0,001
TAQ groups	0.66	0.71	0.73	<0,001

= between 1 and 4), medium traumatization ($n = 75$, CTS = between 5 and 8), and severe traumatization ($n = 16$, CTS >9).

For both mean DES and mean MID-HU, there are significant differences between the trauma severity groups (none, mild, moderate, severe childhood traumatization) based on the ANOVA results (see Table 6)

The mean value of both variables (DES and MID-HU) increases with the severity of traumatization (see Table 6). The standard deviations also increase with the severity of traumatization, indicating greater variability in scores among individuals in the more severe trauma groups. These findings suggest that both DES and MID-HU mean scores are associated with the severity of traumatization, with higher trauma severity scores indicating greater dissociation.

Table 6
Mean DES and mean MID-HU among childhood trauma severity groups.

		N	Mean	SD	F	p
mean DES	none	89	9.30	7.89	27.43	<0,001
	mild	113	13.42	11.89		
	medium	75	20.11	16.88		
	severe	16	41.08	30.16		
mean MID-HU	none	89	3.40	4.11	41,56	<0,001
	mild	113	9.20	10.79		
	medium	75	17.92	16.38		
	severe	16	35.66	24.77		

We also analyzed traumatization among groups; they also proved to be significantly different in the severity of traumatization. Participants in the two dissociative groups (dissociative symptoms group and dissociative disorder group) had more severe traumatization than people in the other groups. In the dissociative disorder group all participants reported childhood traumatization and more than one-third of them suffered severe traumatization in their childhood (see Table 7).

5. Discussion

The recognition, diagnostics and treatment of dissociative disorders in Hungary is currently in its infancy. There aren't any valid diagnostic tools to diagnose DD. We wanted to fill this gap by developing the Hungarian version of the Multidimensional Inventory of Dissociation. We used a multi-source data approach to reach these patients and to ensure diversity in participant characteristics. We collected data from a wide range of areas: online, psychiatry and addiction wards of two hospitals, and from psychotherapists working in private practice. We classified participants into 5 groups: (1) healthy control group, (2) DD group, (3) Dissociative symptoms group (4) Psychiatric inpatients group (without dissociation and SUD), and (5) AD inpatients group (without dissociation).

Our results confirmed that the MID-HU is a valid and psychometrically robust, multiscale measure of pathological dissociation. It has strong internal consistency, temporal stability, structural, convergent and discriminant validity. It also showed strong correlations with childhood traumatization (neglect, emotional, physical, and sexual abuse). In essence, the MID-HU appears to exhibit comparable psychometric strengths and validity measures as those found in the original MID (Dell, 2004a, 2004b), the Israeli (H-MID, Somer & Dell, 2005), and the German MID. (G-MID; Gast et al., 2003).

The internal consistency and temporal stability are similar to other international findings. The correlation between mean DES and mean MID-HU is slightly lower than in other research (r:0,87 vs 0.91 in H-MID and 0.90 in MID). However, in our research not only healthy control and DD patients but also psychiatric and AD inpatients took part which could have an impact on the results.

We found that the mean MID-HU correlated strongly with two SR-DDIS subscales; the 'Features associated with DID' subscale (r: 0.79) and the 'Schneiderian first-rank symptoms' subscale (r: 0.62), while only at a moderate level with the other subscales (r:0.40). It is understandable, as both MID-HU and the above mentioned SR-DDIS subscales assess the subjective dissociative experiences of pathological dissociation, while the other SR-DDIS subscales assess DSM-5 symptoms. To the best of our knowledge, no other studies have examined the correlations of these two questionnaires.

A clinically important finding was that in the dissociative disorders group all participants suffered some type of childhood traumatization (neglect, emotional, physical, or sexual abuse), and 36.4 % of them suffered severe traumatization. The two dissociative groups

Table 7
Severity of childhood traumatization among groups.

	n	no trauma	n	mild traumatization	n	medium traumatization	n	severe traumatization	p
Healthy control group ($n = 90$)	50	55,6 %	32	35,6 %	8	8,9 %	0	0 %	<0,001
Dissociative disorder group ($n = 22$)	0	0 %	6	27,3 %	8	36,4 %	8	36,4 %	
Dissociative symptoms group ($n = 55$)	4	7,3 %	20	36,4 %	27	49,1 %	4	7,3 %	
Psychiatric group ($n = 58$)	11	19 %	26	44,8 %	21	36,2 %	0	0 %	
AD group ($n = 68$)	24	35,3 %	29	42,6 %	11	16,2 %	4	5,9 %	

(dissociative symptoms group and dissociative disorder group) proved to be significantly more traumatized than the other groups, though we found childhood traumatization in the psychiatric and AD inpatient groups as well. These findings are similar to the findings in several clinical case series of complex dissociative disorders (Ross et al., 1990a; Martinez-Taboas, 1991; Boon & Draijer, 1993; Sar et al., 1996; cited Sar, 2011), indicating that dissociative patients suffered more severe traumatization than other clinical populations. Our results also highlight that childhood traumatization itself cannot cause DD, it is also common among non-dissociative psychiatric and AD patients.

The main limitation of this study is that we used only self-report questionnaires and no clinical interviews. That could cause distortions in the results. On the other hand, the similarity of our findings to those of three previous studies of the MID's validity proved that even if there were distortions, it wasn't so extended to undermine our results. However, the discriminant validity of the MID-HU should be further analyzed in future studies with clinical interviews (e.g. SCID-D).

We hope that using MID-HU in clinical practice will improve the recognition and diagnostics of DD in Hungary giving more chances for these patients to get the specialized therapy they need.

CRediT authorship contribution statement

Zsófia Boytha: Writing – original draft, Visualization, Methodology, Investigation, Conceptualization. **Ákos Münnich:** Software, Methodology, Formal analysis. **Alexandra Szilágyiné Sándor:** Resources. **Gabriella Tullner:** Investigation. **Zsuzsanna Bélteczki:** Resources, Investigation. **E. Csaba Móré:** Resources. **Krisztina Czere:** Resources. **Tamás Kánya:** Investigation. **Márton Lukács:** Resources. **Judit Molnár:** Writing – review & editing, Supervision, Methodology, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data statement

Data is available from the corresponding author upon reasonable request.

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