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ORIGINAL RESEARCH

# Developing a scale to measure dissociation between self-states (the Dissociation-Integration of Self States Scale, D-ISS Scale)

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## Abstract

**Background and objectives:** This study described the development and assessment of the psychometric properties of the Dissociation-Integration of Self-States Scale (D-ISS). This is a new scale to assess dissociation at the 'between modes' or self-state (personality) level. The D-ISS is rooted in cognitive behavioural theory and designed to measure between-mode dissociation (dissociation between self-states) in clinical practice and research.

**Method:** ***Study 1:*** D-ISS scale items were generated and then answered by 344 young adults (16–25 years) who reported experiencing stressful times. An exploratory factor analysis (EFA) was conducted and the results were used to refine the scale to 25 items.

***Study 2:*** The final 25-item D-ISS was completed by 383 adults (18–65 years) who reported experiencing mental health difficulties. A confirmatory factor analysis (CFA) was conducted using the second dataset. Internal consistency, test–retest reliability, convergent validity and divergent validity of the final D-ISS was assessed.

**Results:** ***Study 1:*** The EFA showed a clear 5-factor solution, which was used to refine the D-ISS to a total of 25 items with five items in each factor.

***Study 2:*** The 5-factor solution from Study 1 was confirmed as a good fit by the CFA using the data collected in Study 2. The D-ISS demonstrated good internal reliability and test–retest reliability. The D-ISS showed no correlations with divergent scales. For convergent validity, the D-ISS showed moderate correlations with the Dissociative Experiences Scale (DES-II).

**Conclusions:** The new D-ISS measure of between-mode dissociation is reliable and valid for the population represented by our sample. Further research into its use in clinical populations is required.

## Key learning aims

(1) To understand and be able to use a new measure of dissociation at the personality or self-states level.
(2) To understand the cognitive behavioural model of dissociation.
(3) To understand the theoretical underpinnings of the scale, in terms of the effects of childhood and adult adversity and other factors on psychological development.
(4) To consider the potential clinical and research applications of the scale.
(5) To appreciate the limitations of the research so far and the nature of future research required.

**Keywords:** dissociation; factor analysis; mental health; personality; self-states; scale development; structural dissociation

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## Introduction

### *What is dissociation?*

Dissociation can be defined broadly as a failure to integrate experiences (memories, perceptions, etc.) that are normally associated (Janet, 1889). 'It involves a variety of psychological processes (such as amnesia, depersonalization, derealization and identity confusion) that may serve the function of reducing awareness of intolerable information (both internally and externally derived)' (Kennedy *et al.*, 2013, p. 26). Real life dissociative experiences can be described as people feeling unreal, with examples of individuals feeling 'trapped in a simulation', or disconnected, like being in a 'bubble' (Černis *et al.*, 2020, pp. 7–8). Other effects of dissociation include feeling as if there are several identities competing for control of one's body and mind, with involuntary 'switching' between self-states or the feeling of watching oneself do things which do not seem in one's control, as one self-state 'takes over' despite other parts of the self wishing the behaviours were not happening.

In the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*; American Psychiatric Association, 2013), dissociation as a process is defined as a 'disruption of and/or discontinuity in the normal integration of consciousness, memory, identity, emotion, perception, body representation, motor control, and behaviour' (p. 291). Dissociative disorders (DDs) identified in the *DSM-5* are: dissociative identity disorder (DID); dissociative amnesia (including dissociative fugue); depersonalisation/derealisation disorder; dissociative subtype of post-traumatic stress disorder (PTSD); other specified dissociative disorder; and unspecified dissociative disorder. Somatic presentations including dissociative convulsions (pseudoseizures), dissociative anaesthesia and sensory loss, and dissociative motor disorder are described as part of the Conversion Disorders or Functional Neurological Symptom Disorders (FNSD) category.

### *Dissociation and identity development*

#### *The cognitive behavioural model of dissociation*

To aid conceptualisation and understanding of dissociation, a cognitive behavioural model of dissociation has been proposed by Kennedy *et al.* (2004). This model is rooted in Beck's (1996) cognitive theory of personality and psychopathology and is applicable across presentations. It can be used in many contexts to help clinicians identify, understand, and intervene with presentations where dissociation is a factor. In this theory, personality is made up of 'modes'. Modes contain different 'schemas': underlying neurological structures and software which determine our interpretation of and responses to internal and external events (Beck, 1996). The whole collection of all possible modes can be said to represent our personality (Beck, 1996). As with Beck's original model, the experience of personality or the self reflects what is happening within and between these modes, allowing conceptualisation and formulation of dissociation at different 'levels' of information-processing.

Beck (1996) describes an initial stage of processing which includes 'orienting schemas' that scan the environment and identify the context based on previous learning and hardwired responses. They then activate the appropriate mode. Each mode contains behavioural, physiological, affective, and cognitive schemas which drive our responding. For example, if our orienting schemas detect the presence of a lift, they may activate a 'lift phobia' mode of responding. Kennedy *et al.* (2004) hypothesised that dissociation can affect the person at three stages or levels of information processing, due to failure to integrate what is normally integrated within and between modes. These failures of integration occur at the following stages:

(1) **Automatic stage** – where the orienting schemas (which occur automatically and are linked with perceptual processing) fail to integrate leading to 'spacing out' and/or intrusive imagery.

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(2) **Within-mode stage** – where there is a failure to integrate information at a strategic processing level, leading to an inability to think, or feel, or behave, or respond physiologically as well as intrusive thoughts, feelings, behaviours, and physiological responses.
(3) **Between-mode stage** – where dissociation results in fragmentation and lack of coherence between the modes or self-states (at the level of the self or personality).

Please see Table 1 below for a succinct summary of each stage. As this paper focuses specifically on exploring a measure focused on between-mode dissociation at the level of the self or personality, for more detailed information on automatic and within-mode dissociation, see Kennedy *et al.* (2004) and Kennedy *et al.* (2013).

**Table 1.** The cognitive behavioural model of dissociation stages

| Stage 1: Automatic processing (mode 1) | Stage 2: Within-mode dissociation (mode 2) | Stage 3: Between-mode dissociation (mode 3) |
|---|---|---|
| Decoupling of automatic processing | Decoupling of cognitive, affective, physiological, and behavioural/ motivational schema | Partial and total decoupling of modes, fragmentation of sense of self |

### *Definition and development of self-states*

A mode in Beck's model (1996) is referred to in the cognitive behavioural model of dissociation as a 'self-state'. Bromberg (2011; p. 73) defines self-states as 'highly individualized modules of being, each configured by its own organization of cognitions, beliefs, dominant affect and mood, access to memory, skills, behaviours, values, actions, and regulatory physiology'.

The authors' own understanding of a self-state is that it involves a sense of identity, choice, values, and will. We all behave and think differently in different situations. For example, when we go to work, we are in a different self-state than when we are with our friends or studying or interacting with our family. A self-state is more than simply a shift in mood; self-states are distinguished by how we understand ourselves in terms of feelings, ways of thinking, behaving, and relating. During between-mode dissociation, modes can become inaccessible or compartmentalised so that when a person is in one self-state they can become 'stuck', that is, unable to access other self-states (Holmes *et al.*, 2005).

A person with a coherent sense of self will be able to access all their self-states at will, whereas dissociation between self-states reduces a person's ability to choose and control which self-state they are in at a given moment, with switching between self-states triggered by external or internal events. Some people experience very separate self-states, or even different 'selves' residing within one body. Others may experience self-states as 'other' or 'not-me' and feel haunted, persecuted or helped by self-states that are experienced as outside of their body. In other words, the self-states dissociation model is not just about whether we have adaptive or maladaptive modes, but about how these are experienced in relation to each other and to the body.

There is an ongoing debate in the field as to whether dissociation is the result of trauma and neglect *versus* whether it is an adaptive part of normal life (Loewenstein, 2018). This study focuses on dissociation resulting from trauma, neglect and other forms of adversity in childhood or adulthood. Research suggests that recurrent trauma can cause a breakdown in the integration of the self, creating fractured dissociated self-states (Putnam, 1997; van der Hart *et al.*, 2004). Specifically, certain traumatic experiences have been related to the development of dissociative symptoms, including sexual, emotional, or physical abuse, child neglect, and other recurrent severe trauma such as witnessing domestic violence (Dalenberg *et al.*, 2014). In these situations, there is a deep conflict between needing to form a relationship with the perpetrator *versus* the need

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to keep safe. One way of resolving the approach/avoidance conflict in these situations is to keep elements of the self separate, or compartmentalised. In this case, one self-state which relates to the carer when they are being abusive, for example, is not connected to another self-state which relates to the carer when they are being loving (Kate *et al.*, 2023). Dissociative processes are hypothesised to be one of the ways that different self-states are held apart in the personality structures of survivors of abuse (Putnam, 1997; Liotti and Farina, 2016; Nijenhuis, 2014; Stokoe, 2014).

Fragmentation of self-states has been described as 'painful incoherence', affecting every aspect of existence, and limiting an individual's potential to develop into a coherent self with true agency to decide and become the person they want to be (Liotti and Farina, 2016; p. 169). Fragmentation of the self into dissociated self-states can also occur in adulthood due to extreme adversity, where severe traumatic events such as becoming a refugee or being trafficked are responded to with dissociation (Zepinic, 2016). Therefore, it is essential when treating individuals who have experienced complex trauma to assess the degree of fragmentation of the self, to formulate this with the client and to reduce dissociation between self-states by increasing awareness, acceptance, and control.

### *Why is assessing dissociation important?*

Dissociation is widespread throughout clinical populations and across mental health conditions (Lyssenko *et al.*, 2018). Lyssenko *et al.* (2018), conducted a meta-analysis of studies using the Dissociative Experiences Scale (DES-II; Carlson and Putnam, 1993) which also included diagnoses of participants, and found clinical levels of dissociation (scores on the DES-II of 15 or more) in anxiety, PTSD, bipolar, personality disorders, schizophrenia, and eating disorders, to name but a few. Dissociative symptoms are also commonly observed in personality disorder, psychosis, and trauma-related presentations (Lynn *et al.*, 2022; Sar, 2011). The lifetime prevalence of dissociative disorders (DDs) ranges from approximately 9 to 18% (Sar, 2011). For in-patients and out-patients in psychiatric populations, prevalence is up to 46% (Loewenstein, 2018). Prevalence of DDs in the general population is higher than prevalence of bipolar, obsessive-compulsive disorder (OCD) and schizophrenia (Boyer *et al.*, 2022). This research evidence suggests that dissociation is an important factor affecting numerous mental health conditions, yet the *DSM-5* separates conditions classified as dissociative disorders. This can result in dissociation being missed in the assessment, formulation, and treatment of other conditions.

Dissociative symptoms interfere with therapy in many ways. Clients may not be able to access certain compartmentalised aspects of themselves needed for therapy to progress (Bae *et al.*, 2016; Kleindienst *et al.*, 2011). Dissociation as a form of unintentional avoidance can also greatly reduce the effectiveness of exposure-based therapeutic work (Verdi *et al.*, 2023; Wolf *et al.*, 2016). Therefore, as this form of dissociation can occur in the different stages proposed by Kennedy *et al.* (2004) (automatic, within-mode and between-mode), developing a measure for all the stages of dissociation is important for clinical practice and for research. Establishing a better sense of the extent of between-mode dissociation that a client is experiencing would help clinicians assess the degree to which dissociation between self-states needs to be part of the clinical formulation and enable better assessment of clinical progress. Being able to measure not just the presence of different self-states, but also the degree of dissociation between self-states would add a new dimension to research across mental health conditions, yet, to the authors' knowledge, there is currently no valid and reliable tool to assess dissociation between self-states.

### *Existing measures of dissociation*

The DES-II (Carlson and Putnam, 1993) is the most commonly used scale for assessment of dissociation. It has good convergent validity with other measures and contains three subscales of

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amnesia, absorption, and depersonalisation/derealisation; however, statistical analyses suggest that the three subscales may not form distinct factors. Indeed, most factor analyses show only one over-arching factor (van Ijzendoorn and Schuengel, 1996), therefore overall scores are the most reliable measure.

As the DES-II was developed in the 1990s, the DES-II may not reflect more recent theoretical advances (Černis *et al.*, 2018). Other scales developed during the 1980s and the 1990s include the Curious Experiences Survey (CES; Goldberg, 1999); the Somatoform Dissociation Questionnaire (SDQ-20; Nijenhuis *et al.*, 1996); the Questionnaire of Experiences of Dissociation (QED; Riley, 1988); the Perceptual Alteration Scale (PAS; Sanders, 1986); and the Dissociation Questionnaire (DIS-Q; Vanderlinden *et al.*, 1993). These scales each reflect different theoretical understandings of dissociation as over time research and theoretical understanding of dissociation have become more complex (Fung *et al.*, 2022; Kennedy *et al.*, 2013).

There is an interview-based assessment for dissociation which requires a larger amount of clinician time and specialist input, for accurate diagnosis of dissociative disorders: The Structured Clinical Interview for Dissociative Disorders (SCID-D; Steinberg, 1994). In addition, Schauer and Elbert (2010) developed the Shutdown Dissociation Scale (Shut-D), which is a shorter brief semi-structured interview that aims to assess individuals' vulnerability to developing dissociation if they have had exposure to traumatic events (Schalinski *et al.*, 2015).

Three more recent scales are the Multidimensional Inventory of Dissociation (MID; Dell, 2006), a lengthy scale which has some useful subscales; the Dissociative Experiences Measure, Oxford (DEMO; Černis *et al.*, 2018), measuring the general construct of dissociation; and the Dissociative Symptoms Scale (DSS; Carlson *et al.*, 2018), measuring moderate to severe experiences of dissociation but validated only in samples of individuals with PTSD.

The Wessex Dissociation Scale (WDS; Kennedy *et al.*, 2004) was the first dissociation scale to be explicitly based on a cognitive behavioural model of dissociation, elaborated above. This scale measured the three levels of dissociation hypothesised to occur at different stages of information-processing, from automatic or pre-conscious orienting schemas (automatic) to strategic processing determining our thoughts, feelings, behaviours, and physiological responses (within-mode), and finally at the personality or self-states level (between-mode). The WDS has good reliability and validity. However, the exploratory and confirmatory factor analyses conducted did not show good item loadings on factor 3 (between-mode dissociation), making this a weakness of the scale.

### *Aim*

We have summarised evidence above that supports the prevalence of dissociation across mental health conditions and the importance of assessment of dissociation being considered in clinical intervention. Current measures of between-mode dissociation have statistical weaknesses and are therefore not fit for purpose (see Kennedy *et al.*, 2004). Consequently, there is no reliable and valid measure of between-mode dissociation. Our aim therefore was to develop a scale to measure between-mode dissociation. We hypothesised that reduced awareness, acceptance, choice/control, differences between self-states and lack of integration of self-states, would characterise dissociation at the personality level.

## Method – Study 1 (EFA)

Study 1 involved the development and refinement of the Dissociation-Integration of Self-States (D-ISS) scale.

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### Item generation

Initial D-ISS items were generated via consensus of three experts. These included the second author (a clinical psychologist with extensive experience of research and practice in this area), a university academic supervisor (with clinical experience in the area) and a doctorate in clinical psychology trainee. Within this group, between-mode dissociation was understood as a fragmentation in personality consisting of compartmentalisation of self-states. The experts used the cognitive-behavioural definition of self-states aligned with Bromberg's (2011; p. 73) definition of 'highly individualized modules of being, each configured by its own organization of cognitions, beliefs, dominant affect and mood, access to memory, skills, behaviours, values, actions, and regulatory physiology'. Important clinical targets of change frequently identified within clinical practice when working with between-mode dissociation were also considered within the expert group. These included an individual's awareness, acceptance, control of their self-states, alongside the degree of difference or psychological distance between self-states, and the extent to which self-states were integrated into the self or 'me' *versus* not experienced as part of the individual, or 'othered'. These discussions led to the generation of an initial list of over 60 items.

The initial items that were generated were discussed with seven individual patients with lived experience of mental health difficulties (aged 18–65). These were identified from one of the authors' four supervisees who identified clients as having dissociation presentations and were willing to volunteer in the development of the scale. These discussions explored the relevance of the items, whether they captured the patient experiences accurately and whether they were easy to understand. This patient group included people of different ages, genders, and ethnicity. We were initially concerned that people would not understand the term 'self-state' (as explained in the introduction to the scale), but feedback from this group was that this was not problematic. After testing items on the patient group, five members of the public, also including people of different ages (18–65), genders, and ethnicity, were asked to complete the questionnaire and give feedback on the suitability of the items. No further specific demographic data were collected for the feedback groups. The feedback resulted in a final item pool of 55 items. A 5-point Likert-type scale was used, ranging from 0 (strongly agree) to 4 (strongly disagree), with opposite scoring for reversed items.

### Participants and procedures

Following the identification of an initial item pool of 55 items, the questionnaire was included in a battery of questionnaires that were administered as part of a doctoral thesis study (Smart, 2021). Ethical approval was granted by the University of Southampton Ethics Committee to use the data from this study as secondary data in the present study (71854.A1). Study 1 therefore employed a cross-sectional secondary data analysis design using the survey-based questionnaire responses.

Informed consent was given by ticking a box on the online survey. Four hundred and seventy-four individuals who reported having been through stressful times, took part in the study; 130 questionnaire responses had missing data, making the final sample 344 participants. Most participants identified as female (84.6%) and White (78.8%). All participants confirmed they were aged between 16 and 25 years ($M = 19.94$, $SD = 1.95$) and that at some point in their life they had experienced stressful life experiences. Participants were given the opportunity to self-report a mental health diagnosis as part of the demographic questions; all participant-related information can be found in the Supplementary material. A mood-repair task was given to participants (adapted from Pennebaker, 1997) which involved expressive writing after the completion of the study. A debriefing form was also provided.

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### Measures

Participants completed a demographic questionnaire that asked about age, gender, ethnicity, and possible mental health diagnoses, as well as the 55-item D-ISS scale. The scale sat within a wider pool of measures that are not relevant to the present study.

### Data analysis – exploratory factor analysis

Exploratory factor analysis (EFA) was employed to further refine the initial questionnaire, as this is a useful analysis for the beginning stages of questionnaire development (Kishore *et al.*, 2021). Our sample of 344 participants lies between the 300 to 500 participants range, which reflects a 'good to very good' sample (Comrey and Lee, 1992). Histograms were used to assess the distribution of data (Wilkinson and APA Task Force, 1999) with the majority showing normal distribution. A scree plot was the chosen factor extraction method, with Kaiser's criterion set at an eigenvalue of 1. Principal axis factoring with direct oblimin oblique rotation was selected as it was assumed that factors would correlate with each other (Field, 2013). The cut-off for loadings onto factors was .45. Results from the EFA were used to refine the questionnaire, resulting in the 25-item questionnaire used with sample 2.

## Results – Study 1 (EFA)

### Demographic information

Demographic information for sample 1 can be seen in the Supplementary material.

### EFA and scale refinement

For sample 1, the KMO measure of sampling adequacy was .935, which is classified as a 'marvellous' rating (Sofroniou and Hutcheson, 1999). Additionally, Bartlett's test of sphericity was significant ($p<.001$; Field, 2013). The .3 cut-off that was used for communalities (Field, 2013) resulted in a total of two items being eliminated from the analysis. The determinant value was not acceptable due to it being below .00001, suggesting multi-collinearity or singularity within the dataset. When this occurs, scanning the matrix for large correlational pairs greater than .8 or .9 is recommended; however, none was identified in our dataset. Multiple regressions were completed, with each dependent variable in turn, with all the remaining items as independent variables (Tabachnick and Fidel, 2007). From this output, if the variance inflation factor (VIF) exceeds 4.0, or the tolerance levels go below 0.2, then a problem with multi-collinearity is assumed (Hair *et al.*, 2010). To assess this, 55 multiple regressions were completed, and this resulted in one item exceeding the VIF and tolerance levels on 53 out of 55 multiple regressions. This item was removed from the analysis. The removal of this item did not cause the determinant value to be above the acceptable value; however, the EFA was continued due to appropriate steps being taken and no evidence of multi-collinearity (Kirby, personal communication, 25 April 2022).

The first EFA was completed with the remaining 52 items. The scree plot showed a levelling off after 6, which explained 56.79% of the total variance. As a result, 14 items were removed due to loading values of <.45, and three were removed due to cross-loadings (>.2). The EFA was repeated with the remaining 35 items. As a result of one further low loading, and three cross loadings, four more items were dropped. A further six items that loaded least on a given subscale were dropped to even out the number of items in each subscale and simplify scoring for clinicians. A final EFA was conducted with a total of 25 items; this produced a scree plot with five factors prior to the point of inflexion and in combination explained 61.94% of the total variance. A 5-factor structure was further evidenced by Kaiser's criterion as only the first five items had eigenvalues greater than 1.

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**Table 2.** EFA factor loadings

| Item | Factor 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| I hate some self-states (R) | .787 | | | | |
| I would like some self-states to disappear (R) | .728 | | | | |
| I would like to get rid of some self-states (R) | .676 | | | | |
| I feel like punishing some self-states (R) | .593 | | | | |
| The self-states cause problems in my life (R) | .468 | | | | |
| I am very aware of having different self-states | | .663 | | | |
| I am aware of all my different self-states | | .643 | | | |
| I know when I have shifted from one self-state to another | | .629 | | | |
| I can tell when I have been in one self-state and then in another | | .571 | | | |
| I am not aware of all the self-states (R) | | −.563 | | | |
| I feel that the self-states are combined to form me as a whole | | | .785 | | |
| I am formed of all the self-states | | | .745 | | |
| The self-states are all aspects of me as a person | | | .633 | | |
| The self-states feel connected together in some way | | | .623 | | |
| The self-states are integrated together | | | .588 | | |
| The different self-states have different names (R) | | | | .784 | |
| When I'm in one self-state I often don't remember what happened when I was in a different self-state (R) | | | | .576 | |
| Some self-states are male and some are female (R) | | | | .574 | |
| Some self-states are children, some are more grown up (R) | | | | .476 | |
| Some self-states are dangerous to me or other people (R) | | | | .467 | |
| I have control over moving between self-states | | | | | .710 |
| I have no choice over whether I move between self-states (R) | | | | | .695 |
| I cannot control whether I end up in one self-state or another (R) | | | | | −.653 |
| I have no choice about what self-state I am in (R) | | | | | −.634 |
| I can choose what self-state I am in in any situation | | | | | .600 |

*Note*. If an item has (R) after the statement, this means that the item is reverse scored.

The final scale consisted of 25 items with five items in each factor (see Table 2). Subscale titles were defined by the supervisory team identifying the common theme of items in each factor and naming each factor accordingly. The first factor was termed 'Acceptance', the second factor 'Awareness', the third factor 'Integration', the fourth factor 'Difference', and finally the fifth factor was termed 'Control'.

## Method – Study 2 (CFA)

Study 2 aimed to confirm the psychometric properties of the Dissociation-Integration of Self-States (D-ISS) scale.

### *Participant recruitment and procedures*

The second phase of the study employed a cross-sectional survey-based mixed design. Participants were recruited using purposive recruitment, via MQ Participate, Call for Participants, University of Southampton Twitter, and the Southampton Psychology Undergraduate platform. There were no missing data due to the forced choice method used. Ethical approval was granted by the University of Southampton Ethics Committee (72890).

Data were collected from a new sample using the refined, 25-item scale. In total, 383 participants with mental health difficulties aged between 18 and 65 years of age completed the online questionnaire, the majority aged between 18 and 25 ($n = 324$). Most of the participants were female (81.5%) and White (66.8%). To assess test–retest reliability, 77 of the 383 participants completed the questionnaire again at a second time-point, 2 weeks after their initial completion of the questionnaire.

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To be eligible, participants had to give their age as between 18 and 65 years and report experience of mental health difficulties. The rationale for use of members of the general population with mental health problems was based on dissociation, trauma and adverse childhood experiences being widespread for individuals with mental health problems (Lyssenko *et al.*, 2018). Our measure assumes that dissociation is prevalent and that individuals with a range of mental health problems may experience between-mode dissociation.

Informed consent was given by ticking a box on the online survey. Participants were given opportunity to self-report a mental health diagnosis if they had one as part of the demographic questions; all participant-related information can be found in the Supplementary material. Participants completed three online self-report scales (see below); they were then given the debriefing form. Participants had the option to click into a separate survey, where they could enter their email into a prize draw: this gave them an option to consent to completing the scale again after 2 weeks. If participants accessed the study via the Southampton Psychology Undergraduate platform, they received credits that contributed to one of their academic modules.

### *Measures*

Measures included a demographic questionnaire that asked about age, gender, ethnicity, and mental health diagnoses; the 25-item scale comprising the D-ISS; and a further two scales, described below.

#### Dissociative Experiences Scale – revised version *(*DES-II: *Carlson and Putnam, 1993)*

The DES-II has 28 self-report items assessing the frequency and severity of dissociative experiences. The respondent uses an 11-point Likert-type scale to indicate the percentage of time they have dissociative experiences, in increments of 10%, from 0% (never) to 100% (always). The DES-II is a well-established measure with good psychometric properties (Carlson and Putman, 1993). Cronbach's α at the first and second time points of our study was 0.94 and 0.95, respectively.

#### Wessex Dissociation Scale *(*WDS: *Kennedy et al., 2004)*

The WDS has 40 self-report items assessing dissociation based on the cognitive behavioural model. A 6-point Likert-type scale assesses the frequency of each dissociative experience from 0 (never) to 5 (all the time). The WDS has three subscales, automatic (11 items), within-mode (12 items), and between-mode (17 items). Therefore, as well as an average total, the scoring of the scale can be broken down into the subcategories of dissociation proposed by the model. An individual would score higher on the automatic subscale if they were experiencing 'spacing out', fragmentation of memory and intrusive imagery. Someone with within-mode dissociation may score highly on items related to pain, emotional numbness, or thought blocking, for example. Those that experience between-mode dissociation may score more highly with items related to amnesia, fugue states, and/or loss of time. The scale has been shown to have good psychometric properties (Kennedy *et al.*, 2004). Cronbach's α at the first and second time points was 0.94 and 0.95, respectively.

### *Data analysis – confirmatory factor analysis*

To further analyse the psychometric properties of the questionnaire, the items from the refined D-ISS were analysed with a confirmatory factor analysis (CFA), using the data collected in Study 2. The CFA was conducted using SPSS Amos version 29.0. Descriptive statistics including means and standard deviations were calculated, to describe normative scores within the sample population.

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For CFA analysis, a minimum sample size of 150–315 participants is suggested within the literature (Muthén and Muthén, 2002). Our sample size was 383 participants. The CFA analysis showed maximum likelihood completed with no violations of normality. The goodness of fit parameters used in the study for the CFA were the comparative fit index (CFI) and a Tucker-Lewis index (TLI) over 0.9 (Bentler, 1990), a root mean squared error of approximation (RMSEA) below 0.08 (Fabrigar *et al.*, 1999), and a standardised root mean square residual (SRMR) below 0.08 (Hu and Bentler, 1999). Re-specifications were considered from the modification indices (MI) output for error co-variations only if they improved the fit and made theoretical sense (Byrne, 2010).

### *Reliability*

Inter-item correlations and Cronbach's α were used to assess internal consistency of the D-ISS items. Cronbach's α was used on the new D-ISS 25-item overall questionnaire and the five subscales to assess internal consistency. The repeat request to complete the D-ISS for test–retest reliability analysis was sent out 2 weeks after first completion (Streiner and Norman, 2008). Intra-class correlation coefficients (ICCs) were deemed the most widely accepted for test–retest reliability analysis (Koo and Li, 2016). The Consensus-based Standards for the selection of Health Measurement Instruments (COSMIN) Checklist (Mokkink *et al.*, 2019) suggests 50–99 participants for test–retest reliability shows good methodological quality. Our sample size was 77 participants.

### *Convergent and divergent validity*

Pearson's correlation coefficient was used to analyse convergent and divergent validity between the newly developed D-ISS with already existing established measures of dissociation (WDS, Kennedy *et al.*, 2004; DES-II, Carlson and Putnam, 1993). Moderate to strong correlations would suggest convergent validity, and weak to null or negative correlations would suggest divergent validity.

For convergent validity, it was expected that the D-ISS would show moderate correlations with the DES-II overall. It was also expected that there would be moderate correlations between the D-ISS and the between-mode subscale of the WDS. To assess divergent validity, weak or no correlations were expected between the D-ISS and WDS automatic and within-mode subscales as these subscales do not specifically measure between-mode dissociation.

## Results – Study 2 (CFA)

### *Demographic information and descriptive statistics*

Demographic information for sample 2 can be seen in Supplementary material. Descriptive statistics for the overall D-ISS score and subscales can be seen in Table 3.

### *CFA*

The final model showed an overall acceptable fit (CFI = .925, TLI = .912, RMSEA = .055, SMRI = .064; see Fig. 1). Modification indices were used to conduct seven re-specification steps; these steps modify the model by adding in parameters to improve the fit. Specifically, the seven re-specification steps were added to the CFA model for those between the same factor; no error co-variances were added between different factors as this may have reduced the interpretability of the factors (Bathe-Peters *et al.*, 2023). The seven re-specification steps were added via error co-variances for those items which had high values on the MI output (>10): it was assumed they had shared variance due to similar item content (Byrne, 2010; Hoyle, 2012).

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**Table 3.** Descriptive statistics for the D-ISS overall total and the five subscales in sample 2

| | Descriptive statistics | |
|---|---|---|
| | Mean | *SD* |
| D-ISS overall total | 39.05 | 12.83 |
| Awareness | 7.35 | 3.09 |
| Integration | 6.54 | 3.29 |
| Difference | 5.69 | 4.09 |
| Acceptance | 9.73 | 5.32 |
| Control | 9.73 | 4.13 |

*SD*, standard deviation.

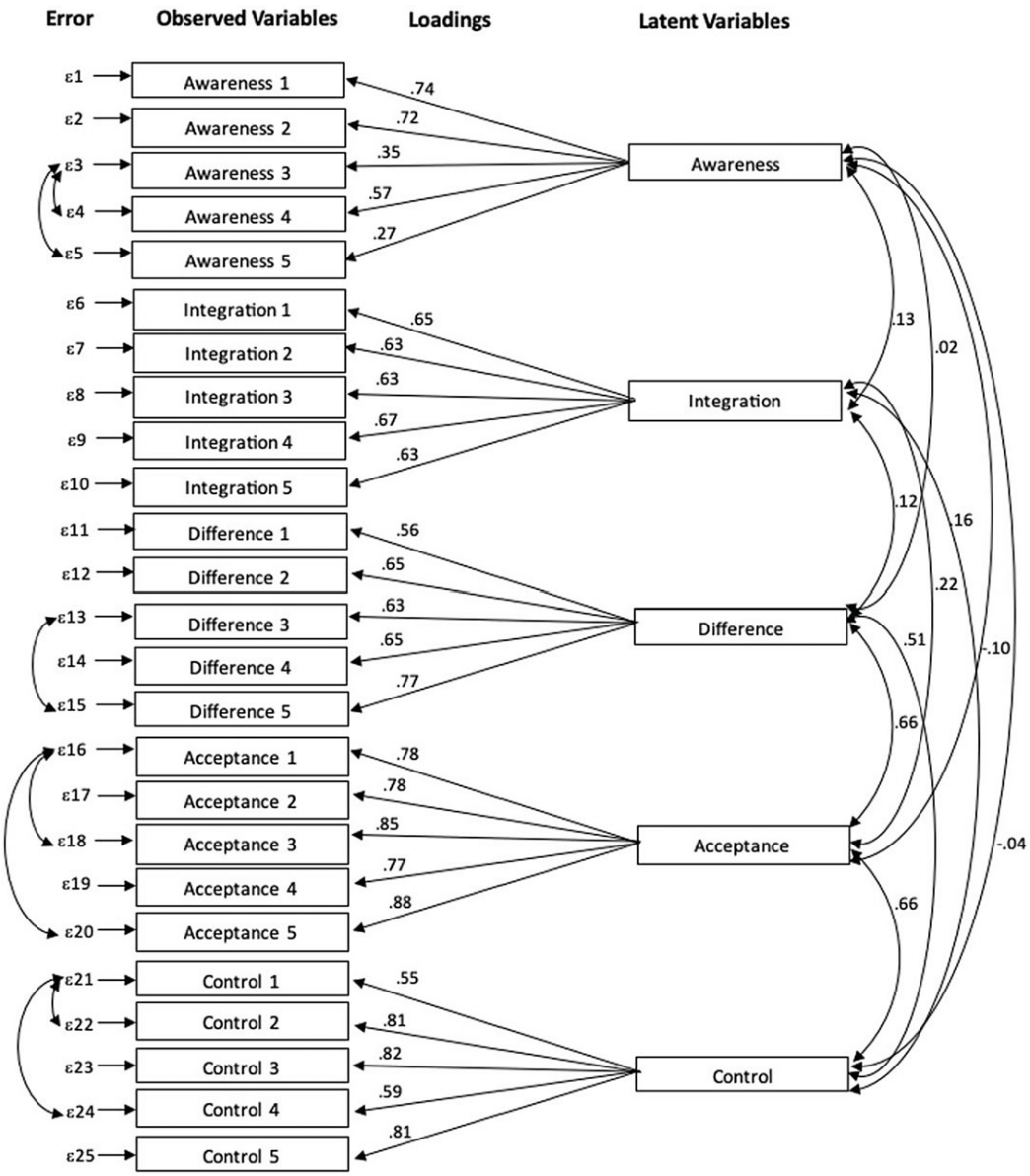


**Figure 1.** Confirmatory factor analysis model (ε, references model errors).

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**Table 4.** Cronbach's α for each of the five D-ISS subscales

| D-ISS subscales | Cronbach's α |
|---|---|
| Awareness | .710 |
| Integration | .778 |
| Difference | .769 |
| Acceptance | .907 |
| Control | .852 |

### *Reliability*

The D-ISS showed good reliability (Cronbach's $\alpha = .865$) with all the subscales achieving acceptable to excellent reliability (Cronbach's $\alpha = .720–.907$; George and Mallery, 2003). Full details on the Cronbach's α output for the subscales of the D-ISS can be seen in Table 4. The majority of inter-item correlations ranged between low and moderate correlations, with a small amount being highly correlated (see Supplementary material). Item-total correlations were all in the acceptable range ($r > 0.3$). For test–retest reliability, the average ICC for the total scale and the subscales showed moderate ($r = 0.5–0.75$) to good reliability ($r = 0.75–0.9$; see Table 5).

### *Convergent validity*

The D-ISS showed significant correlation with the DES-II ($r = .40$, $p < .001$) with a moderate effect size. The D-ISS showed no significant correlation with the WDS between-mode subscale.

### *Divergent validity*

No significant correlations were found when comparing the D-ISS and the WDS automatic and within-mode subscales ($r = -.028$ $p > .05$). Full output of the correlations and significance levels for the WDS subscales can be found in Table 6.

## Discussion

We developed the Dissociation -Integration of Self-States Scale (D-ISS), a new measure based on the cognitive behavioural model (Kennedy *et al.*, 2004) to allow assessment of and assistance in planning of interventions for psychopathology involving between-mode dissociation. Between-mode dissociation is a partial or total decoupling of modes that results in fragmentation and lack of coherence at the level of the self or personality level. Our results indicate that the measure has a clear and robust factor structure and good psychometric properties. The EFA output showed a clear 5-factor structure and the CFA confirmed this by showing goodness of fit. The D-ISS is internally consistent and shows good test–retest reliability, with a good Cronbach's α rating for the overall scale, and subscales with acceptable to excellent ratings. The overall scale showed good test–retest reliability and subscales achieved moderate to good test–retest reliability, suggesting that the individual's performance on the D-ISS is stable over the 2-week time-period. Comparison of the D-ISS with the DES–II showed a moderate significant correlation with a medium effect size, indicating that the scale is measuring dissociation, but not exactly the same constructs as measured by the DES-II. The expected convergent validity with between-mode of the WDS was not found, suggesting that perhaps the WDS between-mode is not such a good measure of between-mode dissociation. We recall that the factor analysis in the development of the WDS did not confirm good item loadings on this factor (Kennedy *et al.*, 2004). The D-ISS showed divergent validity with the WDS subscales of automatic and within-mode dissociation with no significant correlations. These levels did have good item loadings in the original scale development of the WDS and explicitly do not measure between-mode dissociation.

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**Table 5.** Test–retest reliability for the five subscales of the D-ISS

| | ICC | Confidence interval (95%) |
|---|---|---|
| Awareness | .526** | .258, .698 |
| Integration | .753** | .605, .844 |
| Difference | .847** | .760, .903 |
| Acceptance | .832** | .736, .893 |
| Control | .729** | .576, .829 |
| Total scale | .826** | .727, –.889 |

ICC, intra-class correlation coefficient. **$p<.001$.

**Table 6.** Pearson's correlations between the D-ISS subscales and the WDS subscales

| | WDS subscales | | |
|---|---|---|---|
| | Automatic | Within | Between |
| Awareness | –.002 | –.014 | .009 |
| Integration | –.017 | –.060 | –.037 |
| Difference | –.018 | –.035 | –.015 |
| Acceptance | –.017 | .022 | .040 |
| Control | .035 | –.019 | –.007 |

### *Strengths and limitations*

Regarding methodological strengths, the EFA, CFA, and test–retest reliability analyses conducted in Study 2 were all adequately powered given the sample sizes recruited, further supporting the robustness of the analytic output. Although the sample for Study 2 was from the general population/university students, individuals with mental health difficulties were the targeted sample, with most participants disclosing a mental health diagnosis, which therefore captures individuals that are more likely to encounter dissociative experiences. The sample for Study 1 was young adults aged between 16 and 25 years, and the majority of the sample for Study 2 was university students aged between 18 and 25 years, along with older participants. Most participants were female and identified as White. Therefore, generalisability to older adult groups, males, and non-White ethnic groups needs to be further investigated.

The D-ISS is based on the cognitive behavioural model of dissociation, which draws upon Beck's theory of personality and psychopathology. The authors recognise that there are other theoretical understandings of terminology used in this paper such as that of Young *et al.* (2003). However, Beck's theory (1996) fits better in that it forms the basis of our definition and theory of dissociation and self-states. There are most certainly wider theoretical discussions to have, but these are beyond the scope of this paper.

Further demographic details and specific questioning around people's understanding of self-states would have been helpful to gather when collecting feedback from patients and the community. This has been identified as a limitation of this paper with action taken for research currently in progress to further validate the measure (Barton *et al.*, 2024). Current research includes feedback using patient and public involvement (PPI) which asks specifically about individuals' understanding of self-states. It has led to the addition in the instructions of a sentence distinguishing self-states from simple mood states, which was the only query arising from patients (contact the authors for the revised scale).

Data collected via internet-based surveys increases the likelihood of self-selection bias due to some individuals being more likely to complete online surveys than others, automatically creating a systemic bias (Wright, 2005). Additionally, the combination of an online survey and self-report

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data results in some uncertainty regarding the demographic data as there is no guarantee that they are accurate responses (Wright, 2005).

### Clinical implications

The D-ISS is the first scale that has been developed to measure between-mode dissociation (contact the authors for a copy of the revised scale). The design of the scale promotes use in clinical settings due to its short length, a key criterion to consider with limited healthcare resources (Kemper *et al.*, 2019). Additionally, the number of items included in the D-ISS offers a quick scoring system of a maximum overall score (100), and equal maximum for each factor (20), for easy use within clinical practice and research.

Dissociation involves complex psychological processes; dissociative disorders are clouded in stigma and misunderstanding, and are often missed in clinical practice (Gleaves and Reisinger, 2023; Loewenstein, 2018). Current dissociation measures are described as being embedded within 'conceptual unclarity', adding to the difficulty in the assessment and intervention for dissociative disorders (Fung *et al.*, 2022; p. 3). The D-ISS offers a clear and concise measure for dissociation at the personality level, and we hope it will promote assessment, formulation, and psychological treatment. Using the D–ISS alongside other dissociation measures such as the WDS or the DES-II would provide a more extensive picture of an individual's dissociative experiences.

Regarding utilisation of this measure in clinical practice, the pattern of the scores that are obtained can inform the focus of clinical intervention. There are five subscales in total and how they may look will differ in different client presentations and therefore can inform clinical goal-setting. For example, a client may be aware of the self-states but be unable to control them (i.e. have a high score on the awareness subscale, meaning they are aware of the self-states, but a low score on the lack of control subscale); this would indicate that the clinician should focus on development of control. Alternatively, if a client has a high score on the awareness subscale, psychoeducation around dissociation and building awareness of self-states may be an initial clinical goal. This highlights the usefulness of the measure in the absence of clinical cut-off scores. If utilised in clinical practice, clinicians should be advised to use the measure with caution due to the early stages of testing. Additionally, the sample of participants used in these studies does not necessarily represent populations of people who have experienced multiple traumas or adversities, where we would expect to find the most fragmentation of self. Therefore, further validation studies are required in broader populations and clinical settings.

### Future research

Further research is currently being undertaken with the aim to identify specific scores on the D-ISS for a clinical population of people who have a mental health diagnosis. This study protocol was pre-registered 1 October 2024 using Open Science Framework (OSF) Registries (osf.io/5x72b). The study includes public and patient involvement to understand in greater detail people's understanding of the questionnaire and self-states. Further research such as this will help develop clinical norms for different mental health groups.

Due to the sample populations being predominantly young white females from a university-educated background, assessing the reliability and validity of the D-ISS in wider social backgrounds, and within different cultural groups, would be beneficial. Including more males, participants with more varied social status and ages below 18 and above 25 would also aid assessment of the D-ISS's generalisability.

Replication studies are highly recommended to further validate the scale and its use in different clinical populations. Previous research suggests that dissociative symptoms are experienced along a continuum of different clinical diagnoses with increasing severity. For example, highest dissociation scores have been reported in PTSD, borderline personality disorder, and dissociative

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disorders, and lower (but still significant) scores in mood and substance-use related disorders (Lyssenko *et al*., 2018; Rădulescu *et al*., 2020). Replication studies should aim to create clinical norms and cut-offs for the D-ISS for different clinical populations, which can then be used in psychological assessment, formulation, and treatment outcome measurement.

Clinical case studies would help illustrate how to use the D-ISS to set and monitor clinical goals. Additionally, qualitative research of participants' understanding of the questionnaire, the concept of self-states, and elaboration of their examples linked to the items would be extremely valuable. Regarding treatment outcomes, it would be useful within future research to assess whether higher scores on the D-ISS are linked to more severe pathology and alternatively, whether therapeutic intervention results in a decrease in D-ISS scores and improved mental health. Specific therapies such as schema therapy may benefit from using the D-ISS in outcome research: the D-ISS allows assessment of whether maladaptive schemas are not just present but whether they are also dissociated. The scale could also be used in research to understand dissociation at the personality level and its role in mental health problems.

### *Conclusions*

The D-ISS is a new scale assessing between-mode or personality level dissociation. The D-ISS is a reliable and valid measure with a good factor structure. Future research should focus on validating the measure in different clinical populations and cultural groups. Because the D-ISS is unique as a theory-based measure of between-mode dissociation, it has the potential to be a key measure for the assessment and treatment of personality-level dissociation within clinical practice and in future research.

**Key practice points**

(1) The D-ISS could assist in assessment, formulation, treatment focus and outcome measurement in clinical cases involving dissociation, across conditions.
(2) Using the D-ISS alongside the Wessex Dissociation Scale should provide a complete picture of a client's dissociative experiences in line with the cognitive behavioural model.
(3) The design of the D-ISS makes it easy to use in clinical and research settings, with 25 items and a simple scoring system.

## Further reading

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**Supplementary material.** The supplementary material for this article can be found at https://doi.org/10.1017/S1754470X25000042

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