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Research article

Validity of the Persian translation of the differentiation of self inventory (DSI) among Iranian adults

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HIGHLIGHTS

- The CFA results showed that the factor loadings of more than half of the items did not meet the criteria, and 26 items removed.
- The results of EFA in 17 items questionnaire illustrated the four-factor questionnaire, including emotional reactivity, emotional cutoff, I position, and fusion with others.
- The DSI scale can utilize as a valid and reliable tool by psychologists and counselors, especially in couple therapy and premarital counseling.

ARTICLE INFO

ABSTRACT

Because of the importance of self-differentiation in couple therapy and premarital counseling, it is essential to have a suitable tool to measure it. The present study investigates the validity of the Persian translation of Differentiation of Self Inventory (DSI) among Iranian adults. The participants involved 273 people who chose availability (202 males and 82 females). The DSI scale had good enough validity and satisfactory reliability according to face, content, and construct validity test. According to the results of confirmatory factor analysis, 26 items removed because their factor loadings did not meet the criteria and the DSI scale remained as a 17 items questionnaire. Due to the disintegration of factors, exploratory factor (EFA) analysis is used to determine the factors of DSI. The results of EFA supported the four-factor questionnaire, including emotional reactivity, emotional cutoff, I position, and fusion with others.

1. Introduction

Differentiation of self has described as a capability to retain the balance between emotional and intellectual functioning. Also, it has described as an ability to manage the degree of intimacy and autonomy in the relationships (Hargrove, 2009). Differentiation of self is a global necessity. Everybody must learn to consider their distance from others while making intimate relationships with them (Knerr and Bartle-Haring, 2010). Differentiation of self has a relationship with family functioning and anxiety (Dolz-del-Castellar & Oliver, 2021), psychological adjustment (Moral et al., 2021), and social acceptance (Samari and Lalifaz, 2005).

Thorberg and Lyvers (2010) showed that self-differentiation is strongly associated with attachment. Another study showed that adult attachment acts as a mediator between self-differentiation and Alexithymia (Scigala et al., 2021). Wilson (2021) investigated the mediating role of differentiation of self and the results indicated that high levels of relationship satisfaction associated powerfully with differentiation of self, and couples who had high differentiation of self increase their relationship satisfaction more than others (Neophytou et al., 2021). illustrated that higher levels of differentiation of self were associated with lower levels of trait anxiety. Also (Knauth et al., 2006), indicated that differentiation of self has a vital role in managing chronic anxiety.

Bowen (1978) defined differentiation of self as an ability to preserve their connection with the family while can has emotional autonomy. It comprised two dimensions, including intrapsychic that relates to the ability to differentiate the feelings from the thoughts, and interpersonal that relates to the capability to encounter intimacy and autonomy from others (Bowen, 1978). As Bowen (1978) stated, people with a low level of differentiation of self cannot deal with their stresses in life and show emotional imbalances (Duch-Ceballos et al., 2020). Differentiation of self is the cornerstone of Bowen's theory (Bitter, 2014) and is a

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multidimensional construct, which explains the intrapsychic process of individuals as well as the interpersonal ones (Bowen, 1978). It comprised four factors: emotional reactivity (an uncontrolled response in emotional format with automatic responses), emotional cutoff (avoid intimacy, which can be in the form of physical and emotional distance from others), I position (the sense that everybody has about themselves and described as an ability to differentiate between thoughts and feelings), and fusion with others (doing like others while rejecting their thoughts and feelings) (Duch-Ceballos et al., 2020).

Differentiation of self has developed by Skowron and Friedlander (1998) in New York, is a 43-item scale. It has four factors, including emotional reactivity that has 11 items (1, 6, 10, 14, 18, 21, 26, 30, 34, 38, and 40), emotional cutoff that has 12 items (2, 3, 8, 12, 16, 20, 24, 28, 32, 36, 39, and 42), I position that has 11 items (4, 7, 11, 15, 19, 23, 27, 31, 35, 41, and 43), and fusion with others that has 9 items (5, 9, 13, 17, 22, 25, 29, 33, and 37). The underlined items must be reversed score. The original paper showed that DSI Cronbach's alpha values are good in total and for all factors (DSI α = 0.88, emotional reactivity α = 0.84, emotional cutoff α = 0.82, I position α = 0.83, and fusion with others α = 0.74).

Assessing Interpersonal Fusion: Reliability and Validity of a New DSI Fusion with Others Subscale (Skowron and Schmitt, 2003) is the revised form of the DSI, and Differentiation of Self Inventory-Short Form: Development and Preliminary Validation (Drake et al., 2015) is the short form of DSI. DSI was translated and validated in some countries, especially the revised version of it, including Psychometric Evaluation of the Differentiation of Self Inventory-Revised and Mental Health Inventory-18 for Filipino (Antazo, 2020), Psychometric Properties of the Differentiation of Self Inventory-Revised in Turkish Adults (Işı k and Bulduk, 2015), Validation of the Chinese Version of Differentiation of Self Inventory (C-DSI) (Lam and Chan-So, 2015), Psychometric Properties of an Italian Version of the Differentiation of Self Inventory-Revised (It-DSI-R) (Lampis et al., 2017), Assessing the Psychometric Properties of the Differentiation of Self Inventory-Revised for Asian-American Bicultural Adults (Lee and Johnson, 2017), and The Differentiation of Self Inventory-Revised: A validation study in Greek Cultural Context (Neophytou et al., 2021).

In 2004 another version of this scale was developed for adolescents by (Knauth and Skowron, 2004), which assesses DSI in adolescents between 14 to 19 years old. In Iran, the short form of DSI was validated by (Rasoli et al., 2016), which its internal reliability was 0.74. The present study aims to validate Differentiation of Self Inventory (DSI) among Iranian adults and investigate cultural differences between countries. It helps clinicians and researchers have a good measure to assess the self-differentiation of adults by their own culture.

2. Method

2.1. Participants

The ethical agreement for doing the study achieved from the Ethics Committee of the Department of Counseling at the Alzahra University of Tehran. At first, respondents consisted of 304 people who were selected based on availability. Of these, 14 were excluded because they had answered the questionnaire twice, and 17 were excluded because they were detected as outlier using Z score. In the end, 273 people remained. Following the sample size for CFA, Plichta et al. (2013) suggested a ratio of cases to items of 5:1 to 20:1. Regarding remained people (284) and 43 items, this study met the ratio of cases to items (6:1). The remained participants included 202 females and 82 males, and their mean age was 33.33 (from 25 to 53) (SD = 7.68). The demographic characteristics of participants have shown in Table 1 (see Table 1).

Questionnaires were provided in Google Forms and distributed online in cyberspace, and people voluntarily participated in the study. It stated that all information would be confidential. Approximately 20 min are needed to fill out the form. All questionnaires were filled out during two

Table 1. Demographic characteristics of participants.

Variable	Percent (n)
Gender	
Male	71.1 (n = 202)
Female	28.9 (n = 82)
Marital status	
single	46.8 (n = 133)
Married	50.4 (n = 143)
Divorced	2.8 (n = 8)
Educational level	
Under diploma	4.9 (n = 14)
Diploma	16.5 (n = 47)
Bachelor degree	44.4 (n = 126)
Master's or doctoral degree	34.2 (n = 97)
Job	
Clerk	21.5 (n = 61)
businessman	9.9 (n = 28)
Quasi-public	9.2 (n = 26)
Self-employment	23.9 (n = 68)
unemployment	35.5 (n = 101)

weeks, and after finishing this procedure, five people received 100.000 Tomans as a gift randomly.

2.2. Instruments

Differentiation of Self Inventory (DSI) (Skowron and Friedlander, 1998) is a 43-item inventory of the differentiation of self, including four factors: emotional reactivity that has 11 items, emotional cutoff that has 12 items, I position that has ten, and fusion with others that has nine items. Each item uses a six-point Likert scale, ranging from 1 (not at all true of me) to 6 (very true of me). The total score of the scale determined by computing the items' scores. A higher score illustrates a greater differentiation of self. The Cronbach's alpha coefficient for each factor was 0.88, 0.85, 0.79, and 0.70 in the previous study. It was for DSI = 0.88 (Skowron and Friedlander, 1998).

To translate the English version of the DSI scale into Persian, Brislin (1986) method used. DSI scale separately translated by two specialists. One expertise translated the scale from English into the Persian language, and the other translated the scale back from Persian into English. Eventually, three separate translators compared the two versions of the DSI scale, argued about disagreements, and attained concord about the Persian translation.

The Trait version of the State-Trait Anxiety Inventory (STAI-T) (Spielberger, 1970) is a 20-item measure of somewhat constant individual differences in anxiety tendency. Each item uses a four-point Likert scale, ranging from 1 (approximately never) to 4 (approximately ever), and scores range from 20 to 80. A higher score shows greater anxiety. The Cronbach's alpha coefficient for STAI-T has ranged from 0.86 to 0.92 (Spielberger, 1970). Prior research suggests that the STAI-T has acceptable reliability for Iranian people (Khanipour et al., 2011).

3. Data analysis

In the current study, Statistical Package for the Social Science 24 (SPSS 24) was used to analyze data, including mean, standard deviation, correlation, Cronbach's Alpha Coefficient, Z score, and explanatory factor analysis. Also, AMOS software (version 24) was used to assess confirmatory factor analysis, including construct validity, construct reliability, and convergent validity. The impact score was used to count face validity and the Content Validity Ratio (CVR) and the Content Validity Index (CVI) were used to count content validity.

4. Results

4.1. Face validity

Two methods, qualitative and quantitative, were used for determining the face validity of the DSI scale in the current study. In the qualitative part, ten people who were not the main participants in the study asked to determine the obscurity, pertinent, and easiness of each item. Quantitative face validity determined after implementing essential corrections from the people's point of view. Due to that, ten people as the same as the previous sample asked to evaluate the value of each item (obscurity, pertinent, and easiness) on a five-point Likert scale from 1 (not important) to 5 (completely important). Then, the impact score of each item counted by the formula: impact score = frequency (%) × importance. The number of participants who stated an item score of four or five indicated by frequency and importance relates to the mean score of that item. The lower threshold for the impact score is 1.5, and the items gain equal or greater than 1.5 is deemed an acceptable item and remains in the survey (Hajizadeh and Asghari, 2011). In this study, the quantitative face validity announced a test that the impact factor of all items was greater than 1.5, so all items maintained in the DSI scale.

4.2. Content validity

Eight experts (five counselors and two psychologists) assessed the qualitative content validity. They suggested their remarks about the grammar, word usage, and suitable places of phrases. There were a couple of mistakes, according to experts' remarks, all of them applied. Furthermore, the quantitative content validity assessed. Due to that, the Content Validity Ratio (CVR) and the Content Validity Index (CVI) were used (Cook and Beckman, 2006). Therefore, eight experts asked to evaluate the necessity of each of the items based on a three-point Likert scale (1: not required, 2: useful but not required, and 3: required). The subsequent formula used to assess the CVR for an item: $CVR = \frac{ne - N/2}{N/2}$

In the above formula, N illustrates the number of experts, and ne illustrates the number of experts reporting a score of 3 for the item. The results indicate that CVR for all items was greater than the value of the Lawshe table, i.e., 0.75. Then, all items of the scale had good content validity (Lawshe, 2006). CVI was applied to evaluate the easiness, obscurity, and pertinent of the items on a four-point Likert scale (1) not pertinent at all, (2) somewhat pertinent, (3) quite pertinent, and (4) highly pertinent. The results show that the CVI values for all items were greater than 0.70. It indicates that all items had a passable degree of content validity.

4.3. Construct validity

4.3.1. Data preparation

There is no missing data because of using Google Form and determining all necessary items to answer. Standard score (Z) used to assess the outliers and the analysis results in the SPSS software indicated that there were some data more than ±2.58. All data that were not meet these criteria eliminated (Tabachnick et al., 2007). The normality analysis assessed before using the confirmatory factor analysis. The results in the AMOS software (version 24) indicate that the skewness values ranged from -0.75 to 0.14. The kurtosis values ranged from -1.06 to 0.28, showing that the data were dispensed normally (the acceptable range for skewness and kurtosis is respectively ±3, ±7) (Xie et al., 2019).

4.4. Confirmatory and explanatory factor analysis

Confirmatory factor analysis (CFA) with maximum likelihood estimation performed in the AMOS software for assessing the structural validity of the four factors of DSI scale (factor one is containing 12 items, factor two is containing 10 items, factor three is containing 13 items, and factor four containing 9 items). A sample size between 5 to 20 times more than the total items in the questionnaire is acceptable sample size for performing confirmatory factor analysis (Plichta et al., 2013). Therefore, 273 people participated in this study. Firstly, the factor loadings of the items monitored. Factor loadings more than 1, negative, or less than 0.4 of each item must remove (Kline, 2015).

The CFA results illustrated that all factor loadings were less than 1, more than 0.4, and not negative except items 1, 2, 5, 6, 8, 9, 11, 12, 16, 17, 22, 23, 24, 25, 28, 29, 30, 31, 32, 33, 36, 37, 39, 40, 41, and 42 (all items had significant relationships with the latent variables at the level of 0.001). Accordingly, all mentioned items eliminated. Therefore, the factors disintegrated. Because of that, Explanatory Factor Analysis (EFA) was used to determine the factors of DSI. The EFA helps us discover the number of factors and recognize the items with low appropriateness to the already known classifications or items that belong to more than one classification (Boateng et al., 2018). Before studying the factor structure of DSI, skewness and kurtosis were used to evaluating the normality of the sample distribution. According to (Xie et al., 2019), the acceptable range for skewness and kurtosis is respectively ±3 and ±7. Kaiser Meyer-Olkin (KMO) and Bartlett's test of sphericity used to assess the sample and data relevance. The Bartlett's test is meaningful at $p < 0.001$, and the KMO value should be 0.5 or greater (Carpenter, 2018). The principal component analysis with the Direct Oblimin rotation method run, as the factors were correlated. Eigenvalues more than 1.0 used to determine the number of questionnaire factors (Mayers, 2013).

The data met all the essential criteria mentioned above to implementing EFA. The KMO value was 0.86, and Bartlett's test indicated a meaningful rat ($p < 0.001$). The results of EFA showed the four-factor questionnaire, including emotional reactivity, emotional cutoff, I position, and fusion with others that explained 50.45 of the total variances. The total variance values for four factors were respectively 14.12, 13.56, 12.59, and 10.21. The four-factor scale verified by screen plot and eigenvalues >1. Finally, DSI became a 17-item questionnaire with four factors comprised emotional reactivity that has six items (10, 13, 14, 18, 20, and 21), emotional cutoff that has six items (3, 7, 15, 27, 35, 38), I position that has three items (4, 19, and 43), and fusion with others that has two items (26 and 34). The scores of items 3, 10, 13, 14, 18, 20, 21, 26, 34, 35, and 38 must reverse. The total score of the scale determined by computing the items' scores. A higher score illustrates a greater differentiation of self.

The CFA results endorsed that the DSI scale serves as a compelling manifestation of four factors of assessment of differentiation of self (emotional reactivity, emotional cutoff, I position, and fusion with others). The results of correlation analysis indicated that all items had meaningful relationships with the latent variables ($P < 0.001$) (see Figure 1). The highest correlation coefficient was between emotional reactivity and emotional cutoff (r = 0.76), and the lowest correlation coefficient was between I position and fusion with others (r = 0.57). The mean and standard deviation of all the items of the DSI scale indicated in Table 2 (see Table 2).

Then, the following thresholds for fit were applied to measure fit indices: Root Mean Squared Error of Approximation (RMSEA) < 0.08; the Incremental-Fit Index (IFI) > 0.90; CMIN/df < 5; Tucker-Lewis Index (TLI) > 0.90; and Comparative-Fit Index (CFI) > 0.90 (Byrne, 2013). The results of this measurement indicated that the remained items and factors of DSI scale fit the data appropriately (RMSEA = 0.04, IFI = 0.92, CMIN/df = 1.68, TLI = 0.91, and CFI = 0.92).

4.5. Reliability

In the end, Construct Reliability (CR), Convergent Validity (CV), and Cronbach's Alpha Coefficient assessed. To assess the CV of the DSI scale, the AVE method was applied (an AVE >0.5 illustrates an acceptable CV). Results indicated that AVE for DSI did not meet the criteria (AVE = 0.25). On the other hand, it had good CR (CR between 0.7 to 0.8 shows good internal consistency reliability of the scale) (CR = 0.73) (Tabachnick
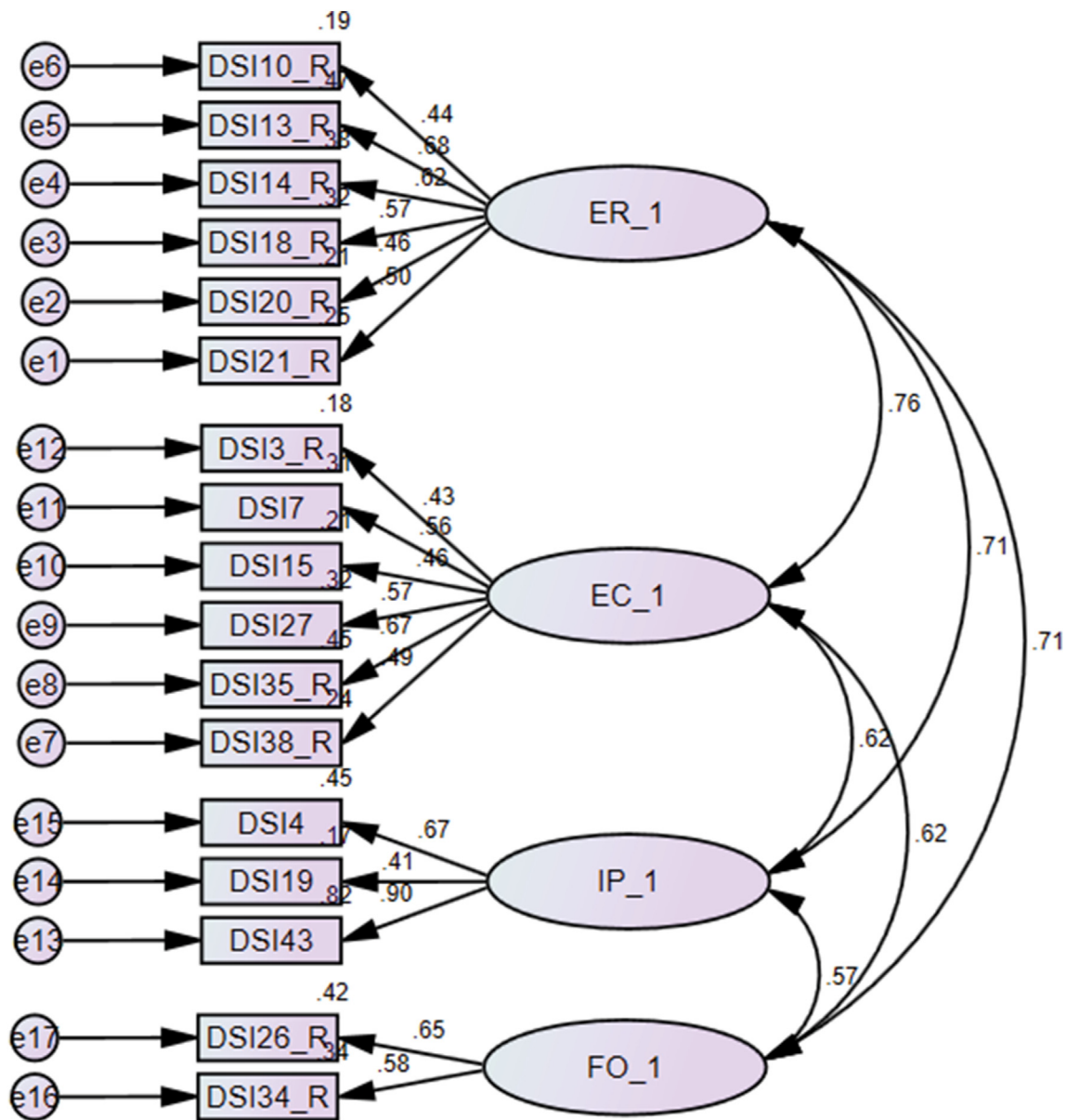
Figure 1. Confirmatory factor analysis with the four factors of the DSI scale ($p < 0.001$). Note: emotional reactivity (DSI10, DSI13, DSI14, DSI18, DSI20, and DSI21), emotional cutoff (DSI3, DSI7, DSI15, DSI27, DSI35, and DSI38), I position (DSI4, DSI19, and DSI43), and fusion with others (DSI26 and DSI34).

et al., 2007). The Cronbach's Alpha Coefficient was used to assess the internal consistency of the reliability of the DSI scale too. It was for factors of DSI (emotional reactivity, emotional cutoff, I position, and fusion with others) respectively 0.71, 0.69, 0.67, and 0.54. It was for the DSI scale totally of 0.84 (Tabachnick et al., 2007).

4.6. Divergent validity

The Trait version of the State-Trait Anxiety Inventory (STAI-T) used to assess divergent validity. Results show that the DSI scale had a negative and significant correlation with STAI-T ($r = -0.434$, $p < 0.01$).

5. Discussion

The present study aims to validate the DSI scale among Iranian adults. Because of that, the questionnaire was translated into the Persian language. Consequently, the translated version of the DSI has no problem. After that, the qualitative and quantitative content validity evaluated. The CFA results showed that the factor loadings of more than half of the items did not meet

the criteria, and 26 items removed. 17 items remained in the scale (3, 4, 7, 10, 13, 14, 15, 18, 19, 20, 21, 26, 27, 34, 35, 38, and 43). This result was consistent with (Işı k and Bulduk, 2015) which 20 items remained. Also, Drake et al. (2015) supported the short form of DSI-R and claimed that the short form had high reliability. Similarities between the Turkish version and the Persian one can be because of the closeness of the culture of the two countries. The concept of differentiation of self in the Middle East is somewhat different from its definition in other countries because of its collectivistic culture. interdependence and intimacy are more valuable than independence in collectivistic cultures (Skowron, 2004), so it can be an explanation for deleting items. Because of the disintegration of the factors, EFA was used to determine the factors of DSI. The results of EFA illustrated the four-factor questionnaire, including emotional reactivity, emotional cutoff, I position, and fusion with others. These results were consistent with the original DSI (Skowron and Friedlander, 1998).

The CR coefficients and Cronbach's alpha showed that the four factors of the DSI scale had acceptable internal consistency. Internal consistency reliability for total DSI was adequate to strong. The results indicate those of (Skowron and Friedlander, 1998), who also found that the four-factor

Table 2. Mean and standard deviation of items of the differentiation of self inventory (DSI).

No	Items	Mean	Std. Deviation
3	I often feel inhibited around my family.	4.79	1.36
4	I tend to remain pretty calm even under stress.	3	1.47
7	No matter what happens in my life, I know that I'll never lose my sense of who I am.	4.24	1.33
10	I wish that I weren't so emotional.	4.16	1.46
13	Whenever there is a problem in my relationship, I'm anxious to get it settled right away.	3.48	1.38
14	At times my feelings get the best of me and I have trouble thinking clearly.	3.15	1.32
15	When I am having an argument with someone, I can separate my thoughts about the issue from my feelings about the person.	3.85	1.31
18	At times, I feel as if I'm riding an emotional roller coaster.	3.65	1.54
19	There's no point in getting upset about things I cannot change.	3.50	1.49
20	I'm concerned about losing my independence in intimate relationships.	3.73	1.47
21	I'm overly sensitive to criticism.	3.91	1.38
26	If I have had an argument with my spouse or partner, I tend to think about it all day.	2.64	1.24
27	I am able to say no to others even when I feel pressured by them.	4	1.46
34	I'm very sensitive to being hurt by others.	2.51	1.19
35	My self-esteem really depends on how others think of me.	4.07	1.42
38	I often wonder about the kind of impression I create.	3.88	1.50
43	I tend to feel pretty stable under stress.	3.80	1.40

DSI had a negative correlation with State-Trait Anxiety Inventory (STAI-T).

6. Limitation and future directions

A limitation of this study is that the reliability of the DSI scale could measure by test-retest besides CR coefficients and Cronbach's alpha. Furthermore, the sample of the study was of lower and middle socio-economic status. As the cultural features might affect the degree of self-differentiation, future studies should involve higher socioeconomic status. Also, like to the limitation of Kim et al. (2015), the present study did not consider any cultural values like collectivism or individualism. Because the study is based on self-report measures, it can become vulnerable to the effect of social desirability bias.

Overall, the DSI scale can utilize as a valid and reliable tool by psychologists and counselors, especially in couple therapy and premarital counseling to determine the couples' self-differentiation. It is recommended that researchers utilize couples as a sample for their future studies. Also, the family therapists who use Bowen (1978) theory can profit from DSI.

Declarations

Author contribution statement

Effat Ghavibazou: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Abbas Abdollahi; Simin Hosseinian: Contributed reagents, materials, analysis tools or data.

Data availability statement

Data are available at the link below: https://figshare.com/s/e21a726846effdfddebd10.6084/m9.figshare.16864552.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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