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## Development of Interpersonal Mindfulness Scale-TR (IMS-TR): A Validity and Reliability Study

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**Abstract:** The purpose of this study is to develop an Interpersonal Mindfulness Scale-TR (IMS-TR) for Turkish culture. For the data collection process, four different sample groups participated in the study. To test the construct validity of the scale an exploratory factor analysis was performed. Results suggested a 13-item, two-factor solution as (1) awareness and (2) being in the moment. Two-factor structure explains 50.65% of the variance. A confirmatory factor analysis results showed good fit for two-factor solution. The Mindfulness in Parenting Questionnaire and the Mindfulness in Marriage Scale were used to examine a convergent validity and positive significant relationships were found between the scales. To test the reliability of the scale Cronbach's Alpha reliability coefficient of the overall scale was determined to be .826. To determine the stability coefficient of the IMS-TR, test-retest method was used and according to result there is a positive relationship between the scales. According to all of these results, it can be said that the IMS-TR has a validity and reliability.

**Keywords:** *Mindfulness, interpersonal mindfulness, validity analysis, reliability analysis, mindfulness scale.*

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### Introduction

Mindfulness has been on the agenda for almost a decade and it has attracted the attention of many researchers examining its components and its effects on individuals. There have been many recent studies focusing on the effects of mindfulness on individuals (Duncan, 2007; Pratscher, Rose, Markovitz, & Bettencourt, 2018; Pratcher, Wood, King, & Bettencourt, 2019). Mindfulness refers to the awareness which emerge through focusing one's attention (Baer, 2003; Brown & Ryan, 2003; Kabat-Zinn, 2003). It can be also defined as awareness due to deliberate attention and focus on the present, moment by moment, and being non-judgmental about current experiences (Kabat-Zinn, 2003). Mindfulness involves individuals' opinions, feelings and objective observations and focuses on inner experiences (Baer, 2003; Kohlenberg et al., 2015; Pratscher et al., 2018). The benefits of the mindfulness have been proven with numerous research. For instance, research has found that mindfulness is related with self-regulation (Brown & Ryan, 2003; Bishop et al., 2004; Rupperecht, Paulus, & Walach, 2017); emotion regulation (Bao, Xue, & Kong, 2015; Cenkseven Onder & Utkan, 2018; Uygur, 2017); empathy (Pepping & Halford, 2016; Pratscher et al., 2019); stress (Bao et al., 2015; Cenkseven Onder & Utkan, 2018; Chu, 2010; Kabat-Zinn, 2005; Neece, 2014), and anxiety (Goodman et al., 2014; Guardino, Dunkel Schetter, Bower, Lu, & Smalley, 2014; Vieten & Astin, 2008). It can be seen that most of the studies in the literature, which focus on the subject, examine mindfulness as experienced through individuals' inner experiences (Frank, Jennings, & Greenberg, 2016). However, research dealing with the effects of mindfulness on interpersonal relationships is quite limited in number (Gillespie, Davey, & Flemke, 2015; Jones, Welton, Oliver, & Thoburn, 2011; Karremans, Schellekens, & Kappen, 2017).

Mindfulness and interpersonal mindfulness are interrelated concepts, but at the same time, they reflect different characteristics (de Bruin et al., 2014; Duncan, 2007; Frank et al., 2016; McCaffrey, Reitman, & Black, 2017; Pratscher et al., 2018; Pratscher et al., 2019). Studies have found positive relationships between data collection tools measuring interpersonal mindfulness and those measuring traditional explanations of mindfulness (Duncan, 2007; Erus, 2019; McCaffrey et al., 2017; Parent, McKee, Rough, & Forehand, 2016; Pratscher et al., 2018; Pratscher et al., 2019). Similarly,

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there are studies that have found relationships between different variables, mindfulness and interpersonal mindfulness. Therefore, it could be claimed that these two concepts involve different constructs (Duncan, 2007; Erus, 2019; Pratscher et al., 2019). Researchers studying interpersonal mindfulness define traditional explanations of mindfulness as intrapersonal mindfulness (Duncan, Coatsworth, & Greenberg, 2009; Kohlenberg et al., 2015). What differentiates intrapersonal mindfulness from interpersonal mindfulness are interpersonal interaction processes. Pratscher et al. (2019) suggest that interpersonal mindfulness is a significant variable providing an explanation for relationships instead of mindfulness. Therefore, it might be concluded that interpersonal mindfulness affects interpersonal relationships to a certain extent.

Examining the effects of mindfulness on interpersonal relationships has been topical in the current literature. There have been recent studies focusing on interpersonal mindfulness (de Bruin et al., 2014; Duncan et al., 2009; Erus, 2019; Lippold, Duncan, Coatsworth, Nix, & Greenberg, 2015; McCaffrey et al., 2017; Parent et al., 2016; Pratscher et al., 2018; Pratscher et al., 2019). Interpersonal mindfulness raises individuals' awareness by being non-judgmental about the present moment while interacting with other people (Stahl & Goldstein, 2010). Mindfulness also evaluates an individual's behaviour towards others and his/her awareness (Frank et al., 2016). This evaluation results in interpersonal mindfulness, which involves listening to others attentively, emotional awareness of self and others, self-regulation, non-judgmental acceptance of self and others and compassion for self and others (de Bruin et al., 2014; Duncan, 2007; Duncan et al., 2009). Pratscher et al. (2019) similarly define interpersonal mindfulness as maintaining moment-to-moment awareness while interacting with others. Individuals become aware of their opinions, feelings, bodily senses and inner experiences. At the same time, they pay attention to what others say, their behaviours, moods, tone of voice and body language.

The presence of mindfulness while interacting with others results in more effective communication (Atkinson, 2013; Burgoon, Berger, & Waldron, 2000; Cohen & Miller, 2009; Pratscher et al., 2018; Stahl & Goldstein, 2010). Interpersonal mindfulness is closely related to positive and functional relationships (Duncan, 2007; Lippold et al., 2015; McCaffrey et al., 2017; Pratscher et al., 2018; Pratscher et al., 2019). Research has also found that interpersonal mindfulness increases relationship quality (Bogels, Lehtonen, & Restifo, 2010; Coatsworth, Duncan, Greenberg, & Nix, 2010; Duncan, 2007; Kohlenberg et al., 2015; Pratscher et al., 2018). Interpersonal mindfulness was developed for the first time by Duncan (2007) to explain parent-child relationship. Studies have also concluded that it is an effective variable in the development of the parent-child relationship (Bogels et al., 2010; Coatsworth et al., 2010; de Bruin et al., 2014; Gouveia, Carona, Canavarro, & Moreira, 2016; Lippold et al., 2015; McCaffrey, 2015; McCaffrey et al., 2017; Parent et al., 2016). In addition, the teacher-student relationship (Frank et al., 2016), friendship relationships (Pratscher et al., 2018), and marital relationships (Erus & Deniz, 2018) have been examined in a number of studies. The studies on interpersonal mindfulness are increasing in number, and contribute considerably to the functionality of relationships. Therefore, this study aims to develop an Interpersonal Mindfulness Scale-TR (IMS-TR) for Turkish culture to measure general interpersonal mindfulness of individuals during the interaction.

## Methodology

### Sample

The sample of the study was determined by the convenience sampling. The sample groups were defined for the research as follows:

- i. The first sample for the construction exploratory factor analysis, item-total correlation, differences between upper and lower 27%, and internal consistency consisted of 375 individuals, with demographic information concerning the sample being presented in Table 1.

Table 1. Demographic Information of Sample 1

Gender		Female	Male				Total
		f	311	64			
	%	82.9	17.1				100
Age		18-20	21-25	26-30	31-35	36 and above	Total
		f	180	61	46	41	47
	%	48	16.3	12.3	10.9	12.5	100
Education Level		High School	Undergraduate Degree	Graduate Degree		Total	
		f	38	273	64		375
	%	10.1	72.8	17.1		100	

As can be seen in Table 1, the sample consisted of 311 female (82.9%) and 64 male (17.1%) participants. In addition, 180 participants (48%) were aged between 18-20, 61 participants (16.3%) were aged between 21-25, 46 participants (12.3%) were aged between 26-30, 41 participants (10.9%) were aged between 31-35 and 47 participants (12.5%)

were aged 36 and over. In addition, 38 participants (10.1%) graduated from high school, 273 participants (72.8%) graduated from undergraduate level and 64 participants (17.1%) graduated from Master or PhD programs.

- ii. The second sample for the confirmatory factor analyses were consisted of 194 participants with the demographic information of the sample shown in Table 2.

Table 2. Demographic Information of Sample 2

	Female		Male	Total	
	<b>Gender</b>	f	108	86	194
	%	55.7	44.3	100	
	18-20		21-48	Total	
	<b>Age</b>	f	60	134	194
	%	30.9	69.1	100	
	High School Degree		Undergraduate Degree	Graduate Degree	Total
	<b>Class</b>	f	51	130	13
	%	26.3	67	6.7	100

As can be seen in Table 2, the sample consisted of 108 female (55.7%) and 86 male (44.3%) participants. In the sample group, 60 participants (30.9%) were aged between 18-20 and 134 participants (69.1%) were aged between 21-48. Furthermore, 51 participants (26.3%) graduated from high school, 130 participants (67%) achieved undergraduate degree and 13 participants (6.7%) had graduate degree qualifications.

- iii. One existing scale to measure interpersonal mindfulness in Turkey measures the interpersonal mindfulness with spouses in marriage (Erus & Deniz, 2018) and another scale measures interpersonal mindfulness in parenting (Aslan Gordesli, Aslan, Cekici, Aydin Sunbul, & Malkoc, 2018). In order to evaluate the convergent validity of the IMS-TR in this study, these two scales were used. Since the criteria of these scales require being married and having children, these criteria were sought in the sample group. Demographic information concerning the sample is presented in Table 3.

Table 3. Demographic Information of Sample 3

	Female		Male	Total	
	<b>Gender</b>	f	23	9	32
	%	71.9	28.1	100	
	29-35		36-48	Total	
	<b>Age</b>	f	14	18	32
	%	43.7	56.3	100	
	High School		Undergraduate Degree	Graduate Degree	Total
	<b>Education Level</b>	f	5	11	16
	%	15.6	34.4	50	100

According to Table 3, the sample consisted of 23 female (71.9%) and 9 male (28.1%) participants. In the sample group, 14 participants (43.7%) were aged between 29-35 and 18 participants (56.3%) were aged between 36-48. Furthermore, 5 participants (15.6%) graduated from high school, 11 participants (34.4%) graduated from undergraduate level and 16 participants (50%) graduated from Master or PhD programs. The participants had been married for a minimum 1 year and a maximum 23 years. The mean of their years of marriage was 11.3 years and the average number of children was 1.7.

- iv. The fourth sample for the measure the test-retest reliability of the scale consisted of 52 students who are seniors in the Faculty of Education. Demographic information of the sample is presented in Table 4.

Table 4. Demographic Information of Sample 4

	Female		Male	Total
	<b>Gender</b>	f	45	7
	%	86.5	13.5	100
	20-21		22-29	Total
	<b>Age</b>	f	41	11
	%	78.8	21.2	100

According to the Table 4, the sample was consisted of 45 female (86.5%) and 7 male (13.5%) participants. In sample 4, 41 participants (78.8%) were aged between 20-21 and 11 participants (21.2%) were aged between 22-29.

#### *Data Collection Tools*

Three scales were used for the study. The Interpersonal Mindfulness Scale-TR developed by the researchers was used for construction validity and reliability purposes. The Mindfulness in Parenting Questionnaire was developed by McCaffrey et al. (2017) and adapted to Turkish by Aslan Gordesli et al. (2018). The Mindfulness in Marriage Scale, developed by Erus and Deniz (2018), was used for convergent validity. Details regarding the scales are presented below.

##### *i. Mindfulness in Parenting Questionnaire*

This scale was developed by McCaffrey et al. (2017) and was adapted to Turkish by Aslan Gordesli et al. (2018) on a sample group which consisted of 380 parents with children aged between 3 and 18 years. The aim of the scale is to measure the level of mindful parenting for parents of children and adolescents. Higher scores obtained from the scale mean higher levels of mindfulness in parenting and lower scores mean lower levels of mindfulness in parenting. The original form of the scale has 28 items and two factors; *parental self-efficacy* and *being in the moment with the child*. The Turkish version of the scale consists of 24 questions and two factors as in the original version. In the adaptation process, firstly, confirmatory factor analysis (CFA) was applied to test the construct validity. The results showed that the goodness of fit indices of the scale are acceptable for the original structure. The Cronbach's Alpha internal consistency coefficient was found to range between .73 and .87 for each of the factors and the whole scale. The sample items of the scale are:

- Did you actively bring your attention back to your child when you noticed you had become distracted?
- Did you notice the way your emotions affected your child?

##### *ii. Mindfulness in Marriage Scale*

The Mindfulness in Marriage Scale (MMS), developed by Erus and Deniz (2018), consists of 12 items and a single factor. The aim of the scale is to define the mindfulness level of individuals to their spouses during interaction. Higher scores obtained from the scale mean higher levels of interpersonal mindfulness in relationships with spouses and lower scores mean lower levels of interpersonal mindfulness. In the MMS developing process, explanatory factor analysis found a single factor structure which explained 42.70% of variance. Confirmatory factor analysis (CFA) was applied to test the construct validity for a single factor. The results showed that the goodness of fit indices of the scale are acceptable for a single factor structure. Two different samples were used for the reliability tests. The Cronbach's Alpha coefficient was found to be .87 for the first sample and .85 for the second sample. Sample items are below:

- I listen to my spouse carefully.
- When I communicate with my spouse, I notice a change in her body language.

#### *Data Collection Process*

The data collection process was completed in four steps. In the first step, 375 individuals participated in the study for an exploratory factor analysis. For the second step, the researchers accessed 194 participants for a confirmatory factor analysis to confirm the construction which was discovered by an exploratory factor analysis. In the third step, 32 participants, who are married and have a child or children aged between 3-16 years, participated in the study for convergent validity. For the last step, the scale was applied to 52 individuals for test-retest analysis, which is one of the reliability analysis conducted twice with a two-week interval. In the test-retest analysis, researchers wanted participants to use nicknames. Google Forms were used for four-step-data collection process. Different links, which were generated via Google Forms, were used for each step and the links only shared with relevant participants. The link contains the purpose of the research; how data privacy will be ensured and will only be used for the purpose of the research, how the data should be filled in, brief information about the researchers and instructions for the measurement tools. The consent of the individuals to participate in the study voluntarily was obtained. Not included in the study were 21 missing and incorrectly filled data forms. The data collection process covered June to September 2019. It took approximately 10-20 minutes for participants to complete the data collection tools.

#### *Process*

In this research, the aim is to develop a scale which can measure the interpersonal mindfulness level of individuals. The Interpersonal Mindfulness Scale-TR was developed on the following guidelines: (a) define the construct, (b) generate an item pool, (c) determine the format for measurement, (d) expert review of the initial item pool, (e) consider inclusion of validation items, (f) administer items to a development sample, (g) item evaluation, and (h) optimize scale length (DeVellis, 2017).

### *i. Define the construct*

When the literature is examined, scales that measure the level of mindfulness generally measure internal mindfulness, but the interpersonal interaction dimension of mindfulness is not directly evaluated in these scales. While defining the construct of the scale, researchers particularly distinguished interpersonal mindfulness from internal mindfulness and an item pool was generated according to the concept of interpersonal mindfulness. However according to the literature review, the interpersonal mindfulness scales are rather limited in size and these scales only concentrate on specific areas. For instance, the Mindfulness in Teaching Scale (Frank et al., 2016) has two factors measuring teacher intrapersonal mindfulness and teacher interpersonal mindfulness. This scale was adapted to Turkish by Aslan Gordesli, Aslan, Cekici, Aydin Sunbul, & Malkoc (2019). One more scale is the Mindfulness in Marriage Scale (Erus & Deniz 2018) which has only one factor. Another is the Interpersonal Mindfulness in Parenting Questionnaire which was developed by McCaffrey et al., (2017) and adapted to Turkish by Aslan Gordesli et al., (2018). The scale has two factors; parental self-efficacy and being in the moment with the child. The other scale is the Interpersonal Mindfulness Scale (Pratscher et al., 2019) with four factors; presence, awareness of self and others, non-judgmental acceptance and non-reactivity. This scale only focuses on general interpersonal mindfulness, but it has not yet been adapted to Turkish culture. In conclusion, as a construction of the scale, interpersonal mindfulness is defined in this context, and can be explained as the emergence of the mindfulness level of the individual in a relationship and communicating with other people (Erus, 2019).

### *ii. Generate item pool*

After careful consideration of the following studies from literature regarding mindfulness (Baer, Smith, & Allen, 2004; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Brown & Ryan, 2003; Buchheld, Grossman, & Walach, 2001, Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008, Catak, 2012; Chadwick et al., 2008; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007; Hisli Sahin & Yeniceri, 2015; Kinay, 2013; Lau et al., 2006; Ozyesil, Arslan, Kesici, & Deniz, 2011; Walach, Buchheld, Buittenmuller, Kleinknecht, & Schmidt, 2006) particularly on mindfulness in interaction as general interpersonal mindfulness (Pratscher et al., 2018; Pratscher et al., 2019) interpersonal mindfulness in parenting (Duncan, 2007; de Bruin et al., 2014; McCaffrey, 2015), interpersonal mindfulness in marriage (Erus & Deniz, 2018), and interpersonal mindfulness in teaching (Frank et al., 2016) a pool of 32 theoretically based items were generated. The 32 items are supposed to measure the general interpersonal mindfulness. According to DeVellis (2017) it is usual to begin with a pool of items which is three or four times as large as the final scale. Since it is planned to develop a short scale of around 10 items, it can be said that 32 items for the pool is appropriate.

### *iii. Determine the format for measurement*

The IMS-TR consisted of items designed to measure frequency of behaviour to demonstrate awareness of self and others and communicating in the moment, which indicate interpersonal mindfulness. Each item captured individuals' opinions, beliefs and behaviour about their mindfulness during the communication process. The IMS-TR represented a Likert type scale that contained a number of response items, ranging from 1 (almost never) to 5 (almost always).

### *iv. Expert review of the initial item pool*

In this step for content validity, theoretically-based items in the pool were evaluated by three experts who have conducted academic research on mindfulness. The experts evaluated whether the items were convenient for the theoretical structure and their comprehensibility. According to their feedback, one item was excluded from the item pool.

### *v. Item evaluation*

SPSS 22 and AMOS 20 were used to analyse the data. Before the analysis process, the suitability of the data set was examined in order to perform exploratory and confirmatory factor analyses. The missing values were removed from the data set and extreme values were discarded from the data set by the Mahalanobis distance. Extreme values arise through the association of more than two variables outside the normal range. The Mahalanobis distance is a statistic that measures a single data distance from the centre in the space of the independent variable or sample mean (Cokluk, Sekercioglu, & Buyukozturk, 2016). The way to determine these values is through statistical calculation called the Mahalanobis distance (Kline, 2011; Tabachnick & Fidell, 2013). In an analysis of the Mahalanobis distance, data with a chi-square value below  $p < .001$  was discarded from the data set (Tabachnick & Fidell, 2013). As a result of the analysis, 29 data from the first sample and 13 data from the second sample were removed from the data set. As a result, 346 data for an exploratory factor analysis and 181 data for confirmatory factor analysis were included in the analyses.

Tabachnick and Fidell (2013) state that it is appropriate to have 300 samples for factor analysis. In addition, Kaiser-Meyer-Olkin (KMO) sample adequacy criterion was used to test the suitability of the number of data for factor analysis. KMO compares the magnitude of the observed correlation coefficients with the magnitude of the partial correlation coefficients. A KMO value which is over .5 shows that the data set is suitable for factor analysis (Leech, Barret, & Morgan, 2005; Sencan, 2005). As a result of the analysis, the KMO coefficient was found to be .86. The ratio of 346 data for exploratory factor analysis to the number of items in the item pool (31) was 11.16. Buyukozturk (2011) suggests

that the value per item should be higher than five. In addition, Bartlett's sphericity test was performed, and the result was  $p < .001$ . With this result, it is concluded that the data is from the multivariate normal distribution and is different from the unit matrix in the correlation or covariance matrix. This means that factors can be extracted from the correlation matrix (Cokluk et al., 2016; Sencan, 2005). As a result, the data set was found to be suitable for factor analysis. Exploratory factor analysis was selected in order to examine the factor structure, principal component analysis was selected as the factorization technique and the varimax vertical rotation method was selected as the factor rotation method. A scree plot was used to determine the number of factors. In addition, when determining factors, initial eigenvalues which greater than one were accepted as the criterion. Also item-total correlation coefficients were calculated using the Pearson product-moment correlation coefficient. Independent group t-test was used to compare the item mean scores of the lower and upper 27% of the overall scale scores.

The ratio of the 181 data collected for confirmatory factor analysis to the number of items in the scale (13) is 13.9. This ratio seems to be sufficient for confirmatory factor analysis. The KMO coefficient was .81. As a result of Bartlett's sphericity test, the result was  $p < .001$ . These results show that the data set was ready for analysis. The maximum likelihood method was used as the parameter estimation method in the confirmatory factor analysis.

The reliability analysis of the scale was examined with a Cronbach's Alpha internal consistency coefficient. In addition, in order to assess the convergent validity of the IMS-TR, 32 participants who were married and had a child or children were asked to complete the Mindfulness in Marriage Scale (Erus & Deniz, 2019) and the Mindfulness in Parenting Questionnaire (Aslan Gordesli et al., 2018). The correlation coefficient between the scales was calculated using the Pearson product-moment correlation coefficient. To test the stability of the IMS-TR as a part of reliability, the test-retest method was used. The relationship between the 13-item IMS-TR scale scores, which applied to 52 participants with two-week intervals, was examined using the Pearson product-moment correlation coefficient.

#### vi. Optimize scale length

As a result of the exploratory factor analysis and confirmatory factor analysis the IMS-TR has two factors with 13 items. According to DeVellis (2017) the length of the scale closely related with the reliability values. Since the reliability values of the IMS-TR was sufficient, it was thought unnecessary to eliminate any other items and it was decided to use the scale with 13 items.

## Findings

### Findings for Validity Analysis

The exploratory factor analysis, item-total correlation, differences between upper and lower 27%, the confirmatory factor analysis, Pearson product moment analysis, Cronbach's Alpha internal consistency, test-retest were performed for testing the validity and reliability of the IMS-TR.

#### i. Exploratory factor analysis

As a first step, to discover the structure of the scale, the exploratory factor analysis was conducted with the first sample group. The suitability of the exploratory factor analysis to factor analysis was tested with the Kaiser-Meyer-Olkin (KMO) sample adequacy criterion. In order to be suitable for the factor analysis, the KMO ratio should be over .50 (Leech et al., 2005; Sencan, 2005). The KMO coefficient was found to be .85. As a result of the exploratory factor analysis, factor loadings obtained are presented in Table 5.

Table 5. Results of Exploratory Factor Analysis

Items Numbers	Factor Loadings	
	Awareness	Being in the moment
Item 1	.787	
Item 2	.760	
Item 3	.692	
Item 4	.668	
Item 5	.654	
Item 6	.648	
Item 7	.630	
Item 8	.622	
Item 9	.618	
Item 10		.836
Item 11		.785
Item 12		.692
Item 13		.602

Table 5 shows that the IMS-TR has two factors. When deciding that the IMS-TR has a two-factor structure, the scree plot was examined and two structures with eigenvalues above one were observed. These two factors explain 50.65% of the total variance. The first factor explained 32.86% of the variance and the second factor explained 17.80%. When the items of the IMS-TR were examined, the first factor was determined as awareness and the second factor was determined as being in the moment. As it can be seen in Table 5, the IMS-TR has factor loads ranging from .602 to .836 and consists of two factors. Buyukozturk (2011) stated that it was a good criterion to keep the item which has factor loadings .45 and above on the scale. Accordingly, factor loadings of the IMS-TR fulfil the criterion since the factor load of all items is above .45.

ii. *Item discrimination*

The item-total correlations were calculated using the data collected from 375 participants to determine the sufficiency of the scale's items. Results are presented in Table 6.

Table 6. *Item-Total Correlation Values*

Item Numbers	r
Item 1	.678**
Item 2	.615**
Item 3	.652**
Item 4	.623**
Item 5	.550**
Item 6	.685**
Item 7	.598**
Item 8	.550**
Item 9	.523**
Item 10	.498**
Item 11	.516**
Item 12	.348**
Item 13	.591**

\*\*p<.01

As can be seen in Table 6, correlation coefficients obtained from item-total correlations varied between .348 and .685 and all items were found to be statistically significant ( $p<.01$ ). If item-total correlation coefficients were .30 or higher in the positive direction, it indicates that the items on the scale discriminate individuals well, exemplify similar behaviours and the internal consistency of the scale was high (Buyukozturk, 2011).

In order to determine the discriminative power of the 13-item scale, the raw scores obtained from the scale were ranked from top to bottom. The scores of the upper 27% and lower 27% of the groups were calculated by the independent groups t-test and the discriminative power of the items was obtained. The independent groups t-test results regarding the discriminative power of the scale are presented in Table 7.

Table 7. *Independent Group t-test Values of Bottom and Top 27 %*

Item Numbers	t
Item 1	-13.505**
Item 2	-10.985**
Item 3	-13.767**
Item 4	-12,920**
Item 5	-10.819**
Item 6	-13.575**
Item 7	-11.488**
Item 8	-9.815**
Item 9	-10.224**
Item 10	-9.324**
Item 11	-8.861**
Item 12	-6.487**
Item 13	-11.354**

\*\*p<.01

Table 7 shows that there was a significant difference between bottom and top 27% scores ( $p<.01$ ). This means that each item was found to be discriminatory at the desired level.

iii. *Confirmatory factor analysis*

The AMOS 20 program was used to perform the confirmatory factor analysis to test the structure of 13-item scale by using 181 data gathered from the second sample group. The confirmatory factor analysis (CFA) is a statistical technique that is used to verify the factor structure of a set of observed variables. To perform the confirmatory factor analysis, the fit statistics were examined using the maximum likelihood method. The CFA results of the 13-item and two-factor scale were evaluated according to criteria which are suggested by Schermelleh-Engel, Moosbrugger, and Muller (2003) and it indicates that the model fits well. The fit parameter values are presented in Table 8.

Table 8. *Fit Parameter of CFA*

Fit Parameters	Good Fit	Acceptable Fit	Values of the model
$\lambda^2$	$.05 < p \leq 1.00$	$01 < p \leq .05$	.008
$\lambda^2 / df$	$0 \leq \lambda^2 / df \leq 2$	$2 < \lambda^2 / df \leq 3$	1.486
RMSEA	$0 \leq RMSEA \leq .05$	$.05 < RMSEA \leq .08$	.052
CFI	$.97 \leq CFI \leq 1.00$	$.95 \leq CFI < .97$	.951
NFI	$.95 \leq NFI \leq 1.00$	$.90 \leq NFI < .95$	.867
AGFI	$.90 \leq AGFI \leq 1.00$	$.85 \leq AGFI < .90$	.899
GFI	$.95 \leq GFI \leq 1.00$	$.90 \leq GFI < .95$	.932

RMSEA= Root Mean Square Error of Approximation. CFI = Comparative Fit Index. NFI = Normed Fit Index. AGFI = Adjusted Goodness-of-Fit-Index. GFI = Goodness-of-Fit Index

Table 8 shows that the chi-square value for the structure of the scale is  $\lambda^2=90.648$ . ( $df=61$ ;  $p<.01$ ). A calculation result of the chi-square ratio divided by the degree of freedom ( $\lambda^2/df$ ) was obtained as 1.486. The fact that this value is two or less is seen as a proof that the model fits well (Kline, 2011). Since the obtained value is 1.486, it can be said that the model fits well. Although RMSEA (.052), CFI (.951), AGFI (.899) and GFI (.932) were acceptable fit the model according to Schermelleh-Engel et al. (2003), it was seen that NFI (.867) doesn't fit the model. Bentler (1990) indicates that especially in small samples NFI may not reach the upper limit even if the other parameters fit the model. In addition Mulaik et al. (1989) emphasize that NFI which does not fit the model in small samples less than 200 in size is a deficiency. In the light of these references, it can be said that the fit parameters of CFA fit the model.

iv. *Convergent validity*

The Pearson product moments analysis was conducted to test for the convergent validity. Correlation between the IMS-TR, the Mindfulness in Marriage Scale (Erus & Deniz, 2018) and the Mindfulness in Parenting Questionnaire (Aslan Gordesli et al., 2018) which measure interpersonal mindfulness was performed to test the convergent validity of the IMS-TR and the results are presented in Table 9.

Table 9. *Correlations between factors of IMS-TR, MMS and MPQ*

Factors	1	2	3	4	5	6	7
1- Awareness	1						
2- Being in the moment	.401*	1					
3- IMS-TR (Total)	.894**	.768**	1				
4- MMS	.525**	.362*	.543**	1			
5- Being in the moment with the child	.566**	.506**	.642**	.488**	1		
6- Parental self-efficacy	.639**	.491**	.686**	.523**	.716**	1	
7- MPQ (Total)	.649**	.538**	.716**	.546**	.929**	.924**	1

\* $p<.05$ , \*\* $p<.01$

As can be seen Table in 9, correlations between overall and factor scores of the IMS-TR and the Mindfulness in Marriage Scale (MMS) scores ranged between .362 and .543 ( $p<.05$ ). In addition, correlations between overall and factor scores of the IMS-TR and the Mindfulness in Parenting Scale (MPQ total and factors) scores ranged between .491 and .716 ( $p<.01$ ). According to Sencan (2005) the correlation coefficients between the scales should be  $r=.30$  or higher. Since the IMS-TR has a significant relationship with the Mindfulness in Marriage Scale ( $r=.543$ ) and the Mindfulness in Parenting Questionnaire ( $r=.716$ ), it can be said that the convergent validity of the IMS-TR is sufficient.

v. *Internal consistency*

The reliability of the scale was examined by the internal consistency method. Table 10 shows the Cronbach's Alpha coefficients of the factors and overall scale.



Table 10. Cronbach's Alpha Coefficients of the Factors and Overall Scale

Factors	Item	Cronbach's Alpha
Awareness	9	.852
Being in the moment	4	.712
IMS-TR	13	.826

Table 10 shows that the internal consistency coefficient of the scale was found to be between .712 and .852 in the factors, and .826 for the overall scale. According to Kline (2011), the reliability coefficient which is around .90 is considered excellent, .80 is considered very good, and around .70 is considered sufficient. Therefore, it can be said that internal consistency of the IMS-TR can be evaluated as very good.

#### vi. Stability coefficient

The test-retest method was used to determine the stability coefficient of the scale. Pearson product moments correlation analysis was performed, and the results are presented in Table 11.

Table 11. Results of Pearson Product Moments Correlation for Stability Coefficient

Factors	r
Awareness	.833**
Being in the moment	.760**
IMS-TR	.890**

\*\* p<.001

Table 11 shows that test-retest correlation coefficients scores are .833 and .760 for factors and .890 for overall score. It can be said that participants' opinions do not change in short period of time (Fraenkel & Wallen, 2005).

## Discussion

The Interpersonal Mindfulness Scale-TR (IMS-TR) was developed within the scope of this study in order to determine an individual's mindfulness level during interaction. The validity and reliability studies of the IMS-TR show that the scale has strong psychometric characteristics. The finalized form of the scale was a 13-item with two-factor structure. A 5-point Likert scale is used for each item (1= Almost Never, 2=Rarely, 3=Sometimes, 4=Usually, and 5=Almost Always). There are 3 reverse-scored items in the scale. The highest score obtainable from the scale is 65 and the lowest 13. A high score implies high levels of interpersonal mindfulness. In other words, this participant experiences high level of mindfulness during his/her interaction with people. The scale has two factors for interaction: Awareness (9 items) and being in the moment (4 items). The awareness factor measures to what extent an individual is aware of their own and others' expressions, feelings and behaviours. The sample items of this factor are, "I am aware how I feel while talking with someone", and "I understand the intentions behind what someone tries to say". The highest score obtainable from the awareness factor is 35 and the lowest is 9. A high score may be interpreted as the participants' higher levels of awareness for their own and others' expressions, feelings, and behaviours. The being in the moment factor measures to what extent an individual is in the moment while interacting with others. The sample items of this factor are, "When I don't really listen to someone, I look like I am listening", and "While someone is talking to me, I find myself thinking of other things instead of giving my full attention". The highest score obtainable from this factor is 20 and the lowest is 5. A high score implies that an individual's attention is in the moment of interaction.

According to the exploratory factor analysis, which is one of the validity analyses, the IMS-TR explains approximately 51% of total variance. While the awareness factor explains 32.86% of the variance, the being in the moment factor explains 17.8%. The factor loads of the IMS-TR range between .60 and .84. In addition, item-total correlations of the scale were calculated as .35 and over. Similarly, the comparison of the top-bottom 27% of the groups reveals significant differences among the groups which show the discriminative power of the IMS-TR. The confirmatory factor analysis was performed to examine whether the model which was generated by the exploratory factor analysis fits and results show that the model parameters are sufficient ( $\lambda^2/df=1.486$ , RMSEA=.052, CFI =.951, AGFI=.899, GFI=.932). In order to test the convergent validity of the IMS-TR, the researchers used the MPQ and the MMS. The former measures the level of mindfulness in parenting, and the latter measures this concept in marriage. Positive medium level correlations were found between these scales and the IMS-TR and its factors, which implies that the scale has convergent validity. Cronbach's Alpha internal reliability coefficients for the reliability of the scale were calculated as .83 for the overall IMS-TR score, .85 for the awareness factor and .71 for the being in the moment factor. The test-retest correlation coefficients were found to be higher than .75 for both overall score and factors. When all of the validity and reliability analyses results are considered, it can be concluded that the IMS-TR has sufficient psychometric characteristics.

Interpersonal mindfulness is conceptualized as mindfulness during interpersonal interactions (Pratscher et al., 2019). It refers to maintaining awareness during an interaction and being aware of inner experiences (bodily senses, opinions, reactions, and feelings), verbal and nonverbal communication, and others' moods.

Recent literature focuses on the effects of mindfulness on interpersonal relationships and this topic is becoming increasingly popular (Pepping & Halford, 2016; Pratscher et al., 2018; Wiggins, 2012). Interpersonal mindfulness has recently become an important topic of studies (Frank et al., 2016; Gouveia et al., 2016; Kohlenberg et al., 2015; Parent et al., 2016; Pratscher et al., 2018). Research has found interpersonal mindfulness positively contributes to the interaction process (de Bruin et al., 2014; Duncan, 2007; Duncan et al., 2009; Pratscher et al., 2019) and increases relationship quality (Bogels et al., 2010; Coatsworth et al., 2010; Duncan, 2007; Erus, 2019; Kohlenberg et al., 2015; Pratscher et al., 2018). To illustrate, Duncan (2007) reported that mindfulness in parenting contributes to the quality of parent-child relationships and child management. Similarly, McCafferey et al. (2017) found a positive correlation between interpersonal mindfulness and an authoritative parenting style and a negative correlation with permissive and authoritarian parenting styles as well as over reactivity and laxness, which are both considered as non-functional parental behaviour. Also, Erus (2019) found that interpersonal mindfulness in marriage contributed to emotional intelligence, marital adjustment and subjective well-being. Pratscher et al. (2018) found that general interpersonal mindfulness contributed to quality of friendship. In addition, Pratscher et al. (2019) conducted a comprehensive study in which they developed the Interpersonal Mindfulness Scale. According to the results of this study, there is a positive correlation between the following; interpersonal mindfulness and friendship quality, perspective taking empathy, psychological need satisfaction, emotionality, openness to experiences, conscientiousness, extraversion, agreeable personality traits, social desirability, self-compassion, emotion regulation, authenticity, emotional intelligence, active empathic listening, social communication competence, and social connectedness. The study also shows a negative correlation with depression, anxiety, stress, alexithymia, neuroticism personality, attention deficit and hyperactivity symptoms, social anxiety, anxiousness and avoiding attachment. The development of the IMS-TR for Turkish literature, which measures interpersonal mindfulness that positively affects relationships and individuals, is believed to be significant and valuable, as well as being a useful contribution to future research.

### Limitations and Suggestions

Although this study is thought to be helpful while conducting research on interpersonal mindfulness, it has a number of limitations similar to other studies. The limitation of this research is that although the IMS-TR includes factors of awareness and being in the moment, it does not include non-reactivity and non-judgmental acceptance factors, which exist in some other mindfulness in interaction scales. Another limitation is that the NFI is below the limit of acceptable value which may occur in small sample sizes. However, when all of the validity and reliability analyses are considered, it can be said that the IMS-TR is beneficial to the literature. Therefore, for future studies, it is important to test the theoretical framework of IMS-TR with a larger sample group via conducting structural equation models. Furthermore, future studies could use the IMS-TR to examine the interaction process and its impact on interpersonal relationship quality.

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