

A Study on the Turkish Adaptation, Validity, and Reliability of Two Versions of Triangular Love Scale*

Müzeyyen Soyerⁱ

Mersin University

Cem Ali Gizirⁱ

Mersin University

Abstract

This study aims to adapt Sternberg Triangular Love Scale (STLS) and its revised form of Sternberg Triangular Love Scale-Modified (STLS-M) to Turkish, analyze the validity and reliability of the scales, and assess the psychometric equivalence (measurement invariance) of two scales across groups. The study included two sample groups comprising of 408 (284 females, 124 male) university students who were involved in a romantic relationship and 632 (372 females, 260 male) university students who were not involved in a romantic relationship; the students were enrolled in various faculties of a public university in Turkey. Confirmatory factor analysis was used to examine the construct validity of the two scales. The result of the analyses showed that both the STLS and STLS-M constituted three factors that are called “intimacy”, “passion”, and “commitment”. The Cronbach’s alpha coefficients of the factors for the STLS were .91 for intimacy, .88 for passion, and .93 for commitment. The reliability coefficients for the STLS-M were also .88, .83, and .89 respectively. Consequently, the findings of the study exhibited that both the STLS and STLS-M had a similar construct, indicating very good psychometric properties, and met the criteria for measurement invariance.

Keywords: Commitment, Intimacy, Passion, Romantic Relationships, Triangular Love.

DOI: 10.29329/ijpe.2020.332.5

* This study is an excerpt from the PhD thesis of the first author, supervised by the second author.

ⁱ **Müzeyyen Soyer**, Lecturer Dr., Psychological Counseling and Guidance, Mersin University, ORCID: 0000-0002-4596-4116

ⁱⁱ **Cem Ali Gizir**, Prof. Dr., Educational Sciences, Psychological Counseling & Guidance, Mersin University, ORCID: 0000-0002-1928-781X

Correspondence: cagizir@mersin.edu.tr

INTRODUCTION

Every individual as a social being needs to establish relationships at various levels in the social environments s/he is in and tries to have intimate relationships with others. Hence, happy life for individuals requires actions such as work, friendship, and love that include close relationships with other individuals. In this regard, Berscheid, Snyder and Omoto (1989) highlighted the importance of close relationships for individuals and reported that romantic relationships, which were followed by family and work relationships, were ranked top among the close relationships; they also stated that romantic relationships have a very important place in giving meaning to individuals' life and relationships.

Love, the most important motivation of romantic relationships, might have different meanings for every individual, and its meaning might differ from culture to culture. On the other hand, definitions of love are reported to have gone through changes in time (Masaryk, 2012). An analysis of the studies on romantic love shows that love is seen as an important predictor of several positive psychological features such as happiness (Diener & Lucas, 2000), well-being (Galinha, Oishi, Pereira, Wirtz, & Esteves, 2014), and relationship satisfaction (Sprecher, 2001). In many cultures, marriage and romantic love are also seen as a source of expressing and realizing self (Acevedo & Aron, 2009). On the other hand, the dark side of love should also be taken into consideration. In other words, love may sometimes lead to various psychological problems such as anxiety and depression (Bajoghli et al., 2014). Therefore, love is an important research topic not only because it makes life better or more beautiful but also because it could make it worse as a source of great sorrow and pain (Berscheid, 1999).

A review of the related literature shows that the efforts for understanding romantic relationships and love in the field of psychology have accelerated since 1970, and there have been various theories and models about love until today (Kanemasa, Taniguchi, & Daibo, 2001). Although love in the focus of the scientific field was considered as a one-dimensional concept in the past, the dominant understanding in today's literature is that it demonstrates a multidimensional structure (Myers & Shurts, 2002). Among these different approaches about love, A Triangular Theory of Love developed by Sternberg (1986) has pioneered the studies conducted in recent years and provided an important point of view in love-centered studies (Clemente et al., 2020). In this regard, Sternberg acknowledged that love is composed of three components called intimacy, commitment, and passion and stated that these components reflected the emotional interactions of individuals' previous, current, and future partners. Sternberg also highlighted that each of these components represented the emotional, cognitive, and motivational aspects of love independently of each other.

Intimacy, an important component of triangular love, is associated with emotions such as mutualness and valuing, and it reflects the need for mutual understanding such as honesty and candidness with a romantic partner (Sternberg, 1986; Yela, 2006). Intimacy is also described as mutual disclosure, sharing secrets, feeling candid emotions to each other, striving for the happiness of, being happy with, respecting, taking emotional support from, giving emotional support to, and valuing the person who is loved (Sternberg, 1997).

Commitment, another component of the triangular love, reflects the need for giving a meaning to the future of the relationship and making a decision about the relationship. In other words, the commitment factor highlights an individual's decision to love another individual and maintain the commitment in the progressing process (Sternberg, 1997). At this stage, commitment is associated with the determination of the relationship, feelings of confidence, and desire and responsibility for continuing the relationship (Cassepp-Borges & Teodoro, 2007). In other words, commitment is expressed as the effort and determination of an individual in protecting and continuing love in the romantic relationship in the long term (Andrade, Wachelke, & Howat-Rodrigues, 2015).

Passion, the last component of the triangular love, reflects the physical attraction to the romantic partner and the need for physical and sexual intimacy. Hence, the passion factor constitutes the motivational aspect of the existing relationship towards romanticism, physical attraction, and sexuality. Passion also encompasses the sexual attraction toward the person loved and includes feelings about finding him/her physically attractive (Sternberg, 1986). Hatfield and Rapson (1988) stated that sexual needs could sometimes dominate love relationships, and other needs such as self-confidence, moral interest, commitment, dominance, submission, and self-realization also contribute to the passion component.

Sternberg (1986) stated that love is based on these three components expressed with the morphological peaks of a triangle and emerged depending on two factors that included *the amount of love* and *balance of love*. Sternberg stated that the amount of love reflects the area of a triangle, and the balance of love reflects its intensity towards its components and explained that while the presence of all components is called perfect love, lack of these three components is called lovelessness. Pointing out that successful and satisfying romantic relationships are composed of by balancing these three components, Sternberg (1997) developed the Triangular Love Scale at the center of this theoretical point of view.

A closer analysis of the studies that utilized the Sternberg Triangular Love Scale showed that the sample groups were mainly composed of married individuals (Torqabeh, Abadi, & Haqshenas, 2006), adolescents (Ha, Overbeek, Greef, Scholte, & Engels, 2010; Overbeek, Ha, Scholte, Kemp, & Engels, 2007), or university students (Andrade, Wachelke, & Howat-Rodrigues, 2015; Drahanovic & Hasanagic, 2014; Leeker & Carlozzi, 2014). These studies were also conducted with individuals who had been in a romantic relationship. However, the importance of the identification of the thoughts and expectations of individuals who were not involved in a romantic relationship at least about their ideal love is self-evident. For this purpose, Soloski, Pavkov, Sweeney and Wetchler (2013) modified the original form of the Sternberg Triangular Love Scale so that it could be used by individuals who do not have been in a romantic relationship. This way, it was possible to use the related scale with people who were involved or not in a romantic relationship. Within the scope of this study, the adaptation of the original and the modified forms of the Triangle Love Scale to Turkish in tandem is believed to contribute to the diversification of research focusing on love and romantic relationships.

In this regard, when the developmental tasks of young adulthood are considered in terms of the need for intimacy and development of identity (Chickering & Reiser, 1993), it is emphasized that romantic relationships and love are of great importance for young adults (Mosher & Danoff-Burg, 2007). It is also thought that the viewpoints of young adults about romantic relationships and their sense of how they are perceived by the opposite sex are begin to be shaped in this period. Therefore, it is considered that the development of a multidimensional, qualified measurement tool to evaluate young adults' assessments of love is of great importance. In line with this view, this study tested the construct validity of the original and the modified forms of the Sternberg Triangular Love Scale, which were adapted to Turkish. With their three-factor structure and high-level reliabilities, it is considered that the scales could be used in identifying the level of love and love expectations of young adults.

A review of the studies that focused on love in Turkey showed that these studies were mainly based on the constructivist approach and in the framework of the Color Theory of Love developed by Lee (1973). In line with this, studies on love were generally focused on Lee's love classification (Eros, Ludus, Storge, Pragma, Mania, and Agape) and utilized the *Love Attitudes Scale* developed by Hendrick and Hendrick (1986). Hence, the adaptation of the original and the modified forms of *Sternberg Triangular Love Scale* to Turkish will enable researchers to investigate the romantic love from different aspects by using two different forms of a measurement tool in Turkey.

Furthermore, assessing the measurement invariance across the two versions of Sternberg Triangular Love Scale (STLS and STLS-M) is believed to make important contributions to the related

literature by enabling to make a comparative analysis of the triangular love levels of two separate sample groups of individuals who were involved or not in a romantic relationship. Hence, it seems that the studies on romantic relationships and love in Turkey generally did not examine the individuals who have not been in a romantic relationship, and asked the participating individuals to “think of” their latest romantic relationship or “imagine” that they have a romantic relationship while they are responding to the questions. Therefore, the present study will make it possible to assess the views of individuals who do not have a romantic relationship. As it is known, lack of a romantic relationship does not mean that individuals do not have any views about love. Therefore, an investigation of love by putting individuals who have not been in a romantic relationship in the focus as well could be meaningful.

In addition, a review of the related literature indicated that studies on triangular love were mainly conducted with adults and married people (Sumter, Valkenburg, & Peter, 2013). Given that being in a romantic relationship in the young adulthood is a developmental task that supports emotional, social and relational development of individuals (Chickering & Reisser, 1993), investigation of triangular love in terms of university students is believed to make important contributions to the related literature. In light of this information, this study primarily aims to examine validity and reliability of the Turkish versions of “Sternberg Triangular Love Scale” (STLS) developed based on the Triangular Love Theory and “Sternberg Triangular Love Scale-Modified” (STLS-M) revised by Soloski, Pavkov, Sweeney and Wetchler (2013) and to assess the measurement invariance (psychometric equivalence) of these two scales.

METHOD

Participants

Two study groups were formed using a convenience sampling method to examine the validity and reliability of the Turkish versions of STLS and STLS-M and to test the measurement invariance of two scales. The participants were composed of undergraduate students who were enrolled in various faculties of a public university in Turkey.

The first study group that was formed for the STLS included a total of 408 undergraduate students who were currently involved in a romantic relationship. Of the total sample, 284 (69.6%) were women and 124 (30.4%) were men. The average age of the participants was 21.51 (SD=1.97), and their ages ranged between 18 and 26. An analysis based on the class level showed that 100 (24.5%) students were enrolled in the first year, 67 (16.4%) were enrolled in the second year, 121 (29.7%) were enrolled in the third year, and 120 (29.4%) were enrolled in the fourth year.

The second study group that was formed for the STLS-M was composed of 632 undergraduate students who were not currently involved in a romantic relationship. Of the total sample, 372 (58.9%) were women and 260 (41.1%) were men. The average age of the participants in this group was 20.90 (SD=1.93), with ages ranging between 18 and 26. An analysis based on the class level showed that of all the students in this group, 220 (34.8%) were enrolled in the first year, 110 (17.4%) were in the second year, 161 (25.5%) were in the third year, and 141 (22.3%) were in the fourth year.

As a traditional rule of thumb in the literature, it is stated that sample size should be at least 300 cases for factorial analysis (Tabachnick & Fidell, 2013). Moreover, it is also proposed that the ratio of cases (N) to the number of variables or items (q) should be at least 10 ($N/q \geq 10$) for a particular CFA application (Kline, 2016; Schumacker & Lomax, 2010). Since the STLS and STLS-M included 36 items, the sample sizes of 408 for STLS and 632 for STLS-M were seemed to be appropriate for CFA applications in this study.

Measures

The Personal Information Form: The participants' background characteristics such as age, gender, department, class level, and relationship status were collected through the Personal Information Form prepared by the researchers.

The Sternberg Triangular Love Scale: The Sternberg Triangular Love Scale (STLS), developed by Robert Sternberg (1997), aims to measure the levels of intimacy, passion, and commitment components that are defined in the Triangular Love Theory and that require different levels of motivation in individuals' romantic relationships. Specifically, the STLS is a 36-item scale in which each dimension (intimacy, passion, and commitment) is represented with 12 items. The *Intimacy* dimension indicates an individual's feelings of candidness in romantic relationships and the ease of mutual disclosure. An item in this dimension is "I have a warm and comfortable relationship with my partner" (Item 1). The *passion* dimension indicates individuals' romantic interest in each other and attraction. An example of this dimension is "I cannot imagine life without my partner" (Item 11). The *commitment* dimension indicates individuals' desire for continuing their relationship in the long term. An example of this dimension is "I view my relationship with my partner as permanent" (Item 3). The items are responded on a 9-point Likert scale. Each item in the scale is scored between "I totally disagree (1)" and "I totally agree" (9). Higher scores indicate an increase in the level of triangular love. No items in the scale are scored reversely. Cronbach's alpha internal consistency coefficients of the STLS were .90 for the intimacy dimension, .80 for the passion dimension, .80 for the commitment dimension, and .95 for the reliability of the whole scale. Test-retest reliability of the STLS was 0.70 for intimacy, 0.65 for passion, and 0.78 for commitment (Sternberg, 1997).

The Sternberg Triangular Love Scale- Modified: The Sternberg Triangular Love Scale-Modified (STLS-M), the revised form of The Triangular Love Scale by Soloski, Pavkov, Sweeney and Wetchler (2013), aims to identify the thoughts and expectations of individuals who were not involved in a romantic relationship about ideal love. It is a 36-item scale that is composed of three dimensions (intimacy, passion, and commitment) each of which was composed of 12 items like in the original STLS. An example of the *intimacy* dimension is "I would expect that a person would have a warm and comfortable relationship with their partner" (Item 1). An example of the *passion* dimension is "I would expect that a person would not be able to imagine being without their partner" (Item 11). An example of the *commitment* dimension is "I would expect that a person would view their relationship with their partner as permanent" (item 3). The items are responded on a 9-point Likert scale. Each item in the scale is scored between "I totally disagree (1)" and "I totally agree" (9). The scale has no items that are scored reversely. Cronbach's alpha internal consistency coefficient of the STLS-M was reported as .97 by Soloski, Pavkov, Sweeney and Wetchler (2013).

Translation of STLS and STLS-M to Turkish

Turkish translation of each item in the STLS and the STLS-M was performed by two associate professors in the field of Psychological Counselling and Guidance and one associate professor and an instructor in the field of English Language and Literature. Then these translations were reviewed by the researchers for the identification of the statements that described the items best. The third stage was the administration of the Turkish forms to 20 university students, who were asked to assess the items and indicate the incomprehensible ones, if any. The forms which were revised according to the feedback received from the students were made ready to be used. Before the administration, necessary permissions were obtained from the University Social Sciences Research Ethics Committee and then from the related departments of the university where the study was conducted. Throughout the procedure, all the participants were informed about the purpose of the study and explained the instructions on how to fill in the forms. The administration of the scales took approximately 20 minutes.

Data Analysis

Confirmatory factor analysis was performed to analyze the construct validity of the STLS and STLS-M which were translated to Turkish in this study. Various goodness-of-fit criteria were utilized to determine the fit of the predicted measurement models. These were chi-square, RMSEA (Root mean squared error of approximation), SRMR (Standardized root mean square residual), GFI (Goodness-of-fit index), CFI (Comparative fit index), AGFI (Adjusted goodness-of-fit index), NNFI (Non-normed fit index) and IFI (Incremental fit index) measures of fit respectively. RMSEA and SRMR values of below .08 and GFI, CFI, AGFI, NNFI and IFI values of .90 and over is sufficient to accept the validity of the measurement model tested (Brown, 2006; Schumacker & Lomax, 2010; Sümer, 2000). Furthermore, Cronbach's alpha consistency coefficients were calculated and test-retest reliability analysis was performed to examine the reliability of the STLS and STLS-M. Finally, measurement invariance of the STLS and STLS-M was tested by using the program R.

RESULTS

Validity Analyses of the STLS and STLS-M

Confirmatory Factor Analysis Results of the STLS: This study utilized the confirmatory factor analysis (CFA) to review the factor structure and to test the construct validity of the Turkish STLS. In this process, the theoretical structure and the findings of the original STLS development study (Sternberg, 1997) were taken as the base and the three-factor model with 36 items were analyzed using the confirmatory factor analysis.

As a result of the confirmatory factor analysis, the standardized Lambda (λ) values, t values, and the squared multiple correlation (R^2) values identified for each item in the Turkish STLS are presented in Table 1. The items (Item 2, 5, 6, 9, 10, 19, 21, 23, 25, 35 and 36) that demonstrated low measurement values ($\lambda < .50$; $R^2 < .30$) as a result of the CFA were eliminated from the scale. In terms of the standardized Lambda values, factor loadings of the items ranged between .63 and .88, and all the values obtained were found to be significant ($p < .05$). Moreover, an analysis of the goodness-of-fit indices in the CFA findings showed that the three-factor Turkish STLS measurement model was found to have $\chi^2_{(231)} = 629.29$, $\chi^2/sd = 2.72$, RMSEA = .06, SRMR = .04, GFI = .90, AGFI = .87, CFI = .99, NNFI = .99 and IFI = .99 fit values. Accordingly, the Turkish version of the STLS, which was found to demonstrate a 24-item and three-factor (intimacy, passion, and commitment) structure, was found to meet the construct validation criteria.

Table 1. Descriptive Statistics and Standardized Lambda, t , and R^2 Values of STLS Items

Factors & Items	λ	t	R^2	Corrected Item-Total Correlation	\bar{X}	SS
Intimacy						
Item 1	.70	15.88	.49	.704	7.52	1.92
Item 4	.68	15.28	.46	.693	7.85	1.78
Item 7	.64	14.19	.41	.652	8.52	1.09
Item 13	.72	16.38	.51	.698	7.57	1.90
Item 16	.64	14.02	.40	.632	8.28	1.44
Item 22	.75	18.01	.59	.669	8.33	1.16
Item 28	.81	19.47	.65	.761	7.90	1.66
Item 31	.84	20.74	.71	.793	8.15	1.53
Item 34	.69	15.47	.47	.612	8.19	1.43

Passion						
Item 11	.69	15.59	.48	.665	6.25	2.72
Item 14	.77	17.96	.59	.718	7.20	2.10
Item 17	.67	14.82	.45	.659	7.43	1.88
Item 20	.77	18.01	.59	.729	7.67	1.87
Item 26	.63	13.77	.40	.575	7.04	2.02
Item 29	.72	16.31	.51	.687	6.98	2.27
Item 32	.72	16.33	.51	.636	7.42	1.91
Commitment						
Item 3	.80	19.14	.63	.761	7.50	2.00
Item 12	.78	18.59	.61	.769	8.13	1.57
Item 15	.75	17.77	.57	.749	7.43	2.15
Item 18	.84	20.73	.70	.799	8.10	1.59
Item 24	.64	14.36	.42	.619	7.77	1.70
Item 27	.83	20.46	.69	.779	7.68	1.89
Item 30	.68	15.39	.46	.657	8.00	1.49
Item 33	.88	22.44	.78	.850	7.93	1.84

Table 2. Goodness-of- Fit Statistics for STLS and STLS-M

Fit Indices	Fit Criteria*	Fit Measures	
		STLS	STLS-M
χ^2	-	629.29	789.78
<i>sd</i>	-	231	232
χ^2/sd	< 5	2.72	3.40
RMSEA	< .08	.06	.06
SRMR	< .08	.04	.05
GFI	> .90	.90	.90
AGFI	> .90	.87	.87
CFI	> .90	.99	.98
NNFI	> .90	.99	.98
IFI	> .90	.99	.98

* (Brown, 2006; Schumacker & Lomax, 2010; Sümer, 2000)

Confirmatory Factor Analysis Results of the STLS-M: Confirmatory factor analysis was also utilized in this study to examine the factor structure of the Turkish STLS-M and to test its construct validity. In the analysis process, the findings of the STLS-M validity study (Soloski, Pavkov, Sweeney, & Wetchler, 2013) was taken as the base and the three-factor model with 36 items were assessed using the confirmatory factor analysis.

Table 3. Descriptive Statistics and Standardized Lambda, t, and R² Values of STLS-M Items

Factors & Items	λ	<i>t</i>	R ²	Corrected Item- Total Correlation	\bar{X}	SS
Intimacy						
Item 1	.54	14.00	.30	.561	7.71	1.94
Item 4	.54	14.11	.30	.555	7.74	1.82
Item 7	.71	19.81	.50	.714	8.14	1.46
Item 13	.65	17.49	.42	.614	7.15	1.86
Item 16	.58	15.51	.34	.586	8.22	1.57
Item 22	.71	19.99	.51	.593	7.37	1.94
Item 28	.67	18.47	.45	.573	7.55	1.77
Item 31	.76	21.71	.57	.725	7.79	1.68
Item 34	.75	21.37	.56	.714	7.61	1.74
Passion						
Item 11	.56	14.15	.32	.513	4.14	2.68
Item 14	.69	18.69	.47	.665	5.87	2.43
Item 17	.67	17.88	.45	.661	5.65	2.33
Item 20	.77	21.79	.60	.613	7.14	2.04
Item 26	.56	14.56	.31	.505	5.99	2.27
Item 29	.65	17.52	.42	.607	5.59	2.57
Item 32	.59	15.24	.35	.436	7.37	1.86

Commitment	-	-	-	-	-	-
Item 3	.66	18.03	.44	.661	7.31	2.28
Item 12	.70	19.50	.48	.647	8.06	1.56
Item 15	.70	19.74	.49	.658	7.29	2.10
Item 18	.81	24.22	.66	.782	7.73	1.83
Item 24	.67	18.57	.45	.622	6.85	2.12
Item 27	.72	20.40	.52	.674	7.59	1.73
Item 30	.74	21.09	.54	.663	7.31	1.94
Item 33	.72	20.52	.52	.695	6.88	2.51

Table 3 presents the results of the confirmatory factor analysis with standardized Lambda values, *t* values and the squared multiple correlation (R^2) values recognized for each item in the Turkish STLS-M. According to the CFA results, 12 items (Item 2, 5, 6, 8, 9, 10, 19, 21, 23, 25, 35 and 36) that demonstrated low measurement values ($\lambda < .50$; $R^2 < .30$) were eliminated from the scale. An analysis of the standardized Lambda values showed that the item factor loadings ranged between .54 and .81, and all the values obtained were significant ($p < .05$). Furthermore, an analysis of the goodness-of-fit indices that belonged to the CFA findings (Table 2) showed that the three-factor model had $\chi^2_{(232)} = 789.78$, $\chi^2/sd = 3.40$, RMSEA = .06, SRMR = .05, GFI = .90, AGFI = .87, CFI = .98, NNFI = .98 and IFI = .98 fit values. Hence, the 24-item and three-factor (intimacy, passion, and commitment) structure of the Turkish version of the STLS-M (similar to the Turkish version of the STLS) was found to meet the construct validation criteria.

Analysis of the STLS and STLS-M Measurement Invariance

Table 4 presents the standardized Lambda values and squared multiple correlation values performed to analyze the measurement invariance of the STLS and STLS-M Turkish forms through the R programming. The goodness-of-fit indices in the analysis findings were RMSEA = .08, SRMR = .08, GFI = .97, AGFI = .96, CFI = .89, NNFI = .89, and IFI = .89. All factor loadings were also seemed to be same across groups. Hence, the two Turkish forms of the Sternberg Triangular Love Scale, which had 24 items and three-factor structure (intimacy, passion, and commitment), were found to meet the criteria for measurement invariance.

Table 4. Standardized Lambda and R^2 Values for Measurement Invariance Across STLS and STLS-M

Factors & Items	STLS (N=408)		STLS-M (N=632)	
	λ	R^2	λ	R^2
Intimacy				
Item 1	.61	.38	.60	.36
Item 4	.61	.37	.60	.36
Item 7	.73	.53	.69	.48
Item 13	.66	.43	.68	.47
Item 16	.63	.40	.63	.39
Item 22	.80	.63	.61	.37
Item 28	.75	.56	.70	.48
Item 31	.83	.69	.80	.64
Item 34	.74	.55	.75	.56
Passion				
Item 11	.63	.40	.58	.34
Item 14	.77	.60	.69	.47
Item 17	.73	.53	.64	.41
Item 20	.79	.63	.75	.56
Item 26	.63	.40	.56	.32
Item 29	.71	.51	.65	.42
Item 32	.65	.42	.61	.38

Commitment				
Item 3	.78	.61	.70	.49
Item 12	.76	.58	.73	.53
Item 15	.74	.55	.72	.52
Item 18	.85	.73	.81	.66
Item 24	.69	.48	.63	.39
Item 27	.77	.59	.76	.58
Item 30	.75	.55	.68	.47
Item 33	.89	.79	.71	.50

Reliability Analyses of the STLS and STLS-M

In addition to the validity analyses, Cronbach's alpha internal consistency coefficient and test-retest correlation values of the Turkish STLS and STLS-M were calculated to identify their reliability.

Internal Consistency of the STLS: Analysis results to test the reliability of the Turkish STLS showed that the Cronbach's alpha reliability coefficient of the scale was .91 for "intimacy", .88 for "passion", and .93 for "commitment". The Cronbach's alpha value of the total scale was also .96. These findings indicate that the Turkish STLS had a statistically significant and high-level internal consistency.

Test-retest Reliability of the STLS: To test the reliability of the Turkish STLS within the framework of the test-retest method, the scale was readministered to 48 undergraduate students within two-week intervals. Correlation coefficients obtained in the analysis were .95 for intimacy, .88 for passion, and .90 for commitment. The correlation coefficient identified for the total scale score was .95. As a result, when all the findings obtained from the reliability and validity studies were reviewed, the Turkish version of the STLS consisting of 24 items and three factors were found to meet the reliability and validity criteria at high proportions.

Internal Consistency of the STLS-M: According to the analysis performed to test the reliability of the STLS-M, Cronbach's alpha reliability coefficients of the scale were calculated as .88 for intimacy, .83 for passion, and .89 for commitment. Cronbach's alpha value obtained within the framework of the total scale score was .94. These findings indicate that STLS-M, like STLS, had statistically significant and high-level internal consistency.

Test-retest Reliability of the STLS-M: To test the reliability of the STLS-M within the framework of the test-retest method, the test was readministered to 60 undergraduate students within two-week intervals. The correlation coefficients based on the analysis performed were .80 for "intimacy", .72 for "passion", and .81 for "commitment". The Cronbach's alpha value obtained within the framework of the total scale score was also .81. These findings indicate that all the factors of the scale were significant and had a high-level test-retest reliability. Hence, like in Turkish STLS, the 24-item and three-factor (intimacy, passion, commitment) Turkish STLS-M scale was also found to meet the validity and reliability criteria at high levels.

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

This study investigated the validity and reliability of the original and modified forms of Turkish Sternberg Triangular Love Scale to enable the measurement of triangular love levels of young adults within the framework of three fundamental dimensions in a comprehensive way. Confirmatory factor analysis performed in this line showed that Turkish versions of the STLS and the STLS-M had good construct validity and both scales had a three-factor structure (intimacy, passion, and commitment) with 24 items. Furthermore, the results of the analysis performed for the internal consistency of the STLS and STLS-M showed that the Cronbach's alpha value of the STLS was .96 and the correlation value identified with the test-retest method was .95. Cronbach's alpha internal consistency of the STLS-M was .94 and the correlation coefficient identified with the test-retest

method was .81. These findings indicate that the Turkish versions of STLS and STLS-M are highly reliable. The results also showed that the Turkish STLS and STLS-M met the measurement invariance criteria to a large extent. Consequently, all the findings indicate that the Turkish versions of STLS and STLS-M, which demonstrated a 24-item and three-factor structure, can be used in various research to identify the triangular love levels of young adults.

A review of the literature about romantic relationships indicates a lot of factors that are associated with individuals' love levels. In other words, studies on the triangular love revealed that variables such as culture (Gao, 2001; Tang & Zuo, 2000), self-esteem (Swami & Allum, 2012), marital expectations (Soloski, Pavkov, Sweeney, and Wetchler, 2013), well-being (Acevedo & Aron, 2009), age (Ahmetoğlu, Swami, & Chamorro-Premuzic, 2010), and gender (Lange, Houran, & Li, 2015) were closely associated with individuals' triangular love levels. A review of the studies in terms of the triangular love components shows that the level of intimacy was associated with the variables such as marital satisfaction (Torqabeh, Abadi, & Haqshenas, 2006), conscientiousness and relationship satisfaction (White, Hendrick, & Hendrick, 2004), and psychological stress (Pielage, Luteijn, & Arrindell, 2005); while commitment level was associated with conscientiousness (Engel, Olson, & Patrick, 2002), achieved identity status (Mansoobifar, Mujembari, & Keybolahi, 2012), relationship length (Ahmetoğlu, Swami, & Chamorro-Premuzic, 2010).

A review of other studies about love in literature showed that the triangular love was also investigated with variables such as perceptions of the physical attractiveness of current or previous partners (Swami & Allum, 2012), collectivism with relationship commitment (Bejanyan, Marshall, & Ferenczi, 2015), relationship length (Acevedo & Aron, 2009; Galinha, Oishi, Pereira, Wirtz, & Esteves, 2010), past relationships experienced with parents and friends (Crevier, Poulin, & Boislard, 2012), gender (Munck, Korotayev, & Khaltourina, 2009), sexual orientation (Leeker & Carlozzi, 2014), authenticity (Nábělková & Balážová, 2015), marital quality (Rizzon, Mosmann, & Wagner, 2013), hate (Mamali, 2014), and dark side traits (Ali & Chamorro-Premuzic, 2010).

Furman (2000) stated that romantic relationships experienced in the young adulthood period would affect individuals' romantic relationship experiences in the adulthood period and determine their views about marriage. In this regard, the perceptions, attitudes, and expectations of university students formed as a result of their romantic relationship experiences are considered to determine the nature of their future romantic relationships and marriage. In light of this information, it is believed that the Turkish versions of STLS and STLS-M can be used in studies concerning romantic relationships and love, and they can provide important contributions to the related literature by enabling a simultaneous assessment of young adults who were involved in a romantic relationship or not. Moreover, it is believed that these scales could be used in the studies involving various topics based on romantic relationships such as attachment styles, personality traits, and relationship satisfaction. It is also predicted that research findings obtained through the use of the Turkish STLS and STLS-M might have practical implications in the field of college counseling. In this regard, it is predicted that the scales may contribute to the development of various outreach activities that would help university students to raise awareness about romantic relationships.

On the other hand, this study was conducted with undergraduate students who were enrolled in certain departments of a public university. Reassessment of the psychometric properties of the Turkish versions of STLS and STLS-M through studies to be conducted with different sample groups (adolescents, engaged, married or flirting couples) might make important contributions to the literature. It is also recommended that a comparative analysis of the Turkish versions of STLS and STLS-M with other love-focused measurement tools would bring an important perspective to the related literature. Last but not least, more contributions to the literature could be possible through the development of culture-specific and love-focused new measurement tools in the Turkish culture.

REFERENCES

- Acevedo, B. P., & Aron, A. (2009). Does a long-term relationship kill romantic love? *Review of General Psychology, 13*(1), 59-65.
- Acker, M., & Davis, M. H. (1992). Intimacy, passion and commitment in adult romantic relationships: A test of the triangular theory of love. *Journal of Social and Personal Relationships, 9*(1), 21-50.
- Ahmetoğlu, G., Swami, V., & Chamorro-Premuzic, T. (2010). The relationship between dimensions of love, personality and relationship length. *Archives of Sexual Behavior, 39*, 1181-1190.
- Ali, F., & Chamorro-Premuzic, T. (2010). The dark side of love and life satisfaction: Associations with intimate relationships, psychopathy and Machiavellianism. *Personality and Individual Differences, 48*, 228-233.
- Andrade, A. L., Wachelkeb, J. F. R., & Howat-Rodrigues, A. B. C. (2015). Relationship satisfaction in young adults: Gender and love dimensions. *An International Journal on Personal Relationships, 9*(1), 19-3.
- Bajoghli, H., Keshavarzi, Z., Mohammadi, M. R., Schmidt, N. B., Norton, P. J., Holsboer-Trachsler, E., & Brand, S. (2014). "I love you more than I can stand!" Romantic love, symptoms of depression and anxiety, and sleep complaints are related among young adults. *International Journal of Psychiatry in Clinical Practice, 18*, 169-174.
- Batinic, B., Milosavljevic, M., & Barisic, J. (2016). The influence of attachment styles on romantic love. *European Psychiatry, 33*, 642-642.
- Bejanyan, B., Marshall, T. C., & Ferenczi, N. (2015). Associations of collectivism with relationship commitment, passion, and mate preferences: Opposing roles of parental influence and family allocentrism. *Plos One, 10*(2), 1-24.
- Berscheid, E. (1999). The greening of relationship science. *American Psychologist, 54*(4), 260-266.
- Berscheid, E., Snyder, M., & Omoto, A. M. (1989). The relationship closeness inventory: Assessing the closeness of interpersonal relationships. *Journal of Personality and Social Psychology, 57*(5), 792-807.
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York: Guilford
- Buss, D. M. (1988). The evolution of human intrasexual competition: Tactics of mate attraction. *Journal of Personality and Social Psychology, 54*(4), 616-628.
- Cassepp-Borges, V., & Teodoro, M. L. M. (2007). Propriedades psicométricas da versão brasileira da escala triangular do amor de Sternberg. *Psicologia: Reflexão e Crítica, 20*(3), 513-522.
- Chickering, A. W., & Reiser, L. (1993). *Education and identity*. San Francisco: JosseyBass Publishers.
- Crevier, M. G., Poulin, F., & Boislard, P. (2012). Continuïté entre les relations parentales et amicales à l'adolescence et les relations amoureuses à l'âge adulte émergent. *Canadian Journal of Behavioural Science, 44*(3), 222-230.
- Diener, E., & Lucas, R. (2000). Explaining differences in societal levels of happiness: Relative standards, need fulfillment, culture, and evaluation theory. *Journal of Happiness Studies, 1*, 41-78.
- Dietch, J. (1978). Love, sex roles and psychological health. *Journal of Personality Assessment, 42*(6), 626-634.

- Drahanovic, S., & Hasanagic, A. (2014). Exploring the difference between Turkish and Bosnian students in Triangular Love Scale. *Epiphany Journal of Transdisciplinary Studies*, 7(2), 128-141.
- Engel, G., Olson, K. R., & Patrick, C. (2002). The personality of love: Fundamental motives and traits related to components of love. *Personality and Individual Differences*, 32(5), 839-853.
- Erikson, E. H. (1968). *Identity: Youth and crisis*. New York: W. W. Norton Company.
- Furman, W. (2002). The emerging field of adolescent romantic relationships. *Current Directions in Psychological Science*, 11, 177-180.
- Galinha, I. C., Oishi, S., Pereira, C. R., Wirtz, D., & Francisco, E. (2014). Adult attachment, love styles, relationship experiences and subjective well-being: Cross-cultural and gender comparison between americans, portuguese and mozambicans. *Social Indicators Research*, 119, 823-852.
- Galinha, I. C., Oishi, S., Pereira, C. R., Wirtz, D., & Esteves, F. (2014). Adult attachment, love styles, relationship experiences and subjective well-being: Cross-cultural and gender comparison between Americans, Portuguese and Mozambicans. *Social Indicators Research*, 119, 823-852.
- Gao, G. (2001). Intimacy, passion, and commitment in Chinese and US American romantic relationships. *International Journal of Intercultural Relations*, 25, 329-342.
- Ha, T., Overbeek, G., Greef, M., Scholte, R. H. J., & Engels, R. C. M. E. (2010). The importance of relationships with parents and best friends for adolescents' romantic relationship quality: Differences between indigenous and ethnic Dutch adolescents. *International Journal of Behavioral Development*, 34(2), 121-127.
- Hatfield, E. (1988). Passionate and companionate love. In R. J. Sternberg, & M. L. Barnes (Eds.). *The Psychology of love* (pp. 191-217). New Haven: Yale Press.
- Hatfield, E., & Rapson R. (1996). *Love and sex, cross-cultural perspectives*. Boston: Allyn and Bacon.
- Hendrick, C., & Hendrick, S. (1986). A theory and method of love. *Journal of Personality and Social Psychology*, 50, 392-402.
- Hendrick, S. S., Hendrick, C., & Adler, N. L. (1988). Romantic relationships: Love, satisfaction and staying together. *Journal of Personality and Social Psychology*, 54, 980-988.
- Kim, J., & Hatfield E. (2004). Love types and subjective well-being: A cross- cultural study. *Social Behavior and Personality*, 32(2), 173-182.
- Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). New York: Guilford Press.
- Lange, R., Houran, J., & Li, S. (2015). Dyadic relationship values in Chinese online daters: Love American style? *Sexuality and Culture*, 19, 190-215.
- Lee, J. A. (1973). *The colors of love: An exploration of the ways of loving*. Don Mills, Ontario, Canada: New Press.
- Leeker, O., & Carlozzi, A. (2014). Effects of sex, sexual orientation, infidelity expectations, and love on distress related to emotional and sexual infidelity. *Journal of Marital and Family Therapy*, 40(1), 68-91.
- Lemieux, R., & Hale, J. L. (1999). Intimacy, passion and commitment in young romantic relationships: Successfully measuring the Triangular Theory of Love. *Psychological Reports*, 85, 497-503.

- Levy, M. B., & Davis, K. E. (1988). Love styles and attachment styles compared: Their relations to each other and to various relationship characteristics. *Journal of Social and Personal Relationships*, 5, 439-471.
- Madey, S. F., & Rodgers, L. (2009). The effect of attachment and Sternberg's Triangular Theory of love on relationship satisfaction. *Individual Differences Research*, 7(2), 76-84.
- Mamali, C. (2014). A vectorial construct of love and hate and Sternberg's triangular model: Towards an integrated model of love and hate. *International Journal of Psychology*, 39(5), 16-32.
- Mansoobifar, M., Mujembar, A. K., & Keybollahi, T. (2012). The correlation between identity status and loving elements (intimacy, commitment, passion). *Social and Behavioral Sciences*, 46, 1167-1170.
- Masaryk, R. (2012). Conceptualizing love: Is it all we need? *Human Affairs*, 22, 263-269.
- Munck, V. C., Korotayev, A., & Khaltourina, D. (2009). A comparative study of the structure of love in the U.S. and Russia: Finding a common core of characteristics and national and gender differences. *Ethnology*, 48, 337-357.
- Mosher, C., & Danoff-Burg, S. (2007). College students' life priorities: The influence of gender and gender-linked personality traits. *Gender Issues*, 24, 21-33.
- Myers, J. E., & Shurts, W. M. (2002). Measuring positive emotionality: A review of instruments assessing love. *Measurement and Evaluation in Counseling and Development*, 34, 238-254.
- Nábělková, E., & Balážová, N. (2015). Autenticita v partnerskom vzťahu mladých dospelých – korelačná štúdia. *Československá Psychologie*, 1, 81-95.
- Overbeek, G., Ha, T., Scholte, R., Kemp, R., & Engels, R. C. M. E. (2007). Brief report: Intimacy, passion and commitment in romantic relationships: Validation of a 'triangular love scale' for adolescents. *Journal of Adolescence*, 30, 523-528.
- Pielage, S. B., Luteijn, F., & Arrindell, W. A. (2005). Adult attachment, intimacy and psychological distress in a clinical and community sample. *Clinical Psychology and Psychotherapy*, 12, 455-464.
- Reis, H. T., & Aron, A. (2008). Love what is it, why does it matter, and how does it operate? *Perspectives on Psychological Science*, 3(1), 80-86.
- Rizzon, A. L. C., Mosmann, C. P., & Wagner, A. (2013). A qualidade conjugal e os elementos do amor: Um estudo correlacional. *Contextos Clínicos*, 6(1), 41-49.
- Rubin, Z. (1970). Measurement of romantic love. *Journal of Personality and Social Psychology*, 16(2), 265-273.
- Sanderson, B., & Kurdek, L. A. (1993). Race and gender as moderator variables in predicting relationship satisfaction and relationship commitment in a sample of dating heterosexual couples. *Family Relations*, 42, 263-267.
- Schumacker, R. E., & Lomax, R. G. (2010). *A beginner's guide to structural equation modeling* (3rd Ed.). New York: Routledge.
- Soloski, K. L., Pavkov, T. W., Kathryn, S. A., & Wetchler, J. L. (2013). The social construction of love through intergenerational processes. *Contemporary Family Therapy*, 35, 773-792.

- Sprecher, S. (2001). Equity and social exchange in dating couples: Associations with satisfaction, commitment and stability. *Journal of Marriage and the Family*, 63, 599–613.
- Sprecher, S., Aron, A., Hatfield, E., Cortese, A., Potapova, E., & Levitskaya, A. (1994). Love: American style, Russian style and Japanese style. *Personal Relationships*, 1, 349-369.
- Sternberg, R. J. (1986). A triangular theory of love. *Psychological Review*, 93(2), 119-135.
- Sternberg, R. J. (1997). Construct validation of a triangular love scale. *European Journal of Social Psychology*, 27, 313-335.
- Sumter, S. R., Valkenburg, P. M., & Peter, J. (2013). Perceptions of love across the lifespan: Differences in passion, intimacy and commitment. *International Journal of Behavioral Development*, 37(5), 417-427.
- Sümer, N. (2000). Yapısal eşitlik modelleri: Temel kavramlar ve örnek uygulamalar. *Türk Psikoloji Yazıları*, 3(6), 49-74.
- Swami, V., & Allum, L. (2012). Perceptions of the physical attractiveness of the self, current romantic-partners, and former partners. *Scandinavian Journal of Psychology*, 53, 89-95.
- Tabachnick, B., & Fidell, L. (2013). *Using Multivariate Statistics*. Boston, MA: Pearson Education Inc.
- Tang, S., & Zuo, J. (2000). Dating attitudes and behaviors of American and Chinese college students. *The Social Science Journal*, 3(1), 67-78.
- Torqabeh, M. H., Abadi, A. F., & Haqshenas, H. (2006). Relations between love styles and marital satisfaction. *Journal of Mazandaran University of Medical Sciences*, 16(54), 99-109.
- White, J. K., Hendrick, S. S., & Hendrick, C. (2004). Big five personality variables and relationship constructs. *Personality and Individual Differences*, 37(7), 1519-1530.
- Whitley, B. E. (1993). Reliability and aspects of the construct validity of Sternberg's Triangular Love Scale. *Journal of Social and Personal Relationships*, 10(3), 475-480.
- Yela, C. (2006). The evaluation of love simplified version of the scales for Yela's tetragonal model based on Sternberg's model. *European Journal of Psychological Assessment*, 22(1), 21-27.