

The Reliability and Validity of the Lifespan Sibling Relationship Scale in a Turkish Emerging Adult Sample

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The present study examines the reliability and validity of the Turkish version of the Lifespan Sibling Relationship Scale (LSRS; Riggio, 2000). A total of 578 (336 female, 242 male) Turkish emerging adults participated in this study. A Confirmatory Factor Analysis (CFA) was used to test construct validity for the original six-factor model of the scale with 48 items. Results of the CFA indicated a good model fit. Furthermore, the second-order CFA result showed that the scale can be scored for both the subdimensions and the test as a whole. Multi-group CFA result revealed that the measured construct is invariant across the genders. The results suggested that the Turkish version of the LSRS had adequate internal consistency and construct validity, indicating that it can be reliably used to measure attitudes toward sibling relationship in emerging adulthood among a Turkish population.

Key words: sibling relationship, emerging adulthood, the LSRS, reliability, validity

Sibling relationship is one of the most enduring relationships throughout an individual's life, as it begins with the birth of the younger sibling and terminates with one of the siblings' passing away (Noller, 2005). Sibling relationship is defined as one of the most important family subsystems having a great impact on the well-being of individuals (Stormshak, Bullock, & Falkenstein, 2009). Having a positive sibling relationship not only increases the levels of individuals' well-being (Sherman, Lansford, & Volling, 2006), self-esteem (Hsiu-Chen Yeh & Lempers, 2004) and life satisfaction (Milevsky, 2005) but it also helps them develop empathy

(Lam, Solmeyer, & McHale, 2012) and conflict resolution strategies (Howe, Rinaldi, Jennings, & Petrakos, 2002). Consequently, having a close and positive sibling relationship can be regarded as a buffer by decreasing the risk of depressive symptoms (Buist, Dekovic, & Prinzie, 2013). On the other hand, having a conflictual and low quality sibling relationship may result in negative outcomes, such as risky behaviors and adjustment problems for the individuals because they mostly involve high levels of conflict and negative attitudes towards each other (e.g., Natsuaki, Ge, Reiss, & Neiderhiser, 2009; Rende, Slomkowski, Lloyd-Richardson, & Niaura, 2005).

Past research on siblings has mostly examined the early years of sibling relationship when sibling relationship is not voluntary (e.g., Downey & Condrón, 2004; Howe, Ross, & Recchia, 2011; McHale, Updegraff, &

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Whiteman, 2012; Stoneman, 2001). During childhood, siblings have strong and intense ties. Sibling relationship of children involves intimacy, warmth and conflict. In adolescence, sibling relationship mostly becomes less intense due to relatively less sibling interaction. In a study conducted by Updegraff, McHale, and Crouter (2002), adolescents reported greater intimacy with friends as compared to siblings. Researchers have also focused on sibling relationship during middle and old adulthood (e.g., Fuller-Thomson, 2000; Greif & Woolley, 2015; Khodyakov & Carr, 2009). In middle adulthood, when individuals are engaged with their own family-related commitments such as marriage and parenthood, sibling relationships become less salient (White, 2001). Yet, the interaction among siblings mostly increases again when they have to collaborate in the care of their elderly parents' health. During later adulthood, sibling bonds become stronger again. After specific major life events such as retirement, marriage of children or death of parents, individuals need support from their siblings in order to overcome the feelings of loneliness (Goetting, 1986). That is to say, siblings are an essential source of familial support and remain central in each other's social network throughout the lifespan, even after the loss of parents. Sex composition of a sibling dyad has also been recognized as important in sibling influences. Several research findings have shown that same-sex siblings particularly female-female dyads have a more positive relationship quality and feel closer to each other, compared to male-male or male-female dyads (Jeong, Jeong, Yu, Lyoo, Im, Bae, & Kim, 2013; Riggio, 2000; Riggio, 2006).

Previous research has mostly focused on sibling relationship during childhood. There is limited research on sibling relationship during emerging adulthood when individuals undergo major changes such as leaving parental home, attending college, making career plans (e.g.,

Conger & Little, 2010; Milevsky & Heerwagen, 2013). Overall, these studies revealed that siblings usually keep their relationship even though they spend less time together and their daily contact decreases distinctly due to the particular changes and life events related to emerging adulthood. These important life events may lead to both excitement and stress in emerging adults' lives. Although emerging adults mostly feel more autonomous and independent during this period, they may still need family support while trying to cope with the particular challenges of emerging adulthood (Aquilino, 2006). Emerging adults might seek help from family members, particularly from their siblings, as they are close in age and have similar history. Higher levels of support from siblings have been reported to predict better adjustment during this period (e.g., Hollifield & Conger, 2015; Milevsky, 2005). According to Cicirelli (1995), siblings have great influence on each other's psychological and behavioral development, not only in their childhood years but also throughout the entire lifespan. As Riggio (2000) acknowledged, "attitudes toward the childhood sibling relationship may be seen as a meaningful component of attitudes toward the sibling relationship in adulthood" (p. 710). In short, sibling relationship is crucial for the well-being of individuals in each stage of life. Sibling support, in particular, helps emerging adults overcome the major life challenges associated with this particular stage of life. However, as there are relatively fewer research findings available focusing on the emerging adult population, more research is needed to understand the nature and consequences of various sibling relationship patterns among emerging adults. Moreover, the majority of existing research findings reported are mostly based on western culture. In order to gain more insight about the issue, an up-to-date, valid, reliable assessment tool, applicable to various emerging adult populations coming from different cultural background is needed.

The related literature reveals that there are only a few widely used instruments developed to measure sibling relationship quality. The Sibling Relationship Questionnaire (SRQ) was developed by Furman and Buhrmester (1985) to measure the sibling relationship of children. The Adult Sibling Relationship Questionnaire (ASRQ) was developed by Stocker, Lanthier, and Furman (1997) to measure the sibling relationship of adults. However, the ASRQ was designed to measure the current relationship among adult siblings. The Lifespan Sibling Relationship Scale, which is a relatively new scale, differs from the other instruments developed to measure sibling relationship quality because it has an important advantage of measuring the quality of sibling relationship across the lifespan. The Lifespan Sibling Relationship Scale (LSRS, 2000) was developed by Riggio to measure individual attitudes toward sibling relationship both in childhood and in adulthood. The LSRS was developed from the “tri-componential” view of attitudes (Eagly & Chaiken, 1998). According to this conceptualization, attitudes are composed of affective, cognitive, and behavioral components. Moreover, the LSRS was designed to measure the attitudes toward not only adult sibling relationship but also childhood sibling relationship because attitudes developed in childhood were described as being a profound component of attitudes toward adulthood sibling relationship. Based on these two perspectives, the LSRS was designed as a measure composed of six subscales that assess affect, beliefs and cognitions both in childhood and adulthood sibling relationship. In the original validity and reliability study, the LSRS was found to have good psychometric properties including discriminant validity, internal consistency and test-retest reliability (Riggio, 2000). Since then, the LSRS has been used in English speaking countries such as the USA and Canada (Burbidge & Minnes, 2014; Frank, 2007; Frank, 2008; Portner & Riggs, 2016).

These studies revealed that the LSRS has adequate psychometric properties. It has also been adapted and translated into other languages, such as Korean and Italian (Jeong et al., 2013; Sommantico, Donizzetti, De Rosa, & Parrello, 2017). Both studies confirmed the validity and reliability of the scale across different cultures with good psychometric properties. The LSRS was also translated into Turkish language by Öz (2015). In her study, the scale was tested for an adolescent sample, but the confirmatory factor analysis did not reveal acceptable results. Öz Soysal, Yurdabakan, Uz Baş, and Aysan (2016) conducted another study in order to explore the validity and reliability of the LSRS in a sample of young adults and revealed acceptable results. However, neither of these studies attempted to perform the second-order confirmatory factor analysis and they did not report whether the scale factor structure varies for each gender, either. Therefore, this present study aimed to examine the basic psychometric properties of the Lifespan Sibling Relationship Scale (Riggio, 2000) and expand the state of knowledge concerning psychometric properties of the Turkish version of the Lifespan Sibling Relationship Scale (LSRS) with an emerging adult sample by performing the second order CFA and investigating gender differences of the sibling dyads.

Method

Data Collection Procedure and Participants

The data for the current study were gathered from 601 emerging adults studying at different Turkish universities using a convenient sampling method. After getting required permissions from METU, Human Subjects Ethics Committee (HSEC), four different campuses were visited by the researcher to gather data. Privacy and confidentiality issues were shared with all participants and they were informed

about their right to withdrawal. The instrument took approximately 10-15 minutes to complete. Out of 601 participants, 18 were removed since they had an excess of missing data over 10% (Little & Rubin, 1987). When all cases with missing data were excluded, 583 cases remained. Since SEM is a multivariate analysis, multivariate outliers had to be identified as well. Multivariate outliers of the current study were checked by using Mahalanobis Distance (*Mahalanobis D*²). As a result, 5 outliers, were removed from the data set. After the elimination of all missing cases and influential outliers, the study was conducted with a sample of 578 Turkish university students. The number of female participants was 336 (58%) and the number of male participants was 242 (42%). The age of the participants ranged between 18 and 26 ($M = 20.86$, $Mdn = 21$, $Mo = 21$, $SD = 2.11$). The mean age was found to be 20.89 ($SD = 2.01$) for female participants and 21.08 ($SD = 2.24$) for male participants.

Instruments

Lifespan Sibling Relationship Scale (LSRS; Riggio, 2000). The Lifespan Sibling Relationship Scale (LSRS) was developed by Riggio (2000) to measure individual attitudes toward adult sibling relationship. The LSRS has 48 self-report items that are scored on a 5-point Likert scale indicating the degree to which respondents agreed or disagreed with the statement concerning their sibling relationship (1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neither agree nor Disagree*, 4 = *Agree* and 5 = *Strongly Agree*). The LSRS is composed of six subscales that assess emotions concerning the sibling and the sibling relationship as a child (Child Affect; CA; e.g., "I was proud of my sibling when I was a child") and as an adult (Adult Affect; AA; e.g., "I am proud of my sibling"); beliefs about the sibling and the sibling relationship as a child (Child Cognitions; CC; e.g., "My sibling and I

had a lot in common as children") and as an adult (Adult Cognitions; AC; e.g., "My sibling and I have a lot in common"); and behavioral interactions with the sibling and the positivity of those interactions as a child (Child Behavior; CB; e.g., "My sibling and I spent time together after school as children") and as an adult (Adult Behavior; AB; e.g., "I presently spend a lot of time with my sibling"). In the original validity and reliability study of the LSRS, 711 undergraduate and graduate students, with a mean age of 23.5 years, completed the LSRS (Riggio, 2000). Coefficient alphas for the six subscales were found to be from .84 to .91. Coefficient alpha for the total LSRS was found to be .96. Test-retest reliability correlations were all greater than .80. The present study was conducted to adapt the LSRS into Turkish with an emerging adult sample as it was done in the original validity and reliability study (Riggio, 2000).

Translation Process of the LSRS. After getting the approval letter from Riggio, the developer of the Lifespan Sibling Relationship Scale, the original scale including 48 items was translated from English into Turkish by two English language teachers working at a university level and an English/Turkish interpreter. After comparing all translations, an expert counselor who is advanced in English agreed on the final version by selecting the best alternative for each item. Afterwards, the Turkish version of the LSRS was back-translated into the original language by another English language teacher who had no access to the original scale. The back translation showed that the scale was accurately translated. Subsequently, a Turkish literature teacher checked the Turkish version of the LSRS in order to ensure the accuracy of Turkish wording and grammar of the final Turkish version.

Demographic Information Form. The demographic information form involves various questions concerning the participants' age, gender, and their siblings' age, gender. Participants were

asked to choose the sibling that had the greatest impact on their lives and respond to all items in regard to that chosen sibling.

Statistical Procedures

Confirmatory factor analysis (CFA) and Second order CFA were used to examine construct validity of the scale. In addition, Factor Inter-correlations were reported to show correlations among sub-factors. A multi-group CFA was performed to investigate four versions of measurement invariance of the scale. The internal consistency coefficient (Cronbach's α) was calculated to test the reliability of the scale. Lastly, multivariate analysis of variance (MANOVA) was conducted to examine sex differences in LSRS subscales. Analysis of Moment Structures (AMOS) Version 18.0 software (Arbuckle, 2009) and SPSS version 23 were used to analyze the current data.

Results

Descriptive Statistics of the Turkish Version of LSRS

Descriptive statistics including means, standard deviations of all measured subscales of the LSRS and independent measures *t*-test results are presented by gender in Table 1 below.

Confirmatory Factor Analysis

First, the original six-factor structure of CRSQ with 48 items proposed by Riggio (2000) was evaluated. Results of the CFA model on the item level showed an inadequate model fit [χ^2 (1068) = 4517.79, $p = .00$; χ^2/df -ratio = 4.23; $GFI = .70$, $CFI = .74$ and $RMSEA = .07$, $SRMR = .14$]. Goodness-of-fit indexes were beyond the expected critical values, suggesting that the model fit is insufficient.

Next, CFA was used with item parceling techniques because of some empirical pros of parcels. First, models tested by item parceling techniques are more parsimonious. Besides, in the models, it is less likely that residuals will be correlated or that dual loadings will emerge. Lastly, because of item parceling techniques, various sources of sampling error can be decreased (MacCallum et al., 1999). To sum up, the technique of parceling items was used to reduce the number of indicators of lengthy scales, in order to obtain more continuous and normally distributed data and to improve the fit of the CFA model (Bandalos & Finney, 2001).

Therefore, the original six-factor structure suggested by Riggio (2000) was tested to examine the goodness of fit to the data with the technique of item parceling. Each factor consists of 2-item parcels and each item parcel in-

Table 1 *Descriptive statistics for the Lifespan Sibling Relationship Scale (LSRS)*

LSRS Subscales	Total Sample (n = 578)		Female (n = 336)		Male (n = 242)		<i>t</i> (576)	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Child Affect	31.81	4.62	31.88	4.71	31.71	4.49	.43	.670
Child Behavior	29.61	5.14	29.92	5.24	29.18	4.98	1.72	.086
Child Cognitions	30.74	5.13	31.04	5.27	30.33	4.92	1.64	.102
Adult Affect	33.58	4.15	34.12	4.09	32.84	4.13	3.69	< .001
Adult Behavior	29.97	5.07	30.80	5.19	28.82	4.68	4.73	< .001
Adult Cognitions	33.72	4.56	34.07	4.51	33.23	4.61	2.21	.028

cludes 4 items, which were selected based on their skewness and kurtosis values. The skewness and kurtosis values of the item parcels ranged from -.009 to -.819, indicating the normal

distribution of the item parcels. That is, all item parcels were normally distributed. Their skewness and kurtosis values are presented in Table 2.

Table 2 *Item parcels of the LSRS and their skewness and kurtosis values*

<i>Item Parcels</i>	<i>Skewness</i>	<i>Kurtosis</i>
P1CA	-.217	-.681
P2CA	-.462	-.524
P3CB	-.060	-.436
P4CB	-.017	-.727
P5CC	-.231	-.696
P6CC	-.009	-.703
P7AA	-.557	-.825
P8AA	-.187	-.667
P11AB	-.015	-.615
P12AB	-.196	-.819
P9AC	-.677	-.453
P10AC	-.346	-.714

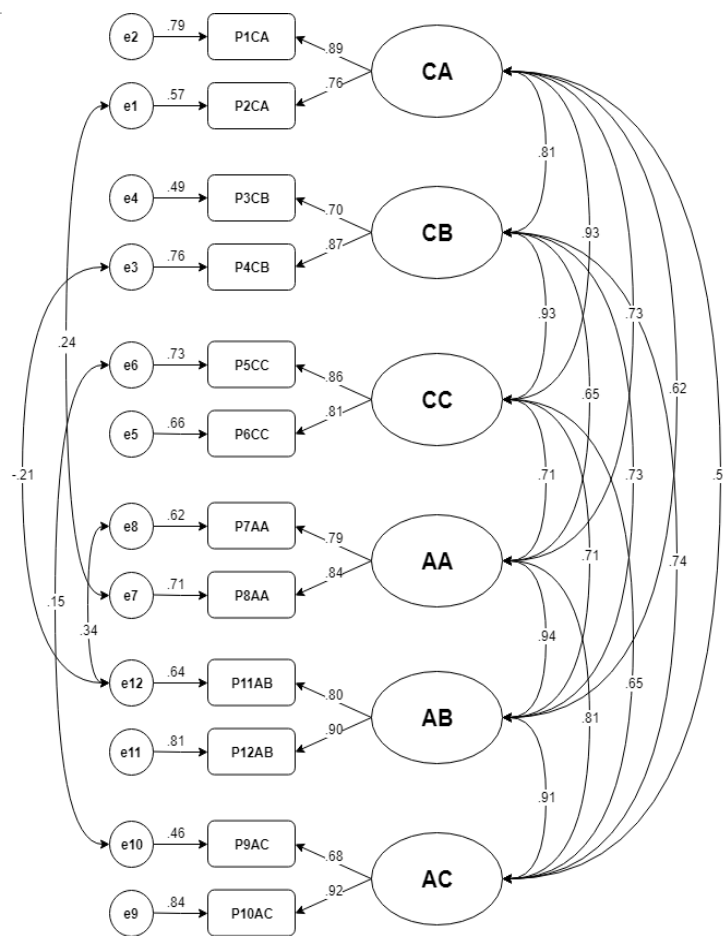
Table 3 *Parameter estimates of the LSRS*

			<i>Standardized Regression Weight</i>	<i>S.E.</i>	<i>C.R.</i>	<i>p</i>
Parcel 1 CA	<---	CA	.889	.056	20.808	.001
Parcel 2 CA	<---	CA	.758			
Parcel 3 CB	<---	CB	.700	.040	19.170	.001
Parcel 4 CB	<---	CB	.871			
Parcel 5 CC	<---	CC	.856	.038	24.543	.001
Parcel 6 CC	<---	CC	.814			
Parcel 7 AA	<---	AA	.787	.033	21.523	.001
Parcel 8 AA	<---	AA	.844			
Parcel 11 AB	<---	AB	.799	.027	24.598	.001
Parcel 12 AB	<---	AB	.898			
Parcel 9 AC	<---	AC	.679	.035	18.112	.001
Parcel 10 AC	<---	AC	.916			

Note. CA – Child Affect; CB – Child Behavior; CC – Child Cognitions; AA – Adult Affect; AB – Adult Behavior; AC – Adult Cognitions.

Running the confirmatory factor analysis, each item parcel was allowed to load on its suggested factor and all six factors were considered as related to each other. The results indicated a good model fit for the data [$\chi^2(39) = 224.700, p < .01; \chi^2/df = 5.76; TLI = .94, CFI = .96$

and $RMSEA = .09, SRMR = .04$]. The goodness-of-fit indices (TLI, CFI, and SRMR) suggested that the six-factor model fit is adequate. Compared with item-level data, model based on parceled data indicated better fit for the current data. Yet, the modification indexes were exam-



Note. CA – Child Affect; CB – Child Behavior; CC – Child Cognitions; AA – Adult Affect; AB – Adult Behavior; AC – Adult Cognitions.

Figure 1 Path diagram for six-factor model of the confirmatory factor analysis with standardized regression weights

ined and modifications suggested by the program were checked. According to these suggestions, the error covariance of parcel P2CA-P8AA; parcel P7AA-P11AB; parcel P4CB-P11AB and parcel P5CC-P9AC were freely estimated, since they measure the similar affects, cognitions or behaviors.

New results indicated a good model fit for the data [$\chi^2(35) = 139.534, p < .01; \chi^2/df = 3.99; TLI = .96, CFI = .98$ and $RMSEA = .07, SRMR = .03$]. The chi-square difference test, $\chi^2 \text{diff}(4) = 85, 166, p < .001$, indicated that the conducted modification improved the model significantly. Figure 1 represents the confirmatory factor analysis result. Since the modified CFA result was better, a second order CFA and Multi-group CFA were conducted with modification indices.

Overall, model fit indices showed that the six-factor structure became a better fit with particular modifications. Each parameter's estimated value (column 1), standard error (column 2), and critical ratio (column 3) are listed in Table 3.

Factor Intercorrelations for the First-Order Model

The factor intercorrelations for the six first-order factors are presented in Table 4. All six factors of the scale were found to be moderately to highly correlated. Particularly, the three adult subscales and the three child subscales were found to be more strongly correlated

among each other. From the theoretical point of view, the correlations were expected.

Second order CFA

Second order CFA was performed to assess whether or not Lifespan Sibling Relationship construct loads into six underlying sub-constructs (CA, AA, CC, AC, CB, and AB). The result showed good model fit for the data [$\chi^2(43) = 199.633, p < .01; \chi^2/df = 4.64; TLI = .95, CFI = .97$ and $RMSEA = .07, SRMR = .03$]. The findings confirmed that the six sub-constructs are the component of the Lifespan Sibling Relationship construct. Therefore, the result indicated that the scale can be scored for both the sub-dimensions and the test as a whole.

Measurement Invariance Using Multi-group CFA

A multi-group CFA was performed to have evidence of measurement invariance to assure that the construct identities are the same across the genders. Specifically, four models (Unconstrained, Measurement weights, Structural covariances, and Measurement residuals) comparisons were used to assess four forms of measurement invariance.

Specifically, configural invariance, metric (factorial) invariance, scalar invariance, and strict factorial invariance were evaluated by compar-

Table 4 *Factor intercorrelations among the subscales of LSRS for the first-order model*

Factor	AB	AC	CA	CB	CC
AA	.94	.81	.73	.65	.71
AB	-	.91	.62	.73	.71
AC	-	-	.53	.74	.65
CA	-	-	-	.81	.93
CB	-	-	-	-	.98

Note. AA – Adult Affect; AB – Adult Behavior; AC – Adult Cognitions; CA – Child Affect; CB – Child Behavior; CC – Child Cognitions. All coefficients are significant at $p < .001$

ing models according to ΔCFI . Since ΔCFI s were found be smaller than 0.01, multi-group CFA result showed excellent model fit for the data to submit the equivalent of the group (see Table 5). Therefore, the measurement model is invariant and the same model can be used across the gender.

Reliability of LSRS

The reliability of the scale was calculated from the internal consistency coefficient (Cronbach’s α). Item-total correlation ranged from .32 – .67. The LSRS had adequate internal consistency for both subscales (for CA $\alpha = .80$, for CB $\alpha = .77$, for CC $\alpha = .81$, for AA $\alpha = .80$, for AB $\alpha = .74$, for AC $\alpha = .83$) and the total scores ($\alpha = .95$). Item-total correlation ranged from .32 – .67. Since all values have been found to be greater than .70, internal consistency values of the scale can be considered as adequate (Nunnally & Bernstein, 1995).

Gender Differences

As it can be seen in the descriptive statistics table (Table 1) above, female participants had higher scores than male participants for each subscale. Furthermore, a two-way (participant

sex by chosen sibling sex) multivariate analysis of variance (MANOVA) was conducted to examine sex differences in LSRS subscales. Using Wilks’s lambda, results showed a significant multivariate effect of participant sex $\Lambda = 0.94, F(6,569) = 6.18, p < .001, \eta^2 = .061$; a significant multivariate effect of sibling sex $\Lambda = 0.97, F(6,569) = 3.19, p = .004, \eta^2 = .033$ and a significant multivariate effect of the interaction between the participant sex and chosen sibling sex $\Lambda = 0.96, F(6,569) = 4.50, p < .001, \eta^2 = .045$. All results of multivariate and univariate analyses of variance (MANOVA and ANOVAs) for the effects of participant’s sex, his/her chosen sibling sex and the interactions between them are presented in Table 6.

For childhood subscales, univariate tests showed that Child Affect and Child Cognition subscales did not differ significantly according to participant sex, sibling sex and the interaction between them. Univariate tests also indicated that among childhood subscales only Child Behavior subscale differed significantly according to participant sex by sibling sex interaction ($F(1,574) = 7.21, p = .007, \eta^2 = .012$), but it did not differ significantly according to the sibling sex. On the other hand, for adult subscales univariate tests demonstrated that female participants reported significantly

Table 5 *Fit statistics of the LSRS Multi-group CFA*

Multi-group comparison factor analysis	χ^2	df	χ^2/df	p	GFI	CFI	RMSEA	ΔCFI
Configural invariance	175.636	82	2.14	< .001	.952	.981	.045	-
Metric (factorial) invariance	175.636	82	2.14	< .001	.952	.981	.045	-
Scalar invariance	195.002	97	2.01	< .001	.947	.981	.042	-
Strict factorial invariance	214.968	113	1.90	< .001	.942	.980	.040	.01

Note. χ^2 – Chi-Square; GFI – Goodness of Fit Index; CFI – Comparative Fit Index; RMSEA – Root Mean Square Error of Approximation

higher scores on Adult Affect ($F(1,574) = 13.01, p < .001, \eta^2 = .022$), on Adult Behavior ($F(1,574) = 20.68, p = .001, \eta^2 = .035$) and on Adult Cognition ($F(1,574) = 4.41, p = .036, \eta^2 = .008$) than male participants. Furthermore, univariate tests also demonstrated that Adult Behavior and Adult Cognition subscales dif-

fered significantly according to participant sex by sibling sex interaction, but only Adult Behavior subscale differed significantly according to participant sex, sibling sex and the interaction between them. All significant interactions are demonstrated in Figure 2, Figure 3, Figure 4 and Figure 5.

Table 6 Multivariate and univariate analyses of variance F ratios for the effects of participant sex and chosen sibling sex

Variable	MANOVA $F(6, 569)$	ANOVA $F(1,574)$					
		CA	CB	CC	AA	AB	AC
Participant Sex	6.18***	.43	3.35	3.19	13.01***	20.68***	4.41*
Sibling Sex	3.19**	2.03	.03	.68	.56	8.22**	2.35
P. Sex x S. Sex	4.50***	.67	7.21**	1.73	3.16	20.05***	9.69**

Note. F ratios are Wilks's approximation of F ; ANOVA – univariate analysis of variance; MANOVA – multivariate analysis of variance; CA – Child Affect; CB – Child Behavior; CC – Child Cognitions AA – Adult Affect; AB – Adult Behavior; AC – Adult Cognitions; * $p < .05$, ** $p < .01$, *** $p < .001$

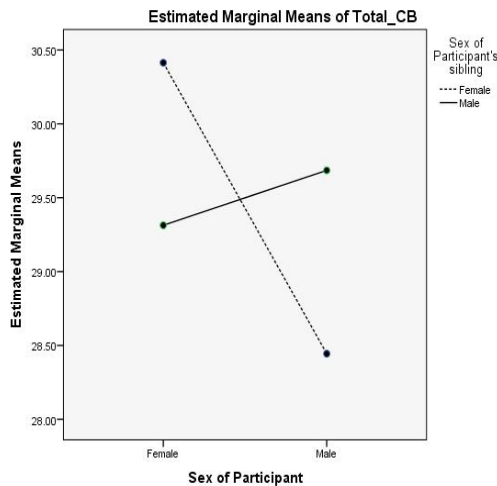


Figure 2 Interaction between sex of participant and sex of participant's sibling on Child Behavior subscale

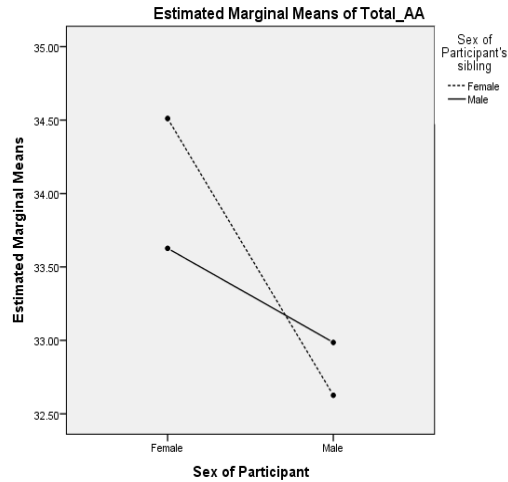


Figure 3 Interaction between sex of participant and sex of participant's sibling on Adult Affect subscale

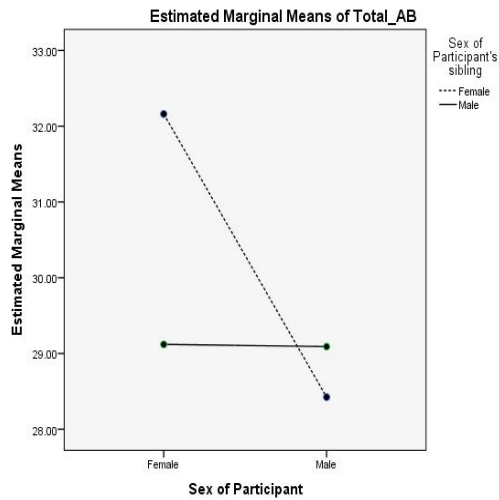


Figure 4 Interaction between sex of participant and sex of participant's sibling on Adult Behavior subscale

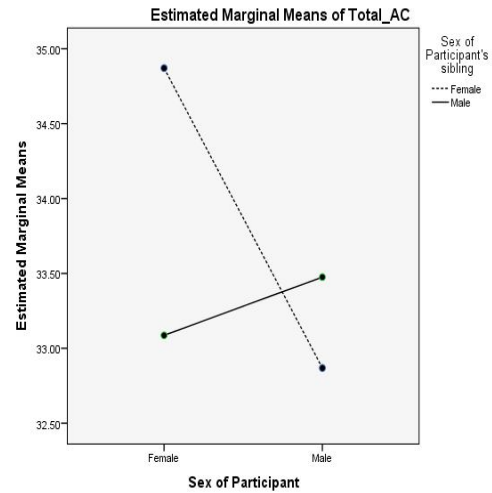


Figure 5 Interaction between sex of participant and sex of participant's sibling on Adult Cognition subscale

Discussion

The aim of the current study was to examine the reliability and validity of the Lifespan Sibling Relationship Scale (LSRS) with a sample of Turkish emerging adults. In order to test the factor structure of the LSRS, the six-factor model suggested by Riggio (2000) was evaluated by testing the first-order model. The results indicated that the original six factor model fits the scores obtained from current sample of the study. Based on the factor intercorrelations for the six first-order factors, moderate correlations between factors were revealed. These results supported the theoretical view that the Lifespan Sibling Relationship (as measured by the LSRS) consists of six separate, yet related constructs. Even though all intercorrelations were found to be significant, three adult subscales (adult affect, adult behavior, adult cognitions) and three child subscales (child affect, child behavior,

child cognitions) were found to be more closely correlated with each other. Furthermore, adult affect and child affect; adult behavior and child behavior; adult cognition and child cognition subscales were also found to have high correlations. In other words, attitudes toward sibling relationship in adulthood were found to be similar to attitudes toward sibling relationship in childhood.

Furthermore, second-order CFA was conducted during scale validation of multidimensional constructs. Although the original study conducted by Riggio (2000) recommended using total score of the scale, it provided no concrete evidence for the use of the total score. In the current study, second-order CFA was performed on the six underlying sub-constructs (CA, AA, CC, AC, CB, and AB), the goodness-of-fit of the model was found to be adequate. The result verified that the six sub-constructs are the component of the Lifespan Sibling Relationship construct. Thus, the scale can be

scored for both the sub-dimensions and the test as a whole. Neither the original study nor the previous Turkish adaptation studies of the LSRS (Öz, 2015; Öz Soysal et al., 2016) attempted to test for a higher-order factor in order to compute a score for the entire scale.

Moreover, multi-group CFA provided further validity evidence for the scale. The result indicated that the measurement model is invariant and the construct identities are the same across the genders. In addition, the reliability of test scores for all subscales and total score revealed good internal consistency reliability, which is consistent with previous studies (Jeong et al., 2013; Riggio, 2000; Sommantico et al., 2017).

Past research has shown that sibling relationships of young women are closer and more intimate than sibling relationships of young men (Connidis, 2001; Dolgin & Lindsay, 1999; Jeong et al., 2013; Pulakos, 1989; Riggio, 2000; Riggio, 2006). In the current study, female emerging adults also reported significantly higher scores than Turkish male emerging adults in Adult subscales, suggesting that female participants have closer and more satisfying relations with their siblings than male participants do. This finding is in line with the results of Riggio (2000) and Sommantico et al. (2017). The current study also revealed that female participants reported significantly higher scores than male participants, particularly on Adult Affect and Adult Behavior subscales. On the other hand, neither the participant's sex nor sibling's sex were found to have a significant effect on the responses to childhood subscales of the LSRS.

As a conclusion, these findings provided evidence about properties of the Turkish version of the scale. In order to enable international researchers to compare their results and explore universal aspects of sibling relationships, it is necessary to test whether the scale is invariant across nations. Then, the Turkish version scale can be applicable to diverse samples for comparison of LSRS across cultures.

However, some of the caveats of the study call for future study to confirm the results. Firstly, during the application of the instruments, participants were asked to choose one sibling who had the greatest influence on them. Future research can also investigate other siblings' influence and role. Moreover, there are a number of factors that affect the sibling relationship quality. In this current study, sex composition of sibling dyads and gender differences were reported. It has been revealed that gender differences were only found in the attitudes toward adult sibling relationship, not in childhood sibling relationship. In other words, as siblings age, gender differences emerge. Future studies can investigate the underlying reasons for this finding. Designing longitudinal studies might reveal the possible causes of gender differences in adulthood. Moreover, further replication studies are required to make definite inferences, since the present study is the first research that investigated gender differences with a Turkish emerging adult sample within the context of sibling relationship. Future researchers may also investigate other structural features of a sibling dyad such as birth order, age difference, and family size.

The present study was designed as a cross-sectional one, so the data was collected at one time point. However, the relationship between the participants and their siblings may change and show variety over time. In this case, gathering data at multiple time points is needed in order to make casual inferences by comparing the results of each time point. Another recommendation for future research is to conduct mixed method studies by integrating the quantitative and qualitative data in order to provide a better insight and deeper understanding of the sibling relationship quality. Gathering data through questionnaires and conducting interviews with both sides of a sibling dyad might also contribute to future sibling relationship research.

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