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Adaptation of the Social and Emotional Loneliness Scale for Adults to Turkish Culture

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Abstract: This study addresses the pervasive human experience of loneliness, shifting from a traditional unidimensional perspective to a more nuanced, multidimensional understanding. The Social and Emotional Loneliness Scale for Adults (SELSA) was developed based on this conceptual shift, and this study focuses on adapting the scale to Turkish culture. Data from 197 Turkish adults (Mean age = 23 years, SD = 5.12) were analyzed using exploratory factor analysis, revealing a three-factor structure consistent with the original scale. The factors, namely social loneliness, romantic loneliness, and family loneliness, explained 23.7%, 17.5%, and 10.4% of the variance, respectively. One item was excluded from the scale due to the lack of contribution to any factor. Clear factor analysis results and high Cronbach's alpha reliability coefficients (0.92, 0.93, and 0.90 for social, romantic, and family loneliness, respectively, and 0.90 for the total scale) indicate strong internal consistency. The findings not only affirm the applicability of SELSA in the Turkish context but also contribute to a nuanced understanding of loneliness. The multidimensional approach, supported by robust psychometric properties, offers a valuable tool for comprehensively assessing and addressing diverse facets of loneliness in Turkish young adults.

Keywords: emotional loneliness; social loneliness; SELSA; factor structure; reliability; validity; Turkey



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1. Introduction

Many decades ago, Robert Weiss (1975) propounded loneliness as the feeling of being socially isolated, which he likened to a persistent and unpleasant disease that has no positive qualities. Loneliness is not merely a lack of social connections but a complex emotional state arising from a perceived mismatch between desired and actual interpersonal relationships (Peplau and Perlman 1982). Definitions vary, but all underscore loneliness as an unpleasant, subjective experience resulting from inadequate social relationships (Peplau and Perlman 1982). The present study aims to culturally adapt the Social and Emotional Loneliness Scale (SELSA; DiTommaso and Spinner 1993) into Turkish, aligning with Weiss's comprehensive understanding of loneliness as a complex emotional state arising from perceived disparities in interpersonal relationships.

1.1. Conceptualization and Theorization of Loneliness

Loneliness conceptually differs from aloneness and solitude, with empirical evidence highlighting the importance of quality over quantity in social connections (Long and Averill 2003). Indeed, Hawkey et al. (2003) showed that the occurrence of loneliness is not related to the length of social engagements or the duration of being alone. Living alone does not necessarily mean that an individual is isolated, experiences loneliness, or has a low level of social participation (Primack et al. 2017). As evidence of this, Evans et al. (2019) indicated that while the frequency of living alone may increase with age, feelings of loneliness may decrease. Moreover, empirical evidence has consistently shown that the quality of social

connections is a more reliable predictor of loneliness than their quantity. This suggests that perceived social isolation, or the sense of feeling disconnected from others, can lead to loneliness even when an individual is surrounded by people (Cacioppo et al. 2000; Lim et al. 2016; Maes et al. 2016; Wheeler et al. 1983). The theoretical framework concerning the inherent human need for social belonging also emphasizes the psychological impact of social interactions and relationships rather than their mere presence or absence (Baumeister and Leary 1995). The other characteristic of loneliness emphasized in the literature is its duration, which varies from temporary to chronic (Young 1982), influencing the overall well-being of individuals.

Loneliness has been found to have strong correlations with various unfavorable outcomes related to mental health, physical well-being, and psychological functioning, including depression (Victor and Yang 2012), poor self-esteem (Cacioppo et al. 2006; Miller 2011; Musetti and Corsano 2021), perceived stress (Cacioppo et al. 2000), alcoholism (Åkerlind and Hörnquist 1992), poor sleep quality (Cacioppo et al. 2002; Hawkey and Cacioppo 2010), aggressive behaviors, social anxiety, and impulsivity (Cacioppo et al. 2014; Ernst and Cacioppo 1999; Kearns et al. 2015), a higher risk for Alzheimer's disease (Wilson et al. 2007), physical health symptoms (Hawkey et al. 2009), chronic work and/or social stress (Hawkey et al. 2009), poor self-rated health (Victor and Yang 2012), disabilities (Luo et al. 2012; Perissinotto et al. 2012), low energy and fatigue (Davies et al. 2021; Hawkey and Cacioppo 2010), decreased inflammatory control, immunity and executive functioning (Cacioppo et al. 2011), and mortality (Davies et al. 2021; Drageset et al. 2013; Georges et al. 2005; Lyyra and Heikkinen 2006; Patterson and Veenstra 2010; Shiovitz-Ezra and Ayalon 2010; Tilvis et al. 2011).

In addition, individuals who experience loneliness often exhibit increased levels of anxiety, anger (both inwardly and outwardly directed), and shyness, while demonstrating decreased levels of sociability, optimism, and social skills (Cacioppo et al. 2000). Furthermore, higher levels of loneliness are associated with dissatisfaction with living circumstances (Hector-Taylor and Adams 1996), poor quality social relationships (Hawkey et al. 2008; Mullins and Dugan 1990; Routasalo et al. 2006), poor social support (Yildirim and Kocabiyik 2010), and low life satisfaction (Tümkeya et al. 2008). Hawkey et al. (2009) also found that lonely individuals face more challenges in regulating their emotions. Overall, loneliness can affect our mental and emotional well-being, physical health, and longevity via a complex interplay of social and biological mechanisms fundamental to human existence. Therefore, deeply understanding and effectively measuring loneliness is of utmost significance.

Loneliness, a complex emotion, has garnered considerable attention in both theoretical and empirical research. Various models, such as the cognitive discrepancy model, social needs theory, socioemotional selectivity theory, evolutionary theory of loneliness, and multidimensional theory of loneliness, have been proposed to elucidate its causes and consequences. The cognitive discrepancy model posits that loneliness arises when there is a dissonance between one's existing and desired social relationships (Paloutzian and Janigian 1987; Perlman and Peplau 1982), emphasizing the subjective nature of loneliness and the role of individual perception. The social needs theory underscores the fundamental human requirement for social interaction (Bowlby and Weiss 1973; Reichmann 1959), positing that loneliness results from unmet social needs (Fardghassemi and Joffe 2022) and emphasizing the crucial role of social connectedness in mental well-being. Weiss's multidimensional theory distinguishes social loneliness, arising from a perceived lack of broader social connections, and emotional loneliness, associated with deficiencies in intimate relationships, highlighting their distinct but interconnected nature. The socioemotional selectivity theory suggests that age influences individuals' prioritization of relationship quantity or quality, impacting the types of loneliness experienced. Finally, the evolutionary model views loneliness as a signal of inadequate social connections, prompting efforts to enhance social bonds essential for survival. While loneliness may evoke negative emotions and self-protective tendencies, the inclination to repair or replace social relationships is expected to prevail, mitigating severe consequences.

Loneliness traditionally was viewed as a unidimensional construct (Russell et al. 1980), but an alternative conceptual approach that admits that loneliness is a multifaceted phenomenon and cannot be captured by a single global measure is the most well-accepted today (e.g., De Jong Gierveld and Van Tilburg 2010; Hyland et al. 2019; Liu and Rook 2013; Sønderby and Wagoner 2013). As mentioned before, Weiss (1975) first proposed the multidimensional theory of loneliness, which distinguishes emotional and social forms of loneliness. The first form pertains to the absence of close social connections, while the latter involves the absence of a broader social circle. Emotional loneliness, a recurring theme across all studies in this area, is commonly linked with the absence or deterioration of intimate attachment relationships. According to Weiss (1975), these relationships are established in romantic pair bonds and family, and dissatisfaction in these relationships may cause feelings of emotional loneliness, involving feelings of detachment, disconnection, or alienation from those close individuals and environments. For older adults, perceptions of ageism and stereotyping exacerbate emotional loneliness (Mansfield et al. 2021). On the other hand, social loneliness is often viewed as an “objective” state determined by the number of social connections a person has. However, it is further explained as a subjective assessment of feeling isolated, absence of companionship, lacking a sense of belonging, and having limited access to a fulfilling social network. In essence, social loneliness refers to a sense of detachment from others. Empirical evidence differentiates emotional and social loneliness (De Jong Gierveld 1987; Russell et al. 1984; DiTommaso and Spinner 1993, 1997; DiTommaso et al. 2004). More specifically, loneliness in various kinds of relationships, such as romantic, family, and social relationships, have been found to be different forms of loneliness (Schmidt and Sermat 1983). DiTommaso and Spinner (1993, 1997) and DiTommaso et al. (2004) assessed romantic and family loneliness as components of emotional loneliness in accordance with Weiss’s typology of loneliness.

Loneliness is a growing concern that is highly prevalent throughout the world. Research indicates that children between the ages of seven and twelve have the lowest prevalence rates of loneliness, with less than 20% reporting experiencing loneliness (Bartels et al. 2008). However, during adolescence, loneliness prevalence rates increase significantly as youths face the challenge of establishing their own identity, with rates ranging between 20% and 71% for late adolescents and young adults (Brennan 1982; Hawthorne 2008; Rönkä et al. 2014). Middle-aged adults report lower levels of loneliness, with prevalence rates ranging between 11% and 30% (Dykstra et al. 2005; Hawthorne 2008). Nevertheless, the prevalence of loneliness tends to increase again during old age, as individuals face increasing frailty, decreased mobility, and the loss of loved ones (Dykstra et al. 2005). In fact, between 40% and 50% of adults over the age of 80 report experiencing loneliness (Dykstra et al. 2005; Victor et al. 2005). Loneliness is also a prevalent issue among different age groups in Turkey, as evidenced by research. For example, a study conducted by Eskin (2001) found that 65% of high school students experience loneliness. Similarly, Buluş (1997) discovered that 15.5% of university students experience a high level of loneliness. Other studies, such as the ones by Odacı (1994) and Özdemir and Tuncay (2008), reported that a significant percentage of university students (48.8% and 60.2%, respectively) also experience loneliness. The available evidence suggests that loneliness is an increasingly pressing concern for society, and therefore, it warrants further investigation.

1.2. Measuring Loneliness

The initial challenge in determining loneliness is the measurement of loneliness itself. It is crucial to comprehend and measure loneliness effectively. While there are measurement tools used in Turkey for assessing the feeling of loneliness, they can be considered limited in number. The measurement tools used in the adaptation of loneliness measurement in Turkey include the UCLA Loneliness Scale (Russell 1996; Demir 1989), the Loneliness Scale in Work Life (Wright et al. 2006; Doğan et al. 2009), the Loneliness Scale for Children (Asher and Wheeler 1985; Kaya 2005), and the YIYO Loneliness Scale for the Elderly (van Tilburg and de Jong Gierveld 1999; Akgül and Yeşilyaprak 2015). Among these scales,

the UCLA Loneliness Scale is widely used as a measuring tool, but it measures loneliness in a unidimensional way.

Akgül (2020) additionally adapted a multidimensional measurement tool, which is the short form of the Social and Emotional Loneliness Scale for Adults (SELSA-S; DiTommaso et al. 2004). The 15-item scale, similar to the long form, encompasses three factors: family, romantic, and social. The family and romantic factors gauge emotional loneliness, while the social factor assesses social loneliness, in line with Weiss's multidimensional theory of loneliness. The original 37-item SELSA (DiTommaso and Spinner 1993) has proven instrumental in effectively assessing loneliness across various cultural contexts. Additionally, Cramer and Barry (1999) have shown that SELSA has better reliability and validity compared to other popular measurement instruments of loneliness, such as the UCLA Loneliness Scale (ULS, Version 3; Russell 1996), the Differential Loneliness Scale (DLS; Schmidt and Sermat 1983), De Jong Gierveld's (1987) multidimensional scale, Russell et al.'s (1984) social and emotional loneliness scale and Loneliness Rating Scale (LRS; Scalise et al. 1984). Although SELSA-S has been successfully adapted to Turkish culture, there is a need to adapt the long version for a more comprehensive understanding of loneliness in the Turkish context.

The long version provides a more extensive range of items, capturing a broader spectrum of emotions and experiences related to loneliness. Turkish culture, with its unique social dynamics and interpersonal relationships, may require a more nuanced approach. The additional items allow for a finer distinction in expressing and understanding loneliness within the cultural context, ensuring a more culturally sensitive assessment. When the specificities of the three subscales were investigated, the need for the version became apparent. First, the long form includes a Romantic Subscale that delves into the complexities of romantic relationships. Turkish cultural norms regarding romantic partnerships differ, and the inclusion of items such as "I have a romantic partner to whose happiness I contribute" addresses the cultural importance placed on mutual contribution to a partner's well-being. This specificity enhances the measure's relevance to the Turkish population. Then, the Family Subscale in the long version delves into family dynamics, a significant aspect of Turkish culture. The items explore feelings of belonging, care, and support within the family unit. This aligns with the cultural emphasis on familial ties, offering a more comprehensive assessment of loneliness within the family context. Last, the Social Subscale, with its exploration of friendships and social connections, addresses the importance of social relationships in Turkish culture. The additional items, such as "I feel 'in tune' with others" and "I have friends that I can turn to for information," provide a more thorough examination of the interconnectedness that is valued within Turkish social circles.

In addition, the original SELSA demonstrates robust internal consistency, as evidenced by Cronbach's alpha scores ranging from 0.89 to 0.93 across its subscales. The original SELSA-S also shows strong internal consistency ranging from 0.87 to 0.90. In contrast, the adapted SELSA-S, while still demonstrating satisfactory internal consistency with alphas ranging from 0.76 to 0.85, falls slightly below the levels achieved by both the original SELSA and SELSA-S. The differences in alpha scores between the two versions highlight the potential for the long version to provide a more reliable and internally consistent measure of loneliness within the Turkish cultural setting. Moreover, the long version's higher internal consistency suggests that the additional items contribute to a more comprehensive and internally consistent assessment of loneliness. This comprehensive coverage is particularly valuable in capturing the multi-faceted nature of loneliness within Turkish culture, where social, emotional, and familial dynamics play intricate roles.

The higher internal consistency of SELSA implies that the measure is more likely to provide valid and precise results in the Turkish cultural context. The reliability of the instrument strengthens its utility in accurately assessing loneliness, which is critical for both research and clinical applications. This study, therefore, aims to adapt the long form of SELSA, originally developed by DiTommaso in 1993, to the Turkish context. This adaptation is expected to contribute significantly to the accurate assessment of loneliness among Turkish adults, addressing the unique socio-cultural nuances inherent in this population.

2. Materials and Methods

2.1. Participants

The initial sample comprised 311 Turkish participants. However, the survey was fully completed by only 197 participants, constituting the final sample size for analysis.

Various rules of thumb regarding sample size for factor analysis have been proposed in the literature. [Streiner \(1994\)](#) recommends a minimum of five subjects per variable or a total of 100 subjects, whichever is greater. Similarly, [Kline \(1994\)](#) recommends a minimum of 100 subjects. Following these guidelines, the sample size of 197 participants is deemed adequate for conducting analyses on SELSA, which encompasses 37 variables.

The mean age of the sample is 23 (SD = 5.12) years, ranging from 18 to 57. Other characteristics of the sample can be found in Table 1.

Table 1. Characteristics of the sample (N = 197).

Characteristics	N (%)
Gender	
Female	117 (59.4%)
Male	80 (40.6%)
Education	
High school	9 (4.6%)
Undergraduate	168 (85.3%)
Postgraduate	20 (10.2%)
Marital status	
Single	134 (68%)
Married	20 (10.2%)
Cohabiting	7 (3.6%)
Girlfriend/boyfriend	36 (18.3%)
Parents' marital status	
Married	163 (82.7%)
Divorced and both are single	10 (5.1%)
Divorced and one of them (or both) is married to another partner	3 (1.5%)
Widowed	10 (5.1%)

2.2. Measures

2.2.1. Demographics and Aloneness

Participants were asked for demographic information, including their sex, education level, and marital status. In addition to these, participants were asked to provide the specific number of individuals in their social network, including family members, housemates, friends, and close friends, individuals whom they could contact in the event of a crisis, and people whom they could visit without prior notice. The objective of these questions was to measure the actual aloneness.

2.2.2. Loneliness

Loneliness was measured with the Social and Emotional Loneliness Scale for Adults (SELSA; [DiTommaso and Spinner 1993](#)). The scale consists of 37 items scored on a 7-point Likert scale ranging from “strongly disagree” to “strongly agree”. High scores indicate high loneliness. SELSA evaluates loneliness in three different dimensions: romantic (e.g., “I have an unmet need for a close romantic relationship.” and “I wish I had a more satisfying romantic relationship.”), family (e.g., “I feel alone when I’m with my family” and “No one in my family really cares about me.”), and social (e.g., “What’s important to me doesn’t seem important to the people I know.” and “I don’t have a friend(s) who shares my views, but I wish I did.”). These subscales are comprised of 12, 11, and 14 items, respectively. Romantic and family subscales measure emotional loneliness and social subscale measures social loneliness. In the original sample, Cronbach’s alphas of the subscales are 0.93, 0.89, and 0.91, respectively.

Because of the lack of Turkish adaptation of SELSA, we translated it into Turkish, and two other native Turkish speakers checked the translation. Exploratory Factor Analysis (EFA) conducted on this Turkish version yielded the same factor structure as in the original study and precisely the same items loaded on the same factor except for one item, which is excluded from the Turkish version (item 6 in romantic factor). Cronbach's alphas indicated very similar reliability coefficients to the original scale, ranging from 0.90 to 0.93 (see the factor analysis in Results for details).

2.3. Procedure

The present study employed a cross-sectional design, and data were collected in Turkey during the period spanning December 2022 through February 2023. An online survey was conducted using the web-based survey tool Qualtrics to collect data from participants, who were recruited via a combination of social media and personal networks. To be included in the study, participants had to meet the criteria of being Turkish adults over the age of 18. The study ensured that participants received information about the research purpose, anonymity guarantees, and voluntary participation via the consent form. The survey took approximately five minutes to complete.

2.4. Data Analysis

2.4.1. Data Preparation

To prepare the data for analysis, several steps were taken. Missing data were examined, and it was found that 1.4% of the data was missing. Individual items within SELSA were found to have missing values ranging from 0% to 3.6%. Listwise exclusion was used for missing cases during the analysis. Normality and outliers were also screened before any analyses. The results of both Kolmogorov–Smirnov and Shapiro–Wilk normality tests indicated that only one variable, total loneliness, was normally distributed (0.05, $p = 0.20$ and 0.99, $p = 0.34$, respectively). In comparison, types of loneliness, including romantic, social, and familial loneliness, conflicts within parental relationships, and the attachment to both mother and father did not exhibit a normal distribution ($p < 0.05$). However, it is noteworthy that the skewness and kurtosis values of all these variables remained within the acceptable range of -2 to 2 , signifying that the data followed a normal distribution.

2.4.2. Validity and Reliability of the Loneliness Scale

The factorial structure of SELSA was assessed by Exploratory Factor Analysis (EFA). To be able to conduct the analysis, visually scanning the correlation matrix, correlations between variables were checked for the absence of potential multicollinearity risk, and no correlation above 0.90 was detected. Multicollinearity was also checked via the determinant of the correlation matrix, which was higher than the necessary value ($8.57 > 0.000001$). Additionally, Bartlett's Test of Sphericity indicated that there were sufficient correlations among variables ($\chi^2 = 4663.36$, $p < 0.001$).

Further, The Kaiser–Meyer–Olkin (KMO) test indicated sampling adequacy for the factor analysis with a KMO value of 0.89. After these preliminary analyses, EFA was carried out on 37 items with an oblique factor rotation (direct oblimin). Oblique rotation was employed to allow correlations between factors. During the factor extraction process, Kaiser's criterion of eigenvalues being over 1, scree plot, and parallel analysis were used to investigate the number of factors to extract. The reliability of the scale was tested via Cronbach's alpha reliability coefficient.

2.4.3. Background and Loneliness Relations

To detect any relationship between demographics and loneliness as well as loneliness types of interest (romantic, family, and social loneliness), t -tests for sex, Pearson's correlations for age, Spearman's correlations for education, and one-way analysis of variances (ANOVA) for marital status and parent's marital status were applied. Furthermore, the cor-

relation between loneliness and the quality of the parent's marriage was examined using the Pearson correlation.

2.4.4. Aloneness and Loneliness Relation

The study utilized Pearson's correlation to explore the possible association between the participants' levels of loneliness (including the three types of loneliness—romantic, family, and social) and the number of individuals around them (i.e., aloneness).

3. Results

3.1. Exploratory Factor Analysis

The objective of this study was to evaluate the validity of SELSA and to achieve this, Exploratory Factor Analysis (EFA) was utilized. An initial EFA with oblique rotation was conducted on 37 items of SELSA to identify the underlying structure of the data. The Kaiser criterion indicated the presence of four factors with eigenvalues greater than 1. However, the commonalities of variables after extraction showed that no commonality was above 0.7 and the average communality was below 0.6, indicating that Kaiser's rules were not met. Additionally, while the first three factors explain 52.17% of the variance, the last factor explains only 2.76% of the variance. A scree plot and parallel analysis suggested three factors to be extracted. In the final EFA, three factors (oblique rotation) were extracted. Results showed a clear factor structure explaining 51.64% of the variance in total. The factor loadings after rotation, as well as the eigenvalues after extraction and the percentage of variance explained by each factor, are provided in Table 2. The highest factor loading of each item is highlighted in bold in the table, ranging between 0.36 and 0.94. As shown in the table, item 11 ("I wish I could tell someone who I am in love with, that I love them.") does not contribute to any of the identified factors above the threshold value of 0.30. As a result, the item was removed from the Turkish version of the scale.

Table 2. EFA Results for the Loneliness Scale.

Item	Communality	Factor Loadings		
		1	2	3
Romantic Loneliness				
*4. I have a romantic partner with whom I share my most intimate thoughts and feelings.	0.89	−0.02	0.94	−0.08
*8. I have a romantic or marital partner who gives me the support and encouragement I need.	0.88	−0.01	0.94	−0.11
*14. I'm in love with someone who is in love with me.	0.89	0.00	0.94	−0.11
*21. I have a romantic partner to whose happiness I contribute.	0.79	−0.04	0.89	−0.11
*18. I have someone who fulfills my emotional needs.	0.66	0.03	0.81	0.04
*7. There is someone who wants to share their life with me.	0.64	0.00	0.80	−0.06
10. I have an unmet need for a close romantic relationship.	0.62	−0.12	0.77	0.12
*16. I have someone who fulfills my needs for intimacy.	0.50	0.24	0.64	0.04
*1. I am an important part of someone else's life.	0.41	0.22	0.56	0.12
15. I wish I had a more satisfying romantic relationship.	0.32	−0.01	0.56	0.05
12. I find myself wishing for someone with whom to share my life.	0.13	−0.09	0.36	0.00
11. I wish I could tell someone who I am in love with, that I love them.	0.07	−0.27	0.06	0.03
Family Loneliness				
*23. I feel close to my family.	0.74	−0.01	0.02	0.86
*17. I feel part of my family.	0.67	0.00	−0.02	0.82
2. I feel alone when I'm with my family.	0.62	0.02	0.03	0.78
*22. My family is important to me.	0.53	−0.07	0.00	0.75
*9. I really belong in my family.	0.52	−0.02	−0.01	0.73
5. There is no one in my family I can depend upon for support and encouragement, but I wish there were	0.55	0.09	−0.09	0.71
*6. I really care about my family.	0.43	−0.19	0.03	0.69
20. There is no one in my family I feel close to, but I wish there were.	0.49	0.03	0.00	0.69
*19. My family really cares about me.	0.49	0.08	0.01	0.66
3. No one in my family really cares about me.	0.36	0.14	−0.04	0.54
13. I wish my family was more concerned about my welfare.	0.21	0.07	0.00	0.43
Social Loneliness				
*13. I have a friend(s) with whom I can share my views.	0.75	0.84	0.06	0.05
*7. I have friends that I can turn to for information	0.68	0.83	−0.03	−0.04

Table 2. Cont.

Item	Communality	Factor Loadings		
		1	2	3
11. I don't have a friend(s) who understands me, but I wish I did.	0.58	0.79	0.00	−0.07
2. I don't have a friend(s) who shares my views, but I wish I did.	0.57	0.77	0.03	−0.06
*3. I feel part of a group of friends.	0.62	0.77	−0.07	0.04
*10. I have friends to whom I can talk about the pressures in my life.	0.59	0.76	0.04	0.02
*9. I can depend upon my friends for help.	0.58	0.74	0.09	0.04
*4. My friends understand my motives and reasoning.	0.46	0.66	0.03	0.03
14. I'm not part of a group of friends and I wish I were.	0.42	0.63	−0.11	0.03
12. I do not feel satisfied with the friends that I have.	0.33	0.59	−0.03	0.04
*6. I have a lot in common with others.	0.34	0.54	0.13	0.05
5. I feel 'in tune' with others.	0.40	0.52	0.05	0.20
*8. I like the people I hang out with.	0.18	0.43	0.01	−0.02
1. What's important to me doesn't seem important to the people I know.	0.22	0.38	0.03	0.18
Eigenvalues		8.77	6.48	3.85
% of variance		23.70	17.52	10.42

* Reverse-coded items.

These three factors were ultimately preserved in the loneliness scale, mirroring the composition of the original scale. Similarly, the first factor refers to “social loneliness”, the second to “romantic loneliness” and the third to “family loneliness”.

3.2. Descriptive Statistics

Table 3 presents the means and standard deviations of the scale and three subscales, along with the gender-based differences. Notably, the data indicate no significant distinctions between men and women in terms of both overall loneliness and the three dimensions of loneliness, namely romantic, family, and social loneliness.

Table 3. Descriptive statistics of SELSA and gender differences.

Variables	M	SD	Mean (SD)		t-Test	Effect Size
			Men	Women	t (df)	Cohen's d [CI]
Social loneliness	2.67	1.08	2.73 (1.05)	2.59 (1.07)	−0.19 (187)	−0.13 [−0.42 0.16]
Romantic loneliness	4.18	1.71	4.10 (1.96)	4.26 (1.55)	0.63 (187)	0.09 [−0.20 0.39]
Family loneliness	2.31	1.04	2.25 (1.05)	2.32 (1.04)	0.48 (187)	0.07 [−0.22 0.36]
Loneliness	3.09	0.81	3.08 (0.96)	3.09 (0.72)	0.10 (187)	0.02 [−0.28 0.31]

3.3. Intercorrelations and Internal Consistency

Cronbach's alpha scores were computed to assess the internal consistency of all subscales. Table 4 presents the Cronbach alpha coefficients and intercorrelations among the subscales. Notably, all Cronbach's alpha coefficients surpass 0.9, signifying that each of the three subscales exhibits desirable levels of reliability.

Table 4. Intercorrelations and Cronbach's Alpha scores of SELSA subscales.

	1.	2.	3.	Cronbach's α
1. Social loneliness	1.0			0.92
2. Romantic loneliness	0.09	1.0		0.92
3. Family loneliness	0.38 *	0.02	1.0	0.90

Note: $n = 189$; * $p < 0.001$.

The only noteworthy correlation is observed between social and family loneliness, albeit the magnitude is moderate. Correlations between social and romantic loneliness, as well as romantic and family loneliness, are not statistically significant. These low intercorrelations among the subscales support the conclusion that they represent distinct dimensions.

3.4. Criterion-Related Validity

Loneliness has consistently been demonstrated in the literature to be unrelated to the literal state of being alone. In light of this, the measure of aloneness was employed to assess criterion-related validity, aiming to explore the association between loneliness and the experience of being alone (see Table 5 for the descriptive statistics). The results revealed that there are only small negative correlations between social loneliness and the number of close friends ($r = -0.15$, $p = 0.039$) and the number of people who can be contacted during an emergency ($r = -0.15$, $p = 0.045$). However, the study discovered that loneliness was not significantly related to the number of family members, friends, roommates, acquaintances available for a casual chat, people who allow them to visit without prior notice, individuals with whom they can easily share their problems or worries, confidants with whom they can express their genuine thoughts and feelings, and companions with whom they can enjoy and have fun. Consequently, criterion-related validity is mainly confirmed.

Table 5. Descriptive statistics of social networks.

Variables	Range	Mean	SD
Family member	0–9	3.58	1.32
Housemate	0–350	4.61	25.25
Friends	0–26,262	174.7	1905.95
Close Friends	0–100	5.66	8.74
Emergency contacts	0–300	7.84	23.00
People you can call for casual conversation	0–999	17.76	76.95
People you can visit unannounced	0–300	5.33	22.07
People you can share your troubles with	0–300	6–77	22.82
People can you share your deepest feelings and thoughts with	0–300	5.44	22.47
People you can share laughter and enjoy with	0–26,262	154.05	1919.64

3.5. Background Variables and Loneliness Relations

The relationship of loneliness with sex, age, education, marital status, parent's marital status, and the quality of parent's marriage was analyzed using, *t*-test, correlation, and analysis of variance. This comprehensive examination aims to contribute valuable insights into the validity of the adaptation process by exploring the associations between loneliness and various demographic and family-related factors. *T*-test results indicated that males and females did not differ from each other in either the amount of overall loneliness or the specific types of loneliness experienced (Table 3). The Pearson correlation analysis yielded that total loneliness and romantic loneliness are negatively correlated with age ($r = -0.23$, $p = 0.004$ for loneliness, $r = -0.27$, $p < 0.001$ for romantic loneliness), indicating that as individuals age, they typically experience a decrease in feelings of loneliness, both in general and specifically in their romantic relationships. Additionally, we conducted a hierarchical regression analysis to explore the predictive role of the interaction between age and gender on loneliness. In Step 1, the main effects were introduced, while the interaction effect was added in Step 2. Gender was dummy-coded (0 = female, 1 = male), and age was mean-centered. The results revealed a significant interaction effect of Age X Gender ($\beta = -0.20$, $t(193) = -2.59$, $p < 0.05$). This suggests that loneliness tends to decrease with age for both males and females; however, this decrease is more pronounced for males ($\beta = 5.08$) than females ($\beta = 3.50$). It is noteworthy that male participants exhibit higher levels of loneliness before the age of approximately 22 compared to their female counterparts. However, beyond this age, a shift occurs in the loneliness dynamics, with females emerging as more susceptible to loneliness.

Age was, initially, a significant predictor of loneliness ($\beta = -0.20$, $t = -2.80$, $p < 0.05$), but its significance diminished after introducing the interaction term to the model ($\beta = -0.11$, $t = -1.40$, $p > 0.5$). The main effect of gender was not statistically significant ($\beta = -0.04$, $t = -0.51$, $p > 0.5$).

The Spearman correlation analysis showed that education is moderately and negatively associated with loneliness ($r = -0.26$, $p < 0.001$), including romantic ($r = -0.20$,

$p = 0.006$), family ($r = -0.17, p = 0.02$), and social loneliness ($r = -0.19, p = 0.008$). This indicates that as education increases, the level of loneliness decreases.

Moreover, a one-way ANOVA showed significant effects of marital status on total loneliness ($F(3,193) = 17.91, p < 0.001$) and romantic loneliness ($F(3,193) = 88.83, p < 0.001$). Post hoc analyses using the Tukey post hoc test indicated that the mean of overall loneliness of singles is significantly higher ($M = 3.35, SD = 0.67$) than married ($M = 2.50, SD = 0.73$) and cohabiting participants ($M = 2.90, SD = 1.08$). Furthermore, singles have significantly higher romantic loneliness ($M = 5.07, SD = 1.14$) than participants who are married ($M = 2.41, SD = 0.83$), who cohabit with a romantic partner ($M = 2.23, SD = 1.12$), as well as who have a girlfriend or a boyfriend ($M = 2.24, SD = 1.17$). However, the results did not show any significant differences between being married, living together, or being in a romantic relationship regarding experiencing overall loneliness and romantic loneliness.

In addition, another one-way ANOVA pointed out that the effect of parents' marital status does not have any significant effect on loneliness and any types of loneliness ($F(3,182) = 0.34, 1.18, 2.70$, and 0.67 , respectively, all $p > 0.05$). Lastly, the quality of a parent's marriage has a moderate and negative correlation with family loneliness ($r = -0.35, p < 0.001$) and a small negative correlation with total loneliness ($r = -0.17, p = 0.03$). This suggests that if the quality of a parent's marriage declines, their children are likely to feel lonelier, especially in the family context.

4. Discussion

Loneliness stands as a prominent psychological concern, with a mounting number of individuals experiencing its effects with each passing day. Loneliness is associated with a plethora of adverse emotional, behavioral, and cognitive consequences, including but not limited to low self-esteem, high social anxiety, behaving less trusting and more hostile fashion, negative perceptions of other people's intentions and actions, negative self and other views, lack of confidence, and difficulties in social relationships and skills (e.g., Cacioppo et al. 2006; Cacioppo and Patrick 2008; Kiliç and Sevim 2005; Şentürk and Kirazoğlu 2010). As such, it is crucial to measure loneliness thoroughly and meticulously. In line with this, the present study aimed to adapt SELSA to Turkish culture. The original 37-item SELSA (DiTommaso and Spinner 1993) has been widely effective in evaluating loneliness across diverse cultural contexts. While the adaptation of SELSA-S to Turkish culture has been successful, there is a recognized need to adapt the longer version for a more comprehensive and nuanced exploration of loneliness within the Turkish context.

Initially, to test construct validity, the exploratory factor analysis conducted on SELSA, consisting of a total of 37 items, reveals that all items aggregate into three factors with eigenvalues greater than one. This indicates that similar to the original version, the scale maintains a three-factor structure. The items exhibit factor loadings ranging from 0.36 to 0.94, and each item is loaded to exactly the same factor as the original SELSA (DiTommaso and Spinner 1993). Collectively, these three factors account for 51.64% of the variance, a value very close to the explained variance observed in the origin again (i.e., 52.4%). These findings affirm the effective construct validity of the scale.

Additionally, this study unveiled that SELSA demonstrates strong measurement reliability when assessing romantic, family, and social loneliness among Turkish adults. High Cronbach alpha scores as well as low correlations between subscales justify that social, family, and romantic loneliness are relatively distinct constructs. These results are consistent with ones from the original long-form SELSA (DiTommaso and Spinner 1993), short-form SELSA-S (DiTommaso et al. 2004), and Turkish-adapted SELSA-S (Akgül 2020). Taken together, these results provide strong validity evidence for the adapted SELSA.

Earlier studies indicated that the quality, but not quantity, of relations is related to loneliness (e.g., Evans et al. 2019). Thus, a correlation analysis was performed to test the relation between the feeling of loneliness and actual aloneness measured by some questions about the number of people in their lives. The results of the analysis indicated that only social loneliness has weak associations with a small number of close friends or limited

emergency contacts. Loneliness is typically understood as a feeling of social isolation and dissatisfaction with one's current social relationships, according to established definitions (Bowlby and Weiss 1973; Peplau and Perlman 1982). This means that loneliness is not necessarily determined by the number of people in our lives but by our perception and need for relationships. This fact has been supported by various studies (e.g., Cacioppo et al. 2009; Cutrona 1982).

The small but significant correlations that we found, on the other hand, are consistent with prior research indicating that the significance people place on having a large number of friends tends to differ depending on age. Specifically, studies conducted on young adults, such as research by Victor and Yang (2012) suggest that younger individuals tend to prioritize having a greater number of relationships, whereas older individuals tend to prioritize the quality of their relationships. These results are also consistent with the socioemotional selectivity theory, suggesting that younger individuals tend to have larger and more varied social networks, which consist of a greater number of relatively new acquaintances (Carstensen et al. 1999). Similarly, Durualp and Çiçekoğlu (2013) found that Turkish adolescents who do not have close friends and report dissatisfaction with their relationships are more likely to experience loneliness. During and after adolescence, having friends becomes increasingly important, and teenagers often seek out peer groups with whom they can share their innermost thoughts and problems, as well as enjoy themselves (Baran 2011). Based on this previous research, it is understandable to find in the current study that individuals tend to experience increased feelings of loneliness as the number of close friends and emergency contacts diminishes.

In addition, the smallness of these correlations could be due to the nature of the sample group, which includes individuals with both romantic partners (such as those who are married, in a relationship, or cohabiting) and those without. Past research has suggested that individuals with romantic partners tend to place less value on having friendships (Kalmijn 2012) and that their friendship networks tend to shrink once they enter a romantic relationship (Kalmijn 2003). Therefore, combining these two types of individuals in the same study sample may have influenced the results of the study. On the other hand, the study findings revealed that loneliness did not exhibit a significant correlation with various social factors, including the number of family members, friends, roommates, acquaintances available for casual conversations, people permitting unannounced visits, individuals for sharing troubles, confidants for expressing genuine thoughts and feelings, and companions for enjoyment and leisure. Consequently, the criterion-related validity of the measure is primarily affirmed.

Romantic loneliness demonstrated a significant correlation with involvement in a romantic relationship, regardless of marital status, cohabitation, or having a girlfriend/boyfriend, thus providing evidence of concurrent validity. In contrast, no discernible relationship was identified between the same measure and social or family loneliness. This finding supports the discriminant validity of the loneliness scales, indicating that they effectively measure distinct aspects of loneliness. These align with the findings of Russell et al. (1984), indicating that emotional loneliness was associated with deficiencies in romantic and dating relationships rather than deficits in friendships and family relationships.

In summary, this Turkish adapted SELSA demonstrates psychometric properties akin to those of the original 37-item SELSA and 15-item SELSA-S, both of which are multidimensional measure for assessing loneliness. As a result, it can be employed in research studies to assess the levels of loneliness among Turkish adults.

Limitations and Future Suggestions

The study's examination of sociodemographic correlates of loneliness within the sample is subject to certain limitations that warrant consideration. Notably, the non-representative nature of the sample, potentially skewed towards younger individuals, including students and conveniently available participants, introduces a potential source of bias. This is particularly pertinent when interpreting findings related to sociodemographic

factors like age. Furthermore, the analysis reveals uneven representation in subgroups, with some groups having notably small sample sizes, such as the cohabiting group with only 3.6% and parents who are divorced, and one of them (or both) is married to another partner with only 1.5% of respondents. While equal sample sizes among subgroups are not an explicit assumption of the analysis of variance, it is important to note that deviations from equal sample sizes may pose a risk. This risk primarily involves the potential reduction in statistical power and a decrease in the robustness of the analysis, particularly in the presence of unequal variances. Therefore, the disparities in subgroup sizes may impact the reliability and generalizability of the comparative analyses.

In light of these limitations, caution is advised in generalizing the findings to broader populations, as the lack of representativeness may compromise the external validity of the results beyond the characteristics of the study sample. Therefore, the conclusions drawn from the subsequent statistical analyses are labeled as partial findings due to uneven sample sizes across subgroups. We recommend that future studies carefully consider and address this limitation when attempting to replicate or extend these findings. Additionally, addressing the issue of small subgroup sizes could involve implementing a stratified analysis approach to ensure adequate representation within each subgroup, thereby improving statistical power and reliability.

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