

**Received:** December 15, 2015

**Revision received:** November 25, 2015

**Accepted:** February 7, 2016

**OnlineFirst:** April 5, 2016

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[www.estp.com.tr](http://www.estp.com.tr)

**DOI** 10.12738/estp.2016.2.0380 • April 2016 • 16(2) • 553-578

*Research Article*

## Serial Multiple Mediation of General Belongingness and Life Satisfaction in the Relationship Between Attachment and Loneliness in Adolescents

Mehmet Ali Yıldız<sup>1</sup>

*Adiyaman University*

### Abstract

The current research aims to investigate the serial-multiple mediation of general belongingness and life satisfaction in the relationship between loneliness and attachment to parents and peers in adolescents. The participants of the research consisted of 218 high school students ( $F = 126$ , 57.8%;  $M = 92$ , 42.2%). Age of the participants' ranged between 14 and 18 with a mean of 15.84 ( $SD = 1.42$ ). Instruments in the current research included the Personal Information Form, Inventory of Parent and Peer Attachment, UCLA Loneliness Scale, General Belongingness Scale, and Satisfaction with Life Scale. Data analysis was conducted using descriptive statistics, the Pearson correlation coefficient, ordinary least-squares regression analysis, and bootstrap method. Based on the research findings, the serial-multiple mediation of general belongingness and life satisfaction in the relationship between loneliness and attachment to parents and peers was found to be statistically significant. Findings of the study were discussed under the light of relevant literature, and some suggestions were made for future studies.

### Keywords

Attachment • Loneliness • General belongingness • Life satisfaction • Bootstrap method •  
Serial-multiple mediation

<sup>1</sup> Correspondence to: Mehmet Ali Yıldız (PhD), Department of Guidance and Psychological Counseling, Faculty of Education, Adiyaman University, Adiyaman, Turkey. Email: maliyildiz@adiyaman.edu.tr & alipdr@hotmail.com

Citation: Yıldız, M. A. (2016). Serial multiple mediation of general belongingness and life satisfaction in the relationship between attachment and loneliness in adolescents. *Educational Sciences: Theory & Practice*, 16, 553-578.

Attachment is defined as the emotional bond a person builds with someone significant in their lives (Ainsworth, 1969, p. 2; Becker-Weidman & Shell, 2010, p. 1; Bridges, 2003, p. 177). During infancy and childhood, bonds are established with parents (or caregivers) who are looked to for protection, comfort, and help. These bonds are sustained throughout the adolescence and adulthood, but are commonly completed through new bonds with people of the opposite sex (Bowlby, 2012, p. 213). One of these bonds shows up in peer attachment. According to Hazan and Shaver (1994, p. 8), if peers perform the same priority functions as one's parents did during infancy and childhood, and if peers satisfy the individual's same needs for support and safety as their parents did, then after a while, the bond of attachment is expected to be transferred from parents to peers. Ainsworth (1969, p. 2; Bowlby, 2012a, p. 135), on the other hand, emphasized that the attachment builds later, whether to parents or peers, and tends to be sustained; this attachment is not a term that implies a temporary relationship or emotional bond. Namely, an attachment figure and the need for a secure personal base are not limited to children. This need is crucial for adolescents and adults (Bowlby, 2012a, p. 134–135). In this respect, Ainsworth (1969, p. 2) stated that attachment may occur at any age and does not refer to immaturity or helplessness. Similarly, Bowlby (1979, p. 129; 2012, p. 166; 2012b, p. 107) emphasized that any formed attachment tends to sustain, and the attachment is a life-long phenomenon lasting from the cradle to the grave. Thus, attachment begun in infancy was determined to last until young adulthood in a longitudinal study by Waters, Hamilton, and Weinfield (2000). In Fraley's (2002) meta-analysis of the results of longitudinal studies on whether attachment lasts from infancy to adulthood, attachment was found to last until adulthood at a stable medium-level.

Bowlby (2012b, p. 14) emphasized that mother-child attachment brings along very powerful affects or emotions like happiness and sadness. Bailham and Harper (2004, p. 49) stated that the interactions between children and their primary caregiver in the first two years of life provide the building blocks for children's relationships. The quality of this relationship in early childhood significantly influences a child's physical, emotional, behavioral, cognitive, and social development. According to Shaver and Mikulincer (2007, p. 652), children being protected and supported in an attachment relationship helps them function better in non-attachment domains, such as exploration, creative thinking, being empathic towards others, and having prosocial behaviors. Bowlby (2012, p. 158–213) emphasized that the capacity to build relationships with others is considered a basic characteristic of effective personality functions and mental health, and that attachment relationships serve a key role for individual survival. Today, there is sound and impressive evidence that the attachment style an individual develops during infancy, childhood, and adulthood is seriously influenced by the parents' (or caregivers') behavior patterns towards the individual (Bowlby, 2012, p. 162). Ainsworth et al.'s (1978) "Strange Situation" procedure is an

example of this (as cited in Bowlby, 2012, p. 218). During this process, children were observed while briefly separated and reunited with their caregivers. In their research, Ainsworth et al.'s (1978) defined three styles of attachment: secure, anxious-resistant, and avoidant. Main and Solomon (as cited in Shorey, 2009, p. 65) later contributed the fourth style: disorganized (Bowlby, 2012, p. 218–219; Shorey, 2009, p. 65). The first is the secure style of attachment. Children develop secure attachments who find themselves in a relationship with their parents that adequately provide sensitive, loving, harmonious, consistent, proper, and accepting care (Howe, 2005, p. 31). These children develop management skills through their interactions with their caregivers and expect that their emotional needs will be satisfied by the caregivers (Calkins & Hill, 2007, p. 236). The second style of attachment is anxious-resistant attachment, where the individual does not feel assured that their parents are available or will respond when asked for help. Due to this uncertainty, the individual, worried about exploring the world, has separation anxiety and a tendency to stick to their parents. The third style of attachment is the avoidant attachment. In such attachment, the individual does not feel confident about receiving a helpful response when seeking care. On the contrary, the individual expects rejection in such a situation. This style of attachment, with a more latent conflict, develops based on being reprimanded by the mother whenever the individual approaches her for comfort and protection (Bowlby, 2012, p. 162–163, 219). The fourth style of attachment is disorganized attachment. Children, unable to organize their behaviors or develop a mechanism of defense for seeking security or company, experience increased and disorderly distress and arousal. Whatever the behavioral strategy the child uses, they do not find affection, comfort, or attention. Although there is not an explicit way of regulating the emotionality that occurs, the child, often abused and seriously ignored, is left distressed (Howe, Brandon, Hinings, & Schofield, 1999, p. 29). In relation to consequences, secure attachment is associated with well-being whereas insecure attachment is associated with challenges (Diener & Diener McGavran, 2008, p. 350–351).

The attachment system is an internal working model or an envisioned world that includes one's self and significant others where interpersonal relationships are represented and behaviors are then accordingly exhibited (Becker-Weidman & Shell, 2010, p. 1). The internal working model is the sum of an individual's thoughts that define one's memories, emotions, behaviors, and expectations, thereby shaping the individual's behaviors. Attachment-related behaviors such as preferring certain people over others, physically approaching or distancing one's self from attachment figures, asking people for help, and showing sadness for loss are defined by this internal model (Mercer, 2006, p. 39). When children's attachment needs are satisfied, others are worth giving love to or receiving love from in their internal working model; these children can also be loved, valued, and affected. Relationships represent a secure basis for exploring the world. However, children whose attachment needs

are not satisfied have a mostly negative internal working model and are left feeling unattended, unvalued, unaffected, humiliated, and unwanted. Thus, their internal working model does not care about others, registering others as uncaring, holding back, indifferent, and unfriendly; consequently, these children are not able to find adequate safety in a relationship that cannot provide a secure basis (Taylor, 2010, p. 22). These individuals' internal working model in adolescence or adulthood is considered to be significantly influenced by their early experiences of attachment (Steinberg, 2007, p. 376). Children with satisfied attachment needs can love other people, find significance and closeness, and feel belongingness towards their parents and other people in close relationships through the trust that they have developed. Moreover, secure and healthy attachment is expected to positively influence individuals' belongingness. However, insecure and unhealthy attachment may likely lead to a lack of belongingness within the individual. Chen et al. (2012) found a positive relationship between insecure attachment and social disconnection in adolescents in their study. In other studies, significant-level relationships were found between attachment styles and need for belongingness (Chen, Hewitt, & Flett, 2015; Greenwood & Long, 2011; Leary, Kelly, Cottrell, & Schreindorfer, 2013; Venta, Mellick, Schatte, & Sharp, 2014).

According to Hagerty, Lynch-Sauer, Patrusky, Bouwsema, and Collier (1992, p. 236), sense of belongingness is defined as the personal experience of involvement in a system or environment based on the individual's feeling inseparable from parts of that system or environment. Sense of belongingness is described in two dimensions. The first is about valued involvement where the individual experiences feelings of value, need, and acceptance. The second is about fit, where the individual's perception of individual characteristics are complementary to the system or environment. According to Baumeister and Leary (1995, p. 500) on the other hand, belongingness has two basic features. The first is about a person often needing a personal relationship or interaction with another individual. Ideally, these interactions are expected to be emotionally positive and make the individual happy; however, most of these interactions basically require avoiding conflicts and negative emotions. The second is that people need to foresee the future continuation of their relationships, as well as to perceive affective attention, interpersonal bonds, and continuity. In this sense, an individual's interactive relationship with another person is a substantially ensured bond, and the perception of this bond is required for satisfying the sense of belongingness. Leary et al. (2013) found a positive relationship with belongingness to building secure and satisfying interpersonal relationships.

Low or unsatisfied levels of belongingness in individuals may be said to lead to loneliness. Thus, significant-level relationships were found between belongingness and sense of loneliness in yet other studies (Chipuer, 2001; Mellor, Stokes, Firth,

Hayashi, & Cummins, 2008). Asher and Paquette (2003, p. 75) described loneliness as a cognitive awareness of deficiency upon reactions to sadness, longing, or emotional emptiness in an individual's social and personal relationships. Perlman and Peplau (1984, p. 13–15; 1998, p. 571), on the other hand, have defined loneliness as the subjective psychological distress experienced when there is considerable deficiency in the quality and quantity of individuals' social relationship networks. Loneliness is often an unpleasant and distressful experience, as well as a threat to one's mental health when extensively and extendedly experienced. Margalit (2010, p. 1) stated that loneliness is a source of distress with short and long-term negative consequences, as well as being a considerable developmental problem. According to Krause-Parelio (2008, p. 66), loneliness is an affective phenomenon that may negatively impact an individual's physical and mental development, as well as inhibit one's social development.

Adolescents, compared to young children, are considered to be at a higher risk of experiencing loneliness. Adolescents tend to experience high-levels of personal distress during adolescence due to disconnecting from parental attachment in their active search for identity and increased need for peer relations and appreciation (Margalit, 2010, p. 36–37). During adolescence, as in all stages of development, considerable social needs include acceptance from family, peers, and other social environments; being in a relationship; and feeling supported. When this social need is not satisfied, the individual may prefer avoiding social environments, experiencing a disruption in social and personal fit along with a sense of isolation (Yıldız & Duy, 2014, p. 195). Consequently, the individual may feel lonely. In this respect, Asher and Paquette (2003, p. 75) emphasized loneliness as an internal situation that could be strongly impacted by the characteristics of an individual's social life. Individuals' levels of belongingness and life satisfaction may vary based on the quality of their parent and peer attachments. According to Pavot (2008, p. 125), life satisfaction represents an individual's overall judgment dependent on the cognitive appraisal of one's life as a whole. According to Diener, Suh, Lucas, and Smith (1999), life satisfaction includes the desire to change one's life, satisfaction with the past and present, and the views of one's close environment and life. Satisfaction domains in relation to life consist of work, family, leisure time, health, money, self, and a person's close environment. Larsen and Prizmic (2004, p. 49) emphasized that people with high levels of life satisfaction spend time with others, join in groups, have many friends, build social support networks of loving relationships, are often happy with others' availability, and are motivated to participate in more social activities. In this respect, individuals can be expected to develop social relationships and as a consequence, feel that they belong, having an increase in life satisfaction and a decrease in loneliness. Therein, Larsen and Prizmic (2008, p. 275) stated that socialization may be useful in reducing negative affect. For instance, talking about a distressing situation with someone else may provide the opportunity for restructuring the situation through cognitive re-

appraisal and re-interpretation. Thus, the researchers proposed that positive affect may be revealed through sharing how one feels and through other's efforts.

In some studies within the relevant literature, negatively significant relationships have been found between loneliness and attachment to parents and peers (Bogaerts, Vanheule, & Desmet, 2006; Collins, 2003; de Minzi, 2006; Demirli & Demir, 2014; Deniz, Hamarta, & Ari, 2005; Hecht & Baum, 1984; Erözkan, 2004; İlhan, 2012; Karakuş, 2012; Kerns & Stevens, 1996; Kurt, Sayıl, & Tepe, 2013; Levi-Belz, Gvion, Horesh, & Apter, 2013; Man & Hamid, 1998; Moller, Fouladi, McCarthy, & Hatch, 2003). In other studies, on the other hand, significant-level relationships were found in life satisfaction and subjective well-being to attachment (Akbağ & Ümmet, 2013; Deniz & Işık, 2010; Eken, 2010; Jiang, Huebner, & Hills, 2013; Lecce, 2008; Ma & Huebner, 2008; Özer, 2009; Özdemir & Koruklu, 2013; Wei, Liao, Ku, & Shaffer, 2010; Yıldız, 2014). However, negatively significant relationships were found between loneliness and general belongingness (Malone, Pillow, & Osman, 2012; Mellor et al., 2008; Yıldız, 2013).

Determining through general belongingness and life satisfaction how attachment in adolescents influences their loneliness may be crucial for conducting mental health-based studies, particularly preventative ones, and relevant interventions for adolescents to counter the negative effects of loneliness. Determining these relationships through theoretical support and explanations, the current study is thought to contribute considerably to the literature, in particular to the literature on adolescent loneliness. Furthermore, relevant mental health experts such as psychological counselors, psychologists, and psychiatrists may use the findings of this study in their practice with adolescents. As can be seen in the findings of studies within the relevant literature, there are significant-level relationships between attachment, loneliness, belongingness, and life satisfaction as test variables of the model. However, studies have often investigated the direct relationships between these variables while no studies as of yet have tested the mediating relationships among these variables. The current study aims to test the serial-multiple mediation of general belongingness and life satisfaction in the relationship of loneliness to attachment with parents and peers.

## Method

### Research Design

This study has been conducted based on the correlational design. According to Heppner, Wampold, and Kivlighan (2013, p. 272), relational designs are used in order to study relationships between two or more variables. The causal relationships among attachment (predicting variable), general belongingness (mediating variable), life satisfaction (mediating variable), and loneliness (criterion variable) are the research variables that were tested via serial-multiple mediation method and evaluated.

## Participants

The research population consisted of students attending high schools in center-city Adiyaman during the 2012-2013 school year. Participants totaled 218 students attending 9<sup>th</sup> (100 students, 45.9%), 10<sup>th</sup> (30 students, 13.8%), 11<sup>th</sup> (48 students, 22%) and 12<sup>th</sup> (40 students, 18.3%) grades in Adiyaman Yunus Emre Vocational and Technical Anatolian High School and in Adiyaman IMKB Anatolian High School; 126 were females (57.8%) and 92 were males (42.2%). Ages of the participants varied as follows with a mean age of 15.84 ( $SD = 1.42$ ): 14 (34 students, 15.6%), 15 (64 students, 19.4%), 16 (35 students, 16.1%), 17 (72 students, 33%), and 18 (13 students, 6%). The convenient sampling method was used in order to determine the sample group. Convenient sampling is about selecting individuals that can easily be reached to obtain a response in a research (Cohen, Manion, & Morrison, 2007, p. 113–114).

## Instruments

**Inventory of Parent and Peer Attachment (IPPA).** The adaptation study of this scale into Turkish, which had been developed by Armsden and Greenberg (1987) in order to assess parent and peer attachment in adolescents, was conducted by Kocayörük (2010). In IPPA, experiences associated with attachment are measured in three sub-dimensions (trust, communication, and alienation), and the sum of these dimensions also leads to the total score of attachment. Item factor loadings were found as .45 and .87 through explanatory factor analysis. Based on the confirmatory factor analysis, the SRMR varied between .05 and .07; RMSEA was between .06 and .07; GFI varied between .89 and .91; AGFI was between .86 and .89; and CFI varied between .93 and .94, for the fit values of the three sub-dimensions. For the scale reliability, in relation to internal consistency coefficients, Cronbach's alpha was found as  $\alpha = .91$  for mother-attachment total score,  $\alpha = .92$  for father-attachment total score, and  $\alpha = .89$  for peer-attachment total score. The IPPA application on 77 adolescents with a two-week interval for test-retest reliability showed the following correlation values:  $r = .34$  to  $.72$  for mother attachment;  $r = .63$  to  $.81$  for father attachment; and  $r = .46$  to  $.55$  for peer attachment. Significant relationships were found between IPPA and self-esteem with the positive and negative affect scales in the analyses conducted for criterion-related validity. In the current study, the internal consistency coefficient for the total scale was found as .94.

**General Belongingness Scale (GBS).** The General Belongingness Scale (GBS), developed by Malone et al. (2012), is a Likert-type self-evaluation scale used in order to determine individuals' levels of general belongingness. GBS has two subscales: acceptance/inclusion and lack of rejection/exclusion. The adaptation study into Turkish for the scale was conducted by Yıldız (2013). In the study conducted by Yıldız (2013) with 567 adolescents, according to explanatory factor analysis, factor

load values of GBS were found between .55 and .84. All fit indices of the GBS were found at good levels in the confirmatory factor analysis [ $\chi^2 = 153.36$ , df = 53,  $\chi^2/\text{df} = 2.89$ ; RMSEA = .06; RMR = .04; SRMR = .04; GFI = .96; AGFI = .94; CFI = .97; NFI = .96, NNFI = .96]. Significant-level relationships were found between general belongingness and loneliness ( $r = -.64$ ) and between life satisfaction ( $r = .36$ ), parent attachment (between  $r = .21$  and  $.39$ ), and peer attachment (between  $r = .33$  and  $.39$ ) in analyses conducted for criterion-related validity on 140 students. Composite reliability (CR) and average variance extracted (AVE) values of the GBS for acceptance/inclusion sub-scale were found as CR = .77, AVE = .46 (46%); these were CR = .85 and AVE = .63 (63%) for the rejection/exclusion sub-scale, and CR = .90, AVE = .69 (69%) for the overall scale. Cronbach's alpha coefficient for the acceptance/inclusion sub-scale was found as  $\alpha = .76$ , as  $\alpha = .85$  for the rejection/exclusion sub-scale, and as  $\alpha = .81$  for the overall scale. The GBS test-retest reliability coefficient, obtained through administration with a two-week interval on 97 students, for the overall scale was found as  $r = .80$ . In the current study, the internal consistency coefficient for the overall scale was found as .89.

**Satisfaction with Life Scale (SWLS).** The SWLS was developed in order to assess the overall satisfaction of an individual with one's life. The SWLS consists of 5 items in a single dimension and is a 7-point Likert-type scale (with 1= Strongly Disagree and 7= Strongly Agree). The highest obtainable score on the scale is 35 and the lowest is 5. Higher scores on the scale indicate higher life satisfaction. The SWLS is appropriate for measuring adolescent and adult life satisfaction. The adaptation study for the scale into Turkish was conducted by [Köker \(1991\)](#). In reliability studies for SWLS, the test-retest reliability coefficient was determined as  $r = .85$  and item-test correlations were between .71 and .80. In the current study, the scale's internal consistency coefficient was found as .85.

**UCLA Loneliness Scale.** The UCLA Loneliness Scale was developed by [Russell, Peplau, and Ferguson \(1978\)](#). The scale was revised by [Russell, Peplau, and Cutrona \(1980\)](#) with a complete review of items shaped into 10 positives and 10 negatives. The scale's adaptation study into Turkish was conducted by [Demir \(1989\)](#). It is a 4-point Likert-type scale (1= never experienced and 4 = often experienced). The highest obtainable score on the scale is 80 and the lowest is 20. In the validity study conducted by [Demir \(1989\)](#), in order to determine how strongly the UCLA Loneliness Scale identifies individuals that experience a sense of loneliness, the scale was administered to a group of 36 people who had been diagnosed with neurotic depressive disorder and complained about loneliness, as well as to another group of 36 people who had not complained about loneliness. Based on the test results, a significant difference was found between the two groups in relation to the scores obtained on the scale. For the UCLA Loneliness Scale's validity test, correlation levels of .77 and .82 were found

with the Beck Depression Inventory and social introversion sub-scale of the Multi-score Depression Scale, respectively. A high internal consistency coefficient (.96) was found in the scale reliability analysis. A high correlation (.94) was found between the scores obtained for test-retest reliability administering within a two-week interval. In the current study, the internal consistency coefficient for the scale was found as .87.

**Personal Information Form.** Information on the participants' ages, grades, and genders was collected through the Personal Information Form.

## Procedure

The researcher administered the instruments and personal information form to the adolescent volunteers. In consideration of students who had felt tired, the scale forms were presented in different orders, thus reducing the error ratio in the measurement. Application of the scales took 20-25 minutes. Descriptive statistics were used in analyzing the research data, and the relationships between research variables were examined using the Pearson correlation coefficient. Statistical significance of the tested model in the current research was studied through the software developed by Hayes (2012; 2013), the approach based on ordinary least-squares regression, and the bootstrap method. According to Hayes' (2012; 2013) approach, the statistical significance of the indirect mediating effects of variables upon the bootstrap method is evaluated based on whether the point estimate of the mediating variable is zero within a 95% bias corrected and accelerated confidence interval (BCa CI). As such, a variable with a no-point estimate within the zero-interval is considered statistically significant. In addition, through a contrast test conducted with the software developed by Hayes (2012; 2013), specific indirect effects of the variables were determined and the variable with a more powerful mediation for the model was selected upon a comparison of mediating variable pairs. Bootstrap analyses in the current research were conducted using the IBM SPSS, downloaded from <http://www.afhayes.com/spss-sas-and-mplus-macros-and-code.html>, and with the Serial-Multiple Mediation Model 6 from <http://www.afhayes.com/> (Hayes, 2012) through PROCESS Macro. Hayes (2013) recommended 10,000 bootstrap samples to be used for mediation analyses in the test from Serial-Multiple Mediation Model 6. Thus, data obtained from 10,000 bootstrap samples were used in the current study. The significance level of the current study was set as .05. Data analysis in the current study was conducted through IBM SPSS 22.0.

## Results

Pearson correlation analysis was used in order to determine the relationships between research variables. Table 1 includes the obtained findings and descriptive statistics.

Table 1

*Descriptive Statistics and Pearson Correlation Coefficient Values Regarding Study Variables*

Variables	Mean	SD	1	2	3	4	5	6
1. Mother Attachment	71.85	14.55	---					
2. Father Attachment	63.68	16.69	.51**	---				
3. Peer Attachment	69.49	13.40	.41**	.26**	---			
4. General Belongingness	37.80	7.57	.39**	.32**	.37**	---		
5. Life Satisfaction	28.85	7.21	.58**	.54**	.45**	.46**	---	
6. Loneliness	37.54	9.91	-.42**	-.33**	-.64**	-.63**	-.56**	---

Note. N = 218, \*\* $p < .01$ .

Values presented in Table 1 indicate that a positive significant relationship was found between attachment to mother and father and attachment to peers. Positive significant relationships of parental and peer attachment with general belongingness and life satisfaction were found. However, negative significant relationships were found between them and loneliness. On the other hand, a positive significant relationship between general belongingness and life satisfaction was found, but negative significant relationships of general belongingness and life satisfaction with loneliness were found.

To determine the serial-multiple mediation of general belongingness and life satisfaction in the relationship between attachment to mother and loneliness, the regression-based approach and bootstrap method as recommended by Hayes (2012; 2013) was used. In this approach, non-standardized Beta coefficients are calculated in order to reduce Type 1 errors due to distribution. However, through the bootstrap method used for examining indirect effects, values obtained upon re-sampling and problems that may be due to distribution can be controlled. Obtained findings are presented in Figure 1.

As can be seen in Figure 1, total effect ( $c = -.28$ ,  $SE = .04$ ,  $t = -6.78$ ,  $p < .001$ ) of mother attachment on loneliness was at a significant level (Step 1). In addition, the

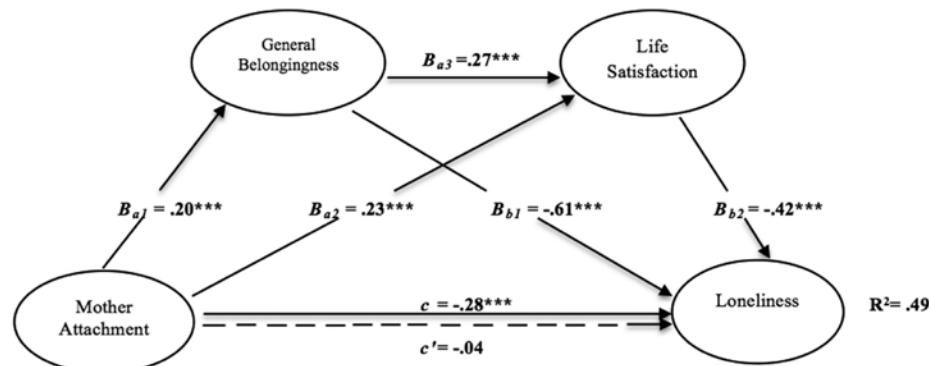


Figure 1. Serial-multiple mediation of general belongingness and life satisfaction in the relationship between mother attachment and loneliness with non-standardized beta values. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

direct effects of mother attachment on general belongingness ( $B = .20$ ,  $SE = .03$ ,  $t = 6.12$ ,  $p < .001$ ) and life satisfaction ( $B = .23$ ,  $SE = .03$ ,  $t = 8.16$ ,  $p < .001$ ) were at significant levels. The direct effect of general belongingness as the first mediating variable on the second mediating variable of life satisfaction ( $B = .27$ ,  $SE = .05$ ,  $t = 4.93$ ,  $p < .001$ ) is on significant level (Step 2). A review of the direct effects of mediating variables on loneliness, on the other hand, showed that the effects of general belongingness ( $B = -.61$ ,  $SE = .07$ ,  $t = -8.34$ ,  $p < .001$ ) and life satisfaction ( $B = -.42$ ,  $SE = .09$ ,  $t = -4.84$ ,  $p < .001$ ) were at significant levels (Step 3). When mother attachment and all other mediating variables were simultaneously entered into the equation (Step 4), the relationship between mother attachment and loneliness, in relation to direct effect, was not at a significant level ( $c' = -.04$ ,  $SE = .04$ ,  $t = -1.06$ ,  $p > .05$ ). Based on this result, the mediating variables were observed to mediate between mother attachment and loneliness. In addition, the model overall was seen to be at a significant level ( $F_{(3-214)} = 68.60$ ,  $p < .001$ ) and explained 49% of the total variance in loneliness.

The comparison of indirect effects and specific effects of adolescents' attachment to mother on their loneliness levels through general belongingness and life satisfaction is included in Table 2.

Table 2  
*Comparison of the Indirect Effects of Mother Attachment on Loneliness through General Belongingness and Life Satisfaction and Its Specific Indirect Effects*

Effects	Product of Coefficients		Bootstrapping 95% BCa Confidence Interval	
	Point Estimate	SE	Lower	Upper
Total Indirect Effects	-.2415	.0383	-.3208	-.1715
Mother → Belongingness → Loneliness	-.1220	.0385	-.2107	-.0611
Mother → Belongingness → Lif.Sat → Loneliness	-.0226	.0082	-.0445	-.0104
Mother → Life Satisfaction → Loneliness	-.0970	.0277	-.1628	-.0507
Contrasts				
Model 1 versus Model 2	-.0994	.0383	-.1900	-.0405
Model 1 versus Model 3	-.0250	.0581	-.1441	.0826
Model 2 versus Model 3	.0744	.0255	.0325	.1344

Note. N = 218,  $k = 10,000$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Model 1 = Mother-Belongingness-Loneliness; Model 2 = Mother-Belongingness-Life Satisfaction-Loneliness; Model 3 = Mother-Life Satisfaction-Loneliness.

Statistical significance of the indirect effects within the tested model in the current research was examined over 10,000 bootstrap samples. Estimates were taken at a 95% confidence interval, and the bias corrected and accelerated (BCa CI) results are presented in Table 2. As seen in Table 2, the total indirect effect (the difference between total and direct effects/ $c-c'$ ) of mother attachment through general belongingness and life satisfaction on loneliness is statistically significant (point estimate =  $-.2415$ ; 95% BCa CI  $[-.3208, -.1715]$ ). Within the tested model, when considering the mediating variables separately and together in relation to the mediating indirect effects of

mother attachment on loneliness, single mediation of general belongingness (point estimate = -.1220; 95 % BCa CI [-.2107, -.0611]), serial-multiple mediation of general belongingness and life satisfaction (point estimate= -.0226; 95% BCa CI [-.0445, -.0104]), and single mediation of life satisfaction (point estimate = -.0970; 95% BCa CI [-.1628, -.0507]) were found statistically significant.

Contrasting findings presented in pairs were included in the current research in order to determine whether specific indirect effects of mediating variables were stronger than others. Current research analysis results showed three contrasting pairs were obtained. However, as the separate mediating effects of general belongingness and life satisfaction were at a zero-point estimate interval within the 95% BCa confidence interval, the said variables were not found to be statistically different from each other in relation to mediating power. Also, two statistically significant contrasts not within the zero-point estimate based on the 95% BCa confidence interval have been presented in Table 2. Based on the contrasting pairs of specific direct effects, the variable of general belongingness was observed to have stronger mediation than the serial-multiple mediation of general belongingness and life satisfaction. In another comparison, life satisfaction was observed to have a stronger mediation than the serial-multiple mediation of general belongingness and life satisfaction.

Findings obtained about the serial-multiple mediation of general belongingness and life satisfaction in the relationship between attachment to father and loneliness is presented in Figure 2.

As can be seen in Figure 2, the total effect ( $c = -.19$ ,  $SE = .04$ ,  $t = -5.05$ ,  $p < .001$ ) of father attachment on loneliness was at a significant level (Step 1). In addition, the direct effects of father attachment on general belongingness ( $B = .14$ ,  $SE = .03$ ,  $t = 4.97$ ,  $p < .001$ ) and life satisfaction ( $B = .19$ ,  $SE = .02$ ,  $t = 7.70$ ,  $p < .001$ ) were at significant levels. The direct effect of general belongingness as the first mediating variable on the second mediating variable

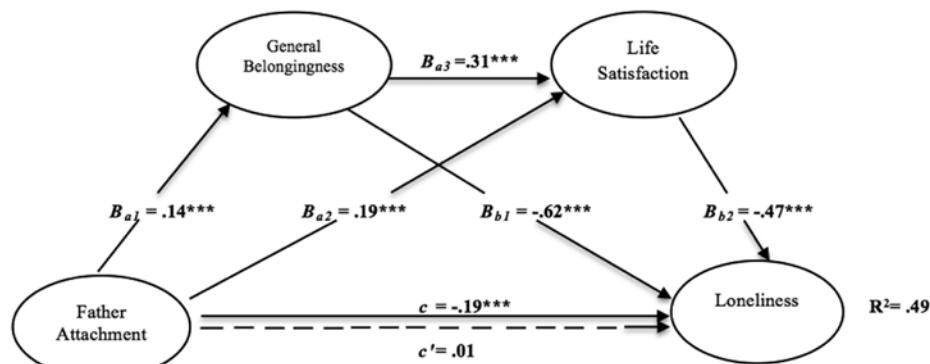


Figure 2. Serial-multiple mediation of general belongingness and life satisfaction in the relationship between father attachment and loneliness with non-standardized beta values. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

of life satisfaction ( $B = .31$ ,  $SE = .05$ ,  $t = 5.71$ ,  $p < .001$ ) was at a significant level (Step 2). A review of the direct effects of mediating variables on loneliness, on the other hand, showed that the effects of general belongingness ( $B = -.62$ ,  $SE = .07$ ,  $t = -8.59$ ,  $p < .001$ ) and life satisfaction ( $B = -.47$ ,  $SE = .09$ ,  $t = -5.51$ ,  $p < .001$ ) were at significant levels (Step 3). When father attachment and all other mediating variables were simultaneously entered into the equation (Step 4), the relationship between father attachment and loneliness, in relation to direct effect, was not at a significant level ( $c' = .01$ ,  $SE = .03$ ,  $t = .21$ ,  $p > .05$ ). Based on this result, mediating variables were observed to mediate between father attachment and loneliness. Additionally, it was seen that the model was overall at a significant level ( $F_{(3-214)} = 67.89$ ,  $p < .001$ ) and explained 49% of the total variance in loneliness.

The comparison of indirect effects and specific effects of adolescents' attachment to father on their loneliness levels through general belongingness and life satisfaction has been included in Table 3.

Table 3  
*The Comparison of Indirect Effects of Father Attachment on Loneliness through General Belongingness and Life Satisfaction and Its Specific Indirect Effects*

Effects	Product of Coefficients		Bootstrapping 95% BCa Confidence Interval	
	Point Estimate	SE	Lower	Upper
Total Indirect Effects	-.2005	.0297	-.2627	-.1459
Father → Belongingness → Loneliness	-.0906	.0294	-.1573	-.0432
Father → Belongingness → Lif.Sat → Loneliness	-.0211	.0074	-.0406	-.0102
Father → Life Satisfaction → Loneliness	-.0889	.0228	-.1414	-.0503
Contrasts				
Model 1 versus Model 2	-.0695	.0285	-.1369	-.0253
Model 1 versus Model 3	-.0017	.0465	-.0968	.0846
Model 2 versus Model 3	.0678	.0219	.0312	.1182

Note. N = 218, k = 10,000, \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Model 1 = Father-Belongingness-Loneliness; Model 2 = Father-Belongingness-Life Satisfaction-Loneliness; Model 3 = Father-Life Satisfaction-Loneliness.

Statistical significance of the indirect effects within the tested model in the current research was examined on 10,000 bootstrap samples. Estimates were taken within a 95% confidence interval; the BCa CI results are presented in Table 3. As seen in Table 3, the total indirect effect (the difference between total and direct effects/ $c-c'$ ) of father attachment through general belongingness and life satisfaction on loneliness was statistically significant (point estimate = -.2005; 95% BCa CI [-.2627, -.1459]). Within the tested model, when mediating variables were considered separately and all together in relation to the mediating indirect effects of father attachment on loneliness, single mediation of general belongingness (point estimate = -.0906; 95% BCa CI [-.1573, -.0432]), serial-multiple mediation of general belongingness and life satisfaction (point estimate = -.0211; 95% BCa CI [-.0406, -.0102]), and single mediation of life satisfaction (point estimate = -.0889; 95% BCa CI [-.1414, -.0503]) were found statistically significant.

Contrasting findings presented in pairs were included in the current research in order to determine whether specific indirect effects of mediating variables were stronger than others. Current research analysis results showed three contrasting pairs were obtained. However, as the separate mediating effects of general belongingness and life satisfaction were at the zero-point estimate interval within the 95% BCa confidence interval, the said variables were not found to statistically differ from each other in relation to mediating power. Also, two statistically significant contrasts not within the zero-point estimate based on the 95% BCa confidence interval have been presented in Table 3. Based on the contrasting pairs of specific direct effects, the variable of general belongingness was observed to have stronger mediation than the serial-multiple mediation of general belongingness and life satisfaction. In another comparison, life satisfaction was observed to have a stronger mediation than the serial-multiple mediation of general belongingness and life satisfaction.

Findings obtained about the serial-multiple mediation of general belongingness and life satisfaction in the relationship between attachment to peers and loneliness is presented in Figure 3.

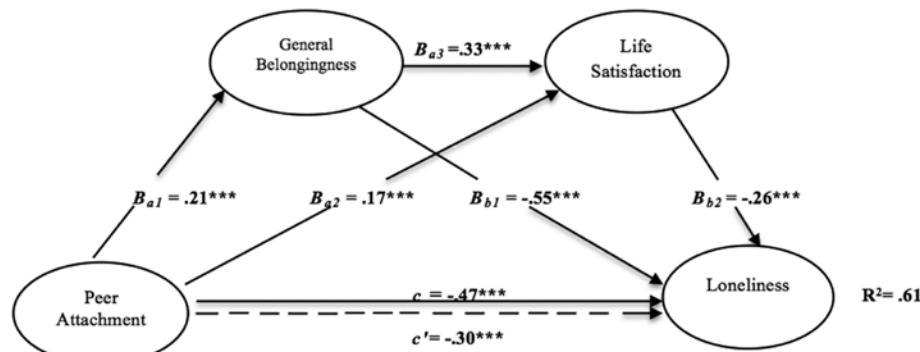


Figure 3. Serial-multiple mediation of general belongingness and life satisfaction in the relationship between peer attachment and loneliness and non-standardized beta values. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

As can be seen in Figure 3, the total effect ( $c = -.47$ ,  $SE = .04$ ,  $t = -12.13$ ,  $p < .001$ ) of peer attachment on loneliness was at a significant level (Step 1). In addition, the direct effects of peer attachment on general belongingness ( $B = .21$ ,  $SE = .04$ ,  $t = 5.77$ ,  $p < .001$ ) and life satisfaction ( $B = .17$ ,  $SE = .03$ ,  $t = 5.28$ ,  $p < .001$ ) were at significant levels. The direct effect of general belongingness as the first mediating variable on the second mediating variable of life satisfaction ( $B = .33$ ,  $SE = .06$ ,  $t = 5.63$ ,  $p < .001$ ) was at a significant level (Step 2). A review of the direct effects of mediating variables on loneliness, on the other hand, showed that the effects of general belongingness ( $B = -.51$ ,  $SE = .06$ ,  $t = -8.04$ ,  $p < .001$ ) and life satisfaction ( $B = -.26$ ,  $SE = .07$ ,  $t = -3.79$ ,  $p < .01$ ) were at significant levels (Step 3). When peer attachment and all other mediating

variables were simultaneously entered into the equation (Step 4), the relationship between peer attachment and loneliness in relation to its direct effect was at lower but significant levels ( $c' = -.30$ ,  $SE = .04$ ,  $t = -8.37$ ,  $p < .001$ ). Based on this result, the mediating variables were observed to mediate between peer attachment and loneliness. Additionally, the model overall was seen to be at a significant level ( $F_{(3-214)} = 113.46$ ,  $p < .001$ ) and explained 61% of the total variance in loneliness.

The comparison of indirect effects and specific effects of adolescents' attachment to peers on their loneliness levels through general belongingness and life satisfaction is included in Table 4.

Table 4

*The Comparison of Indirect Effects of Peer Attachment on Loneliness through General Belongingness and Life Satisfaction and Its Specific Indirect Effects*

Effects	Product of Coefficients		Bootstrapping 95% BCa Confidence Interval	
	Point Estimate	SE	Lower	Upper
Total Indirect Effects	-.1704	.0340	-.2449	-.1116
Peer → Belongingness → Loneliness	-.1064	.0364	-.1918	-.0491
Peer → Belongingness → Lif.Sat → Loneliness	-.0180	.0077	-.0387	-.0067
Peer → Life Satisfaction → Loneliness	-.0461	.0170	-.0879	-.0187
Contrasts				
Model 1 versus Model 2	-.0884	.0361	-.1763	-.0339
Model 1 versus Model 3	-.0603	.0479	-.1630	.0229
Model 2 versus Model 3	.0281	.0163	.0026	.0692

Note. N=218, k=10,000, \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Model 1 = Peer Belongingness-Loneliness; Model 2 = Peer Belongingness-Life Satisfaction-Loneliness; Model 3 = Peer-Life Satisfaction-Loneliness.

Statistical significance of the indirect effects within the tested model in the current research was examined over 10,000 bootstrap samples. Estimates were taken within 95% confidence interval, and the BCa CI results are presented in Table 4. As seen in Table 4, the total indirect effect (the difference between total and direct effects/ $c-c'$ ) of peer attachment through general belongingness and life satisfaction on loneliness was statistically significant (point estimate =  $-.1704$ ; 95% BCa CI [-.2449, -.1116]). Within the tested model, when mediating variables were considered separately and all together in relation to the mediating indirect effects of peer attachment on loneliness, the single mediation of general belongingness (point estimate =  $-.1064$ ; 95% BCa CI [-.1918, -.0491]), serial-multiple mediation of general belongingness and life satisfaction (point estimate =  $-.0180$ ; 95% BCa CI [-.0387, -.0067]), and single mediation of life satisfaction (point estimate =  $-.0461$ ; 95% BCa CI [-.0879, -.0187]) were found statistically significant.

Contrasting findings presented in pairs were included in the current research in order to determine whether specific indirect effects of mediating variables were stronger than others. Current research analysis results showed three contrasting pairs were obtained. However,

as the separate mediating effects of general belongingness and life satisfaction were at the zero-point estimate interval within a 95% BCa confidence interval, the said variables were not found to statistically differ from each other in relation to mediating power. Also, two statistically significant contrasts not within the zero-point estimate based on the 95% BCa confidence interval have been presented in Table 4. Based on the contrasting pairs of specific direct effects, the variable of general belongingness was observed to have stronger mediation than the serial-multiple mediation of general belongingness and life satisfaction. In another comparison, life satisfaction was observed to have a stronger mediation than the serial-multiple mediation of general belongingness and life satisfaction.

## Discussion

Based on the findings from the serial-multiple mediation tested in the current research, the serial-multiple mediation of general belongingness and life satisfaction and the separate mediation of single mediating variables were found statistically significant in the relationship of adolescent loneliness with their attachment to parents and peers. Based on the contrasting pairs of specific indirect effects, the sizes of mediating effects of general belongingness and life satisfaction were not found to statistically differ from each other in relation to parent and peer attachment in each of the tested models. On the other hand, separate single mediations of general belongingness and life satisfaction were found to be stronger than their serial multiple mediation together.

[Aldwin \(2007, p. 277\)](#) stated that the development of a secure attachment relationship with a sensitive care between a caregiver and an infant is a strong fundament for children's emotional and social development. According to [Bridges \(2003, p. 183\)](#), a great majority of developmental studies have shown that attachment during childhood influences social, emotional, and cognitive situations in later years, and attachment is a key factor for developmental well-being throughout childhood and adolescence. According to [Steinberg \(2007, p. 374\)](#), on the other hand, individuals who were pleased with the secure attachment to a caregiver were more competent with their peers; in addition, there was evidence that these individuals had more healthily and safely built the internal working models that allowed them to have more satisfying close relationships during adolescence and adulthood. According to theoretical explanations, the ability of adolescents' attachment relationships, particularly those that are associated with their belongingness and loneliness, to reflect the level of their social developments were supported with the findings of the current research. Again, according to theoretical explanations, attachment is a continuous phenomenon not only during infancy but also for life ([Ainsworth, 1969, p. 2](#); [Bowlby, 2012, 2012a](#)). A review of the current research findings indicated that attachment relationships are effective during adolescence ([Bowlby, 2012](#)). Attachment has been observed to influence individuals' loneliness both directly and through life satisfaction and general belongingness.

Sense of belonging is a concept associated with attachment and loneliness (Hagerty et al., 1992). Both loneliness and belongingness share the subjective perception of a bond with others. As stated in the relevant literature, loneliness is not associated with a sense of belonging, close relationships to others, or participation, but is based on the perception of the quality of these social interactions (Rokach, 2011). According to Kohut (1984 as cited in Chipuer, 2001), people have a sense of a subjective bond or belonging and they need to feel part of something in order to inhibit feelings of loneliness. Chipuer (2001) stated that individuals without a sense of community are at great risk of experiencing social isolation and feelings of alienation, which may lead to feelings of loneliness. According to Mellor et al. (2008), unsatisfied needs of belonging may lead to social isolation, alienation, and loneliness. Thus, sense of belonging is not only a precursor to social bonding, but also serves a buffer against loneliness. Unsatisfied needs of belonging may also reduce individuals' well-being. The significant effect of belongingness on loneliness, as seen in these theoretical explanations, was supported with the findings of the current research.

Findings obtained in the current research were observed to agree with theoretical explanations and research findings in the relevant literature. In a study by Greenwood and Long (2011), they found that individuals who had anxious attachment to parents felt more the need to belong. Venta et al. (2004) found negatively significant relationships between thwarted belongingness and secure attachment in their research. In Chen's (2003) study, the quality of adolescents' relationships with their families was determined to contribute to the sense of belonging towards them; similarly, adolescents' who had high quality relationships with their friends had an increase in their sense of belongingness; sense of belongingness towards family and friends reduced adolescents' sense of loneliness. According to Allen and Bowles (2012), there are significant relationships among belongingness, life satisfaction, and well-being. Belongingness is an important characteristic of psychological functionality. Mellor et al.'s (2008) study showed that individuals with a low-level sense of belongingness had low-level life satisfaction and were less pleased with interpersonal relationships. In that study, loneliness mediated between the unsatisfied need of belonging and life satisfaction. Jung, Song, and Vorderer (2012) found negative relationships between belongingness and loneliness, and positive relationships between belongingness and well-being; they also found negative relationships between well-being and loneliness. Baskin, Wampold, Quintana, and Enright's (2010) study found that belongingness had a significant effect on low peer acceptance, loneliness, and depression. O'Rourke and Cooper (2010) found positive relationships between belongingness and happiness and between optimism and sense of friendship in their study. On the other hand, in some studies that have been conducted, negatively significant relationships were found with sense of belongingness to loneliness, depression, and anxiety (Hagerty & Williams, 2010; Hagerty, Williams, Coyne, & Early, 1996).

The current research showed a higher-level direct effect of peer attachment on loneliness than that of parent attachment on loneliness. This is thought to possibly be due to peer relationships being more highlighted than relationships with parents during adolescence. The closeness or distance that adolescents perceive from their peers can be said to have significant effects on their loneliness. In this sense, Hazan and Shaver (1994, p. 9) stated that adolescents' attachment behaviors are directed towards peers during adolescence, changing to provide peers with closeness and a secure refuge while parents as attachment figures gradually lose their importance. In another study, Raja, McGee, and Stanton (1992) found low levels of well-being in adolescents who perceived peer attachment at low levels; these adolescents were observed to have higher levels of mental illness. Adolescents who perceived their peer attachment to be at higher levels were observed to feel stronger. In Kurt et al.'s (2013) study, peer attachment was observed to reduce adolescents' levels of loneliness. Adolescents may attribute great importance to their relationships with peers during adolescence. They may be more sensitive towards negative factors than adults, or they may have trouble tolerating them when their relationships are poor. On the other hand, many studies in the relevant literature have supported the findings of the current research. In these studies, similar to the findings here, negatively significant relationships between loneliness and attachment to parents and peers had been noted (Berlin, Cassidy, & Belsky, 1995; Bogaerts et al., 2006; Collins, 2003; de Minzi, 2006; Deniz et al., 2005; Goossens, Marcoen, van Hees, & van de Woestijne, 1998; Hecht & Baum, 1984; Kerns & Stevens, 1996; Kobak & Sceery, 1988; Ma & Huebner, 2008; Man & Hamid, 1998). In Wiseman, Mayseless, and Sharabany's (2006) study, a negative relationship was found between secure attachment style and loneliness, whereas positive relationships were found between anxious-preoccupied attachment style and loneliness. In DiTommaso, Brannen-McNulty, Ross, and Burgess' (2003) study, the perceived loneliness of people with secure parent attachments was found at lower levels. On the other hand, İlhan (2012) found that anxious attachment and secure attachment predicted loneliness at significant levels. In another study, Erözkan (2004) found significant-level relationships between adolescent attachment styles and loneliness in high school. According to Bridges (2003, p. 183), a great majority of developmental studies have shown that attachment during childhood influences social, emotional, and cognitive situations in later years, and attachment is a key factor for developmental well-being throughout childhood and adolescence. The results of the current study also show the effect of attachment on adolescents' sense of loneliness, particularly with social, cognitive, and affective elements. In this sense, the finding here is consistent with those in the relevant literature.

Again in another study, Yıldız (2014) found positively significant relationships between parent attachment and subjective well-being. In Özdemir and Koruklu's study (2013), positively significant relationships were found in parent and peer

attachments with life satisfaction. Jiang et al. (2013) found positively significant relationships between parent attachment and life satisfaction. Armsden and Greenberg (1987) determined positively significant relationships among parent attachment, self-esteem, and life satisfaction.

In some studies, negative relationships were found between loneliness and subjective well-being (Bramston, Pretty, & Chipuer, 2002; Chipuer, Bramston, & Pretty, 2003; Sharma, 2011) and loneliness and life satisfaction (Bugay, 2007; Çivitci, Çivitci, & Fiyakalı, 2009; Goodwin, Cook, & Yung, 2001; Kapıkırın, 2013; Kapıkırın & Yağcı, 2012; Mellor et al., 2008; Nickerson & Nagle, 2004; Salimi, 2011; Schumaker, Shea, Monfries, & Groth-Marnat, 1993; Yıldız, 2013).

Negatively significant relationships were found between loneliness and general belongingness in some studies (Malone et al., 2012; Mellor et al., 2008; Yıldız, 2013) in the relevant literature. Significant-level relationships were found among adolescents' parent and peer attachment, general belongingness, life satisfaction, and loneliness. Findings from these studies support the findings of the current research.

Based on the general result of the current research, general belongingness and life satisfaction have been determined to function as a buffer against loneliness. In this context, reducing adolescents' loneliness levels and increasing their general belongingness and life satisfactions against loneliness can be said to be important in relation to mental health services that prevent and protect. In order to reduce adolescents' loneliness levels and increase their general sense of belonging and life satisfaction, psycho-educational programs such as social-skills education for developing peer relationships, particularly in school by psychological counselors, could be recommended. At schools, students with lower levels of belongingness and life satisfaction and with higher levels of loneliness can be identified by psychological counselors. Individual psychological counseling, as well as positive psychology-based psycho-educational program applications, may be organized for these students. Family education for families with adolescents can be conducted to raise awareness of belongingness, attachment, and loneliness issues. In a future study, parallel-multiple mediation with the variable of perceived social support may be included in a similar model as tested in the current research. The same model may be tested on adolescents' different attachment styles. This study did have some limitations. Firstly, the study was limited to students attending two high schools in Adiyaman. Thus, the findings may be generalized to these and similar students. In this way, the current model may be examined for similar results with data collected in other cities and regions. Secondly, participating adolescents had no clinical diagnoses of mental health, and this requires care when results are generalized to other groups. Convenience sampling, used in selecting the sample group, may be considered as a

third limitation. The same model may be tested in future studies through the use of more powerful methods, such as sampling methods based on probability. In addition, the current study was limited to the features assessed by the instruments used. These limitations must be considered when evaluating the research findings.

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