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The Relationship between Father-Love Absence and Loneliness: Based on the Perspective of the Social Functionalist Theory and the Social Needs Theory

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ABSTRACT

Fathers play an important role in adolescents' development, which is significant for their development and influences their mental health, including feeling of loneliness. However, the effects and mechanisms of father-love absence on individual loneliness are not clear. Based on the social functionalist theory and the social needs theory, this study examines the influence of individual father-love absence on loneliness and its underlying mechanisms. A questionnaire survey was administered to 319 junior high school students and 1,476 high school students. The results showed that adolescents with father-love absence had higher levels of loneliness, and that father-love absence affected loneliness levels through mediating pathways of individual gratitude, peer relationships, and gratitude to peer relationships. This study not only confirms the negative effects of father-love absence on adolescents' loneliness, but also explains the mediate roles of individual gratitude and peer relationships. It enriches the theoretical system related to family education and has important theoretical and practical implications for further interventions on adolescents' mental health from the perspective of fatherless parenting.

KEYWORDS

Father-love absence; loneliness; gratitude; peer relationships

Introduction

Following traditional family role divisions, mothers are primarily responsible for Child-rearing and caregiving [1]. Given the fact that the widespread phenomenon of father-love absence in numerous families, which identifies as the father in the family may not be physically absent but is emotionally absent [2]. Father-love absence is defined as the absence of cognitive, emotional, volitional, and behavioral

aspects that influences between the father and the individual during childhood [3]. In contrast to prior research about father absence, the concept of father-love absence in the current study is primarily focused on the father's psychological absence during an individual's childhood. Unlike father absence, father-love absence is potential, and can significantly influence an individual's mental health [4]. Because father-love absence means that adolescents psychologically grow up in an incomplete family structure,



experience a disharmonious family atmosphere, and believe that they do not obtain complete love from parents. It can predispose them to feelings of loneliness [5]. Consequently, father-love absence may be an important factor influencing an individual's loneliness. However, as of the present, the influence of father-love absence on adolescent loneliness and the underlying mechanisms involved remain unclear. Hence, in the current study we address this gap using the social functionalist theory and the social needs theory to explore the association between father-love absence and loneliness, with gratitude and peer relationships serving as mediators. Providing a relevant foundation for mitigating loneliness among adolescents experiencing father-love absence.

The relationship between father-love absence and loneliness

Loneliness refers to an individual's subjective sense of isolation resulting from unmet interpersonal relationship needs, whether in terms of quality or quantity [6]. Loneliness has various adverse effects on individuals, including accelerated aging [7,8] and increased mortality [9] in terms of physical health. It also has predictive negative effects on mental health, such as personality disorders [10] and mental disorders [11]. A recent report on global adolescent loneliness reveals a significant surge among adolescents worldwide since 2010, rendering it a severe global concern [12]. Consequently, it is crucial to investigate the origins of loneliness. Many factors contributing to loneliness can be traced back to early life environments [13]. Father's love, as important interactions in an individual's early environment, plays a crucial role because father-love absence can result in the deficiency of essential emotional bonds between father and children. Moreover, it may impede the establishment of intimate relationships, hinder the development of fundamental trust. Thus, it is hard for individual to develop the comprehension of intricate emotions, perceptions, and social behaviors as individuals mature. Consequently, individuals experiencing father-love absence have a higher propensity to experience loneliness [14,15].

The association between father-love absence and loneliness is also supported by the social needs theory. The social needs theory is an important theory focusing on the mechanisms of loneliness generation, regarding that loneliness can emerge when adolescents are dissatisfied with their social needs or experience a lack of interpersonal relationships [16]. It is essentially a subjective experience of one's own social circumstances [17]. Weiss found that individuals possess six inherent social needs, including the needs for attachment, social integration, and nurturing [18]. These needs can only be satisfied within particular social relationship contexts, and the absence of such needs' fulfillment or the absence of specific social relationships can lead to the emergence of loneliness among the individual. In the early environment of an individual, the father, being a significant relationship [19], plays a crucial role in individual's growth. Father-love absence results in the individual's inability to meet attachment and nurturing needs, leading to the development and increase of loneliness. As a result, this study proposes H1: father-love absence positively predicts adolescents' loneliness.

The mediating role of gratitude

Gratitude, as an emotion or personality trait, recognizes good deeds and affective experience of appreciation and pleasure that develops when an individual is favored [20]. It includes a complex array of subjective feelings, including curiosity, appreciation, and appreciation of life [21]. As a positive emotion trait, gratitude directs an individual's attention towards the positive and valuable attributes of others, resulting in a more favorable memory bias [22]. Consequently, it contributes to the establishment and sustenance of relationships while fostering greater closeness with others [23]. Thus, gratitude diminishes the likelihood of an individual experiencing loneliness [24]. Furthermore, fathers play a crucial role in shaping the development of adolescents' gratitude [25] because fathers offer direct guidance to adolescents regarding gratitude [26]. Simultaneously, fathers' perceptions of emotional experiences, including gratitude, have an indirect yet significant influence on children's development of gratitude [27,28]. Therefore, father-love absence may negatively predict individual levels of gratitude. Accordingly, we propose H2: father-love absence influences adolescents to develop loneliness through the mediating effect of gratitude.

The mediating role of peer relationships

Peer relationships encompass interpersonal connections formed and cultivated through shared activities and mutual support during interactions among individuals of the same age and similar levels of psychological development [29]. Peer relationships, functioning as microsystems influencing individual development, have a direct and profound influence on an individual's loneliness [30]. This subjective experience of lacking peer relationships can evoke feelings of loneliness in individuals. As individuals enter adolescence, their focus on seeking intimacy and emotional support gradually shifts from parents to peers [31], and peer relationships become increasingly vital [32]. Consequently, adolescents with inadequate peer relationships face challenges in attaining social satisfaction and positive emotions from their peers, potentially resulting in loneliness. Similarly, the evidence with regard to the lower the quality of peer relationships, the greater the loneliness experienced by adolescents [33,34]. Regarding the relationship between father-love absence and peer relationships, adolescents experiencing father-love absence often exhibit a diminished sense of security in their interpersonal interactions. So, they face challenges in forming positive relationships with others [35]. In summary, this study proposes H3: father-love absence leads to loneliness through the mediating influence of peer relationships.

The chain mediation of gratitude to peer relationship

Gratitude is a positive emotion that contributes to the establishment of interpersonal relationships, which reduces an individual's sense of isolation, diminishes the feelings of insecurity and instability [36]. Consequently, it can enhance an individual's interaction with the external environment, fostering more positive peer social relationships [37-39]. On the other hand, gratitude also aids in repairing interpersonal

relationships; individuals who exhibit gratitude can develop more positive perceptions of their partners, display a greater willingness to sustain long term relationship with others [40], and cultivate closer connections among their peers [41]. Therefore, individuals with high levels of gratitude enjoy more harmonious peer relationships.

According to social functionalist theory, emotions are formed in dynamic social interactions that are influenced by relationships [42]. At the same time, emotions can affect individual's connections with others [43]. Keltner et al. further extended this theory, finding that emotions can also affect one's interpersonal relationships [44]. Interactions with fathers, as an important interpersonal relationship for individuals, affect the individual's emotion of gratitude. The emotion of gratitude affects one's peer relationships. Conversely, connections and interactions with peers may further lead to the individual's loneliness. Therefore, individuals with father-love absence may present less gratitude emotions, have weaker peer relationships, and possess more loneliness. Building on this premise, we advance H4: father-love absence influences adolescences' loneliness through the chain mediation involving gratitude to peer relationships.

Differences in gender

Prior research has demonstrated significant gender disparities in the consequences of father-love absence on mental health among adolescents. For instance, Sears et al. reported in their study that father-love absence was a stronger effect of aggressive behaviors in males [45]. McLanahan et al. indicated in their research that father-love absence had a more pronounced impact on the emotional and mental health development of males [46]. Hetherington et al. suggested in their study that women with father-love absence are less likely to form intimate relationships compared to men, which may result in heightened feelings of loneliness [47]. Therefore, building upon these previous findings and aligning with the preceding hypotheses, we introduce H5: Gender differences may exist in the mechanisms through which father-love absence affects loneliness between gratitude and peer relationships.

The present study

The purpose of the current study is to investigate the impact of father-love absence on adolescents' loneliness, with a focus on the mediating roles played by gratitude and peer relationships. While some prior research has assessed the influence of early adverse environments on the mental health of adolescents [48–50], much of the existing literature has focused primarily on the effects of childhood maltreatment on adolescent loneliness. However, how father-love absence specifically affects feelings of loneliness in children and the underlying mechanisms has not been directly explored in previous research. At the same time, owing to the traditional division of family roles in China, the role and status of the father within the Chinese family have been consistently due to the distinctiveness of gender role. Resulting in a father-child relationship that diverges from those in other cultures. Chinese society confronts various challenges, including the high prevalence of parental divorce

and the shift from the traditional extended family model to the nuclear family model. This could potentially contribute to an increasing absence of father in the Chinese society. Therefore, we recruited participants from China. In summary, utilizing the social functionalist theory, the social needs theory, and a review of relevant literature, this study aims to assess the link between father-love absence and feelings of loneliness.

Research Methodology

Participants

In this study, questionnaire was administered to 2,148 students from a junior high school and a senior high school in Hunan Province, China. Some participants were excluded from the analyses, because neither those complete all the questionnaires, nor they filled out questionnaires indiscriminately. Thus, a total of 1,795 valid samples were collected, and the questionnaire completion rate was 83.56%. Among them, 319 students in the third year of junior high school, 568 were senior one school students, 462 were senior two school students, and 446 were senior three school students. The sample consisted of 774 males with a mean age of 16.23 ± 1.32 and 1021 females with a mean age of 16.33 ± 1.17 . All participants were free from any mental health condition. They all provided handwritten informed consent prior to completing the questionnaire. All subjects signed an informed consent form before participating in the formal study. At the same time, we obtained full consent from teachers and parents before distributing the research questionnaire to the students. Detailed instructions were given to fill out the questionnaire. The study was approved and consented by the ethics approval of the authors' institution.

Tools

The father-love absence scale

The Father-Love Absence Scale (FLAS), developed by Xiang et al. [3], was used to assess the extent of father-love absence in adolescents. The scale is based on the Chinese cultural context and contains four subscales of emotional, cognitive, behavioral, and volitional deficits with a total of 18 items (e.g., "My father rarely considers things from my perspective"). Each item is scored on a 5-point scale ranging from 1 ("completely inconsistent") to 5 ("completely consistent"), with higher scores indicating a greater degree of father love deficit. In this study, the Cronbach's alpha coefficient for this scale was 0.901, and for the subscales, it was 0.878, 0.896, 0.827, and 0.866, respectively.

The gratitude questionnaire

The Gratitude Questionnaire (GQ-6), developed by McCullough et al. [20] and adapted by Wei et al. [51], was used in this study, which contains a total of 6 items. The scale has been demonstrated to be suitable for the Chinese adolescent population and exhibits good reliability and validity [20]. Example of a question: I have many people and things in my life for which I am grateful. The questionnaire was scored on a 7-point scale, with 1 indicating total disagreement and 7 indicating total

agreement; the third question was reverse scored. Higher scores on the questionnaire indicate greater gratitude. In this study, the Cronbach's alpha coefficient for this questionnaire was 0.706.

Peer relationship scale

In this study, six items from the School Adjustment Scale developed by Cui [52] were used for peer relations, such as "My classmates are not friendly to me". The scale has been demonstrated to be suitable for the Chinese adolescent population and exhibits good reliability and validity [53]. The scale is scored on a 5-point scale, with 1 being a complete discrepancy and 5 being a perfect match. Six questions are scored inversely, with higher scores indicating better peer relationships. In this study, the Cronbach's alpha coefficient for this questionnaire was 0.908.

The loneliness scale

The Loneliness Scale (UCLA Loneliness Scale, ULS-8) developed by Hays and Dimatteo [54] and adapted by Wu et al. [55] was used to assess individual loneliness in this study. The scale has been demonstrated to be suitable for the Chinese adolescent population and exhibits good reliability and validity [56]. The scale consists of eight items (e.g., if I were not there, others would be better off) and is scored on a 3-point scale ranging from 'no' to 'yes'. The higher the scale score, the more lonely the individual. In this study, the Cronbach's alpha coefficient for this scale was 0.878.

Data analysis

First, a common method deviation analysis was performed on the data by Harman's one-way test using validated factor analysis incorporating all variables into the same latent variable. The results revealed a very poor model fit index [$\Delta\chi^2 = 32.514$, $p < 0.001$; RMSEA = 0.133; SRMR = 0.129; CFI = 0.436]. Therefore, there is no serious common method bias in this study.

The constructed measurement models were then tested using AMOS 24.0 to examine how well the indicators predicted the underlying variables. The scale assessing father-love absence were split into four factors. The scale assessing gratitude were split into two factors. The question assessing peer relationships were split into three factors. The scale assessing loneliness were split into three factors. According to the suggestion by Hu et al. [57] and Kenny [58] for the model fit index, $\Delta\chi^2 = \chi^2/df \leq 5$, CFI (0.90 or more), TLI (0.90 or more), RMSEA (0.08 or less), and

SRMR (0.08 or less) were used as indicators to evaluate the good fitness of the model.

Results and Analysis

Descriptive statistical analysis

Descriptive statistics were utilized to illustrate the correlation among the variables. Table 1 displays the mean, standard deviation, and correlations among father-love absence, gratitude, peer relationships, and loneliness. Significant correlations exist between these variables. These findings offer preliminary support for the hypothesis.

Measurement model testing

The potential variables in the measurement model included father-love absence, gratitude, peer relationships, and loneliness. The results indicated that the data fit the measurement model well [$\Delta\chi^2 = 0.781$, $p < 0.001$; RMSEA = 0.041; SRMR = 0.032; CFI = 0.987]. In addition, factor loading for all latent variables were significantly correlated with them ($p < 0.001$), suggesting that latent variables can be a good proxy for observed variables. Table 1 shows the means, standard deviations, and correlations between father-love absence, gratitude, peer relationships, and loneliness, with all variables correlated with each other. The results may provide initial support for the hypothesis.

Structural model reasonableness assessment

Without the mediating variables gratitude and peer relationships, father-love absence significantly predicts loneliness. Model 1 was then developed in which father-love absence directly predicts loneliness and also indirectly predicts loneliness through gratitude to peer relationships (see Fig. 1). The results showed a good fit of model 1 [$\Delta\chi^2 = 4.006$, $p < 0.001$; RMSEA = 0.041; SRMR = 0.032; CFI = 0.987] (see Table 2). Therefore, we used model 1 as the structural model.

Significance tests for mediating variables

Also, the bootstrap method was used to test the stability of the model mediation effect by randomly sampling 2000 bootstrap samples generated from the original data set (N = 1795). The results showed that gratitude [-0.086, -0.015] and peer relationships [-0.238, -0.122] mediated significantly between father-love absence and loneliness at 95% confidence intervals. Gratitude [0.054, 0.160] played a significant role between father-love absence affecting peer

TABLE 1

Descriptive statistics and bivariate correlations for all variables

	<i>M</i>	<i>SD</i>	1	2	3	4
Father-love absence	45.41	13.80	1			
Gratitude	30.90	5.60	-0.287***	1		
Peer relationships	10.72	4.62	0.321***	-0.378***	1	
Loneliness	20.37	3.44	-0.347***	0.314***	-0.542***	1

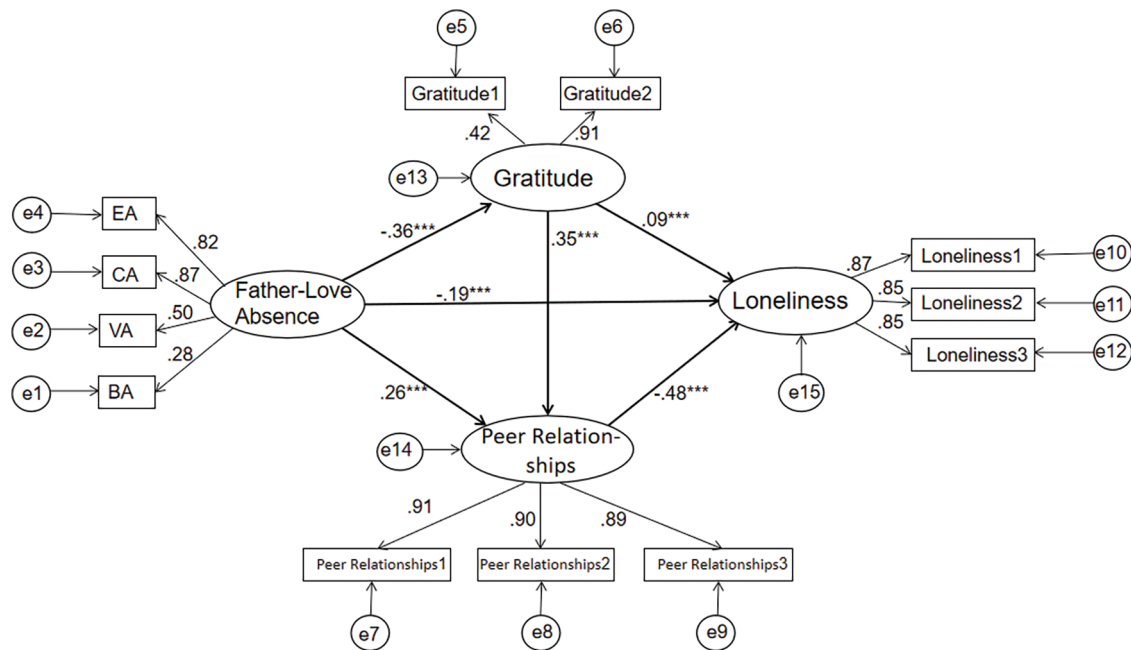


FIGURE 1. The chain mediation model 1. Note: The chain mediation model 1 examining the mediating effect of Father-Love Absence and Loneliness. Factor loading are standardized EA, CA, VA, and BA of Father-Love Absence. Gratitude 1 and Gratitude 2 of Gratitude. Peer Relationships 1, Peer Relationships 2, and Peer Relationships 3 of Peer Relationships. Loneliness 1, Loneliness 2, and Loneliness 3 of Loneliness. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

TABLE 2

Fitting index of model 1

	χ^2	<i>df</i>	$\Delta\chi^2$	CFI	RMSEA	SRMR	AIC	ECVI
Model 1	192.292	48	4.006	0.987	0.041	0.032	252.292	0.141

Note: RMSEA, mean square error of approximation; SRMR, standardized mean square residual; CFI, comparative fit index; AIC, Akaike information criterion; ECVI, expected cross-validation index.

relationships, and peer relationships [0.079, 0.155] between gratitude affecting loneliness (see Table 3).

Stability analysis of the model across gender

To test the stability of the structural model, the model was further analyzed for stability across gender. First, the five latent variables were tested for the presence of gender differences. The results showed that there were no significant gender differences in father-love absence [$t_{(1795)} = 0.846, p > 0.05$], gratitude [$t_{(1795)} = -1.146, p > 0.05$], and loneliness [$t_{(1795)} = 1.103, p > 0.05$]. In contrast, there were significant gender differences in peer relationships [$t_{(1795)} = 2.084, p < 0.05$] and the male peer relationship scores were higher than the female peer relationship scores.

Based on the gender differences found, further multi-cluster analysis was used to examine the stability of the models. Based on the Byrne’s [59] study, two models were developed in this study, one allowing free estimation of pathways across gender (unconstrained structural pathways) and the other allowing significantly equal path coefficients for both genders (constrained structural pathways), while holding the underlying parameter factor loadings, error variances, and structural covariances constant. The results showed a significant difference between the two models [$\Delta\chi^2 = 2.378, p < 0.001$], while both models met the criteria for goodness of fit (see Table 4). Therefore, the above multicluster analysis model is acceptable. In addition, because of the susceptibility to reach significant levels due to

TABLE 3

Standardized indirect effect and 95% confidence intervals

Paths	Indirect effect estimation	Lower limit	Upper limit
Father-love absence → Gratitude → Loneliness	-0.045	-0.086	-0.015
Father-love absence → Peer relationships → Loneliness	-0.175	-0.238	-0.122
Father-love absence → Gratitude → Peer relationships	0.089	0.054	0.160
Gratitude → Peer relationships → Loneliness	0.112	0.079	0.155

TABLE 4

Comparison of cross-gender constrained and unconstrained structural pathway models

	χ^2	<i>df</i>	$\Delta\chi^2$	CFI	RMSEA	SRMR	AIC	ECVI
Unconstrained structural paths	2.358	104	0.022	0.978	0.028	0.033	394.233	0.195
Constraint structure path	2.204	120	0.018	0.976	0.026	0.033	336.395	0.188

Note: RMSEA, mean squared error of approximation; SRMR, standardized mean squared residual; CFI, comparative fit index; AIC, akaike information criterion; ECVI, expected cross-validation index.

the large sample size, to verify the cross-sex stability of the models, we further examined the cross-sex stability of the structural models using the critical ratios of differences (CRD) of the standard deviations of the two models as indicators. According to the decision rule, an absolute value of the CRD greater than 1.96 indicates a significant difference between the two parameters [60]. The results indicated that there was a significant difference in the structural path from father-love absence to peer relationships (CRD = -2.764), and none of the other structural paths for the remaining variables (CRD father-love absence to gratitude = 1.266, CRD gratitude to loneliness = 1.574, CRD gratitude to peer relationships = -0.716, CRD father-love absence to loneliness = -0.6, CRD peer relationship to loneliness = -0.202).

Discussion

Based on the social functionalist theory and the social needs theory, this study explored the mechanisms of gratitude and peer relationships in the relationship between father-love absence and loneliness. It was found that adolescents with father-love absence experienced more loneliness. In addition, adolescents experiencing father-love absence also indirectly affect loneliness through the mediating roles of gratitude, peer relationships and the chain of gratitude to peer relationships. The results of the study validate the idea that father-love absence causes loneliness and provide an in-depth discussion of the specific intermediary mechanisms between the factors, which provides a broader theoretical reference for curbing the generation of loneliness in adolescents with father-love absence.

Firstly, the results suggest that father-love absence positively predicts loneliness, meaning that adolescents with father-love absence perceive more loneliness, thereby confirming H1. This occurs because father-love absence not only reduces adolescents' access to objective social support [61,62], but also causes adolescents to feel abandoned, thereby impacts perceived subjective social support [63]. When adolescents lack sufficient social support, they tend to develop feelings of isolation [46,64]. Furthermore, fathers interact with their children in a more authoritative and serious manner than mothers, thus fathers play an irreplaceable role in children's emotional development [65]. Consequently, adolescents who experience father-love absence tend to have more emotional problems, including the negative feeling of loneliness [66]. The findings align with the social needs theory, suggesting that individuals experiencing father-love absence have unmet emotional

needs, leading to increased loneliness. This perspective can also be illuminated through the lens of psychodynamic theory, which suggests that father-love absence adolescents with early attachment deficits are more likely to feel lonely. Because they tend to distrust others and try to maintain emotional distance to preserve their independence [67]. Therefore, adolescents with father-love absence have higher levels of loneliness.

Second, mediation analyses tested H2 that gratitude plays a significant mediating role in the effect of father-love absence on loneliness. adolescents with father-love absence tend to feel less loved, cared for, and supported [68,69], while gratitude is often cultivated in positive interpersonal experiences [70] and developed by being loved and supported [71,72]. Therefore, adolescents with father-love absence are less likely to be grateful [73]. When adolescents are grateful to others, they are more motivated to care for others and engage in more reciprocal pro-social behaviors [74], which is an important way to alleviate feelings of loneliness [75]. In addition to changing behavior, gratitude increases adolescents' positive perceptions of and satisfaction with their relationships [39], leading to more good relationships and less loneliness. Therefore, adolescents with high gratitude traits experience less loneliness [24]. Therefore, father-love absence reduces adolescents' loneliness through gratitude.

The results tested H3, that peer relationships play a significant mediating role in the effect of father-love absence on loneliness. Father-love absence, as a typical early adverse environment, can cause adolescents to experience great stress [62,76], and stress can undermine adolescents' sense of security [77]. Adolescents who do not feel secure enough usually lack social skills [78] and are less likely to have good peer relationships. Meanwhile, adolescents with father-love absence lack direct guidance from their fathers on how to handle interpersonal relationships [79] and social learning experiences on how to get along with peers [80] possess limited adolescents weaker in interpersonal skills and poorer in peer relationships. Therefore, father-love absence may lead to increased loneliness due to poorer peer relationships.

Additionally, the results of the cross-gender stability analyses reveal gender differences in the influence of father-love absence on adolescents' peer relationships, H5 was partially tested. Father-love absence can have a more profound impact on peer relationships for females than for males. For females, the father is often the first person of the opposite sex they encounter from birth, and the father's attitudes toward his daughter as she matures can influence her attitudes toward others and her peer relationships [81]. Previous research has also shown that females tend to

exhibit higher levels of dependence on and affection toward their fathers, seeking a sense of security from their father's love more than from any other person [82]. As a result, females with father-love absence often experience heightened insecurity compared with males, which can hinder their ability to form close relationships with others [47] and lead to poorer peer relationships. The findings also reveal that the poorer the peer relationships adolescents have, the more likely they could feel lonely [83]. This is because peer relationships are an integral part of socialization [84], and adolescents with poor peer relationships who often avoid problems in interpersonal interactions or use inappropriate relationship handling [85] are prone to social problems. Social problems can cause adolescents to feel unable to form good intimate relationships with others, thus experience higher levels of loneliness [86]. There are also empirical studies that support that peer relationships negatively predict loneliness [87]. Therefore, father-love absence can have a more profound impact on peer relationships for females than for males.

In addition, father-love absence also affects loneliness through the chain mediated pathway of "gratitude to peer relationships", confirming hypothesis H4. Furthermore, this supports the social functionalist theory, suggesting that adolescents experiencing father-love absence, who do not have their relational needs fulfilled, tend to exhibit lower levels of gratitude. Expressing gratitude towards one another is deemed a vital behavior for sustaining peer relationships [71]. This is because grateful adolescents tend to notice positive behaviors of others, are more likely to value their peers more, and are willing to engage in more relationship maintenance behaviors [37]. At the same time, expressing gratitude builds personal interpersonal relationships by being kind and considerate, which are actually meaningful in maintaining relationship [88]. Therefore, grateful adolescents have better peer relationships. Furthermore, interactions and relationships with peers can significantly impact an individual's experience of loneliness [89]. Thus, father-love absence also affects loneliness through the continuous mediation of gratitude to peer relationships.

Limitations and Contributions

The current study investigated the impact of father-love absence on adolescents' loneliness and extended this inquiry by examining the mechanisms through which gratitude, peer relationships and gratitude to peer relationships mediate this association. However, the findings in this study have limitations and we suggest directions for future study to supplement the limitations. First, all of the data in this study were self-reported, so there may be social biases such as social desirability effects. Future studies could reveal causal associations between variables through the experimental design. Secondly, this study adopted a cross-sectional design, allowing preliminary insights into variable relationships, but establishing definitive relationships necessitates verification through longitudinal study or experimental research designs. Third, it is important to note that the participants in this study were exclusively students

from mainland China. Therefore, future research should consider including subjects from diverse cultural backgrounds.

This study examines the effects of father-love absence on adolescent loneliness and its underlying mechanisms. The results reveal the detrimental effects of father-love absence on adolescent development, expanding the knowledge about the relationship between fathers and child development. From the perspective of academic research, the findings expand upon the social functionalist theory, indicating that individuals experiencing father-love absence influence the development of gratitude, their peer relationships, and increase adolescent loneliness. Concurrently, these results extend the social needs theory, positing that adolescents experiencing father-love absence struggle to fulfill their emotional requirements, rendering them more susceptible to loneliness. Furthermore, while previous studies have indicated that a father's physical absence impacts the emotional development of individuals, resulting in the development of adverse mental health [90], this current study extends this understanding by highlighting that a father's love absence also has implications for the emotional well-being of individuals. The study expands the understanding of the complex relationship between family relationships and adolescent mental health, with a particular emphasis on the critical role of fathers in the development of adolescent mental health. It contributes to further research in the field of family psychology and provides a strong basis for understanding how family relationships affect individual mental health.

From the perspective of practice, the results of the study provide a valuable foundation for investigating and addressing the adverse consequences of early adversity. The findings suggest that mitigating the impact of father-love absence on adolescent loneliness by fostering individual gratitude and enhancing the quality of peer relationships. It significantly promotes mental health under educational and societal contexts. This research extends practical recommendations for mental health practitioners to the fields of family and education for the enhancement of adolescent mental health.

In conclusion, this study not only enriches our comprehension of the association between family dynamics and adolescent mental health, but also provides us a compelling rationale for research and practice, with important theoretical and practical implications on promote teenagers' mental health and well-being.

Conclusion

The present study demonstrates the association between father-love absence and loneliness, as well as the mediating roles of gratitude, peer relationships, and gratitude to peer relationships. By doing so, this research extends the current knowledge regarding the relationship between father-love absence and loneliness and thereby extends the social functionalist theory and the social needs theory. It places significant importance on father's love from the perspective of adolescent mental health. And the findings could give some insights on early childhood intervention for loneliness,

and help educators and mental health practitioners to understand the source of loneliness among the teenagers, therefore to promote the awareness of fathers' love among the family structure in the society to ensure the wellbeings of teenagers from the scope of love.

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Availability of Data and Materials: The data will be provided upon request to the corresponding author.

Ethics Approval: The study was approved by the Medical Ethics Committee of Hunan Normal University (IRB number: 051). All participants signed the informed consent in this study.

Conflicts of Interest: The authors declare that they have no conflicts of interest to report regarding the present study.

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