



# The Interplay Between Anxiety and Avoidance Dimensions of Attachment to Chinese Fathers in Internalizing Problem Behavior among Early Adolescents: An Intercultural Investigation

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Accepted: 12 March 2023 / Published online: 11 May 2023  
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## Abstract

Guided by the attachment theory, this study investigated the interplay between anxiety and avoidance dimensions of attachment to Chinese fathers in early adolescents' internalizing problem behavior. This study further examined whether this association might exhibit an intercultural difference between the Han and Dong-Xiang ethnic groups. A total of 1019 adolescents between 10 and 15 years old ( $M_{age} = 12.66$ ,  $SD = 1.51$ ; 52.8% girls) participated in this study. Participants were uniformly instructed to complete a packet of well-established questionnaires written in simplified Chinese. Based on a hierarchical linear regression, interactive patterns of anxiety and avoidance exhibited an intercultural difference: adolescents with a fearful attachment style reported the highest levels of internalizing problem behavior among the Han, whereas adolescents with a preoccupied attachment style did so among the Dong-Xiang. Through these results, the current study highlights the vital role of attachment to fathers in early adolescents' internalizing problem behavior and emphasizes the interactive patterns between anxiety and avoidance in interpreting the variance of internalizing problem behavior. Further, the results not only have important theoretical implications for the discussion of attachment as a universal or cultural phenomenon, but also highlight practical ways to mitigate early adolescents' internalizing problem behavior.

**Keywords** Internalizing problem behavior · Attachment anxiety · Attachment avoidance · Fathers · Early adolescents

## Highlights

- Little is known about the relation between attachment to fathers and early adolescents' internalizing problem behavior (IPB).
- This study examined how the interplay between anxiety and avoidance dimensions of attachment was differentially related to youth's IPB.
- Adolescents from two ethnic groups (Han and Dong-Xiang) were involved in probing culture-specific research patterns.
- Han adolescents with fearful attachment style reported the highest levels of IPB.
- Dong-Xiang adolescents with preoccupied attachment style reported the highest levels of IPB.

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**Supplementary information** The online version contains supplementary material available at <https://doi.org/10.1007/s10826-023-02587-z>.

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Early adolescence (10–15 years) is a developmental stage characterized by increased self-awareness and autonomy, rapid pubertal maturation, and socioemotional changes (Caissy, 1994; Eccles et al., 1993; Steinberg et al., 2006). While adolescents gain increasingly more autonomy from their parents and spend a progressive amount of time with peers, maintaining the availability of attachment to parental figures remains essential for optimal psychosocial development (Bowlby, 1973; Lieberman et al., 1999). Parent-child conflict often arises during early adolescence as parents attempt to maintain control over adolescents' behavior, which creates a conflict with their increasing self-awareness and

autonomy (Eccles et al., 1993; Steinberg et al., 2006). When grappling with these salient developmental changes and transitions, adolescents have demonstrated high vulnerability to internalizing problem behavior (Garthe et al., 2021; Tang et al., 2019), conceptualized as inwardly oriented problems related to emotional problems and peer relationship difficulties in the current study (Goodman et al., 2010). Given that such behavior interferes with adolescents' domains of functioning and long-term well-being, the association of internalizing problem behavior with attachment to parental figures should be investigated, as the association may have considerable implications for the smooth transitioning required for adolescents' optimal development.

Several features of Chinese culture make it a meaningful context in which to investigate the correlates of internalizing problem behavior in early adolescence. For instance, adolescents' internalizing problem behavior has mostly been neglected in traditional Chinese society, largely due to emotional restraint being highly emphasized (Lan, 2022; Liu et al., 2019). Chinese individuals are also less likely to seek professional counseling services when experiencing psychological distress (Feng & Lan, 2020). In Chinese culture, visiting a psychologist is highly stigmatized and results in losing the dignity of the whole family (Pan & Liu, 2019). These cultural norms and emphases may make Chinese adolescents more vulnerable to stressful life experiences, thereby leading to high internalizing problem behavior. Given this possibility, further investigation into the correlates of this problem behavior in Chinese adolescents will provide essential insights into tailored intervention or prevention programs. In the current study, guided by the attachment theory (Bowlby, 1973; Bowlby & Ainsworth, 2013), we particularly focused on the role of attachment in early adolescents' internalizing problem behavior.

Attachment refers to a long-lasting emotional bond between children and their primary caregivers during early childhood (Bowlby, 1973; Bowlby & Ainsworth, 2013). Interactions with attachment figures are stored in children's mental representations based on internal working models of oneself (worthy or unworthy of love and support) and others (responsive or unresponsive). Socioemotional adjustments and new interpersonal relationships established during early adolescence highlight the importance of studying parent-adolescent attachment (Buist et al., 2004) since adolescents' attachment systems undergo an essential reconstruction of earlier established internal working models from basic to meta-representational processes (Main et al., 1985; Pace et al., 2019; Pace et al., 2020). Adolescents with secure attachment, for instance, have internal working models of self as worthy of love and support, and models of others as reliable and responsive (Bowlby & Ainsworth, 2013). In this regard, attachment figures' sensitive and responsive care soothes adolescents' psychological distress and

alleviates their negative emotions (Brumariu & Kerns, 2010). Empirical studies have documented that secure attachment to parents significantly buffers against adolescents' internalizing problem behavior (Berlin et al., 2008; Buist et al., 2004), including among Chinese adolescents (Chen and Santo (2016); Li et al., 2020).

Despite these research advances, several existing salient limitations of prior research still warrant further investigation: (a) relatively few studies focus on the role of attachment to fathers (compared to research predominantly on attachment to mothers; Li et al., 2020; Nie et al., 2016); (b) analysis of the association between specific attachment styles and internalizing problem behavior remains scarce (see also Brumariu & Kerns, 2010); and (c) considering that attachment theory has been criticized as biased toward modern industrialized societies (Rothbaum et al., 2000), few researchers have investigated whether the association between attachment to fathers and adolescents' internalizing problem behavior exhibits cultural differences.

## Attachment to Fathers

As portrayed by a well-known Chinese proverb, "it is the fathers' fault to rear children without instructing them." Indeed, the traditional Chinese family background emphasizes fathers' responsibility in disciplining their children's behavioral patterns (Li & Lamb, 2015). Mothers undeniably continue to be regarded as the primary caregivers of their children in contemporary society and play an essential role in child-rearing and providing emotional support, but Chinese fathers' style and timing related to child-rearing have changed over the last century (Li et al., 2015; Li, 2020). This change has particularly evolved due to dramatic changes in sociocultural values and significant improvements in women's educational backgrounds. As a result, more women have participated in the workforce and have spent relatively less time child-rearing than in preceding years (Liu et al., 2016). These salient changes within the family contribute to mounting evidence that modern fathers are frequently involved in their children's education, such as by attending parent-teacher meetings, establishing educational goals and occupational plans, and cultivating children's independence (Cao & Lin, 2019; Ho et al., 2010).

Previous research has shown that fathers' involvement is positively related to adolescents' adaptive socioemotional functions, including low levels of internalizing problem behavior (Feng et al., 2019; Su et al., 2017). Extant research also indicates that fathers can affect the onset of internalizing problem behavior in adolescence at a level comparable to that of mothers (Brumariu & Kerns, 2010). Involved fathers can, for instance, model masculine traits for adolescents and cultivate their desirable masculinity

(Li, 2020). Due to the presence of several stressful scenarios in early adolescence, studying father-adolescent attachment are therefore especially relevant.

## Attachment Styles and Internalizing Problem Behavior

Prior meta-analyses have revealed that secure attachment is moderately and negatively related to adolescents' internalizing problem behavior (Colonnesi et al., 2011; Dagan et al., 2021; Spruit et al., 2020). Similarly, recent longitudinal findings have supported this association pattern (e.g., Verhees et al., 2021). Much of the extant research has, however, focused on the role of a single continuum of attachment (secure-insecure) in adolescents' internalizing problem behavior. Comparatively little research has been devoted to understanding the association between distinct attachment styles and adolescents' internalizing problem behavior.

In terms of different attachment styles, Bartholomew and Horowitz's (1991) four-category model has received considerable attention. More specifically, this model is based on the interplay between two attachment dimensions of anxiety and avoidance, with reference to the internal working models of self and others. High/low anxiety indicates negative or positive views of self, whereas high/low avoidance reflects negative or positive attitudes toward others. Therefore, this model yields four categories of attachment styles based on natural configurations of high/low anxiety and high/low avoidance: (a) secure (low anxiety and low avoidance), (b) preoccupied (high anxiety and low avoidance), (c) dismissing (low anxiety and high avoidance), and (d) fearful (also known as disorganized; high anxiety and high avoidance).

The existing limited studies have indicated that insecure attachment styles are differentially associated with internalizing problem behavior based on which insecure attachment subtypes and developmental periods are under examination (Dagan et al., 2020; Dagan et al., 2021). For example, adolescents with preoccupied attachment show more internalizing problem behavior than adolescents with dismissing attachment. Dagan and his colleagues explained that adolescents with preoccupied attachment styles might pay excessive attention to unpleasant attachment-related memories; feel unsure of their fathers' feelings and unsafe in the father-child relationship; and often become clingy, demanding, or possessive toward their fathers. These adverse fixations on attachment-related memories potentially increase adolescents' proneness to emotional distress. In contrast, dismissing adolescents may employ avoidance-oriented strategies and tend to emotionally distance themselves from their fathers, both denying the importance of the

fathers and detaching easily from them. Such behaviors may decrease adolescents' vulnerability to internalizing problem behavior. Despite this indication regarding the differential relations between preoccupied/dismissing attachment styles and internalizing problem behavior, it is still unclear whether the levels of internalizing problem behavior are distinct between preoccupied attachment and fearful attachment, and between dismissing attachment and fearful attachment.

Adolescents with fearful attachment often fear being abandoned but also struggle with being intimate. They may cling to their fathers when feeling rejected but feel trapped when close to them (Bartholomew & Horowitz, 1991). Consequently, adolescents are inclined to experience intense internal conflicts between seeking and avoiding closeness, often without an organized strategy for getting any personal needs met (Park et al., 2019). To the best of our knowledge, the differential associations between all four attachment styles and adolescents' internalizing problem behavior are currently less explored, and the findings generated are quite complex (Dagan et al., 2021). Given the existing knowledge gaps, a better understanding of how the interplay between different attachment dimensions of anxiety and avoidance relates to early adolescents' internalizing problem behavior would be both meaningful and informative.

## A Focus on Han and Dong-Xiang Ethnic Groups

In the context of China, a multi-ethnic country with diverse intercultural differences, this study focused on the Han and Dong-Xiang ethnic groups. The differences between these ethnic groups can especially be seen in the economic and sociocultural realms that potentially influence father-child interactions and their psychological consequences. As the majority ethnic group in China, Confucianism remains one of the most influential religious philosophies in the Han (Bond, 2010). For example, Confucianism emphasizes collectivistic welfare and social harmony, in which close interactions among family members and conformity to fathers are highlighted (Bond, 2010; Chen, 2010). Yet those dynamics have been, to some degree, affected by measures that the Chinese government has historically used to restrict population growth, such as the one-child policy. This policy, starting in the 1970s, was implemented mainly among the Han ethnic group, whereas other ethnic minorities were excluded from this policy to increase their populations. In recent years, despite families now being able to have up to two or three children, as of 2021, in response to population aging and labor shortages, the one-child system still significantly influences parental investment in children's human capital among those families who were previously

held to the one-child policy. To enhance the competitiveness of offspring, for instance, fathers within Han families spend more time on childcare and education issues (Cao and Lin (2019); Ho et al., 2010).

Dong-Xiang is an ethnic minority group in China with approximately seven million people (National Bureau of Statistics of China, 2021). Most Dong-Xiang individuals reside in the Lin-Xia Hui Autonomous Prefecture and surrounding regions of Gansu Province, which is in North-western China. In the past decades, the Dong-Xiang ethnic group has, in many aspects, integrated with Han and other ethnic minority groups. For instance, most Dong-Xiang speak in Mandarin and tend to write their language with Chinese characters. Yet the Dong-Xiang undeniably still maintain their unique sociocultural features due to religious, geographical, and economic factors. In terms of religion, most Dong-Xiang adhere to the Islamic faith, and thus problem behaviors against social norms and religious doctrines are highly inhibited (Yin, 1998). Although the government has employed various policies to promote economic growth and full employment in this group (e.g., Dong-Xiang did not have to abide by the one-child policy), the extreme geography (i.e., mountainous regions with meager resources) greatly constrains economic development and educational advances. Prior research has shown that agriculture remains the basis of Dong-Xiang's economy. Further, the educational enrollment and attainment rates of the Dong-Xiang are lower than the national average (e.g., Maslak et al. (2009)). These conditions are problematic because, as documented by prior research (Bradley & Corwyn, 2002), adolescents living in economically disadvantaged situation potentially encounter many psychosocial difficulties due to limited material and social resources.

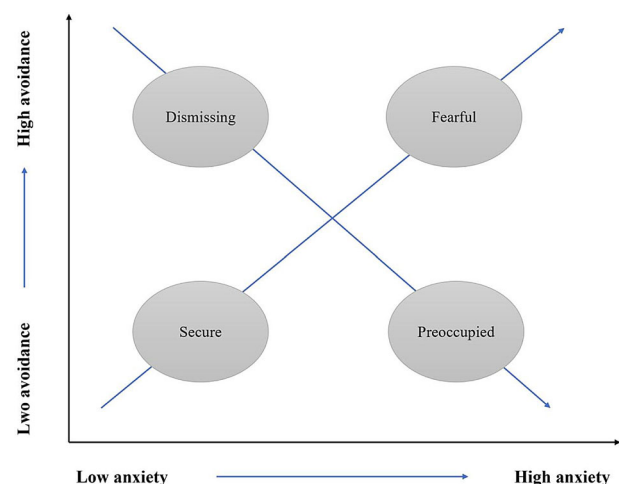
In the existing literature, a dearth of research covers this under-studied Islamic ethnic minority population. The unique sociocultural features and economic situations of this population, as detailed above, make exploring the correlates of internalizing problem behavior among Dong-Xiang adolescents, as compared to the Han ethnic group, a meaningful endeavor. Based on the expected findings, this study would therefore provide novel insights to inform the design of culturally sensitive intervention or prevention programs.

## The Present Study

The objective of the present research was to extend previous studies by investigating the interplay between anxiety and avoidance dimensions of attachment to Chinese fathers in early adolescents' internalizing problem behavior. Further, we examined whether this association might exhibit an intercultural difference between the Han and Dong-Xiang

ethnic groups. To address these research objectives, the moderation analyses between anxiety and avoidance would be performed because we were interested in how combinations (either consistency or discrepancy) of anxiety and avoidance relate to internalizing problem behavior. By consistency, we mean that the levels of two attachment dimensions are the same within one standard deviation of the mean. For example, preoccupied and dismissing attachment styles refer to the consistency between the scores on the anxiety and avoidance dimensions. When using such an approach, researchers can determine how consistency in the levels of anxiety and attachment relates to internalizing problem behavior. In contrast, by discrepancy, we mean the extent to which the levels of two attachment dimensions differ. Secure and fearful attachment styles, for instance, correspond to the discrepancy between the levels of anxiety and avoidance dimensions. In this regard, researchers can gather information regarding the level of internalizing problem behavior because anxiety and avoidance diverge. Figure 1 illustrates the four attachment patterns derived from a combination of anxiety and avoidance. To estimate the intercultural differences of the study associations, the combined sample of Han and Dong-Xiang adolescents would be analyzed, with the ethnic group as an additional moderator.

In the current study, we used a self-reported measurement of attachment with moderation analyses to study the degree of consistencies or discrepancies between anxiety and avoidance as a novel contribution to attachment literature, demonstrating the following advantages. First, while self-reported measurements are a challenging way to gather in-depth information, they are a relatively efficient way to simultaneously identify four-dimensional attachment styles at a low cost. Using separate measurements of attachment styles instead is time-consuming and creates



**Fig. 1** An illustration of the dimensional framework of attachment styles based on moderation analysis

potential participation burdens for adolescents. Second, compared to the existing studies that heavily rely on a single self-reported item to determine each attachment style (e.g., Cacioppo et al., 2019; Demircioğlu & Göncü Köse, 2021), the current study using a measurement with multiple items for anxiety and avoidance dimensions could estimate internal consistencies and ensure sufficient levels of reliability. Finally, we followed the dimensional model of attachment theory (Bartholomew & Horowitz, 1991) and defined four attachment styles via natural configurations of high/low anxiety and high/low avoidance. From this perspective, any consistencies or discrepancies between anxiety and avoidance ratings can be conceptually and meaningfully interpreted because the measurement of both anxiety and avoidance come from the same conceptual domain and get assessed on the same numeric scale.

Due to the scarcity of literature on the interplay between anxiety and avoidance in internalizing problem behavior among Han and Dong-Xiang adolescents, we did not generate specific hypotheses about the associations under investigation. Nevertheless, some expectations can be made. We first expected that adolescents with higher attachment anxiety, regardless of the levels of avoidance (either “preoccupied” or “fearful”), might be more likely to report higher levels of internalizing problem behavior than those with lower anxiety (“secure” and “dismissing”). This is because high attachment anxiety might be more strongly linked to inwardly oriented problems (Dagan et al., 2020; Dagan et al., 2021). By contrast, in the presence of lower attachment anxiety, adolescents with higher attachment avoidance (“dismissing”) might report higher internalizing problem behavior than those with lower attachment avoidance (“secure”), given the well-established evidence showing that adolescents with secure attachment styles tend to report low internalizing problem behavior (Colonnesi et al., 2011; Spruit et al., 2020).

Subsequently, such expected interactive patterns of two attachment dimensions might exhibit an intercultural difference between Han and Dong-Xiang ethnic groups. Although family and father-adolescent relationships are important in both Confucian and Islamic cultural contexts, some differences exist between the cultures as well. Being emotionally distanced from fathers in Confucianism goes against the value of filial piety that requires children to care for and maintain close contact with their elderly parents (Wang et al., 2022). In contrast to the emotional ties in Confucianism, the father-adolescent relationships within Dong-Xiang families are defined by divine power (Hossain & Juhari, 2015). The fathers are responsible for instilling Islamic values in their offspring and internalizing these beliefs through philanthropy and prayer (Hossain & Juhari, 2015). Distance from fathers within Dong-Xiang families is often linked to the worse implementation of Islamic

practices, and in this regard, high attachment avoidance to fathers might have detrimental consequences on adolescents’ optimal functions. Considering these cultural differences, we expected that Dong-Xiang adolescents with higher anxiety, in the presence of higher attachment avoidance (“fearful”), might report higher internalizing problem behavior than those with lower anxiety and/or lower avoidance. In contrast, the same combinations of higher anxiety and higher avoidance in internalizing problem behavior among Han counterparts might not be as severe as among Dong-Xiang adolescents.

In addition, according to prior research (e.g., Cheung et al., 2018), sociodemographic characteristics (i.e., gender, age, and family socioeconomic status [SES]) are linked to early adolescents’ internalizing problem behavior. Girls, older adolescents, and adolescents from families with low SES backgrounds, for example, tend to report high internalizing problem behavior. We, therefore, statistically controlled for these variables when examining the previously defined objectives.

## Methods

### Participants and Procedures

Before data collection, the current study was approved by the Research Ethics Committee affiliated with the first author’s university. Through personal networks and school collaborations, the authors contacted public primary and secondary schools in Lin-Xia city, Gansu province (northwest China). We performed a passive parental consent procedure because an active consent often causes selection bias and is practically difficult to perform, thereby resulting in a low participation rate (Ellickson & Hawes, 1989). More specifically, we established formal meetings with school principals and head teachers to provide information about the research objectives, general procedures, and participant rights. In China, soliciting consent from school principals and head teachers, who are considered the legal guardians of school-based research, is a common practice (Ma et al., 2020). After obtaining approval from the principals and head teachers, we asked head teachers in each classroom to send parents a pre-designed message about our research project via WeChat (a popular Chinese social media platform used to connect parents with teachers). Parents were told that participation in the current study was voluntary and that their children’s responses were strictly confidential and anonymous. During the actual survey, their children could decide to stop participating at any time. Parents were also instructed to individually contact head teachers if the parents no longer wanted their children to participate in the investigation. In such cases, the children would be assigned

**Table 1** Descriptive statistics and bivariate correlations between study variables for Han and Dong-Xiang adolescents

	Han ( <i>n</i> = 754)			Dong-Xiang ( <i>n</i> = 265)			<i>t</i> / $\chi^2$	1	2	3	4	5	6
	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range							
1. Attachment anxiety	1.92	1.01	1–7	1.85	0.92	1–5	1.00	–	0.57**	0.42**	–0.05	–0.08*	–0.04
2. Attachment avoidance	2.56	1.17	1–4	2.52	1.20	1–5	0.47	0.48**	–	0.36**	0.09*	–0.03	–0.06
3. Internalizing problem behavior	6.52	3.45	1–7	6.42	3.69	0–18	0.39	0.39**	0.35**	–	–0.07	–0.06	–0.02
4. Age	12.74	1.54	10–15	12.47	1.46	10–15	2.30	–0.06	0.11	–0.02	–	–0.01	–0.09*
5. Gender <sup>a</sup>	–	–	1–2	–	–	1–2	–0.01	–0.08	–0.05	–0.12*	–0.01	–	–0.02
6. Socioeconomic status	4.99	1.76	0–9	5.32	1.65	0–9	–2.64	–0.09	–0.11	–0.06	–0.15*	0.15*	–

*N* = 1019

<sup>a</sup>coded as 1 = male, 2 = female. Correlation coefficients displayed below the diagonal are for Dong-Xiang adolescents, above for Han adolescents.

\**p* < 0.05, \*\**p* < 0.001

other academic duties while this investigation was conducted. This procedure has been widely employed in school-based research in China (e.g., Feng & Lan, 2020; Xu et al., 2018; Wang et al., 2019). The data collection for the current investigation occurred between June and July 2019. During school hours, we asked students to give verbal assent to participate in this study. Subsequently, we gave standardized instructions to students, and asked them to fill in a packet of questionnaires in a pencil-to-paper format.

Approximately 1700 school-aged adolescents participated in the current investigation. We first excluded adolescents who did not belong to Han and Dong-Xiang ethnic groups. Moreover, we excluded eight adolescents who were above 15 years old due to the focus on early adolescence in the current study (McElwain & Bub, 2018). Three samples were also deleted due to them violating linear regression assumptions (see the Data Analytic Plan for elaboration). A final valid sample of 1019 adolescents between 10 to 15 years old (*M*<sub>age</sub> = 12.66, *SD* = 1.51; 52.8% girls) was employed in the following analyses. At the time of data collection, they attended 4th, 5th, 6th, 7th, and 8th grades. Of these adolescents, 754 (*M*<sub>age</sub> = 12.72, *SD* = 1.52; 52.8% girls) were from the Han ethnic group, and 265 (*M*<sub>age</sub> = 12.47, *SD* = 1.46; 52.8% girls) were from the Dong-Xiang ethnic group. In terms of parental education levels, most Han adolescents' fathers (26.9%) and mothers (32.1%) had completed high school education and middle school education or lower; by contrast, most Dong-Xiang adolescents' fathers (20.8%) and mothers (24.2%) had completed undergraduate education or higher. Concerning family SES (as measured by the Family Affluence Scale; Boyce et al., 2006), 43.9% and 48.7% of Han and Dong-Xiang adolescents came from high-income families, 46.0% and 45.7% came from medium-income families, and 10.1% and 5.7% came from low-income families. Preliminary analysis revealed that these two ethnic groups of adolescents matched well in terms of socio-demographic characteristics (see Table 1).

## Measures

### Internalizing problem behavior

Internalizing problem behavior was assessed using the subscales of (5 items) emotional problems and peer relationship problems (5 items) of the Strengths and Difficulties Questionnaires (SDQ; Goodman, 1997). The SDQ is a well-established and widely-used self-report measurement to assess adolescent psychopathology (Kersten et al., 2016). The Chinese version of the SDQ has been previously validated in adolescents, showing good reliability and validity (Yao et al., 2009). To be specific, adolescents were asked to respond to each statement within the past six months on a 3-point Likert scale (0 = *not true*, 1 = *somewhat true*, and 2 = *certainly true*). A sum score of all these items was obtained, with higher scores indicating higher levels of internalizing problem behavior. In the present study, Cronbach's alpha was 0.68 and 0.72 for Han and Dong-Xiang adolescents.

### Anxiety and avoidance attachment

Anxiety and avoidance dimensions of attachment to father were assessed by a short form of The Brief Experiences in Close Relationships Scale-Revised Child version (ECR-RC; Brenning et al., 2014). The Chinese version of the ECR-RC was generated based on standard translation-back translation procedures (Vijver & Leung, 1997). More specifically, the ECR-RC consists of 12 items, with six items per anxiety and six items per avoidance. Item examples are "I worry that my father does not really love me (anxiety)," and "I prefer not to tell my father how I feel deep down (avoidance)." Following prior research (Marci et al., 2018), the response format has been changed into a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*completely agree*), making it more understandable for young

adolescents. The mean score per each attachment dimension was calculated, with higher scores indicating higher attachment anxiety and higher attachment avoidance.

We examined the psychometric properties of the ECR-RC for the father form in the current sample based on the following steps. First, we conducted confirmatory factor analysis (CFA) to evaluate the factor structure and calculated Cronbach's alpha to assess internal consistency. Second, we used multi-group CFA to test measurement invariance across Han and Dong-Xiang adolescents. Third, we completed a series of structural equation modeling to examine convergent validity. Due to the space limitations in the manuscript, however, we only presented the results for the first step; the findings from the second and third steps can be found in the Supplementary Materials. In the current study, the ECR-RC demonstrated good reliability and validity for Han adolescents (Cronbach's alpha was 0.92 and 0.81 for attachment anxiety and attachment avoidance, respectively;  $\chi^2 [26, n = 754] = 55.38, p < 0.001$ ; CFI = 0.994, TLI = 0.992, RMSEA = 0.039). Meanwhile, the ECR-RC showed good reliability and validity for Dong-Xiang adolescents (Cronbach's alpha was 0.89 and 0.83 for anxiety and avoidance, respectively;  $\chi^2 [26, n = 265] = 49.81, p < 0.001$ ; CFI = 0.984, TLI = 0.978, RMSEA = 0.059).

### Socio-demographic characteristics

Adolescents were asked to indicate their age, gender, ethnicity, grade levels, and parental educational background. In terms of parental educational background, four options were available: (1) undergraduate education or higher, (2) high school education, (3) middle school or lower education, and (4) I do not know (coded as missing values). Adolescents' family SES was assessed using the Family Affluence Scale (FAS; Boyce et al., 2006). The FAS has been widely used to assess family affluence in adolescent samples, given that young adolescents often have difficulties with reporting accurate information regarding their parents' occupational status or family income, consequently resulting in low completion or high non-response rates (Currie et al., 2008; Lan et al., 2021; Liu et al., 2012). The FAS consists of four items (i.e., number of owned cars, number of owned computers, youth's own bedroom, and frequency of traveling during the past year). Adolescents were asked to rate each item based on the specific numbers of their family belongings (e.g., 0 = no, 1 = one, 2 = two, and 3 = more than two). A sum score of all these items was calculated, with higher scores indicating higher family affluence. Of these scores, 0 to 2 indicated low affluence, 3 to 5 medium affluence, and 6 to 9 high affluence (Boyce et al., 2006).

### Data Analytic Plan

Data analyses were performed using SPSS 27.0 (IBM Corp., 2020) and R software (R Core Team, 2020) in the

following order. First, descriptive statistics and bivariate correlations were performed. A series of independent *t*-tests were used to examine group differences in continuous variables, and a chi-square test was employed to detect group differences in gender. Second, we employed a hierarchical linear regression to examine the interplay between anxiety and avoidance to father in adolescents' internalizing problem behavior between Han and Dong-Xiang ethnic groups. A hierarchical linear regression, as a special form of a multiple linear regression, was performed to statistically "control" for certain variables to investigate whether adding variables significantly enhances the performance of the model (Lindenberger & Pötter, 1998). In this context, study variables are added to the model in separate steps. This variance-partitioning procedure is particularly useful to examine whether additional two- or three-way interactions (i.e., moderation effect) can, in terms of going beyond the main effects, significantly account for model interpretations. During this analysis step, we used the restricted maximum likelihood (REML) estimator instead of the maximum likelihood estimation (ML) to potentially exclude the effect of multicollinearity on parameter estimation in the context of hierarchical linear regression (Yu et al., 2015). We acknowledge that employing relatively coarse Likert scales to assess study variables, particularly the outcome, may inevitably cause information loss, which somewhat increases the probability of a Type II error (Russell & Bobko, 1992). Nevertheless, it is a common standard in developmental literature to establish an aggregate score based on the sum or average of the Likert-type scales, and further examine study associations using linear regression (Lindenberger & Pötter, 1998).

Before performing this analysis, the assumptions of linear regression were examined. We used Mardia's multivariate skewness and kurtosis to detect the assumption of multivariate normality and applied the Mahalanobis distance to detect the presence of multivariate outliers in this study (Ma et al., 2020). Three cases were identified from this step of the analysis, resulting in the exclusions from the further analysis. In addition, a preliminary analysis exhibited less than 1% missing values per each study variable. Hence, the full information maximum likelihood estimation was used to handle missing data in this study, which provides more accurate standard errors and parameter estimates by retaining the original sample size (Enders, 2001).

In hierarchical linear regression, categorical variables (i.e., gender and ethnic groups) were dummy-coded, and continuous variables were mean-centered before entering the regression model. Subsequently, the predictors were entered into the regression model in the following steps. First, covariates, including age, gender, and family SES were entered. Second, the variables of attachment anxiety, attachment avoidance, and ethnic groups were added,

examining the unique associations of these variables with internalizing problem behavior. Third, the two-way interactions between these study variables (attachment anxiety x attachment avoidance, attachment anxiety x ethnic groups, and attachment avoidance x ethnic groups) were entered, ascertaining the interactive patterns of these variables on the outcome. Fourth, the three-way interaction term of attachment anxiety, attachment avoidance, and ethnic groups added was created and entered into the model. Adjusted *R*-square was used to calculate the explained variance of each step on the outcome (Miles, 2014), and changes in adjusted *R*-square and *F*-values were employed to assess the additional variance of each step on the outcome. Significant interactions were then probed using simple slope analysis, in which the moderator was divided into two levels based on the mean (Aiken & West, 1991). In all analyses, we interpreted the significant results as  $p < 0.05$ , and that confidence intervals did not contain zero.

In addition to the main analyses, we also explored the relative sensitivity of these findings (i.e., sensitivity analyses) by removing the adolescents aged 15 in both Han and Dong-Xiang adolescents. A recent meta-analysis has shown that attachment styles are differentially related to internalizing problem behavior, depending on the developmental periods under examination (Dagan et al., 2021). Adolescents who are above 15 years old are in the transitional period from early to middle adolescence. Removing them and re-running data analyses would be both theoretically and statistically meaningful to ensure that the research findings are robust and would not alter under different, plausible scenarios.

## Results

### Preliminary Analysis

Table 1 presents the descriptive statistics and bivariate correlations among study variables, separately by Han and Dong-Xiang adolescents. No significant group differences were found in terms of study variables and covariates. For both groups of adolescents, attachment anxiety and attachment avoidance were positively associated with internalizing problem behavior.

### The Associations of Attachment Anxiety, Attachment Avoidance, and Ethnic Groups with Internalizing Problem Behavior

Results of hierarchical linear regression testing the direct and interactive associations of attachment anxiety, attachment avoidance, and ethnic groups with internalizing problem behavior are summarized in Table 2. Overall, the

model explained 20.0% of the variance in internalizing problem behavior.

As shown in Table 2, confounding effects, tested in the first step, only explained 0.01% of the variance in internalizing problem behavior. Older adolescents and adolescents from low family SES backgrounds reported higher levels of internalizing problem behavior. Main effects, tested in the second step, explained an additional 18.6% of the variance in internalizing problem behavior. Attachment anxiety and attachment avoidance were each positively associated with internalizing problem behavior. The two-way interactions, tested in third step, did not significantly account for the variance of internalizing problem behavior, and none of the interactions was significant. The three-way interaction, tested in the fourth step, explained additionally 0.3% of the variance in internalizing problem behavior. The three two-way interactions were negatively related to internalizing problem behavior, whereas the three-way interaction was positively related to internalizing problem behavior. Given our research objectives, we further interpreted the significant two-way interaction between anxiety and avoidance only and the significant three-way interaction based on the results of simple slope analyses and corresponding graphs.

As shown in Fig. 2, the positive association between attachment anxiety and internalizing problem behavior was significant at both higher levels of attachment avoidance ( $b = 0.96$ ;  $SE = 0.15$ , 95% CI = [0.66, 1.26],  $t = 6.32$ ,  $p < 0.001$ ), and lower levels of attachment avoidance ( $b = 1.37$ ;  $SE = 0.24$ , 95% CI = [0.90, 1.85],  $t = 5.67$ ,  $p < 0.001$ ). Since both lines were significant, we could interpret them in distinct levels of anxiety from a descriptive point of view. Adolescents with higher attachment anxiety, regardless of the levels of avoidance (either “preoccupied” or “fearful”), reported higher levels of internalizing problem behavior than those with lower anxiety (“secure” and “dismissing”). In the presence of lower attachment anxiety, adolescents with higher attachment avoidance (“dismissing”) reported higher internalizing problem behavior than those with lower attachment avoidance (“secure”).

As shown in Fig. 3, for Han adolescents, the positive association between attachment anxiety and internalizing problem behavior was significant at both higher levels of attachment avoidance ( $b = 1.05$ ;  $SE = 0.14$ , 95% CI = [2.16, 3.79],  $t = 7.36$ ,  $p < 0.001$ ), and lower levels of attachment avoidance ( $b = 0.91$ ;  $SE = 0.24$ , 95% CI = [1.55, 3.98],  $t = 3.79$ ,  $p < 0.001$ ). In the presence of higher anxiety, Han adolescents with higher avoidance (“fearful”) tended to report higher internalizing problem behavior than those with lower avoidance (“preoccupied”). In the presence of lower anxiety, Han adolescents with higher avoidance (“dismissing”) tended to report higher internalizing problem behavior than those with lower avoidance (“secure”). That said, Han adolescents with higher



**Table 2** Hierarchical regression analysis predicting internalizing problem behavior from attachment anxiety, attachment avoidance, and ethnic groups

	<i>b</i>	<i>b SE</i>	<i>t</i>	<i>p</i>	<i>Adjusted R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1							
Age	8.97	1.03	8.74	<0.001			
Gender <sup>a</sup>	−0.14	0.07	−1.92	0.06			
Socioeconomic status	−0.55	0.22	−2.51	0.01	0.008	0.011	3.74*
Step 2							
Age	−0.14	0.07	−2.12	0.03			
Gender	−0.34	0.20	−1.73	0.09			
Socioeconomic status	−0.02	0.06	−0.34	0.74			
Anxiety	1.04	0.12	8.64	<0.001			
Avoidance	0.59	0.10	5.85	<0.001			
Ethnic groups <sup>b</sup>	0.02	0.23	0.09	0.93	0.194	0.186	78.62**
Step 3							
Age	−0.14	0.07	−2.10	0.04			
Gender	−0.34	0.20	−1.72	0.09			
Socioeconomic Status	−0.02	0.06	−0.30	0.77			
Anxiety	1.22	0.36	3.34	<0.001			
Avoidance	0.73	0.23	3.12	0.00			
Ethnic Groups <sup>b</sup>	0.46	0.59	0.78	0.44			
Anxiety x Avoidance	−0.03	0.09	−0.38	0.70			
Anxiety x Ethnic Groups	−0.07	0.28	−0.27	0.79			
Avoidance x Ethnic Groups	−0.12	0.22	−0.53	0.60	0.192	< 0.001	0.29
Step 4							
Age	−0.14	0.07	−2.12	0.03			
Gender	−0.32	0.20	−1.58	0.12			
Socioeconomic status	−0.02	0.06	−0.26	0.79			
Anxiety	2.40	0.66	3.65	<0.001			
Avoidance	1.35	0.37	3.65	<0.001			
Ethnic groups <sup>b</sup>	2.76	1.22	2.27	0.02			
Anxiety x Avoidance	−0.41	0.19	−2.10	0.04			
Anxiety x Ethnic Groups	−1.57	0.75	−2.10	0.04			
Avoidance x Ethnic Groups	−0.90	0.42	−2.12	0.03			
Anxiety x Avoidance x Ethnic Groups	0.47	0.22	2.16	0.03	0.195	0.003	4.65*

*N* = 1019;

<sup>a</sup>coded as 1 = Dong-Xiang adolescents, 2 = Han adolescents;

<sup>b</sup>coded as 1 = male, 2 = female

\**p* < 0.05, \*\**p* < 0.001

avoidance (versus lower avoidance) consistently exhibited higher internalizing problem behavior, regardless of the levels of anxiety.

For Dong-Xiang adolescents, the positive association between attachment anxiety and internalizing problem behavior was significant at both higher levels of attachment avoidance ( $b = 0.87$ ;  $SE = 0.27$ , 95% CI = [1.41, 4.03],  $t = 3.25$ ,  $p < 0.001$ ), and lower levels of attachment avoidance ( $b = 1.84$ ;  $SE = 0.42$ , 95% CI = [2.75, 14.27],  $t = 4.37$ ,  $p < 0.001$ ). Specifically, in the presence of higher anxiety, Dong-Xiang adolescents with lower avoidance (“preoccupied”) tended to report higher internalizing

problem behavior than those with higher avoidance (“fearful”). However, in the presence of lower anxiety, Dong-Xiang adolescents with higher avoidance (“dismissing”) were likely to report higher internalizing problem behavior than those with lower avoidance (“secure”). That said, Dong-Xiang adolescents with distinct levels of avoidance exhibited differences in internalizing problem behavior, depending on the levels of anxiety.

Through the comparison of the interaction patterns between these two ethnic groups, we concluded that, in the presence of lower anxiety, both Han and Dong-Xiang adolescents with higher avoidance (“dismissing”) tended to

report higher internalizing problem behavior than those with lower avoidance (“secure”). However, different interaction patterns were exhibited in the presence of higher anxiety. Adolescents with fearful attachment style reported the highest levels of internalizing problem behavior among the Han, whereas Dong-Xiang adolescents with lower avoidance (“preoccupied”) attachment style did so.

### Sensitivity analyses

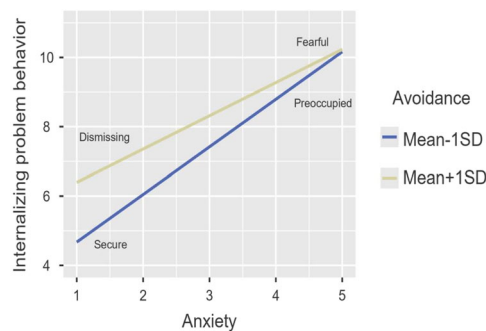
After removing adolescents aged 15 from the current samples, we re-ran the hierarchical linear regression, and the results showed no meaningful change regarding the direction or significance of the findings derived from the original analyses. The consistency of these results provided additional insights into the robustness and trustworthiness of the hierarchical linear regression analysis. We hence retained the original analyses using the full sample size with 15-year-old adolescents included and thereafter discussed the results. The statistical parameters of this step of the analysis can be found in the Supplementary Materials (see Table S2).

### Discussion

Although previous studies have extensively examined the association between attachment especially toward mothers

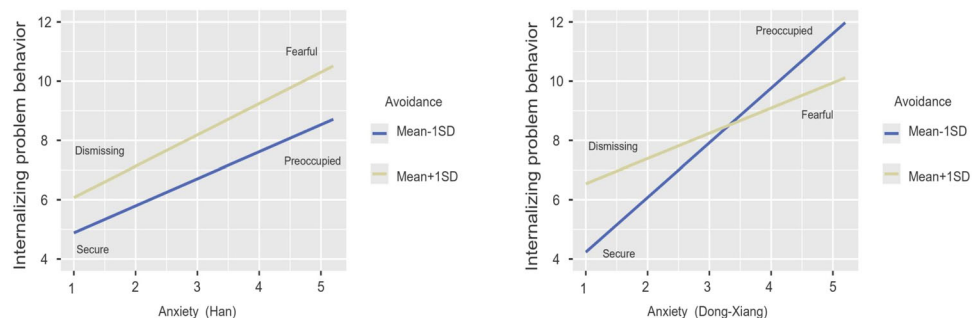
and internalizing problem behavior in adolescents, little research attention has been paid to attachment toward fathers and how different attachment styles are related to adolescents’ internalizing problem behavior. This ignorance is striking during early adolescence, a developmental phase when youth undergo complex changes in their attachment system. Moreover, there is a shortage of empirical studies examining intercultural differences in this association. Attempting to fill these research gaps, we investigated how the interplay between anxiety and avoidance dimensions of attachment to Chinese fathers is associated with the internalization of problem behavior by Han and Dong-Xiang adolescents. Moderation analyses exhibited that adolescents with fearful and preoccupied attachment styles reported high internalizing problem behavior. An intercultural investigation further exhibited that adolescents with a fearful attachment style reported the highest levels of internalizing problem behavior among the Han, whereas adolescents with a preoccupied attachment style did so among the Dong-Xiang.

Consistent with the first expectation, the results exhibited that adolescents with fearful and preoccupied attachment styles tended to report higher internalizing problem behavior than those with secure and dismissing styles. This finding is congruent with previous studies (Colonesi et al., 2011; Dagan et al., 2021; Spruit et al., 2020) documenting that attachment anxiety is a risk factor for adolescents’ internalizing problem behavior. Indeed, adolescents with high attachment anxiety may develop a negative self-image. In this context, adolescents employ negative coping styles in response to stressful circumstances and participate less in social activities, thus increasing their vulnerability to internalizing problem behavior (Rubin et al., 2004). Moreover, the two-way interaction pattern, in line with our expectation, also exhibited that adolescents with secure attachment styles reported less internalizing problem behavior than dismissing attachment styles. One possible explanation for this is that adolescents with attachment security to fathers may feel the responsiveness and availability of their fathers (Bowlby, 1973; Bowlby et al., 2013). Such trust and confirmation in adolescents’ relationships with their fathers forms an internal



**Fig. 2** Interaction effect of attachment anxiety and attachment avoidance on internalizing problem behavior.  $N = 1019$ . Avoidance was divided into two levels based on mean: low =  $M - 1SD$  and high =  $M + 1SD$

**Fig. 3** Interaction effect of attachment anxiety, attachment avoidance, and ethnic groups on internalizing problem behavior.  $N = 1019$ . Avoidance was divided into two levels based on mean: low =  $M - 1SD$  and high =  $M + 1SD$



working model that fathers are trustworthy and dependable when needed. Therefore, an secure emotional bond established between adolescents and their fathers positively impacts adolescents' resilience and capacities to grapple with emotional distress (Gold et al., 2020), resulting in low internalizing problem behavior.

However, this interactive pattern mentioned above exhibited an intercultural difference between Han and Dong-Xiang adolescents. Han adolescents with higher attachment avoidance (both fearful and dismissing) consistently reported higher levels of internalizing problem behavior than those with lower attachment avoidance (both preoccupied and secure). One possible explanation is that, with dramatic sociocultural changes in Han families during the past decade, egalitarianism has penetrated the social consciousness; the father's role in the family is no longer solely that of the breadwinner but includes being more involved in child-rearing (Li, 2020). In many instances, Chinese fathers play an equally important role as mothers in their children's daily activities and psychosocial functioning (Feng et al., 2019; Su et al., 2017). Likewise, most Han families have only one child, and fathers can pay extensive attention to this single child. Attachment avoidance to fathers in this context becomes particularly detrimental. Adolescents may be frequently worried about their daily contact with fathers and hope to keep a proper distance from them. Being emotionally distanced from fathers in Confucianism goes against the value of filial piety that requires children to care for and maintain close contact with their elderly parents (Wang et al., 2022), which may result in high internalizing problem behavior.

Further, Dong-Xiang adolescents with distinct levels of attachment avoidance exhibited differences in internalizing problem behavior, depending on the levels of attachment anxiety. The current findings suggest that attachment avoidance of Dong-Xiang adolescents exhibits differential susceptibility (Belsky & Pluess, 2009), documenting that avoidance is related to early adolescents' differentiating internalizing problem behavior in both high and low anxiety. Adolescents with low avoidance, under low attachment anxiety contexts, may be more likely to effectively manage their emotions and establish positive peer interactions. By contrast, adolescents with low avoidance, under high attachment anxiety contexts, tend to analyze social information on a deeper and more complex level and overly process this information when interacting with their fathers, resulting in their social capacities being jeopardized by their overreactions and sensitivity responses. One possible interpretation for this pattern is that, in Dong-Xiang ethnic groups, parents—especially fathers—assume the primary responsibility for supervising their children to behave within the beliefs of Islam and universal human values (Hossain & Juhari, 2015). In this perspective, the father

figure in a family represents the degree of young adolescents' devotion to divine power and their implementation of Islamic faith and proper practice. Although adolescents frequently approach their fathers in this regard, adolescents may, at the same time, be overly sensitive to the relationships with their fathers due to the emphasis on resolute and paramount Islamic values. Nevertheless, while the current study supports this differential susceptibility pattern, our finding offers only tentative support, so further replication is still needed to draw any solid conclusions.

Along with these significant findings, several limitations in the present research should be acknowledged. First and foremost, the cross-sectional design of the current study does not allow us to infer causality. Future studies should use a longitudinal design to enhance our conceptual understanding of the probable causal chain from attachment toward fathers to adolescents' internalizing problem behavior. Another methodological limitation is that the current study relies solely on self-report questionnaires on an ordinal scale. Distinct attachment styles can be captured by other measurements, such as the Friends and Family Interview (Pace et al., 2020); while time-consuming and costly, such measurements provide the kind of in-depth information that self-reported questionnaires rarely provide. Relatedly, self-reported questionnaires that leverage an ordinal scale, although widely used, violate the statistical assumptions of parametric tests (regarding categorical data as continuous). Therefore, future studies should consider using alternative measurements to obtain more in-depth results with higher validity compared to those obtained via self-reported ordinal scales. Third, although the ECR-RC has demonstrated sound psychometric properties in current samples, its rest-retest reliability and concurrent validity were not examined due to our research constraints. Therefore, future validation studies should address these limitations by comprehensively assessing the Chinese version of the ECR-RC to ensure it is a psychometrically reliable and valid tool for assessing attachment in adolescents. Finally, although the current study adds to the extant research by focusing on the unique role of attachment to fathers, examining a relatively limited range of social contexts may yield a less holistic picture of the linkage between several attachment figures and early adolescents' internalizing problem behavior. Other variables, such as attachment to mothers and peers (Muzi et al., 2022), should be incorporated in future investigations to provide a comprehensive and systematic understanding of the associations between the variables and internalizing problem behavior. These limitations notwithstanding, the current study offers important theoretical and practical implications. With regard to theory, the current study contributes to the understanding of the developmental processes of internalizing problem behavior in early adolescence by

investigating the interplay between anxiety and attachment avoidance. Moreover, the current study enriches the conceptual literature that predominantly and disproportionately focuses on attachment toward mothers, and it demonstrates the essential role of fathers in adolescent healthy development. Additionally, the current findings exhibit ethnic group differences, which could be attributed to cultural differences in father-adolescent attachment relationships, contributing to the discussion of attachment as either a universal or a cultural phenomenon (Keller, 2018; Rothbaum et al., 2000; van IJzendoorn & Sagi-Schwartz, 2008).

In accordance with prior meta-analyses (Spruit et al., 2020), the current findings suggest that attachment insecurity is positively related to internalizing problem behavior. Therefore, school-based counselors or practitioners may administer the quality of attachment assessment among youth and screen those who exhibit high attachment insecurity for further psychological treatment. Moreover, school authorities should start highlighting the unique role of father involvement with adolescent; authorities could, for instance, encourage fathers' participation through parent-child meetings or parent-teacher WeChat groups, excluding possible barriers or misconceptions regarding father-implemented activities. Likewise, tailored father-friendly activities, such as "pair fathers" and "father playgroups," may promote active father involvement (for further details, see Flippin & Crais, 2011). For adolescents who show potentially insecure attachment to their fathers, attachment-based family interventions may be in order (Diamond et al., 2003). Counselors or practitioners should guide or encourage these families to seek individual intervention sessions to repair relational ruptures and rebuild trust in their relationships with their children. At the same time, a therapist may repeatedly interact with students to help them cognitively restructure their relational schemas, as attachment presentations reflect previous repeated interactions with fathers and become consolidated at certain points (Dagan et al., 2020). In addition, the current study suggests that adolescents' cultural or ethnic backgrounds should be carefully considered when performing targeted intervention programs in a bid to improve their efficacy.

## Conclusion

The current study highlights the critical role of attachment to fathers in early adolescents' internalizing problem behavior. Moreover, the interactive patterns between anxiety and avoidance dimensions of attachment are differentially related to adolescents' internalizing problem behavior. Additionally, the current study indicates that attachment theory is essentially universal, but it also exhibits culture-specific expressions of father-adolescent interactions relevant to specific economic and sociocultural realms.

**Acknowledgements** The authors are grateful to adolescents who participated in the current study and several graduate students who assisted with data collection. Moreover, the authors thank the editors and three anonymous reviewers for their constructive comments and feedback on improving the quality of this manuscript. In addition, the authors thank Tatiana Marci for her research inspiration in conducting this study. Of note, during preparation of this article, X. Lan was supported by grants from the Research Council of Norway (grant #288083, #320709).

**Funding** The current study was supported by the General Project of Philosophy and Social Science Planning of Gansu Province in 2021 (NO. 2021YB022) and the project of Education and Teaching Reform Research (Northwest Minzu University; NO. 2021XJCXYJGX06). Open access funding provided by University of Oslo (incl Oslo University Hospital).

## Compliance with Ethical Standards

**Conflict of Interest** The authors declare no competing interests.

**Consent to Participate** Informed consent was obtained from all participants included in the study.

**Ethical Approval** Approval was obtained from the ethics committee of the University affiliated with the first author. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

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## References

- Aiken, L. S., & West, S. G. (1991). *Multiple Regression: Testing and Interpreting Interactions*. Thousand Oaks, CA: SAGE.
- Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: a test of a four-category model. *Journal of Personality and Social Psychology*, *61*, 226–244.
- Belsky, J., & Pluess, M. (2009). Beyond diathesis stress: differential susceptibility to environmental influences. *Psychological Bulletin*, *135*, 885–908. <https://doi.org/10.1037/a0017376>.
- IBM Corporation. (2020). *IBM SPSS Statistics for Windows, Version 27.0*. Armonk, NY: IBM Corp.
- Berlin, L. J., Cassidy, J., & Appleyard, K. (2008). The influence of early attachments on other relationships. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 333–347). New York, NY: Guilford.
- Bond, M. H. (Ed.). (2010). *The oxford handbook of Chinese psychology*. Oxford University Press.

- Bowlby, J. (1973). *Attachment and loss: Vol. 2. Separation*. New York, NY: Basic Books.
- Bowlby, J., & Ainsworth, M. (2013). The origins of attachment theory. *Attachment Theory: Social, Developmental, and Clinical Perspectives*, 45, 759–775.
- Boyce, W., Torsheim, T., Currie, C., & Zambon, A. (2006). The family affluence scale as a measure of national wealth: validation of an adolescent self-report measure. *Social Indicators Research*, 78, 473–487. <https://doi.org/10.1007/s11205-005-1607-6>.
- Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology*, 53, 371–399. <https://doi.org/10.1146/annurev.psych.53.100901.135233>.
- Brenning, K., Van Petegem, S., Vanhalst, J., & Soenens, B. (2014). The psychometric qualities of a short version of the experiences in close relationships scale – revised child version. *Personality and Individual Differences*, 68, 118–123. <https://doi.org/10.1016/j.paid.2014.04.005>.
- Brumariu, L. E., & Kerns, K. A. (2010). Parent-child attachment and internalizing symptoms in childhood and adolescence: A review of empirical findings and future directions. *Development and Psychopathology*, 22, 177–203. <https://doi.org/10.1017/S0954579409990344>.
- Buist, K. L., Dekovic, M., Meeus, W., & van Aken, M. A. (2004). The reciprocal relationship between early adolescent attachment and internalizing and externalizing problem behaviour. *Journal of Adolescence*, 27, 251–266. <https://doi.org/10.1016/j.adolescence.2003.11.012>.
- Cacioppo, M., Barni, D., Correale, C., Mangialavori, S., Danioni, F., & Gori, A. (2019). Do attachment styles and family functioning predict adolescents' problematic internet use? A relative weight analysis. *Journal of Child and Family Studies*, 28, 1263–1271. <https://doi.org/10.1007/s10826-019-01357-0>.
- Caissy, G. A. (1994). *Early adolescence*. New York: Insight.
- Cao, S., & Lin, X. (2019). Masculinizing fatherhood: negotiation of Yang and Jiao among young fathers in China. *Journal of Gender Studies*, 28, 937–947. <https://doi.org/10.1080/09589236.2019.1625312>.
- Chen, B., & Santo, J. B. (2016). The relationships between shyness and unsociability and peer difficulties: the moderating role of insecure attachment. *International Journal of Behavioral Development*, 40, 346–358. <https://doi.org/10.1177/0165025415587726>.
- Chen, X. (2010). Socio-emotional development in Chinese children. In M. H. Bond (Ed.), *The Oxford handbook of Chinese psychology* (pp. 37–52). New York: Oxford University Press.
- Cheung, R. Y., Leung, M. C., Chung, K. K. H., & Cheung, H. Y. (2018). Family risks and adolescent adjustment in Chinese contexts: testing the mediating role of emotional intelligence. *Journal of Child and Family Studies*, 27, 3887–3896. <https://doi.org/10.1007/s10826-018-1233-y>.
- Colonnese, C., Draijer, E. M., Jan, J. M., Stams, G., Van der Bruggen, C. O., Bögels, S. M., & Noom, M. J. (2011). The relation between insecure attachment and child anxiety: a meta-analytic review. *Journal of Clinical Child & Adolescent Psychology*, 40, 630–645. <https://doi.org/10.1080/15374416.2011.581623>.
- Currie, C., Molcho, M., Boyce, W., Holstein, B., Torsheim, T., & Richter, M. (2008). Researching health inequalities in adolescents: the development of the Health Behaviour in School-Aged Children (HBSC) family affluence scale. *Social Science & Medicine*, 66, 1429–1436. <https://doi.org/10.1016/j.socscimed.2007.11.024>.
- Dagan, O., Groh, A. M., Madigan, S., & Bernard, K. (2021). A life-span development theory of insecure attachment and internalizing symptoms: integrating meta-analytic evidence via a testable evolutionary mismatch hypothesis. *Brain Sciences*, 11, 1226. <https://doi.org/10.3390/brainsci11091226>.
- Dagan, O., Facompré, C. R., Nivison, M. D., Roisman, G. I., & Bernard, K. (2020). Preoccupied and dismissing attachment representations are differentially associated with anxiety in adolescence and adulthood: a meta-analysis. *Clinical Psychology Science*, 8, 614–640. <https://doi.org/10.1177/2167702620917455>.
- Demircioğlu, Z. I., & Göncü Köse, A. (2021). Effects of attachment styles, dark triad, rejection sensitivity, and relationship satisfaction on social media addiction: a mediated model. *Current Psychology*, 40, 414–428. <https://doi.org/10.1007/s12144-018-9956-x>.
- Diamond, G., Siqueland, L., & Diamond, G. M. (2003). Attachment-based family therapy for depressed adolescents: programmatic treatment development. *Clinical Child and Family Psychology Review*, 6, 107–127. <https://doi.org/10.1023/A:1023782510786>.
- Eccles, J., Midgley, C., Wigfield, A., Buchanan, C., Reuman, D., Flanagan, C., & Mac Iver, D. (1993). Development during adolescence: The impact of stage environment fit on young adolescents' experiences in schools and in families. *American Psychologist*, 48, 90–101. <https://doi.org/10.1037/0003-066X.48.2.90>.
- Ellickson, P. L., & Hawes, J. A. (1989). An assessment of active versus passive methods for obtaining parental consent. *Evaluation Review*, 13, 45–55. <https://doi.org/10.1177/0193841X8901300104>.
- Enders, C. K. (2001). The performance of the full information maximum likelihood estimator in multiple regression models with missing data. *Educational and Psychological Measurement*, 61, 713–740.
- Feng, L., & Lan, X. (2020). The moderating role of autonomy support profiles in the association between grit and externalizing problem behavior among family-bereaved adolescents. *Frontiers in Psychology*, 11, 1578. <https://doi.org/10.3389/fpsyg.2020.01578>.
- Feng, Y., Whiteman, S. D., Xu, S., Li, L., Jin, S., & French, D. C. (2019). Chinese adolescents' relationships with mothers, fathers, and siblings: associations with youth's internalizing and externalizing problems. *Journal of Relationships Research*, 10, 1–11. <https://doi.org/10.1017/jrr.2019.11>.
- Flippin, M., & Crais, E. R. (2011). The need for more effective father involvement in early autism intervention: a systematic review and recommendations. *Journal of Early Intervention*, 33, 24–50. <https://doi.org/10.1177/1053815111400415>.
- Garthe, R. C., Sullivan, T. N., & Behrhorst, K. L. (2021). A latent class analysis of early adolescent peer and dating violence: associations with symptoms of depression and anxiety. *Journal of Interpersonal Violence*, 36, 2031–2049. <https://doi.org/10.1177/0886260518759654>.
- Gold, S., Edin, K. J., & Nelson, T. J. (2020). Does time with dad in childhood pay off in adolescence. *Journal of Marriage and Family*, 82, 1587–1605. <https://doi.org/10.1111/jomf.12676>.
- Goodman, A., Lamping, D. L., & Ploubidis, G. B. (2010). When to use broader internalising and externalising subscales instead of the hypothesised five subscales on the Strengths and Difficulties Questionnaire (SDQ): data from British parents, teachers and children. *Journal of Abnormal Child Psychology*, 38, 1179–1191. <https://doi.org/10.1007/s10802-010-9434-x>.
- Goodman, R. (1997). The strengths and difficulties questionnaire: a research note. *Journal of Child Psychology and Psychiatry*, 38, 581–586.
- Groh, A. M., Roisman, G. I., van IJzendoorn, M. H., Bakersman-Kranenburg, M. J., & Fearon, R. P. (2012). The significance of insecure and disorganized attachment for children's internalizing symptoms: a meta-analytic study. *Child Development*, 83, 591–610. <https://doi.org/10.1111/j.1467-8624.2011.01711.x>.
- Ho, H. Z., Chen, W. W., Tran, C. N., & Ko, C. T. (2010). Parental involvement in Taiwanese families: father–mother differences. *Childhood Education*, 86, 376–381. <https://doi.org/10.1080/00094056.2010.10523173>.
- Hossain, Z., & Juhari, R. (2015). Fathers across Arab and non-Arab Islamic societies. In J. L. Roopnarine (Ed.), *Fathers across*

- cultures: *The importance, roles, and diverse practices of dads* (pp. 368–390). Santa Barbara, CA: Praeger
- Keller, H. (2018). Universality claim of attachment theory: children's socioemotional development across cultures. *Proceedings of the National Academy of Sciences*, *115*, 11414–11419. <https://doi.org/10.1073/pnas.1720325115>.
- Kersten, P., Czuba, K., McPherson, K., Dudley, M., Elder, H., Tauroa, R., & Vandal, A. (2016). A systematic review of evidence for the psychometric properties of the Strengths and Difficulties Questionnaire. *International Journal of Behavioral Development*, *40*, 64–75. <https://doi.org/10.1177/0165025415570647>.
- Lan, X. (2022). Perceived parental warmth, emotional awareness, and positive adjustment profiles in Chinese and Italian early adolescents: a person-centered approach. *Journal of Adolescence*, *94*, 206–223. <https://doi.org/10.1002/jad.12018>.
- Lan, X., Ma, C., & Ma, Y. (2021). A person-centered investigation of adolescent psychosocial and academic adjustment: the role of peer attachment and Zhong-Yong thinking. *Child Indicators Research*, *14*, 1479–1500. <https://doi.org/10.1007/s12187-021-09807-2>.
- Li, J., Guo, Y., Delvecchio, E., & Mazzeschi, C. (2020). Chinese adolescents' psychosocial adjustment: the contribution of mothers' attachment style and adolescents' attachment to mother. *Journal of Social and Personal Relationships*, *37*, 2597–2619. <https://doi.org/10.1177/0265407520932667>.
- Li, X. (2020). Fathers' involvement in Chinese societies: Increasing presence, uneven progress. *Child Development Perspectives*, *14*, 150–156. <https://doi.org/10.1111/cdep.12375>.
- Li, X., & Lamb, M. E. (2015). Fathering in Chinese culture: Traditions and transitions. In J. L. Roopnarine (Ed.), *Fathers across cultures: The importance, roles, and diverse practices of dads* (pp. 273–306). New York, NY: Praeger
- Lieberman, M., Doyle, A. B., & Markiewicz, D. (1999). Developmental patterns in security of attachment to mother and father in late childhood and early adolescence: associations with peer relations. *Child Development*, *70*, 202–213. <https://doi.org/10.1111/1467-8624.00015>.
- Lindenberger, U., & Pötter, U. (1998). The complex nature of unique and shared effects in hierarchical linear regression: implications for developmental psychology. *Psychological Methods*, *3*, 218–230.
- Liu, C., Wu, X., & Zou, S. (2016). Parents' relative socioeconomic status and paternal involvement in Chinese families: the mediating role of coparenting. *Frontiers in Psychology*, *7*, 940. <https://doi.org/10.3389/fpsyg.2016.00940>.
- Liu, J., Bowker, J. C., Coplan, R. J., Yang, P., Li, D., & Chen, X. (2019). Evaluating links among shyness, peer relations, and internalizing problems in Chinese young adolescents. *Journal of Research on Adolescence*, *29*, 696–709. <https://doi.org/10.1111/jora.12406>.
- Liu, Y., Wang, M., Villberg, J., Torsheim, T., Tynjälä, J., Lv, Y., & Kannas, L. (2012). Reliability and validity of Family Affluence Scale (FAS II) among adolescents in Beijing, China. *Child Indicators Research*, *5*, 235–251. <https://doi.org/10.1007/s12187-011-9131-5>.
- Ma, Y., Ma, C., & Lan, X. (2020). Uncovering the moderating role of grit and gender in the association between teacher autonomy support and social competence among Chinese undergraduate students. *International Journal of Environmental Research and Public Health*, *17*, 6398. <https://doi.org/10.3390/ijerph17176398>.
- Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: a move to the level of representation. *Monographs of the Society for Research in Child Development*, *50*, 66–104. <https://doi.org/10.2307/3333827>.
- Marci, T., Moscardino, U., & Altoè, G. (2018). The brief Experiences in Close Relationships Scale - Revised Child version (ECR-RC): factor structure and invariance across middle childhood and early adolescence. *International Journal of Behavioral Development*, *43*, 409–423. <https://doi.org/10.1177/0165025418785975>.
- Maslak, M. A., Kim, J., & McLoughlin, A. S. (2009). Educational engagement in China: a case from the Northwest. *Journal of Educational Development*, *30*, 254–262. <https://doi.org/10.1016/j.ijedudev.2009.09.003>.
- McElwain, A. D., & Bub, K. L. (2018). Changes in parent-child relationship quality across early adolescence: implications for engagement in sexual behavior. *Youth & Society*, *50*, 204–228. <https://doi.org/10.1177/0044118X15626843>.
- Miles, J. (2014). *R squared, adjusted R squared*. In N. Balakrishnan, T. Colton, B. Everitt, W. Piegorisch, F. Ruggeri, & J. L. Teugels (Eds.), Wiley statsRef: Statistics reference online. John Wiley
- Muzi, S., Rogier, G., & Pace, C. S. (2022). Peer power! Secure peer attachment mediates the effect of parental attachment on depressive withdrawal of teenagers. *International Journal of Environmental Research and Public Health*, *19*, 4068. <https://doi.org/10.3390/ijerph19074068>.
- National Bureau of Statistics of China. (2021). *China Statistical Yearbook*. Beijing: China Statistics Press.
- Nie, Y. G., Li, J. B., & Vazsonyi, A. T. (2016). Self-control mediates the associations between parental attachment and prosocial behavior among Chinese adolescents. *Personality and Individual Differences*, *96*, 36–39. <https://doi.org/10.1016/j.paid.2016.02.077>.
- Pace, C. S., Muzi, S., & Steele, H. (2020). Adolescents' attachment: content and discriminant validity of the friends and family interview. *Journal of Child and Family Studies*, *29*, 1173–1186. <https://doi.org/10.1007/s10826-019-01654-8>.
- Pace, C. S., Di Folco, S., Guerriero, V., & Muzi, S. (2019). Late-adopted children grown up: a long-term longitudinal study on attachment patterns of adolescent adoptees and their adoptive mothers. *Attachment & Human Development*, *21*, 372–388. <https://doi.org/10.1080/14616734.2019.1571519>.
- Palkovitz, R. (2019). Expanding our focus from father involvement to father-child relationship quality. *Journal of Family Theory & Review*, *11*, 576–591. <https://doi.org/10.1111/jftr.12352>.
- Pan, H., & Liu, F. (2019). The prevalence of complicated grief among Chinese people at high risk: a systematic review and meta-analysis. *Death Studies*, *1*, 11. <https://doi.org/10.1080/07481187.2019.1648342>.
- Park, Y., Debrot, A., Spielmann, S. S., Joe, S., Impett, E., & MacDonald, G. (2019). Distinguishing dismissing from fearful attachment in the association between closeness and commitment. *Social Psychological and Personality Science*, *10*, 563–572. <https://doi.org/10.1177/1948550618768823>.
- Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*, 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>.
- R Core Team. (2020). *R: A language and environment for statistical computing*. Vienna: R Foundation for Statistical Computing.
- Rothbaum, F., Weisz, J., Pott, M., Miyake, K., & Morelli, G. (2000). Attachment and culture: security in the United States and Japan. *American Psychologist*, *55*, 1093–1104. <https://doi.org/10.1037/0003-066X.55.10.1093>.
- Rubin, K. H., Dwyer, K. M., Booth-LaForce, C., Kim, A. H., Burgess, K. B., & Rose-Krasnor, L. (2004). Attachment, friendship, and psychosocial functioning in early adolescence. *The Journal of Early Adolescence*, *24*, 326–356. <https://doi.org/10.1177/0272431604268530>.
- Russell, C. J., & Bobko, P. (1992). Moderated regression analysis and Likert scales: too coarse for comfort. *Journal of Applied Psychology*, *77*, 336–342. <https://doi.org/10.1037/0021-9010.77.3.336>.
- Spruit, A., Goos, L., Weenink, N., Rodenburg, R., Niemeyer, H., Stams, G. J., & Colonna, C. (2020). The relation between

- attachment and depression in children and adolescents: a multi-level meta-analysis. *Clinical Child and Family Psychology Review*, 23, 54–69. <https://doi.org/10.1007/s10567-019-00299-9>.
- Steinberg, L., Dahl, R., Keating, D., Kupfer, D. J., Masten, A. S., & Pine, D. S. (2006). The study of developmental psychopathology in adolescence: Integrating affective neuroscience with the study of context. In D. C. D. J. Cohen (Ed.), *Developmental psychopathology*, Vol. 2: *Developmental neuroscience* (2nd ed., pp. 710–741). Hoboken, NJ: John Wiley.
- Su, L., Kubricht, B., & Miller, R. (2017). The influence of father involvement in adolescents' overall development in Taiwan. *Journal of Adolescence*, 59, 35–44. <https://doi.org/10.1016/j.adolescence.2017.05.010>.
- Tang, X., Tang, S., Ren, Z., & Wong, D. F. K. (2019). Prevalence of depressive symptoms among adolescents in secondary school in mainland China: a systematic review and meta-analysis. *Journal of Affective Disorders*, 245, 498–507. <https://doi.org/10.1016/j.jad.2018.11.043>.
- van IJzendoorn, M. H., & Sagi-Schwartz, A. (2008). Cross-cultural patterns of attachment: Universal and contextual dimensions. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (2nd ed., pp. 880–905). New York: Guilford Press.
- Verhees, M. W., Finet, C., Vandesande, S., Bastin, M., Bijttebier, P., Bodner, N., & Bosmans, G. (2021). Attachment and the development of depressive symptoms in adolescence: the role of regulating positive and negative affect. *Journal of Youth and Adolescence*, 50, 1649–1662. <https://doi.org/10.1007/s10964-021-01426-y>.
- Vijver, F. J. R., & Leung, K. (1997). *Methods and data analysis for cross-cultural research (Cross-Cultural Psychology)*. Sage Publications
- Wang, C., Nie, Y., Ma, C., & Lan, X. (2022). More parental Guan, more academic engagement? Examining the moderating roles of adolescents' gender and reciprocal filial piety. *The Journal of Genetic Psychology*, 183, 78–90. <https://doi.org/10.1080/00221325.2021.2007350>.
- Wang, J., Shi, X., Yang, Y., Zou, H., Zhang, W., & Xu, Q. (2019). The joint effect of paternal and maternal parenting behaviors on school engagement among Chinese adolescents: The mediating role of mastery goal. *Frontiers in Psychology*, 10, 1587 <https://doi.org/10.3389/fpsyg.2019.01587>.
- Xie, S., & Li, H. (2019). 'Tiger mom, panda dad': a study of contemporary Chinese parenting profiles. *Early Child Development and Care*, 189, 284–300. <https://doi.org/10.1080/03004430.2017.1318870>.
- Xu, W., Ding, X., Goh, P. H., & An, Y. (2018). Dispositional mindfulness moderates the relationship between depression and post-traumatic growth in Chinese adolescents following a tornado. *Personality and Individual Differences*, 127, 15–21. <https://doi.org/10.1016/j.paid.2018.01.032>.
- Yao, S., Zhang, C., Zhu, X., Jing, X., McWhinnie, C. M., & Abela, J. R. (2009). Measuring adolescent psychopathology: psychometric properties of the self-report strengths and difficulties questionnaire in a sample of Chinese adolescents. *Journal of Adolescent Health*, 45, 55–62. <https://doi.org/10.1016/j.jadohealth.2008.11.006>.
- Yin, W. (1998). Dongxiang Autonomous County (Gansu Province). *Chinese Education & Society*, 31, 53–76. <https://doi.org/10.2753/CED1061-1932310353>.
- Yu, H., Jiang, S., & Land, K. C. (2015). Multicollinearity in hierarchical linear models. *Social Science Research*, 53, 118–136. <https://doi.org/10.1016/j.ssresearch.2015.04.008>.
- Zahn-Waxler, C., Klimes-Dougan, B., & Slattery, M. J. (2000). Internalizing problems of childhood and adolescence: prospects, pitfalls, and progress in understanding the development of anxiety and depression. *Development and Psychopathology*, 12, 443–466. <https://doi.org/10.1017/S0954579400003102>.