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ARTICLE

From Attachment Insecurity to Life Satisfaction: The Pathway of Psychological Needs Satisfaction among Chinese University Students

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ABSTRACT: Background: Life satisfaction represents a core indicator of subjective well-being among university students. Yet the mechanisms linking adult attachment orientations to life satisfaction have not been fully elucidated, particularly within Chinese cultural contexts. Integrating Attachment Theory with Self-Determination Theory, this study aims to investigate how attachment anxiety and avoidance are associated with life satisfaction, with autonomy, competence, and relatedness proposed as parallel mediators. **Methods:** Using multi-stage stratified random sampling, 488 Chinese university students (48.0% male; Mean_{age} = 20.15, SD = 1.42) were recruited from four universities in Anhui Province, China. Participants completed validated self-report instruments assessing attachment anxiety and avoidance, basic psychological needs satisfaction, and life satisfaction. A parallel mediation model was tested using structural equation modeling with bias-corrected bootstrapping (5000 resamples). **Results:** The hypothesized model demonstrated acceptable fit (χ^2/df = 3.94, CFI = 0.94, RMSEA = 0.078). Attachment anxiety and avoidance were each negatively associated with all three psychological needs (βs ranging from −0.25 to −0.51, all $p < 0.001$), which in turn were positively related to life satisfaction (βs ranging from 0.28 to 0.30, all $p < 0.001$). Total indirect effects were significant for both attachment anxiety ($\beta = -0.33$, 95% CI [−0.42, −0.24]) and avoidance ($\beta = -0.25$, 95% CI [−0.34, −0.18]), whereas direct effects were nonsignificant, indicating full mediation. The model accounted for 49.2% of the variance in life satisfaction. **Conclusions:** These findings suggest that insecure attachment is associated with lower life satisfaction indirectly through reduced fulfillment of basic psychological needs. Practically, interventions need not focus exclusively on modifying attachment styles; rather, fostering need-supportive environments represents a viable and culturally appropriate pathway for enhancing well-being among Chinese university students.

KEYWORDS: Attachment insecurity; attachment anxiety; attachment avoidance; life satisfaction; basic psychological needs satisfaction; autonomy; competence; relatedness

1 Introduction

Life satisfaction, defined as a cognitive appraisal of one's overall quality of life, constitutes a core dimension of subjective well-being [1]. Among university students, life satisfaction is particularly important as it relates to academic achievement, mental health, and successful transition to adulthood [2–4]. However, Chinese university students face unique challenges during this developmental period, including intense academic pressure, career uncertainty, and significant life transitions, which may compromise their life satisfaction [5–7]. Elucidating the underlying mechanisms of life satisfaction in this population is therefore essential for informing effective interventions aimed at enhancing student well-being.

Attachment theory offers a useful lens for examining variations in life satisfaction across individuals [8]. Adult attachment patterns, distinguished by anxiety and avoidance dimensions, represent internalized

working models of relationships formed during early caregiving that continue to influence self-perceptions, views of others, and relationship dynamics throughout the lifespan [8]. Attachment anxiety involves fears of rejection and abandonment, typically expressed through hyperactivating behaviors including persistent reassurance-seeking and emotional over-reliance on others [8,9]. Attachment avoidance, conversely, entails discomfort with intimacy and reliance on others, often manifested through deactivating behaviors such as emotion suppression and compulsive self-sufficiency [8]. Research consistently demonstrates negative associations between both attachment dimensions and well-being outcomes, including life satisfaction, across varied populations [10–12].

While the negative association between insecure attachment and life satisfaction is well established [10,11], existing explanations of the underlying mechanisms tend to focus on discrete mediators such as emotion regulation, self-esteem, or self-compassion [13–15]. These constructs, though informative, each capture only a partial aspect of the psychological processes involved and do not offer an integrative account of how attachment insecurity is broadly associated with lower well-being. The present study addresses this limitation by drawing on Self-Determination Theory (SDT) as a unifying explanatory framework. SDT identifies three fundamental psychological needs, autonomy, competence, and relatedness, that constitute the essential nutriments for optimal functioning and well-being [16,17]. These three needs map directly onto the domains most susceptible to disruption by insecure attachment patterns [8,9], thereby providing a theoretically coherent and comprehensive mediational model that moves beyond piecemeal explanations.

Moreover, empirical research examining this integrated framework among Chinese university students remains especially scarce, despite cultural factors that may shape both the expression of attachment patterns and the pathways through which psychological needs are fulfilled in collectivistic societies [18,19]. Recent data reveal considerable psychological difficulties among Chinese university students, as fewer than half (46.7%) report having meaning in life while around 40% struggle with existential confusion [20,21]. Addressing these empirical gaps serves dual purposes. It enables a deeper understanding of the processes through which attachment relates to life satisfaction, and provides an evidence base for interventions that are culturally contextualized and focus on modifiable psychological variables.

1.1 Adult Attachment and Life Satisfaction

According to attachment theory, formative relational experiences in early life establish expectancies regarding the availability and responsiveness of attachment figures, which subsequently affect emotion regulation capacities, social competence, and psychological well-being throughout development [8]. Extensive research consistently demonstrates negative associations between both forms of insecure attachment, attachment anxiety and attachment avoidance, and life satisfaction [10,11].

Individuals high in attachment anxiety harbor persistent fears of being unvalued and rejected, resulting in heightened emotional reactivity, impaired regulation of negative affect, and over-reliance on external validation for maintaining self-esteem [8]. These hyperactivating strategies are often linked to relationship conflict, emotional exhaustion, and lower life satisfaction [8,10]. Individuals high in attachment avoidance, in contrast, maintain emotional distance from others, suppress emotional expression, and avoid intimacy to protect themselves from potential rejection [8,9]. Although these deactivating strategies may provide short-term emotional protection, they tend to limit meaningful social connections and emotional support, potentially contributing to lower life satisfaction [10,11]. Longitudinal evidence further confirms that insecure attachment in young adulthood predicts lower life satisfaction nearly a decade later, underscoring the enduring consequences of attachment patterns for well-being [22].

Studies among Chinese university students demonstrate comparable findings, showing that both attachment dimensions, anxiety and avoidance, are negatively associated with life satisfaction and subjective well-being [10,23]. Yet, the pathways by which attachment relates to life satisfaction in this student group remain insufficiently investigated. Clarifying these mediating pathways is crucial to inform intervention strategies aimed at promoting psychological well-being among Chinese university students.

1.2 The Mediating Role of Basic Psychological Needs Satisfaction

Self-Determination Theory (SDT) offers a valuable theoretical lens for examining the processes by which attachment shapes life satisfaction [12,16]. SDT posits that psychological wellness and adaptive functioning hinge primarily on fulfilling three fundamental needs: autonomy (experiencing choice and authenticity in one's behavior), competence (perceiving effectiveness and mastery in one's endeavors), and relatedness (sensing connection and care from significant others) [17]. When these needs are fulfilled, individuals experience enhanced well-being, vitality, and life satisfaction, whereas need thwarting contributes to diminished wellness and emotional distress [16]. Cross-cultural evidence supports the robustness of these associations: a large-scale study across 27 European countries confirmed that all three basic psychological needs were positively related to life satisfaction and negatively related to depressive symptoms in every country examined [24].

Attachment orientations may influence life satisfaction by shaping individuals' ability to satisfy their basic psychological needs [25,26]. Those with secure attachment, characterized by positive relational schemas of self and others, demonstrate greater capacity to meet autonomy, competence, and relatedness needs via effective affective management, adaptive stress responses, and constructive interpersonal engagement [8]. In contrast, insecure attachment patterns may systematically impede need satisfaction through maladaptive emotional and behavioral regulation strategies.

Individuals with high attachment anxiety exhibit chronic fears of abandonment and excessive dependence on others for self-worth validation, which may undermine all three basic psychological needs. First, their hyperactivating strategies and dependence on external validation compromise autonomy satisfaction, as they struggle to act in accordance with their authentic values and preferences [25,27]. Second, their intense self-doubt and negative self-perceptions interfere with competence satisfaction, as they chronically question their abilities and perceive themselves as ineffective [23,25]. Third, although individuals with attachment anxiety desperately seek closeness, their excessive reassurance-seeking, emotional reactivity, and jealousy often create relationship conflict and instability, thereby frustrating relatedness needs [8].

Similarly, individuals with high attachment avoidance employ deactivating strategies that suppress emotional expression, maintain interpersonal distance, and emphasize self-reliance, which may also impede basic need satisfaction. First, while avoidant individuals may appear autonomous, their autonomy is defensive rather than authentic, reflecting a compulsive need for independence rather than genuine self-endorsement [16]. Second, their reluctance to seek help and dismissal of social support may compromise competence satisfaction, as they deprive themselves of valuable feedback and assistance in mastering challenging tasks [16]. Third, and most directly, their avoidance of intimacy and emotional connection fundamentally undermines relatedness need satisfaction, depriving them of meaningful social bonds [12,23].

Research findings corroborate these theoretical propositions. Empirical investigations reveal that both forms of insecure attachment, anxiety and avoidance, are negatively associated with the fulfillment of autonomy, competence, and relatedness needs [10,23]. Moreover, fulfillment of the three basic psychological needs demonstrates robust positive associations with life satisfaction and subjective well-being in varied

cultural contexts [16,23]. Recent studies with Chinese university students further reinforce this evidence, showing that basic psychological needs mediate the associations between interpersonal connectedness and meaning in life [21], while childhood relational adversity has been found to affect psychological distress through the pathway of need frustration [28]. Accordingly, basic psychological needs satisfaction likely serves as a mediating mechanism in the association between adult attachment and life satisfaction.

1.3 The Current Study

While SDT provides a compelling theoretical framework, empirical evidence examining basic psychological needs as mediators in the attachment-well-being link remains limited and fragmented. The mediating role of need satisfaction has been confined largely to domain-specific relational contexts such as coach-athlete relationships, with inconsistent results across attachment dimensions and a focus on context-specific outcomes rather than global life satisfaction [29], or has involved conceptually distinct constructs such as place attachment rather than interpersonal attachment [30]. Consistent with these observations, a recent systematic review indicated that no study has tested a comprehensive parallel mediation model incorporating both attachment dimensions and all three basic psychological needs as simultaneous mediators of life satisfaction [23]. Given the unique cultural context of Chinese higher education, characterized by intense academic competition, collectivistic values, and specific developmental challenges, it is important to investigate whether these theoretical relationships hold in this population.

The present research investigates whether and how adult attachment patterns (anxiety and avoidance) are associated with life satisfaction in Chinese university students, testing the satisfaction of basic psychological needs (autonomy, competence, and relatedness) as parallel mediators. Drawing on attachment theory and SDT, we advance the following hypotheses:

Hypothesis 1: *Attachment anxiety is negatively associated with life satisfaction.*

Hypothesis 2: *Attachment avoidance is negatively associated with life satisfaction.*

Hypothesis 3: *Basic psychological needs satisfaction (autonomy, competence, and relatedness) serves as a mediator in the negative association between attachment anxiety and life satisfaction.*

Hypothesis 4: *Basic psychological needs satisfaction (autonomy, competence, and relatedness) serves as a mediator in the negative association between attachment avoidance and life satisfaction.*

Fig. 1 depicts the hypothesized model. Through investigating these associations, the present research advances theoretical knowledge of how attachment shapes well-being in Chinese university students and offers an empirical foundation for designing interventions that address both attachment patterns and psychological needs to improve life satisfaction.

2 Methodology

2.1 Participants and Procedure

The required sample size was determined prior to data collection. Following established guidelines for structural equation modeling, Kline [31] recommends a minimum of 200 cases, with sample sizes of 300 to 500 recommended for models of moderate complexity. To accommodate potential data loss from incomplete or careless responses, a target sample of 500 was set.

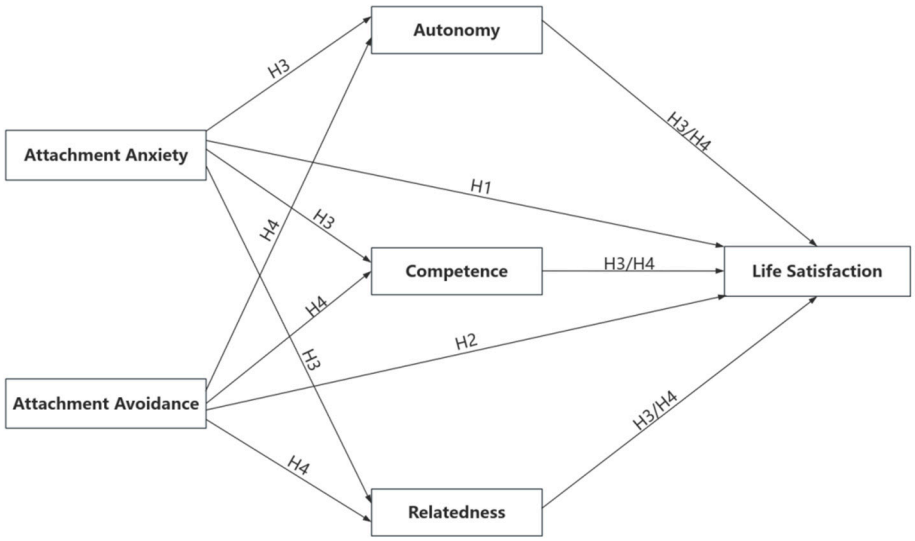

Figure 1: The hypothesized parallel mediation model. Note: H1–H4 represent Hypotheses 1 to 4.

Participants were recruited using a multi-stage stratified random sampling procedure from universities in Anhui Province, mainland China. Randomization was performed using the RAND function in Microsoft Excel. At Stage 1, the university population was stratified by institutional type (i.e., "Double First-Class", provincial public, and private universities), and four universities were selected to represent these three tiers of the Chinese higher education system: one "Double First-Class" university (n = 194), two provincial public universities (n = 176 and n = 69, respectively), and one private university (n = 61). Sample sizes across universities were approximately proportional to their undergraduate enrollment within the sampling frame. At Stage 2, within each selected university, four academic schools (i.e., faculties or colleges) were randomly selected from the university's full roster of schools. At Stage 3, within each selected school, classes were stratified by grade level (freshman through senior, targeting approximately 25% per grade), and specific classes were randomly selected from enrollment records. At Stage 4, individual students were randomly selected from each chosen class using their student identification numbers as the sampling frame. Inclusion criteria were: (a) full-time undergraduate enrollment and (b) age 18 years or older. Exclusion criteria were: (a) questionnaires with more than 5% missing items and (b) evidence of careless responding, identified by identical responses across all items (i.e., patterned responses). Following these screening procedures, 12 responses were removed (5 for excessive missing data, 7 for patterned responses), yielding 488 usable responses (valid response rate = 97.6%).

Participants ranged in age from 18 to 23 years (Mean = 20.15, SD = 1.42). Table 1 presents the sample's demographic profile. Gender, academic year, and household registration status (hukou) were included to characterize sample composition. Hukou is a Chinese residential classification system distinguishing urban and rural origins, and is associated with disparities in educational resources and psychosocial adjustment among university students [32]. These demographic variables served to describe sample representativeness.

Data were collected through in-person administration. All participants received information about the study objectives, were guaranteed anonymity and data confidentiality, and gave written informed consent prior to their involvement. Survey completion required approximately 20 min. All participants received 10 RMB for their time. Ethical approval was obtained from the Ethics Committee for Research Involving Human Subjects, Universiti Putra Malaysia (Reference Number: JKEUPM-2025-245), and all procedures followed the Declaration of Helsinki guidelines.

Table 1: Demographic characteristics of the participants.

Variable	Category	Frequency	Percentage
Gender	Male	234	48.0
	Female	254	52.0
Hukou	Urban	367	75.2
	Rural	121	24.8
Grade Level	Freshman (Grade 1)	122	25.0
	Sophomore (Grade 2)	120	24.6
	Junior (Grade 3)	122	25.0
	Senior (Grade 4)	124	25.4

2.2 Research Instruments

2.2.1 Adult Attachment

The Experiences in Close Relationships Scale-Chinese Version (ECR-C) measured adult attachment orientations [33]. The 36-item instrument comprises two 18-item subscales assessing attachment anxiety (e.g., "I worry about being abandoned") and avoidance (e.g., "I prefer not to show how I feel deep down"). Participants responded on 7-point scales (1 = strongly disagree, 7 = strongly agree). Higher values indicate greater insecurity. The ECR-C demonstrated sound psychometric properties in Chinese samples [33]. In the current study, Cronbach's α values were 0.91 for attachment anxiety and 0.88 for attachment avoidance.

2.2.2 Basic Psychological Needs Satisfaction

The Basic Psychological Need Satisfaction Scale (BPNSS; Chinese version) measured satisfaction of three basic psychological needs [17,34]. The 21-item instrument comprises three subscales assessing autonomy (7 items; e.g., "I feel like I am free to decide for myself how to live my life"), competence (6 items; e.g., "Most days I feel a sense of accomplishment from what I do"), and relatedness (8 items; e.g., "People in my life care about me"). Participants responded on 7-point scales (1 = not at all true, 7 = very true). Higher values indicate greater need satisfaction. The Chinese version demonstrated good psychometric properties [34]. In the current study, Cronbach's α values were 0.78 for autonomy, 0.82 for competence, and 0.85 for relatedness.

2.2.3 Life Satisfaction

The Satisfaction with Life Scale (SWLS; Chinese version) measured global life satisfaction [35,36]. The 5-item instrument uses a single dimension (e.g., "In most ways my life is close to my ideal"). Participants responded on 7-point scales (1 = strongly disagree, 7 = strongly agree). Higher total scores indicate greater life satisfaction. The Chinese version has demonstrated good reliability and validity [36]. In the current study, Cronbach's α was 0.84.

2.3 Data Analysis

Analyses were conducted using SPSS 26.0 and AMOS 29.0 (IBM Corp., Armonk, NY, USA). Preliminary analyses included computation of descriptive statistics, Pearson bivariate correlations, and Harman's single-factor test to assess common method bias. The main analyses followed Anderson and Gerbing's two-step approach to structural equation modeling [37]. In Step 1, a confirmatory factor analysis (CFA) was performed to evaluate the measurement model and establish construct validity, including examination of factor loadings for each latent variable. In Step 2, the structural model was estimated to test the hypothesized

direct and indirect effects. Model fit was evaluated using multiple indices with established cut-off criteria: chi-square to degrees of freedom ratio (χ^2/df) < 5.0 (acceptable), Comparative Fit Index (CFI) > 0.90, Tucker-Lewis Index (TLI) > 0.90, and Root Mean Square Error of Approximation (RMSEA) < 0.08 [38]. Indirect effects were evaluated using bias-corrected bootstrapping with 5000 resamples; significance was determined by 95% confidence intervals that did not contain zero [39]. Maximum likelihood estimation was employed for all SEM analyses. To evaluate the robustness of the hypothesized model, an alternative reverse mediation model was compared using fit indices and the Akaike Information Criterion (AIC) [40], and a direct-effects model (without mediators) was estimated to rule out statistical artifacts [41].

3 Results

3.1 Descriptive Statistics and Correlations

Harman's single-factor test indicated that the first factor explained 21.85% of total variance, which is well below the 40% threshold, suggesting that common method bias was not a substantial concern in this dataset. Table 2 presents the means, standard deviations, and Pearson bivariate correlations for all study variables. As expected, attachment anxiety was significantly and negatively correlated with life satisfaction ($r = -0.31$, $p < 0.01$) and the three basic psychological needs: autonomy ($r = -0.35$, $p < 0.01$), competence ($r = -0.52$, $p < 0.01$), and relatedness ($r = -0.30$, $p < 0.01$). Similarly, attachment avoidance showed significant negative correlations with life satisfaction ($r = -0.20$, $p < 0.01$), autonomy ($r = -0.30$, $p < 0.01$), competence ($r = -0.29$, $p < 0.01$), and relatedness ($r = -0.32$, $p < 0.01$). Furthermore, the three dimensions of basic psychological needs satisfaction (autonomy, competence, and relatedness) were positively intercorrelated and showed significant positive associations with life satisfaction (*r*s ranged from 0.45 to 0.53, $p < 0.01$). A weak but significant positive correlation was found between attachment anxiety and attachment avoidance ($r = 0.11$, $p < 0.05$).

Table 2: Descriptive statistics and correlations among study variables.

Variable	Mean	SD	1	2	3	4	5	6
1. Attachment Avoidance	62.13	15.95	1					
2. Attachment Anxiety	64.47	18.72	0.11*	1				
3. Autonomy	28.67	6.49	−0.30**	−0.35**	1			
4. Competence	26.68	6.26	−0.29**	−0.52**	0.62**	1		
5. Relatedness	40.95	7.08	−0.32**	−0.30**	0.35**	0.39**	1	
6. Life Satisfaction	19.87	5.34	−0.20**	−0.31**	0.48**	0.53**	0.45**	1

Note: N = 488. *$p < 0.05$, **$p < 0.01$.

3.2 Measurement Model Testing

A CFA was conducted to examine the measurement model consisting of six latent variables: attachment anxiety, attachment avoidance, autonomy, competence, relatedness, and life satisfaction. The results indicated that the measurement model provided an acceptable fit to the data: $\chi^2 = 609.92$, df = 155, $p < 0.001$; χ^2/df = 3.94; CFI = 0.94; TLI = 0.93; RMSEA = 0.078 (90% CI [0.071, 0.084]). As shown in Table 3, all fit indices met established cut-off criteria, supporting the validity of the measurement structure for structural equation modeling.

Table 3: Fit indices for the measurement model.

Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA (90% CI)
Measurement Model	609.92	155	3.94	0.94	0.93	0.078 [0.071, 0.084]
Recommended Cutoff	–	–	<5	>0.90	>0.90	<0.08

Note. N = 488. CFI, Comparative Fit Index; TLI, Tucker-Lewis Index; RMSEA, Root Mean Square Error of Approximation.

3.3 Structural Model and Hypothesis Testing

The structural model was examined to test the hypothesized relationships. The model fit indices indicated a satisfactory fit to the data: χ^2/df = 3.94, CFI = 0.94, TLI = 0.93, RMSEA = 0.078.

As shown in Fig. 2, attachment anxiety was significantly and negatively associated with autonomy ($\beta = -0.32$, $p < 0.001$), competence ($\beta = -0.51$, $p < 0.001$), and relatedness satisfaction ($\beta = -0.29$, $p < 0.001$). Similarly, attachment avoidance was negatively associated with autonomy ($\beta = -0.30$, $p < 0.001$), competence ($\beta = -0.25$, $p < 0.001$), and relatedness satisfaction ($\beta = -0.32$, $p < 0.001$). Furthermore, autonomy ($\beta = 0.30$, $p < 0.001$), competence ($\beta = 0.28$, $p < 0.001$), and relatedness ($\beta = 0.29$, $p < 0.001$) were all significantly and positively associated with life satisfaction. Bias-corrected bootstrap 95% confidence intervals for all nine structural paths excluded zero, confirming the robustness of these estimates. The structural model explained 21.70% of the variance in autonomy, 35.60% in competence, 20.80% in relatedness, and 49.20% in life satisfaction.

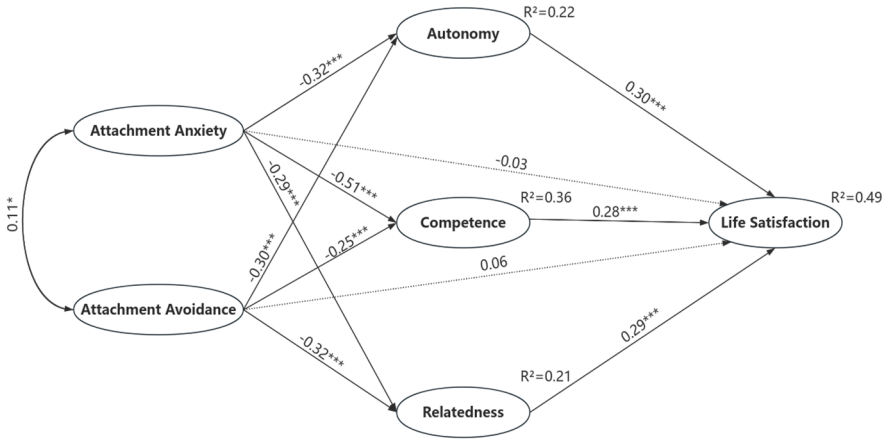

Figure 2: Structural equation model of the relationships among adult attachment, basic psychological needs, and life satisfaction. Note: Solid lines represent significant pathways ($p < 0.001$); dotted lines represent nonsignificant pathways ($p > 0.05$). Values on arrows are standardized path coefficients. R^2 indicates the proportion of variance explained. $^*p < 0.05$, $^{***}p < 0.001$.

To test the hypothesized mediation effects, bias-corrected bootstrapping with 5000 resamples was conducted. As summarized in Table 4, the direct effects of both attachment anxiety ($\beta = -0.03$, 95% CI [−0.12, 0.07]) and attachment avoidance ($\beta = 0.06$, 95% CI [−0.02, 0.15]) on life satisfaction were nonsignificant, as both confidence intervals contained zero. In contrast, the total indirect effects through basic psychological needs were significant for both attachment anxiety ($\beta = -0.33$, 95% CI [−0.42, −0.24]) and attachment avoidance ($\beta = -0.25$, 95% CI [−0.34, −0.18]). This pattern of significant indirect effects coupled with nonsignificant direct effects is consistent with full mediation: basic psychological needs satisfaction fully accounts for the associations between both attachment dimensions and life satisfaction.

Thus, Hypotheses 3 and 4 were supported, and the associations proposed in Hypotheses 1 and 2 were entirely explained by the mediating pathway through basic psychological needs satisfaction.

Table 4: Direct and indirect effects on life satisfaction.

Hypothesis	Paths	β	SE	95% CI	Result
H1	Anxiety → SWL (direct)	−0.03	0.05	[−0.12, 0.07]	Direct effect nonsignificant
H2	Avoidance → SWL (direct)	0.06	0.04	[−0.02, 0.15]	Direct effect nonsignificant
H3	Anxiety → Needs → SWL (indirect)	−0.33	0.05	[−0.42, −0.24]	Supported (full mediation)
H4	Avoidance → Needs → SWL (indirect)	−0.25	0.04	[−0.34, −0.18]	Supported (full mediation)

Note: N = 488. SWL, Satisfaction with Life. Needs, basic psychological needs satisfaction (autonomy, competence, and relatedness). For all effects, significance was determined by bias-corrected bootstrap 95% confidence intervals (CIs) (5000 resamples); confidence intervals not containing zero indicate significance. Detailed path coefficients for individual structural paths are presented in Fig. 2.

3.4 Alternative Model Comparisons

To evaluate the robustness of the full mediation interpretation and rule out the possibility of statistical artifacts, two sets of analyses were conducted.

First, an alternative reverse mediation model was tested, in which life satisfaction was specified as the predictor, basic psychological needs as mediators, and attachment anxiety and avoidance as outcome variables. As shown in Table 5, this model demonstrated substantially poorer fit than the hypothesized model across all indices (χ^2/df = 4.50, CFI = 0.93, TLI = 0.91, RMSEA = 0.085, AIC = 822.52), with RMSEA exceeding the acceptable threshold of 0.08. In comparison, the hypothesized model showed superior fit (χ^2/df = 3.94, CFI = 0.94, TLI = 0.93, RMSEA = 0.078, AIC = 719.92), with an AIC difference of 102.60, indicating a substantially better fit [40].

Table 5: Fit indices for the hypothesized and alternative models.

Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA	AIC
Hypothesized Model	609.92	155	3.94	0.94	0.93	0.078	719.92
Reverse Mediation Model	724.52	161	4.50	0.93	0.91	0.085	822.52

Note: N = 488. df, degree of freedom; CFI, comparative fit index; TLI, Tucker-Lewis Index; RMSEA, root mean square error of approximation; AIC, Akaike information criterion.

Second, to address the concern that the nonsignificant direct effects might reflect a statistical artifact of shared variance rather than true mediation, a direct-effects model was estimated in which only attachment anxiety and attachment avoidance were linked to life satisfaction, without the inclusion of the three need satisfaction variables. In this model, both attachment anxiety ($\beta = -0.36$, $p < 0.001$) and attachment avoidance ($\beta = -0.19$, $p < 0.001$) were significantly associated with life satisfaction, establishing robust total effects. However, this model accounted for only 16.4% of the variance in life satisfaction. When the three basic psychological needs were introduced as mediators in the hypothesized model, the explained variance in life satisfaction increased substantially to 49.2%, while the direct paths from attachment anxiety ($\beta = -0.03$, $p = 0.57$) and attachment avoidance ($\beta = 0.06$, $p = 0.14$) dropped to near zero and became nonsignificant. This substantial attenuation of the direct effects upon inclusion of the mediators, consistent with classical mediation principles [41], provides compelling evidence that the full mediation pattern reflects a genuine psychological process rather than a statistical artifact.

4 Discussion

This research investigated how adult attachment patterns relate to life satisfaction in Chinese university students, testing basic psychological needs satisfaction as a unifying mediational framework that moves beyond previously examined discrete mediators such as emotion regulation, self-esteem, and self-compassion. Findings strongly supported this hypothesized parallel mediation model. A central finding was that the fulfillment of basic psychological needs fully accounted for the associations between both insecure attachment dimensions (anxiety and avoidance) and life satisfaction. Specifically, insecure attachment showed no significant direct associations with life satisfaction; instead, it was related to lower well-being indirectly through impeded satisfaction of autonomy, competence, and relatedness needs. These results extend the existing literature in three important ways. First, by simultaneously modeling both attachment dimensions and all three basic needs, the present findings move beyond prior work that tested mediation within domain-specific relational contexts [29] or involved conceptually distinct constructs [30], positioning need satisfaction as the operative mechanism in the attachment-well-being link. Second, the full mediation pattern contrasts with the partial mediation commonly observed in Western samples [25,42], suggesting that cultural context may shape the centrality of need satisfaction in this pathway. Third, the differential patterns of need frustration across attachment dimensions offer nuanced insights into how anxiety and avoidance may be associated with lower well-being through distinct motivational pathways.

4.1 The Mediating Role of Basic Psychological Needs Satisfaction

Supporting integration between Attachment Theory and SDT [8,16,23], our findings confirmed that attachment orientations are closely associated with need fulfillment across autonomy, competence, and relatedness domains. Specifically, the results supported the parallel mediation framework, showing that attachment anxiety and avoidance were indirectly associated with lower life satisfaction through reduced satisfaction of autonomy, competence, and relatedness concurrently.

This complete mediation pattern holds substantial theoretical significance that warrants explicit discussion, as the distinction between full and partial mediation carries meaningful theoretical implications. Partial mediation, as observed in some Western samples [25,42], would suggest that insecure attachment relates to well-being through multiple independent pathways, with need frustration being only one of several mechanisms. In contrast, the full mediation observed here indicates that need satisfaction is not merely one contributing factor but rather the central pathway through which attachment insecurity is associated with lower life satisfaction. This finding suggests that the cognitive and behavioral strategies associated with insecure attachment, whether hyperactivating or deactivating, are not inherently linked to lower well-being; rather, they may act as barriers to engaging with environmental conditions necessary for psychological need satisfaction.

Importantly, the current study advances theoretical understanding by testing a comprehensive, unified framework rather than merely adapting existing models to a new sample. While prior research has examined links among attachment, needs, and specific psychological outcomes, these investigations have frequently focused on discrete pathological symptoms such as depression or distress [25,42] or examined partial pathways within specific populations or relational domains rather than testing both attachment dimensions and all three basic needs concurrently in relation to global life satisfaction. The full mediation pattern observed here carries two specific implications for the broader literature. First, it suggests that the attachment–well-being association may be more fully explained by motivational processes than previously recognized, given that prior models examining partial pathways left substantial direct effects unaccounted for. Second, the divergence from partial mediation structures often reported in Western literature suggests

that cultural context may structurally shape these pathways, with the collectivistic emphasis on social harmony and interdependence in Chinese culture potentially amplifying the importance of need fulfillment for well-being. For Chinese university students, who navigate a developmental period marked by identity exploration and extensive social engagement beyond the family context [43], the subjective experience of having one's needs met appears to be the proximal determinant of life satisfaction, absorbing the distal influence of attachment history. This implies that even individuals with insecure attachment can achieve adequate well-being if they find ways to fulfill their basic needs despite relational vulnerabilities [21,44].

4.2 Attachment Anxiety and Need Satisfaction

Findings showed that attachment anxiety was strongly and negatively associated with all three basic needs, with the strongest associations observed for competence and autonomy. This aligns with the theoretical view of attachment anxiety as a "hyperactivating" strategy marked by chronic vigilance and self-doubt [8].

The substantial inverse relationship between attachment anxiety and competence need satisfaction appears particularly acute in China's intensely competitive academic landscape. Individuals exhibiting anxious attachment patterns, whose fragile self-regard hinges upon others' approval, demonstrate heightened vulnerability to viewing academic or social setbacks as validating beliefs about their inadequacy [45,46]. This deficiency-oriented mindset may hinder their sense of mastery, making it difficult to internalize successes or feel genuinely competent. In the demanding academic environment faced by Chinese university students, where evaluation and competition are pervasive [47,48], these attachment-related vulnerabilities may be particularly detrimental to competence satisfaction.

Regarding autonomy, the negative association reflects the conflict between the need for volitional functioning and the anxious desire for merger. In Chinese culture, where social harmony is emphasized [49,50], anxiously attached individuals may feel compelled to suppress their authentic self-interests to maintain proximity and gain approval from significant others. This "compulsive compliance" may constrain autonomous functioning for the sake of relational security, leaving the need for self-endorsement unfulfilled [9,16]. Paradoxically, while anxiously attached individuals crave relatedness, their excessive reassurance-seeking and emotional volatility often strain interpersonal bonds, ultimately frustrating the very need they desperately seek to satisfy [8,51].

4.3 Attachment Avoidance and Need Satisfaction

Attachment avoidance was significantly and negatively associated with the satisfaction of all three needs, most notably relatedness. This supports the view that the "deactivating" strategies of avoidant individuals, suppressing attachment needs and maintaining emotional distance, come at a high psychological cost [8].

The pronounced deficit in relatedness satisfaction likely reflects avoidant strategies that prioritize self-reliance over intimacy. By keeping others at arm's length and avoiding self-disclosure, avoidant students may limit their access to the deep, supportive connections that are essential for well-being [8,52]. In the university setting, this isolation may reduce opportunities to access the social capital and emotional support systems crucial for navigating stress.

Crucially, our findings challenge the notion that avoidant individuals possess "high autonomy". While they often claim independence, the negative association with autonomy satisfaction suggests this is a "defensive independence" rather than true volition. According to SDT, autonomy involves acting from integrated values, whereas avoidant independence is often a reactive flight from vulnerability [16]. Moreover,

competence deficits among avoidant individuals may stem from their unwillingness to seek assistance (perceiving it as indicating weakness), which may constrain their capacity to master difficulties and cultivate authentic feelings of effectiveness [52,53], especially in the group-based academic activities prevalent in Chinese universities.

4.4 Findings within the Chinese Cultural Context

These results invite a culturally informed interpretation. Although SDT proposes that basic needs are universal [16], the means by which individuals fulfill these needs are theorized to vary across cultures. While specific cultural variables were not directly measured in the present study, contextualizing our findings within a collectivistic society that values interdependence and filial piety [54,55] offers a valuable theoretical lens, providing possible explanations rather than definitive conclusions. In such a context, the inability to form secure connections (relatedness) or to meet social expectations (competence) may carry a heavier psychological burden than in individualistic cultures.

The finding that attachment insecurity was negatively associated with need satisfaction across all three domains in the present sample, even within a culture that explicitly encourages social reliance, is noteworthy. It suggests that cultural emphasis on harmony does not automatically buffer the negative associations of insecure attachment. On the contrary, the imperative to maintain Mianzi (face) may create an intrapsychic conflict for insecurely attached individuals, where the external demand for harmony masks a profound internal lack of need satisfaction [56,57]. For instance, the high academic pressure in China might amplify the competence anxiety of anxiously attached students, while the strong cultural norm of group integration might make the social withdrawal of avoidant students more maladaptive and isolating [58,59].

4.5 Theoretical and Practical Implications

From a theoretical perspective, this research provides initial evidence for the integration of personality-based (attachment) and motivation-based (SDT) frameworks in a non-Western context, although the cultural mechanisms underlying the observed patterns remain to be directly tested. Findings confirm that attachment security serves to establish a "secure base" enabling individuals to pursue fulfillment of autonomy, competence, and relatedness needs [8,16,23].

From a practical perspective, the full mediation finding carries optimistic implications for intervention. It implies that we do not necessarily need to alter or restructure deep-seated attachment orientations to improve students' well-being. Instead, interventions can focus on the more malleable mediator: need satisfaction [16]. For students with attachment anxiety, interventions should focus on competence-building (e.g., attributional retraining to reduce self-blame) and autonomy support (helping them distinguish their own values from others' expectations) [60,61]. For students with attachment avoidance, the focus should be on creating safe, low-stakes opportunities for relatedness (e.g., structured peer mentoring) and reframing help-seeking not as a dependency-oriented behavior, but as a proactive competence-enhancing strategy [62,63]. At the institutional level, universities should foster an "autonomy-supportive" rather than controlling environment [61,64], reducing excessive competitive pressure to allow students' intrinsic motivation and competence to flourish.

4.6 Limitations and Future Directions

Several limitations warrant consideration. First, the cross-sectional design precludes causal inferences. The findings represent statistical mediation consistent with, but not proof of, the proposed causal sequence. Alternative causal directions remain plausible; for instance, lower life satisfaction may shape perceptions of

need fulfillment, which could in turn color reports of attachment insecurity, or need satisfaction itself may contribute to the development of more secure attachment orientations over time. Although the alternative model comparisons favored the hypothesized direction, such comparisons cannot establish causal ordering with cross-sectional data alone. Multi-wave longitudinal or experimental designs are needed to clarify the temporal precedence among these variables.

Second, all variables were assessed via self-report measures at a single time point, raising the risk of common method variance. Although Harman's single-factor test indicated that the first factor accounted for only 21.85% of total variance, this test has recognized limitations as a standalone diagnostic. Shared response tendencies related to negative affectivity or social desirability may have inflated the observed associations to some degree. That said, the constructs examined in this study are inherently subjective experiences most validly captured through self-report. Future research should nonetheless consider incorporating multi-method assessments to further mitigate common method concerns.

Third, the sample consisted exclusively of university students from one province (Anhui, China), which limits generalizability to other age groups, occupational populations, regions with different socioeconomic characteristics, and non-Chinese cultural contexts. Future research should replicate this model across more diverse samples to establish the boundary conditions of these findings.

Fourth, although the findings are discussed in relation to Chinese cultural characteristics such as collectivism, social harmony, and concern for Mianzi, no cultural variables were directly measured in this study. The cultural interpretations offered in the Discussion are therefore speculative and should be treated as theoretically grounded hypotheses rather than empirical conclusions. Future research should incorporate explicit measures of cultural orientation (e.g., individualism–collectivism scales, face concern inventories) to empirically test whether and how cultural factors moderate the attachment–needs–well-being pathway.

Finally, the multi-stage stratified random sampling design introduced a nested data structure (students within classes within schools within universities). The present analyses employed conventional SEM in AMOS, which does not adjust for potential clustering effects. However, several factors mitigate this concern: individual students were randomly selected within classes rather than surveying intact classes, reducing within-cluster homogeneity; the psychological variables examined reflect individual-level traits that are theoretically less susceptible to cluster-level confounding. Future research should nonetheless consider employing multilevel SEM to account for nested sampling structures more rigorously.

5 Conclusions

The present study advances our understanding of the psychological mechanisms linking adult attachment to life satisfaction among Chinese university students by integrating attachment theory with self-determination theory into a parallel mediation framework. Results demonstrated that basic psychological needs satisfaction fully mediated the associations between both attachment dimensions (anxiety and avoidance) and life satisfaction, with direct effects being nonsignificant.

Regarding theoretical contributions, this study offers three key insights. First, the full mediation finding positions need satisfaction as the operative mechanism, rather than a peripheral correlate, in the attachment-well-being link. The nonsignificant direct effects suggest that attachment insecurity is not inherently associated with lower life satisfaction; rather, this association appears to operate through impeded need fulfillment, a modifiable psychological process. Second, this pattern contrasts with the partial mediation commonly observed in Western samples and domain-specific relational contexts, suggesting that the centrality of need satisfaction in the attachment-well-being pathway may vary across cultural and relational settings. Third, attachment anxiety was most strongly associated with competence deficits,

whereas attachment avoidance was most strongly linked to relatedness deficits, challenging the assumption that avoidant self-reliance reflects genuine autonomy.

Regarding practical implications, interventions need not focus exclusively on restructuring deep-seated attachment patterns. Instead, fostering need-supportive environments that promote students' experiences of choice, mastery, and belonging represents a more feasible strategy for mitigating the detrimental associations between insecure attachment and life satisfaction among Chinese university students.

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