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The Effect of Decision-Making Styles on Emotional Security and Loneliness in Adolescents: Testing a Structural Equation Model

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A B S T R A C T

Purpose: Objective: The present study aimed to explain the direct and indirect relationships between decision-making styles and emotional security and loneliness among adolescents using a structural equation modeling approach.

Methods and Materials: This study employed a descriptive–correlational and cross-sectional design and utilized Structural Equation Modeling (SEM). The statistical population consisted of all adolescents aged 15–18 years who were students in Tehran between May and June 2024. The sample size included 200 participants selected through stratified random sampling. Research instruments included the Belonging and Emotional Security Tool (BEST), the General Decision Making Style Questionnaire (GDMS), and the UCLA Loneliness Questionnaire (Russell Loneliness Scale). Descriptive analyses were conducted using SPSS version 27, and structural equation modeling was performed using SmartPLS version 4. The significance level was set at 0.05.

Findings: The results indicated that the avoidant decision-making style had a significant negative effect on emotional attachment ($\beta = -0.421$, $T = 4.285$, $p < .001$) and emotional security ($\beta = -0.456$, $T = 4.015$, $p < .001$), while showing a significant positive effect on loneliness ($\beta = 0.253$, $T = 2.965$, $p = .003$). In contrast, the dependent decision-making style showed no significant effect on emotional attachment ($\beta = -0.037$, $p = .686$), emotional security ($\beta = -0.059$, $p = .450$), or loneliness ($\beta = 0.075$, $p = .343$). Regarding the intuitive decision-making style, its effects on emotional attachment ($\beta = -0.065$, $p = .443$) and emotional security ($\beta = 0.001$, $p = .993$) were not significant; however, a significant positive effect on loneliness was observed ($\beta = 0.212$, $T = 3.031$, $p = .002$). The rational decision-making style demonstrated a significant positive effect on emotional attachment ($\beta = 0.367$, $T = 6.927$, $p < .001$) and emotional security ($\beta = 0.121$, $T = 2.464$, $p = .014$), along with a strong negative effect on loneliness ($\beta = -0.462$, $T = 7.202$, $p < .001$), confirming the determining role of this style within the proposed model.

Conclusion: Overall, the findings indicate that decision-making styles play a decisive role in shaping emotional security and the experience of loneliness among

adolescents. The rational style functions as a protective factor, whereas the avoidant style operates as a risk factor.
Keywords: *Decision-Making Styles; Emotional Security; Loneliness.*

1. Introduction

Adolescence represents a critical developmental period characterized by rapid biological, cognitive, emotional, and social transformations that profoundly influence psychological adjustment and mental health trajectories. During this stage, individuals encounter increasing autonomy demands, identity formation challenges, and complex interpersonal expectations, all of which require effective decision-making capacities and emotional regulation competencies. The interaction between cognitive decision-making processes and emotional experiences becomes particularly salient in adolescence, as maladaptive patterns during this period may contribute to long-term psychological vulnerability, including loneliness, emotional insecurity, and internalizing problems (Baldini et al., 2025; Páez-Gallego et al., 2020).

Loneliness has emerged as one of the most significant psychological concerns among adolescents worldwide. Contemporary psychological literature conceptualizes loneliness not merely as social isolation but as a subjective discrepancy between desired and perceived social relationships. Research demonstrates that loneliness is associated with emotional distress, depressive symptoms, suicidal ideation, and reduced quality of life among young populations (Hamid & Dasht Bozorgi, 2025; McCarthy et al., 2026). Increasing societal changes, including digitalization, altered social interaction patterns, and shifting family dynamics, have intensified experiences of loneliness during adolescence (Kamasak et al., 2026). Moreover, loneliness has been identified as a central mechanism linking environmental, interpersonal, and psychological factors to mental health outcomes, suggesting that understanding its antecedents is essential for preventive psychological interventions (Gijsbers et al., 2024).

Parallel to loneliness, emotional security constitutes a fundamental psychological need during adolescence. Emotional security refers to an individual's perception of psychological safety, emotional stability, and confidence within interpersonal relationships and social environments. Adolescents who experience emotional insecurity are more likely to develop anxiety, depressive symptoms, and maladaptive coping strategies. Empirical findings indicate that emotional security mediates the association between environmental stressors and psychological maladjustment, highlighting its protective function in youth development (Wang et al., 2025). Family interactions and parenting practices significantly influence adolescents' emotional security, as parental burnout, psychological intrusion, and family dysfunction may undermine emotional stability and resilience (Mohammadi et al., 2023; Zhou et al., 2025).

Decision-making processes represent another crucial psychological domain shaping adolescents' emotional and social outcomes. Decision-making styles reflect stable cognitive–behavioral tendencies individuals use when confronting choices or solving problems. These styles—including rational, intuitive, avoidant, dependent, and spontaneous patterns—are closely related to self-regulation, resilience, and behavioral adjustment (Kaveh et al., 2025). Adolescents' decision-making abilities continue to develop due to ongoing maturation of executive functions and socio-emotional neural systems, making this period particularly sensitive to maladaptive decision patterns. Studies have shown that ineffective decision-making styles are associated with stress vulnerability, risk-taking behavior, and psychological distress among high school students (Hosseini et al., 2023).

From a developmental psychology perspective, decision-making is not solely a cognitive activity but a multidimensional process influenced by emotional experiences and interpersonal contexts. Value-driven decision-making has been found to mediate relationships between relationship quality and internalizing symptoms, suggesting that emotional and relational factors shape how adolescents evaluate and select behavioral alternatives (Jones et al., 2026). Similarly, psychological well-being and adaptive functioning are positively associated with rational decision-making styles, whereas impulsive or avoidant patterns are linked to poorer emotional outcomes (Páez-Gallego et al., 2020).

Recent research increasingly emphasizes the reciprocal relationship between loneliness and decision-making. Social disconnection may impair cognitive flexibility and risk evaluation, leading individuals toward avoidant or emotionally driven decisions. Conversely, maladaptive decision-making styles may limit effective social engagement, thereby reinforcing loneliness experiences. Empirical findings demonstrate that friendship quality and loneliness significantly shape decision-making styles among young individuals, highlighting the bidirectional nature of

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these constructs (Gulzar & Sharma, 2025). Such findings underscore the necessity of examining decision-making styles as predictors of emotional functioning rather than merely behavioral outcomes.

The growing digital context of adolescent life further complicates this relationship. Digital environments expose adolescents to new forms of social comparison, online risk exposure, and behavioral addiction, all of which influence emotional regulation and cognitive decision processes. Digital addiction has been shown to reshape behavioral patterns and decision tendencies, potentially increasing emotional vulnerability and social withdrawal (Kamasak et al., 2026). Structural equation modeling studies have confirmed that cognitive abilities, digital literacy, and psychological health interact dynamically in adolescents' psychosocial adjustment, emphasizing the importance of integrated explanatory models (Barani et al., 2025).

In addition, social-emotional learning competencies have been identified as key determinants of adolescents' behavioral adaptation and psychological health. Adolescents with stronger emotional awareness and regulation abilities demonstrate reduced problematic behaviors and improved interpersonal functioning, suggesting that emotional competencies interact with decision-making mechanisms to influence psychosocial outcomes (Chen et al., 2021). Emotional dysregulation and reduced self-efficacy, on the other hand, contribute to anxiety and loneliness, further supporting the role of cognitive–emotional integration in adolescent mental health (Albikawi & Abuadas, 2025).

Traumatic experiences and environmental stressors also highlight the importance of examining emotional security and loneliness together. Adolescents exposed to natural disasters or severe stress show elevated loneliness and reduced psychological well-being, demonstrating how emotional insecurity amplifies vulnerability during developmental transitions (Akay et al., 2026). These findings align with broader theoretical perspectives suggesting that emotional safety functions as a psychological buffer protecting adolescents from adverse emotional consequences.

Furthermore, contemporary integrative models propose that loneliness should be understood within complex systems of interpersonal, cognitive, and emotional processes. Reviews of loneliness across contexts indicate that cognitive evaluation patterns, self-perception, and social expectations jointly shape loneliness experiences, reinforcing the need to investigate cognitive determinants such as decision-making styles (McCarthy et al., 2026). Longitudinal communication research similarly demonstrates that different patterns of social media engagement influence loneliness and mood through cognitive-emotional pathways, illustrating how daily decisions about social interaction accumulate into broader psychological outcomes (Frison & Eggermont, 2020).

Despite increasing research attention to adolescent loneliness and emotional functioning, several gaps remain in the literature. First, many studies have examined loneliness or emotional security independently rather than as interconnected outcomes emerging from shared cognitive mechanisms. Second, although decision-making styles have been linked to behavioral adjustment, fewer investigations have simultaneously explored their direct and indirect effects on emotional attachment, emotional safety, and loneliness within a unified structural framework. Third, existing research often relies on isolated predictive models rather than comprehensive structural equation models capable of testing complex relationships among psychological constructs.

Structural equation modeling offers a powerful analytical framework for addressing these limitations by allowing simultaneous examination of latent constructs and causal pathways. Previous SEM-based research has demonstrated its effectiveness in explaining psychological phenomena among adolescents, including behavioral adjustment, emotional functioning, and resilience processes (Barani et al., 2025; Huang et al., 2026). Employing such an approach enables researchers to capture both direct and indirect associations between decision-making styles and emotional outcomes.

Considering the theoretical and empirical evidence, decision-making styles may represent a central psychological mechanism linking cognitive processes to adolescents' emotional security and experiences of loneliness. Rational decision-making may function as a protective factor by promoting problem-solving competence and emotional regulation, whereas avoidant or maladaptive styles may increase vulnerability to emotional insecurity and social isolation. Understanding these relationships is particularly important for designing preventive psychological interventions, school-based mental health programs, and counseling strategies targeting adolescents' cognitive and emotional development (Baldini et al., 2025; Kaveh et al., 2025).

Therefore, the present study aims to examine the direct and indirect relationships between decision-making styles

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and emotional security and loneliness among adolescents using a structural equation modeling approach.

2. Methods and Materials

2.1. Study Design and Participants

The present study was classified as an applied research project in terms of purpose. Regarding its nature and data collection method, it employed a descriptive–correlational design. Structural Equation Modeling (SEM) was used to analyze relationships among variables and to examine causal patterns. In this study, decision-making styles were considered independent variables, while emotional security and loneliness were treated as dependent variables. The statistical population consisted of all adolescents aged 15–18 years who were students in Tehran between May and June 2024. Based on prior literature concerning sample size requirements in structural equation modeling and commonly accepted rules of thumb, an adequate SEM sample size should be approximately 2.5 to 5 times the number of items included in the measurement instruments (Hair et al., 2009). Since the total number of questionnaire items was 70, a minimum sample size of 175 participants was required. Considering potential attrition, a sample size of 200 participants was initially selected. Stratified random sampling was used for participant selection.

Inclusion criteria consisted of being between 15 and 18 years of age at the time of data collection, current school enrollment, the ability to read and understand questionnaires and respond independently, provision of informed consent by the student, absence of a history of diagnosed severe neurodevelopmental disorders (e.g., intellectual disability or autism spectrum disorder) based on self-report and school records, and no use of psychiatric medications affecting cognitive or emotional processes during the previous three months. Exclusion criteria included incomplete questionnaires or missing data exceeding 10%, random or inconsistent responding based on data quality control indicators, withdrawal from participation at any stage of data collection, response patterns showing extreme or uniform answers across questionnaires, and the emergence of any diagnosed severe psychiatric condition during the research process that prevented continued participation.

The research procedure began with obtaining the required ethical and administrative permissions from the researcher's university. Subsequently, the researcher visited two high schools in Tehran selected through convenience access. Sampling was conducted based on educational grade levels and classroom units. Students were stratified according to classroom membership, and participants were randomly selected from each class. Data collection and questionnaire administration were conducted in person over a two-month period. During the first month, data were collected from a boys' high school, and during the second month from a girls' high school. Ultimately, 163 questionnaires were retained for analysis from participating students. Thirty-seven questionnaires were excluded due to incomplete responses or intentional response errors. All instruments were administered using a self-report format. To comply with ethical principles, informed consent forms were obtained prior to questionnaire administration. Participation was entirely voluntary, and students were informed that they could withdraw from the study at any time without obligation.

2.2. Measures

Belonging and Emotional Security Tool (BEST): The Adolescent Emotional Security Questionnaire developed by Frey et al. (2008) is a validated self-report instrument designed to assess emotional security (Frey et al., 2008). The questionnaire consists of 25 items rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument includes two dimensions: emotional security (13 items) and emotional attachment (12 items). Scores on the emotional security subscale range from 13 to 65. The developers reported a Cronbach's alpha coefficient of .89 for the overall scale, with reliability coefficients of .86 and .87 for the respective factors (Shadaei et al., 2016). In Iranian samples, the reliability of the questionnaire has been reported as .90 using Cronbach's alpha.

General Decision-Making Style Questionnaire (GDMS): The General Decision-Making Style Questionnaire developed by Scott and Bruce (1995) is a self-report measure designed to assess decision-making styles. The instrument includes five subscales: (1) rational, (2) intuitive, (3) dependent, (4) spontaneous, and (5) avoidant decision-making styles. The rational decision-making style (items 4, 7, 11, 13, and 25) reflects systematic evaluation of alternatives and awareness of decision consequences aimed at maximizing outcomes. The intuitive decision-making style (items 1, 3, 12, 16, and 17) represents an unconscious decision process derived from prior experiences and implicit learning and is largely emotion-based rather than purely analytical. The dependent decision-making style (items 2, 5, 10, 18, and 22) reflects reliance on guidance and support

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from others due to reduced decisional autonomy. The spontaneous decision-making style (items 8, 9, 15, 20, and 24) reflects rapid decision-making under time pressure without prior cognitive deliberation. The avoidant decision-making style (items 6, 14, 19, 21, and 23) refers to postponing decisions and avoiding responses when confronted with problems. The questionnaire contains 25 items scored on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5), producing subscale scores ranging from 5 to 25. Scott and Bruce (1995) reported reliability coefficients of .85, .84, .86, .94, and .87 for the five decision-making styles, respectively. Iranian researchers reported an internal consistency coefficient of .75 for the scale.

Russell Loneliness Questionnaire (UCLA Loneliness Scale): The UCLA Loneliness Questionnaire developed by Russell (1996) was designed to assess perceived loneliness in adolescents (Russell, 1996). The scale consists of 20 items, including 10 negatively worded and 10 positively worded items. Responses are rated on a four-point Likert scale: never (1), rarely (2), sometimes (3), and always (4). Total scores range from 20 to 80, with higher scores indicating greater loneliness. Scores above the mean reflect higher intensity of loneliness. The reliability of the scale has been evaluated using internal consistency and test–retest methods. Russell (1996) reported a test–retest reliability coefficient of .89. In Iranian samples, Cronbach's alpha reliability has been reported as .78 (Dehghani et al., 2019).

2.3. Data Analysis

Descriptive statistics were conducted using SPSS version 27, and structural equation modeling analyses were performed using SmartPLS version 4. Skewness and kurtosis indices were used to assess normality of variable distributions. Because the values for most items exceeded +3 or were lower than −3, the variables did not follow a normal distribution. Therefore, SmartPLS and the Partial Least Squares (PLS) estimation method were used for model estimation. The available sample size of 163 participants was considered adequate for implementing PLS-based structural equation modeling. The significance level was set at .05.

3. Findings and Results

Descriptive statistical indices related to the participants are presented in Table 1. The descriptive findings of participants' demographic characteristics indicated that among the total sample of 163 adolescents, the highest frequency belonged to the 17–18-year age group, including 67 participants (41.1%). This was followed by the 15–16-year age group with 65 participants (39.9%), and finally the 16–17-year age group with 31 participants (19.0%).

Regarding gender distribution, 78 participants (47.9%) were boys and 85 participants (52.1%) were girls, indicating a relatively balanced gender distribution. Examination of parental marital status showed that the majority of participants lived with parents in an intact marital relationship (127 participants; 77.9%), while 24 participants (14.7%) had divorced parents and 12 participants (7.4%) had experienced the death of one parent.

Table 1

Description of Demographic Variables

Variable	Groups	Frequency	Percent
Age	15–16	65	39.9
	16–17	31	19.0
	17–18	67	41.1
	Total	163	100.0
Gender	Boy	78	47.9
	Girl	85	52.1
Marital Status of Parents	Common life	127	77.9
	Divorce	24	14.7
	Death of a parent	12	7.4

After estimating the research model, factor loadings, standard errors, t values, and significance levels of each item were examined. Factor loadings greater than .60 indicated adequate representation of the latent construct by the item, and t values larger than 1.96 at the .05 significance level indicated statistically significant factor loadings.

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Table 2

Factor Loadings and Significance of Measurement Items

Items	Factor Loadings	STDEV	T-value	p-value
Emotional.attachment1 ← Emotional attachment	0.827	0.030	28.027	p < .001
Emotional.attachment10 ← Emotional attachment	0.911	0.022	40.893	p < .001
Emotional.attachment11 ← Emotional attachment	0.886	0.023	37.969	p < .001
Emotional.attachment12 ← Emotional attachment	0.884	0.024	36.329	p < .001
Emotional.attachment2 ← Emotional attachment	0.847	0.028	30.048	p < .001
Emotional.attachment3 ← Emotional attachment	0.861	0.024	35.423	p < .001
Emotional.attachment4 ← Emotional attachment	0.894	0.019	46.376	p < .001
Emotional.attachment5 ← Emotional attachment	0.851	0.032	26.565	p < .001
Emotional.attachment6 ← Emotional attachment	0.919	0.017	53.521	p < .001
Emotional.attachment7 ← Emotional attachment	0.877	0.028	31.693	p < .001
Emotional.attachment8 ← Emotional attachment	0.873	0.025	35.627	p < .001
Emotional.attachment9 ← Emotional attachment	0.841	0.037	22.522	p < .001
Emotional.safety1 ← Emotional safety	0.683	0.069	9.950	p < .001
Emotional.safety10 ← Emotional safety	0.860	0.030	29.051	p < .001
Emotional.safety11 ← Emotional safety	0.823	0.035	23.257	p < .001
Emotional.safety12 ← Emotional safety	0.860	0.028	30.642	p < .001
Emotional.safety13 ← Emotional safety	0.886	0.026	33.454	p < .001
Emotional.safety2 ← Emotional safety	0.872	0.024	36.415	p < .001
Emotional.safety3 ← Emotional safety	0.855	0.029	29.469	p < .001
Emotional.safety4 ← Emotional safety	0.817	0.041	20.104	p < .001
Emotional.safety5 ← Emotional safety	0.708	0.046	15.495	p < .001
Emotional.safety6 ← Emotional safety	0.851	0.030	28.506	p < .001
Emotional.safety7 ← Emotional safety	0.831	0.040	20.841	p < .001
Emotional.safety8 ← Emotional safety	0.856	0.027	31.609	p < .001
Emotional.safety9 ← Emotional safety	0.871	0.024	35.648	p < .001
UCLA1 ← Feeling lonely	0.866	0.028	30.394	p < .001
UCLA10 ← Feeling lonely	0.863	0.032	26.806	p < .001
UCLA11 ← Feeling lonely	0.857	0.035	24.167	p < .001
UCLA12 ← Feeling lonely	0.906	0.018	51.397	p < .001
UCLA13 ← Feeling lonely	0.751	0.050	15.077	p < .001
UCLA14 ← Feeling lonely	0.832	0.033	25.095	p < .001
UCLA15 ← Feeling lonely	0.747	0.057	13.038	p < .001
UCLA16 ← Feeling lonely	0.812	0.039	21.061	p < .001
UCLA17 ← Feeling lonely	0.842	0.037	22.542	p < .001
UCLA18 ← Feeling lonely	0.834	0.043	19.349	p < .001
UCLA19 ← Feeling lonely	0.880	0.026	33.637	p < .001
UCLA2 ← Feeling lonely	0.867	0.032	27.348	p < .001
UCLA20 ← Feeling lonely	0.853	0.039	21.779	p < .001
UCLA3 ← Feeling lonely	0.876	0.026	34.148	p < .001
UCLA4 ← Feeling lonely	0.906	0.021	43.206	p < .001
UCLA5 ← Feeling lonely	0.873	0.029	30.628	p < .001
UCLA6 ← Feeling lonely	0.863	0.030	28.687	p < .001
UCLA7 ← Feeling lonely	0.854	0.034	25.384	p < .001
UCLA8 ← Feeling lonely	0.877	0.026	33.357	p < .001
UCLA9 ← Feeling lonely	0.888	0.025	35.286	p < .001
decision1 ← Intuitive decision-making style	0.974	0.005	202.900	p < .001
decision10 ← Dependency decision-making style	0.941	0.011	89.367	p < .001
decision11 ← Rational decision-making style	0.962	0.011	86.185	p < .001
decision12 ← Intuitive decision-making style	0.954	0.012	81.697	p < .001
decision13 ← Rational decision-making style	0.949	0.011	85.343	p < .001
decision14 ← Avoidant decision-making style	0.923	0.013	70.857	p < .001
decision15 ← Instant decision-making style	0.878	0.021	42.555	p < .001
decision16 ← Intuitive decision-making style	0.965	0.009	112.530	p < .001
decision17 ← Intuitive decision-making style	0.974	0.005	202.900	p < .001
decision18 ← Dependency decision-making style	0.940	0.012	80.090	p < .001
decision19 ← Avoidant decision-making style	0.952	0.009	102.819	p < .001
decision20 ← Instant decision-making style	0.893	0.019	47.300	p < .001
decision21 ← Avoidant decision-making style	0.954	0.009	101.441	p < .001
decision22 ← Dependency decision-making style	0.961	0.008	114.097	p < .001
decision23 ← Avoidant decision-making style	0.936	0.008	112.014	p < .001
decision24 ← Instant decision-making style	0.895	0.027	33.079	p < .001
decision25 ← Rational decision-making style	0.956	0.010	96.033	p < .001
decision4 ← Rational decision-making style	0.965	0.008	118.331	p < .001
decision5 ← Dependency decision-making style	0.955	0.011	90.067	p < .001
decision6 ← Avoidant decision-making style	0.952	0.009	100.562	p < .001

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decision7 ← Rational decision-making style	0.973	0.007	130.187	p < .001
decision8 ← Instant decision-making style	0.894	0.016	54.733	p < .001
decision9 ← Instant decision-making style	0.874	0.023	37.280	p < .001
decisionI3 ← Intuitive decision-making style	0.946	0.014	67.636	p < .001

Figure 1

Path coefficients between variables and p-values.

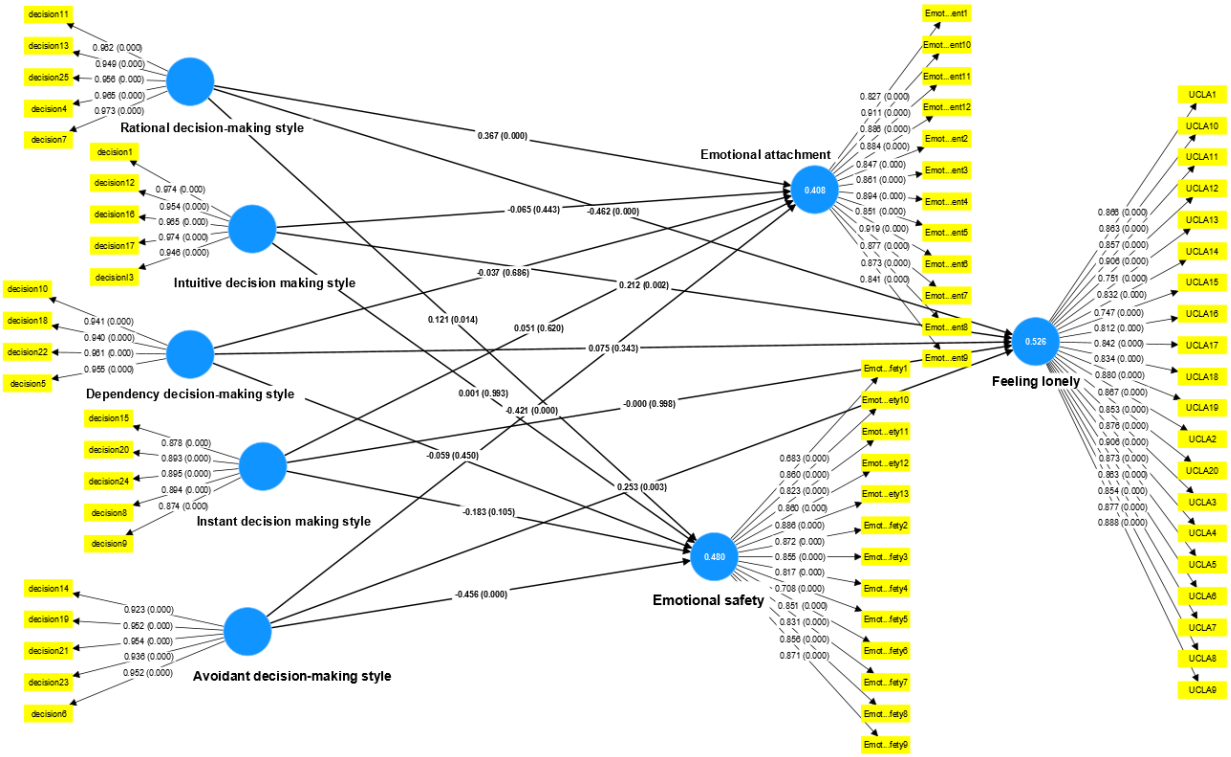

Figure 2

t-values of structural paths.

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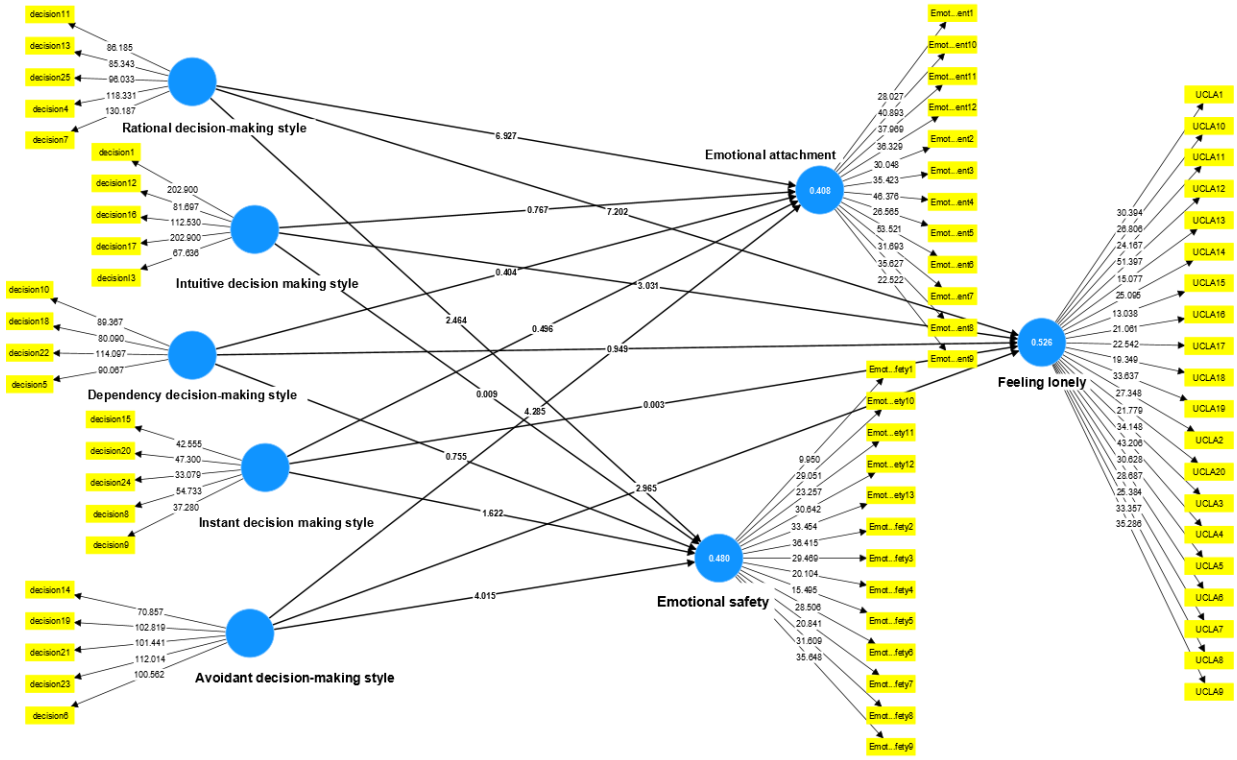

All measurement items demonstrated statistically significant factor loadings ($p < .001$), confirming adequate construct validity of the measurement model.

The results of the measurement model analysis indicated that all indicators of the emotional attachment construct had high and statistically significant factor loadings. The factor loadings for these items ranged from 0.827 to 0.919, and the t statistics for all indicators were greater than 1.96. In addition, the significance levels for all factor loadings were reported as $p < .001$, indicating a strong contribution of these indicators to explaining the emotional attachment construct.

With respect to the emotional safety construct, the findings showed that all item factor loadings were statistically significant. The factor loadings for these indicators ranged from 0.683 to 0.886. Although some items had relatively lower factor loadings (e.g., item 1 with a loading of 0.683), because all loadings exceeded the acceptable threshold of 0.60 and the t statistics ranged from 9.950 to 36.415, the factorial validity of this construct was confirmed.

Results for the loneliness construct (UCLA scale) showed that all indicators had acceptable and statistically significant factor loadings. The factor loadings ranged from 0.747 to 0.906, and t statistics ranged from 13.038 to 51.397. These findings indicate that the loneliness indicators have strong explanatory power for measuring the underlying latent construct.

Finally, results for decision-making styles indicated that all indicators had very high and statistically significant factor loadings. The factor loadings ranged from 0.878 to 0.974, and very large t values were reported (from 33.079 to 202.900). These results reflect very strong factorial validity for the indicators representing decision-making styles, including rational, intuitive, avoidant, dependent, and spontaneous styles.

Path coefficients between the study variables and their significance levels were examined in Table 3. In this study, the bootstrap resampling was set to 5,000.

Table 3

Direct Path Coefficients Between Research Variables (Bootstrapping = 5,000)

Hypothesis Result	Path	Path Coefficient (β)	STDEV	p-value	T-value	2.5% CI	97.5% CI
Supported	Avoidant decision-making style → Emotional attachment	-0.421	0.098	p < .001	4.285	-0.602	-0.210

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Supported	Avoidant decision-making style → Emotional safety	-0.456	0.114	p < .001	4.015	-0.660	-0.211
Supported	Avoidant decision-making style → Feeling lonely	0.253	0.085	0.003	2.965	0.092	0.432
Not supported	Dependency decision-making style → Emotional attachment	-0.037	0.093	0.686	0.404	-0.219	0.150
Not supported	Dependency decision-making style → Emotional safety	-0.059	0.078	0.450	0.755	-0.214	0.096
Not supported	Dependency decision-making style → Feeling lonely	0.075	0.079	0.343	0.949	-0.091	0.220
Not supported	Instant decision-making style → Emotional attachment	0.051	0.103	0.620	0.496	-0.159	0.246
Not supported	Instant decision-making style → Emotional safety	-0.183	0.113	0.105	1.622	-0.417	0.028
Not supported	Instant decision-making style → Feeling lonely	-0.000	0.082	0.998	0.003	-0.162	0.158
Not supported	Intuitive decision-making style → Emotional attachment	-0.065	0.084	0.443	0.767	-0.227	0.104
Not supported	Intuitive decision-making style → Emotional safety	0.001	0.073	0.993	0.009	-0.140	0.146
Supported	Intuitive decision-making style → Feeling lonely	0.212	0.070	0.002	3.031	0.069	0.348
Supported	Rational decision-making style → Emotional attachment	0.367	0.053	p < .001	6.927	0.260	0.467
Supported	Rational decision-making style → Emotional safety	0.121	0.049	0.014	2.464	0.023	0.212
Supported	Rational decision-making style → Feeling lonely	-0.462	0.064	p < .001	7.202	-0.582	-0.336

Based on the results presented in Table 3 and Figures 1 and 2, structural equation modeling showed that the avoidant decision-making style had a statistically significant negative effect on emotional attachment (β = -0.421, T = 4.285, p < .001) and emotional safety (β = -0.456, T = 4.015, p < .001). In addition, this decision-making style showed a statistically significant positive effect on loneliness (β = 0.253, T = 2.965, p = .003). The confidence intervals for these paths did not include zero, supporting the corresponding hypotheses.

In contrast, the results indicated that the dependent decision-making style had no statistically significant effects on any of the outcome variables, including emotional attachment (β = -0.037, p = .686), emotional safety (β = -0.059, p = .450), and loneliness (β = 0.075, p = .343). Therefore, the hypotheses related to these paths were rejected.

The findings also showed that the instant/spontaneous decision-making style did not have statistically significant effects on emotional attachment (β = 0.051, p = .620), emotional safety (β = -0.183, p = .105), or loneliness (β = -0.000, p = .998). Accordingly, none of the hypotheses associated with this decision-making style were supported.

Regarding the intuitive decision-making style, results indicated no statistically significant effects on emotional attachment (β = -0.065, p = .443) or emotional safety (β = 0.001, p = .993). However, its effect on loneliness was statistically significant and positive (β = 0.212, T = 3.031, p = .002), leading to support for the corresponding hypothesis.

Finally, results for the rational decision-making style indicated statistically significant positive effects on emotional attachment (β = 0.367, T = 6.927, p < .001) and emotional safety (β = 0.121, T = 2.464, p = .014). Moreover, the rational decision-making style showed a statistically significant negative effect on loneliness (β = -0.462, T = 7.202, p < .001). The confidence intervals for all of these paths did not include zero; therefore, the corresponding hypotheses were supported.

Overall, these findings indicate that avoidant and rational decision-making styles play more decisive roles in explaining adolescents' emotional attachment, emotional safety, and loneliness, whereas dependent and instant/spontaneous decision-making styles did not play significant roles in this model. Model fit indices are presented in Table 4.

Table 4

Model Fit Indices

Section	Variables / Model	SSO	SSE	Q^2 (= 1 − SSE/SSO)	R-square	R-square Adjusted	SRMR	NFI
Coefficient of Determination	Emotional attachment	—	—	—	0.408	0.389	—	—
Coefficient of Determination	Emotional safety	—	—	—	0.480	0.464	—	—
Coefficient of Determination	Feeling lonely	—	—	—	0.526	0.511	—	—

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Model Fit	Research Model	—	—	—	—	—	0.065	0.977
Predictive Relevance (Q^2)	Emotional attachment	1956.000	1386.903	0.291	—	—	—	—
Predictive Relevance (Q^2)	Emotional safety	2119.000	1431.470	0.324	—	—	—	—
Predictive Relevance (Q^2)	Feeling lonely	3260.000	2039.520	0.374	—	—	—	—

The results obtained from the coefficients of determination indicated that the research model possessed moderate to strong explanatory power for the endogenous variables. Decision-making styles explained 40.8% of the variance in emotional attachment ($R^2 = 0.408$, adjusted $R^2 = 0.389$), 48.0% of the variance in emotional safety ($R^2 = 0.480$, adjusted $R^2 = 0.464$), and 52.6% of the variance in loneliness ($R^2 = 0.526$, adjusted $R^2 = 0.511$). These values indicate satisfactory explanatory capability of the model, particularly in explaining adolescents' loneliness.

Evaluation of global model fit indices showed that SRMR = 0.065, which is below the recommended threshold of 0.08, indicating acceptable structural model fit. Furthermore, NFI = 0.977 demonstrated excellent model fit and strong consistency between empirical data and the proposed theoretical structure.

In addition, results of the Q^2 predictive relevance index indicated adequate predictive capability for all endogenous variables. Q^2 values were 0.291 for emotional attachment, 0.324 for emotional safety, and 0.374 for loneliness. Since all values were greater than zero, the research model demonstrates satisfactory predictive power for explaining the dependent variables. Reliability and validity of the research model are presented in Table 5.

Table 5

Reliability and Validity of the Measurement Model

Section	Variables	Cronbach's Alpha	Composite Reliability (CR)	AVE	1	2	3	4	5	6	7	8
Reliability & Convergent Validity	Avoidant decision-making style	0.969	0.976	0.890	—	—	—	—	—	—	—	—
	Dependency decision-making style	0.963	0.973	0.901	—	—	—	—	—	—	—	—
	Emotional attachment	0.972	0.975	0.762	—	—	—	—	—	—	—	—
	Emotional safety	0.962	0.966	0.690	—	—	—	—	—	—	—	—
	Feeling lonely	0.980	0.982	0.728	—	—	—	—	—	—	—	—
	Instant decision-making style	0.932	0.949	0.787	—	—	—	—	—	—	—	—
	Intuitive decision-making style	0.980	0.984	0.927	—	—	—	—	—	—	—	—
	Rational decision-making style	0.979	0.984	0.923	—	—	—	—	—	—	—	—
HTMT Ratio	Avoidant decision-making style	—	—	—	—	0.757	0.528	0.689	0.560	0.826	0.707	0.207
	Dependency decision-making style	—	—	—		—	0.446	0.571	0.513	0.720	0.568	0.275
	Emotional attachment	—	—	—			—	0.510	0.563	0.424	0.363	0.458
	Emotional safety	—	—	—				—	0.477	0.637	0.476	0.275
	Feeling lonely	—	—	—					—	0.488	0.462	0.555
	Instant decision-making style	—	—	—						—	0.626	0.213
	Intuitive decision-making style	—	—	—							—	0.072

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	Rational decision-making style	—	—	—								—
Fornell–Larcker Criterion	Avoidant decision-making style	—	—	—	0.943	—	—	—	—	—	—	—
	Dependency decision-making style	—	—	—	0.733	0.949	—	—	—	—	—	—
	Emotional attachment	—	—	—	-0.527	-0.445	0.873	—	—	—	—	—
	Emotional safety	—	—	—	-0.668	-0.551	0.504	0.831	—	—	—	—
	Feeling lonely	—	—	—	0.549	0.502	-0.561	-0.467	0.853	—	—	—
	Instant decision-making style	—	—	—	0.789	0.685	-0.421	-0.608	0.474	0.887	—	—
	Intuitive decision-making style	—	—	—	0.690	0.552	-0.367	-0.464	0.457	0.600	0.963	—
	Rational decision-making style	—	—	—	-0.205	-0.269	0.456	0.268	-0.547	-0.208	-0.062	0.961

As shown in Table 5, the reliability and validity of the model were confirmed. Cronbach's alpha coefficients ranged from 0.932 to 0.980, and composite reliability (CR) values ranged from 0.949 to 0.984, all exceeding the recommended threshold of 0.70, indicating excellent internal consistency and measurement stability.

Convergent validity assessment showed that the Average Variance Extracted (AVE) values for all constructs exceeded the criterion value of 0.50. AVE values ranged from 0.690 to 0.927, demonstrating that the indicators of each construct adequately explained a substantial proportion of the variance of their respective latent variables. Therefore, convergent validity of the measurement model was fully supported.

Discriminant validity was examined using both the HTMT ratio and the Fornell–Larcker criterion. HTMT values were all below the conservative threshold of 0.90 (and mostly below 0.85), indicating appropriate conceptual distinction among constructs. The highest HTMT value observed was 0.826 (between avoidant and instant decision-making styles), which remained within acceptable limits.

Furthermore, results based on the Fornell–Larcker criterion demonstrated that the square root of AVE for each construct (diagonal elements of the matrix) exceeded its correlations with other constructs. This pattern was observed across all study variables—including decision-making styles, emotional attachment, emotional safety, and loneliness—confirming satisfactory discriminant validity of the measurement model.

4. Discussion and Conclusion

The present study aimed to investigate the structural relationships between decision-making styles, emotional security, and loneliness among adolescents using structural equation modeling. Overall, the findings demonstrated that decision-making styles play a significant role in explaining adolescents' emotional attachment, emotional safety, and perceived loneliness. Among the examined styles, rational and avoidant decision-making styles emerged as the most influential predictors, whereas dependent and spontaneous styles showed limited explanatory value. These findings contribute to the growing body of developmental psychology literature emphasizing the interaction between cognitive processes and emotional outcomes during adolescence.

One of the most prominent findings of this study was the significant negative effect of avoidant decision-making style on emotional attachment and emotional safety, alongside its positive association with loneliness. Adolescents who tend to postpone decisions or avoid confronting problems appear less capable of maintaining emotionally secure interpersonal relationships. Avoidant decision-making likely restricts active coping and social engagement, increasing vulnerability to emotional disconnection. Previous research supports this interpretation by demonstrating that maladaptive coping and decision avoidance are associated with psychological distress and impaired stress management among adolescents (Hosseini et al., 2023). Similarly, studies examining digital addiction and behavioral disengagement

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suggest that avoidance-based behavioral patterns weaken emotional regulation and social functioning (Kamasak et al., 2026). The current findings extend these perspectives by showing that avoidance is not only a behavioral risk factor but also a cognitive mechanism underlying emotional insecurity.

The positive relationship between avoidant decision-making and loneliness is also theoretically consistent with contemporary loneliness models. Loneliness has been conceptualized as emerging from ineffective social problem-solving and maladaptive cognitive appraisal processes (McCarthy et al., 2026). Adolescents who avoid decisions may withdraw from interpersonal challenges, reducing opportunities for meaningful connection and reinforcing feelings of social isolation. Empirical evidence indicates that loneliness intensifies when individuals disengage from relational problem-solving or rely on passive coping strategies (Frison & Eggermont, 2020). The present findings therefore highlight avoidant decision-making as a potential cognitive precursor to loneliness during adolescence.

In contrast, the rational decision-making style showed a strong positive effect on emotional attachment and emotional safety and a significant negative effect on loneliness. This result underscores the protective role of analytical and goal-oriented decision processes in adolescent development. Rational decision-making involves systematic evaluation of alternatives, anticipation of consequences, and adaptive regulation of emotional responses. Prior research demonstrates that rational decision-making is associated with resilience, self-control, and reduced aggressive or maladaptive behaviors among adolescents (Kaveh et al., 2025). Adolescents capable of thoughtful decision evaluation may experience greater psychological predictability and interpersonal stability, which fosters emotional security.

The inverse relationship between rational decision-making and loneliness aligns with research indicating that cognitive competence enhances social functioning and psychological well-being. Decision-making grounded in reflective thinking promotes constructive communication, effective conflict resolution, and stronger relational bonds. Studies have shown that value-driven decision-making mediates the relationship between relationship quality and internalizing experiences, suggesting that adaptive decisions strengthen emotional connectedness (Jones et al., 2026). Moreover, adolescents with stronger psychological well-being demonstrate more adaptive decision patterns and lower levels of loneliness and emotional distress (Páez-Gallego et al., 2020). The present study reinforces the view that rational cognition functions as a psychological resource protecting adolescents from emotional isolation.

Interestingly, the intuitive decision-making style showed no significant association with emotional attachment or emotional safety but demonstrated a positive relationship with loneliness. Intuitive decision-making relies on affective impressions and implicit experiences rather than systematic reasoning. While intuition can sometimes facilitate rapid adaptation, excessive reliance on emotionally driven decisions may lead adolescents to misinterpret social cues or respond impulsively in interpersonal contexts. Previous research suggests that emotional dysregulation and reduced self-efficacy are associated with increased anxiety and loneliness among students (Albikawi & Abuadas, 2025). The current results indicate that intuition alone may not guarantee emotional security and may even contribute to perceived social disconnection when not balanced by reflective processing.

The lack of significant effects for the dependent decision-making style was another notable finding. Although dependency reflects reliance on external guidance, it did not significantly predict emotional security or loneliness in the present model. One explanation may be that dependency during adolescence can function both adaptively and maladaptively depending on context. Support-seeking behaviors may promote emotional adjustment in supportive environments, yet excessive reliance on others may limit autonomy development. Prior research has shown mixed outcomes regarding dependency, indicating that relational and contextual factors moderate its psychological consequences (Gulzar & Sharma, 2025). Therefore, dependency may not independently influence emotional outcomes unless combined with broader interpersonal dynamics.

Similarly, the spontaneous (instant) decision-making style did not significantly affect emotional attachment, emotional safety, or loneliness. This finding suggests that impulsive decisions alone may not consistently predict emotional functioning. While spontaneous decisions are often associated with risk-taking, their emotional impact may depend on situational demands and personality characteristics. Structural models of adolescent behavior indicate that cognitive abilities and environmental mediators often determine whether impulsivity leads to maladjustment (Barani et al., 2025). Hence, spontaneous decision-making may exert indirect rather than direct effects on emotional outcomes.

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The explanatory power of the structural model further supports the theoretical importance of decision-making styles. Decision-making styles accounted for a substantial proportion of variance in emotional attachment, emotional safety, and loneliness, with the strongest explanatory capacity observed for loneliness. These findings align with research suggesting that loneliness is shaped by a complex interaction of cognitive evaluations, emotional regulation, and environmental influences (McCarthy et al., 2026). The high predictive relevance indices obtained in the present study confirm that decision-making represents a meaningful psychological mechanism in adolescent emotional adjustment.

The observed relationship between emotional security and loneliness is also consistent with family and developmental research. Emotional safety develops through stable interpersonal experiences and perceived psychological support, and disruptions in these processes increase vulnerability to loneliness. Evidence shows that family environment, parental behaviors, and childhood experiences influence psychological security partly through loneliness mechanisms (Mohammadi et al., 2023). Furthermore, emotional security mediates the impact of online risks and environmental stressors on depressive outcomes among youth (Wang et al., 2025). The current study expands this literature by demonstrating that adolescents' cognitive decision styles contribute significantly to these emotional processes.

Environmental and social factors may also help explain the findings. Built environments, daily activity contexts, and social interaction opportunities have been shown to influence emotional states and loneliness experiences among young people (Gijsbers et al., 2024). Adolescents who make rational decisions may be more likely to engage actively with supportive environments, whereas avoidant individuals may disengage from beneficial social contexts. Likewise, traumatic or stressful experiences can intensify loneliness and reduce emotional well-being, emphasizing the role of psychological coping strategies in adaptation (Akay et al., 2026).

Another important implication concerns the role of social-emotional competencies. Adolescents who possess stronger emotional awareness and regulation skills show healthier decision-making and reduced problematic behaviors (Chen et al., 2021). Decision-making styles therefore appear to operate within broader emotional competence systems rather than functioning independently. This perspective supports integrative developmental models suggesting that cognitive and emotional systems co-develop and mutually influence adolescent adjustment.

From a prevention perspective, the results are highly consistent with contemporary approaches to adolescent mental health emphasizing early intervention. Narrative reviews on adolescent suicide prevention highlight loneliness, emotional insecurity, and maladaptive cognitive patterns as major risk factors for psychological crises (Baldini et al., 2025). By identifying decision-making styles as modifiable cognitive processes, the present findings provide a practical pathway for preventive interventions targeting adolescents' psychological resilience.

In summary, the findings indicate that decision-making styles constitute an essential cognitive foundation underlying adolescents' emotional security and loneliness experiences. Rational decision-making functions as a protective factor promoting emotional stability and social connection, whereas avoidant decision-making represents a significant risk factor contributing to emotional insecurity and loneliness. The results reinforce integrative developmental theories proposing that adolescent mental health emerges from the interaction of cognitive decision processes, emotional regulation, interpersonal relationships, and environmental contexts (Huang et al., 2026; Zhou et al., 2025).

Despite its contributions, several limitations should be acknowledged. First, the cross-sectional design limits causal interpretation of relationships among variables. Although structural equation modeling allows examination of directional pathways, longitudinal studies are required to confirm developmental causality. Second, the use of self-report questionnaires may introduce response biases such as social desirability or subjective misinterpretation of items. Third, the sample was limited to adolescents from a single metropolitan context, which may restrict generalizability to different cultural, socioeconomic, or rural populations. Fourth, unmeasured variables such as personality traits, peer relationship quality, or family functioning may have influenced emotional outcomes but were not included in the model.

Future research should employ longitudinal and experimental designs to examine how decision-making styles evolve across adolescence and predict long-term psychological outcomes. Investigating mediating mechanisms such as emotional regulation, resilience, or peer attachment could provide deeper insight into developmental pathways. Cross-cultural comparisons are also recommended to evaluate whether sociocultural contexts

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modify the relationship between decision-making and emotional well-being. Additionally, future studies may integrate neurocognitive measures, behavioral observations, or digital behavior indicators to complement self-report data and improve methodological rigor. Examining intervention-based models that directly modify decision-making styles would further clarify their causal role in emotional adjustment.

The findings suggest important implications for educational and clinical practice. School counselors and psychologists may benefit from incorporating decision-making skills training into adolescent mental health programs. Teaching rational problem-solving strategies, emotional awareness, and adaptive coping skills could strengthen emotional security and reduce loneliness experiences. Family-based interventions may also focus on promoting supportive communication and encouraging adolescents' autonomous yet reflective decision processes. Preventive programs targeting avoidance behaviors and promoting active engagement with social challenges may help adolescents develop healthier interpersonal relationships and emotional resilience. Integrating cognitive-behavioral training with social-emotional learning curricula can provide a comprehensive framework for enhancing adolescent psychological well-being.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

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Declaration of Interest

The authors report no conflict of interest.

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