

Original Research

Self-Concept Clarity and Social Anxiety Among Art College Students: The Sequential Mediating Role of Rejection Sensitivity and Loneliness

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Abstract

Background: Social anxiety poses a notable mental health risk for art-major college students. Although self-concept clarity is known to correlate with social anxiety, less is known about how rejection sensitivity and loneliness jointly explain this association. This study examined the individual mediating effects of rejection sensitivity and loneliness on the association between self-concept clarity and social anxiety among art-major college students. Furthermore, it evaluated the sequential mediating pathway of self-concept clarity → rejection sensitivity → loneliness → social anxiety along with its group-specific characteristics. **Methods:** A convenience sampling method was used to select 543 undergraduate students majoring in art (including fine arts, design, music, and related disciplines) from Chinese universities. The sample included 377 females and 166 males, with ages ranging from 17–26 years (mean [M] = 20.52, standard deviation [SD] = 1.63). Data on self-concept clarity, rejection sensitivity, loneliness, and social anxiety were collected using standardized self-report questionnaires. The mediating effect test was conducted using Hayes' PROCESS macro (Model 6). **Results:** Analysis of 543 art-major students showed that self-concept clarity was significantly negatively associated with social anxiety. Rejection sensitivity and loneliness each independently mediated the association between self-concept clarity and social anxiety. Additionally, the sequential mediation pathway (self-concept clarity → rejection sensitivity → loneliness → social anxiety) was statistically significant, indirect effect = −0.023, SE = 0.008, 95% CI [−0.041, −0.004]. **Conclusions:** Enhancing self-concept clarity among art-major college students may lower their social anxiety levels by decreasing rejection sensitivity and alleviating loneliness. This study provides empirical support for the development of targeted intervention programs to address social anxiety in this specific population.

Keywords: self-concept clarity; social anxiety; rejection sensitivity; loneliness; art college students

1. Introduction

In recent years, with the vigorous development of the cultural and creative industry, society's demand for art talents has become increasingly diversified, and higher art education has also attached greater importance to cultivating students' comprehensive abilities. This educational model not only requires students to possess solid professional skills and innovative artistic thinking (Samaniego et al., 2024) but also emphasizes their ability to integrate into the industry ecosystem and engage in social interactions (Bille and Jensen, 2018; Bridgstock and Cunningham, 2016). Compared with non-art majors, the learning scenarios of art-major college students have the dual attributes of independent creation and social dependence. On the one hand, artistic creation relies on individual independent thinking, which requires in-depth exploration of personal artistic styles and creative concepts to construct a unique artistic language (Özaltun, 2025). On the other hand, high-frequency social activities such as course critiques, group creation, art salons, and exhibition exchanges run through the entire learning process, resulting in a significantly higher intensity of social interaction than that of

students in other majors (Edström, 2008). This dual demand makes art-major college students more sensitive to evaluative cues in social situations. Negative criticism of their works or forced discussions on their creative concepts may trigger doubts about their own artistic abilities, thereby leading to social anxiety. Relevant surveys have confirmed the prevalence of this issue: in interviews and questionnaires conducted among art students from multiple Norwegian universities, many reported experiencing significant anxiety when publicly presenting their works and receiving evaluations (Vaag et al., 2021). Long-term anxiety reduces students' social participation enthusiasm and inhibits their creative initiative. To avoid negative evaluations, some students stick to conservative creative styles and themes (Amabile, 1979), gradually losing the courage to innovate and falling into homogeneous creation. This contradicts the core goal of higher art education: cultivating innovative talents.

Clarifying the formation mechanism of social anxiety among art-major college students is a prerequisite for formulating targeted intervention strategies and safeguarding their mental health and professional development. Most ex-

isting studies on this group focus on the correlation between anxiety and external factors like creative pressure and academic burden (Bullock Muir et al., 2024), but overlook the core mediating role of self-cognitive factors. The Cognitive Behavioral Theory of Social Anxiety (Clark and Wells, 1995) posits that individuals' negative cognitions of self-image are closely associated with the onset of social anxiety. As a core indicator measuring the state of individual self-cognition, self-concept clarity may be correlated with emotional perception and social experience, and further exert an effect on social anxiety. Among these factors, rejection sensitivity and loneliness, as key variables at the emotional and experiential levels, have been consistently confirmed by numerous studies to be correlated with self-cognition and anxiety (Krupa, 2018; Lieberz et al., 2022; Shi et al., 2025). Based on this, the present study integrates classic theories including the Cognitive Behavioral Theory of Social Anxiety and Loneliness Theory to construct a chain-mediated theoretical model: self-concept clarity → rejection sensitivity → loneliness → social anxiety, aiming to systematically explore the intrinsic correlation mechanisms among these variables.

1.1 Self-Concept Clarity and Social Anxiety

The Cognitive Behavioral Theory of Social Anxiety (Clark and Wells, 1995) indicates that individuals' negative cognitions of self-image are the core inducement of social anxiety, which provides theoretical support for the correlation between self-concept clarity and social anxiety. As a foundational achievement in exploring the cognitive mechanisms of social anxiety, this theory has established a theoretical framework for subsequent studies on the association between self-cognition and social anxiety.

Self-concept clarity is a core indicator measuring the clarity, consistency, and stability of an individual's self-cognition (Leigh and Clark, 2018), and its level may be related to the cognitive mode adopted by individuals to cope with social evaluation. Individuals with high self-concept clarity possess a coherent and stable self-referential framework and may therefore be less likely to allow evaluative feedback on their artistic work to directly determine their global self-worth (Campbell et al., 1996; Guerrettaz et al., 2014). In social scenarios such as work reviews and creative discussions, they can objectively interpret external evaluative feedback and will not negate their overall capabilities because of a single negative evaluation (Zielińska et al., 2025). This cognitive trait may contribute to their lower levels of social anxiety. In contrast, individuals with low self-concept clarity tend to define themselves through external evaluations. Moreover, since their self-worth is highly bound to creative achievements (Burlison et al., 2005), they are prone to misinterpreting neutral evaluative feedback as self-negation, thereby generating intense self-doubt—a cognitive pattern that may lead to higher levels of social anxiety. Existing empirical studies have consistently

verified that self-concept clarity is significantly negatively correlated with social anxiety, and this association exhibits stable applicability across diverse populations (Chen et al., 2025; Hume Figueroa and Téllez Alanís, 2025; Li and Xu, 2022; Wang et al., 2024; Zhou et al., 2024).

1.2 The Mediating Role of Rejection Sensitivity

Rejection sensitivity is a critical emotional variable linking self-concept clarity and social anxiety. Its core connotation refers to individuals' heightened vigilance toward potential social exclusion cues, accompanied by negative emotional responses (Foxhall et al., 2019; He et al., 2025). Essentially, rejection sensitivity is an emotional-perceptual trait associated with self-concept cognitive biases, and this study hypothesizes that it plays a mediating role between self-concept clarity and social anxiety.

This potential mediating mechanism follows a progressive correlational logic involving cognitive traits, emotional vigilance, and anxiety levels. On one hand, Campbell (1990) first defined self-concept clarity as the degree of consistency, stability, and definiteness in an individual's self-belief system, emphasizing its role as the core foundation for self-judgment and social information processing. Campbell et al. (1996) further verified through empirical research that low self-concept clarity indicates a lack of internal integration in the self-cognitive system, making it difficult for individuals to form stable and reliable self-reference standards. Such cognitive characteristics force individuals to over-rely on external social feedback to construct and confirm self-cognition. This over-reliance easily triggers cognitive processing biases: without an internal benchmark to distinguish the nature of external information, they tend to adopt a negative attribution style when facing neutral or constructive cues, such as divergent opinions in creative discussions or suggestions for work improvement, and misinterpret them as potential signals of social exclusion or self-denial (Bintaş-Zörer and Dirik, 2023; Pietrzak et al., 2005).

Bintaş-Zörer and Dirik's (2023) cross-theoretical research integrating cognitive-behavioral theory and attachment theory provides a deeper explanation for the formation and transmission of this cognitive bias. They point out that individuals with low self-concept clarity are more likely to activate the early maladaptive schema domain of impaired autonomy formed in early life. The core feature of this schema domain is individuals' doubt about their own autonomous decision-making abilities and the stability of self-worth, which is highly consistent with the core manifestation of low self-concept clarity—lack of consistency and stability in self-cognition (Campbell et al., 1996). Low self-concept clarity prevents individuals from establishing stable self-reference standards, making it difficult for them to independently judge their own behaviors and values, thereby reinforcing the cognitive bias of impaired autonomy. This bias causes individuals to excessively worry

about being unable to independently control others' evaluations during social interactions and increases expectations of relationship rejection. For example, they may interpret divergent opinions in creative discussions as denial of their own independent creative abilities, ultimately significantly enhancing rejection sensitivity. This mechanism clarifies the bridging role of the impaired autonomy schema domain: it converts the cognitive defect of low self-concept clarity (lack of stable self-cognition) into a targeted cognitive bias (doubt about autonomy), directionally amplifying individuals' sensitivity to social rejection and strengthening the theoretical coherence of the pathway linking self-concept clarity, rejection sensitivity, and social anxiety.

The superposition of such continuous misinterpretation of social information and cognitive biases ultimately significantly enhances individuals' vigilance toward rejection cues and increases their level of rejection sensitivity.

On the other hand, art-major college students with high rejection sensitivity tend to activate negative expectations of potential denial before social activities such as work presentations, creative reports, and interactive art workshops—scenarios that are core to art education (Freedman and Dainer-Best, 2024). Socially interactive approaches (e.g., group discussions, collaborative creation) and digital technologies (e.g., augmented reality, multimedia platforms) are increasingly integrated into art classes to enhance engagement and creative thinking (Sattar et al., 2025), but for students with high rejection sensitivity, these interactive contexts may amplify vigilance toward negative cues. During such social interactions, they remain in a defensive state, excessively focusing on others' critical feedback (even constructive suggestions) and interpreting normal collaborative exchanges as threatening rejection scenarios (Sattar et al., 2025; Shi et al., 2025; Zimmer-Gembeck et al., 2021). These emotional and cognitive traits may lead to increased levels of social anxiety, further reducing their participation in valuable interactive learning experiences (Kutsal and Özdemir, 2025; Li and Xu, 2022; Park et al., 2022; Zhao et al., 2024).

1.3 The Mediating Role of Loneliness

Loneliness is defined as the subjective distress arising from a discrepancy between the quality or quantity of social relationships an individual desires and those they actually perceive (McKenna-Plumley et al., 2023). Peplau and Perlman (1982) clearly pointed out that the core of loneliness lies in the subjective quality of social connectedness rather than merely the objective quantity of social interactions, which laid a theoretical foundation for subsequent related research. As a core variable at the social experience level, the present study hypothesizes that loneliness also plays a mediating role in the relationship between self-concept clarity and social anxiety, and its core correlational logic follows the transmission path of self-cognitive traits → social connectedness state → anxiety levels. Specifically,

self-concept clarity is negatively correlated with loneliness: individuals with high self-concept clarity can clarify their own social needs and value orientations, accurately express their ideas, and coordinate cooperative relationships in professional social settings such as collective creation and art salons. These traits help them establish high-quality social connections, thereby reducing their levels of loneliness (Pang et al., 2024; Wu et al., 2023). In contrast, individuals with low self-concept clarity tend to struggle to achieve emotional resonance due to communication misalignments and conceptual conflicts, which may lead to low-quality social connections and further result in higher levels of loneliness (Bechtoldt et al., 2010; Xu and Chen, 2019).

Meanwhile, loneliness is positively correlated with social anxiety, and this association may be realized through two pathways: social cognitive traits and social skill states. The former suggests that chronically lonely individuals may develop a negative schema equating social scenarios with danger and generate negative expectations of failing to integrate into groups, cognitive traits that may induce social anxiety (Maes et al., 2019). The latter proposes that loneliness may prompt individuals to develop social avoidance tendencies. Such avoidance behavior may deprive individuals of opportunities for social practice such as course evaluations, leading to the deterioration of skills including social expression and conflict resolution. Frequent setbacks in subsequent social interactions may further reinforce the cognition of inadequate social competence, and these skill and cognitive states may ultimately exacerbate social anxiety (Haihambo et al., 2025; Lieberz et al., 2022).

1.4 The Sequential Mediating Role of Rejection Sensitivity and Loneliness

Integrating the aforementioned single mediating pathways, the present study proposes a chain-mediating pathway: self-concept clarity → rejection sensitivity → loneliness → social anxiety. This pathway follows the progressive correlational logic of cognitive traits → emotional vigilance → social connectedness state → anxiety levels, providing a basic framework for subsequent model construction and mechanism interpretation.

To intuitively present all the hypothesized correlational pathways mentioned above, the present study constructs a theoretical conceptual model as follows (Fig. 1):

Combining the aforementioned theoretical analysis and the group-specific traits of art-major college students, the intrinsic correlational mechanisms of each pathway in Fig. 1 can be further elaborated hierarchically. First, the core logic of the direct pathway is that self-concept clarity affects individuals' social anxiety levels by shaping their cognitive patterns in coping with social evaluation. Owing to the strong entanglement between artistic creation and self-worth, clear self-cognition helps students decouple work evaluation from self-worth, reducing anxiety triggered by evaluation sensitivity. Conversely,

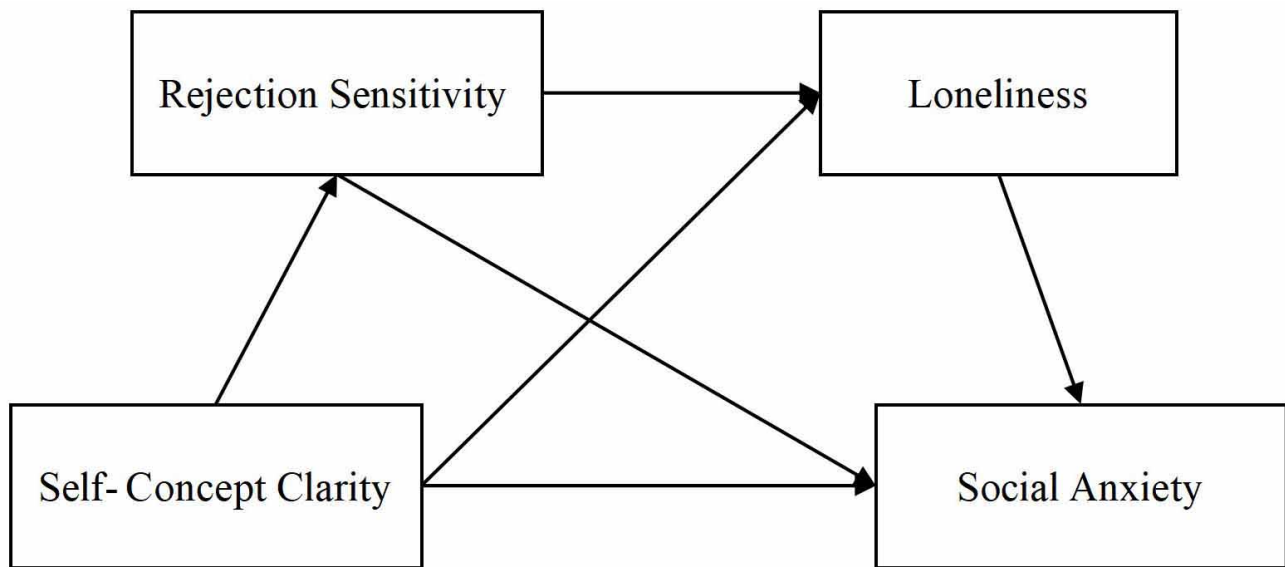


Fig. 1. Chain-mediating theoretical model of self-concept clarity and social anxiety among art students. *Note:* Solid lines denote hypothesized correlational pathways. Among them, the pathway from self-concept clarity to social anxiety represents a direct pathway, while all other pathways are indirect.

vague self-cognition tends to make students internalize negative feedback on works as self-negation, directly leading to high levels of anxiety. Second, the two single mediating pathways reflect the dual transmission mechanisms of cognition-emotion and cognition-experience: the mediation of self-concept clarity through rejection sensitivity essentially stems from self-cognitive biases inducing heightened vigilance toward exclusion cues in professional social interactions; the mediation of self-concept clarity through loneliness centrally arises from vague self-cognition leading to ineffective expression of professional social needs, which in turn results in a lack of social connectedness and anxiety. Finally, the chain-mediating pathway integrates the previous two types of pathways to form a complete progressive chain: vague self-concept triggers biased interpretation of exclusion cues at the cognitive level, further resulting in high rejection sensitivity at the emotional level; high rejection sensitivity drives individuals to avoid core social activities such as course evaluations and interdisciplinary creation, and they often adopt a defensive posture in limited social interactions, leading to superficial interpersonal exchanges, which ultimately results in low-quality social connectedness and loneliness at the experiential level; through the cognitive or skill impairments associated with loneliness, this further induces higher levels of social anxiety at the outcome level.

Among the links in this transmission chain, the key mechanism by which high rejection sensitivity induces loneliness is as follows: individuals' active avoidance of core social activities and their defensive posture in limited social interactions lead to superficial interpersonal communication, and this social state directly gives rise to loneliness

(Corsano et al., 2020; Watson and Nesdale, 2012). Collectively, the aforementioned multiple pathways constitute a multidimensional correlational mechanism of social anxiety among art-major college students, providing a systematic theoretical framework for subsequent empirical testing.

2. Materials and Methods

2.1 Research Questions, Hypothesis and Marginal Contributions

Although existing studies have explored the pairwise relationships between self-concept clarity, rejection sensitivity, loneliness, and social anxiety, there is an obvious gap in systematic research targeting art students, and no study has yet integrated and tested the chain mediating pathway composed of the above variables. Based on this, the core research questions of this study are: What are the relationships between self-concept clarity, rejection sensitivity, loneliness, and social anxiety among art students? Do rejection sensitivity and loneliness play a chain mediating role in the relationship between self-concept clarity and social anxiety?

This study selected 543 art students as participants, covering multiple professional fields such as fine arts, music, design, and dance. It aims to test the above theoretical model through empirical research and reveal the formation mechanism of social anxiety among art students.

The marginal contributions of this study are mainly reflected in two aspects. First, the research perspective is unique, focusing precisely on the group of art students. A previous study mostly takes general college students or working adults as research subjects (Lee et al., 2024); even when involving art students, they mostly focus on the corre-

lation between external factors such as creative pressure and academic burden and anxiety (Bullock Muir et al., 2024; Lee et al., 2024), ignoring the core mediating role of self-cognitive factors. Based on the group-specific characteristics of art students, namely the coexistence of independent creation and high-frequency social interaction, and the high integration of self-concept with professional creation (Burleson et al., 2005; Mansour et al., 2018), this study systematically explores the cognitive-emotional-experiential relationship mechanism of their social anxiety, making up for the deficiency of insufficient group specificity in existing research.

Second, the research model is systematic, testing the complete chain mediating pathway. Previous research is mostly limited to examining pairwise relationships or single mediating effects between variables (Liu et al., 2017), failing to fully reveal the progressive relationship mechanism of cognition-emotion-experience. By incorporating rejection sensitivity and loneliness into the model, this study constructs and tests the chain mediating pathway of self-concept clarity → rejection sensitivity → loneliness → social anxiety, enriching theoretical research on social anxiety's influencing factors and offering targeted support for intervening in this group's social anxiety.

Based on the above theoretical analysis and model construction, this study proposes the following four hypotheses:

H1: Self-concept clarity of art students is significantly negatively correlated with social anxiety.

H2: Self-concept clarity of art students is significantly negatively correlated with rejection sensitivity and loneliness, respectively.

H3: Rejection sensitivity of art students is significantly positively correlated with social anxiety; loneliness is significantly positively correlated with social anxiety; and rejection sensitivity is significantly positively correlated with loneliness.

H4: Rejection sensitivity and loneliness play a chain mediating role in the relationship between self-concept clarity and social anxiety among art students, with the specific pathway being self-concept clarity → rejection sensitivity → loneliness → social anxiety.

The subsequent chapters of the paper will sequentially present the research methods, research results, discussion, and conclusion. The research methods section elaborates on participant screening, measurement tools, and data processing methods; the research results section reports descriptive statistics of variables, correlation analysis, and chain mediation test results; the discussion section interprets the connotation of the research results and analyzes the limitations of the study; the conclusion section summarizes the core research findings and puts forward practical implications.

2.2 Participants

Convenience sampling was adopted to recruit respondents from 7 higher education institutions in Zhejiang Province that offer art-related programs (encompassing art colleges within comprehensive universities and specialized art colleges). Questionnaires were distributed via an online survey platform (Wenjuanxing). A total of 619 questionnaires were retrieved initially, and invalid questionnaires were excluded based on the following criteria: (1) no missing key data in all answered questions; (2) completion time of no less than 90 seconds; (3) no consecutive 10 or more questions with identical options selected. Ultimately, 543 valid questionnaires were kept, resulting in an effective response rate of 87.7%.

The demographic characteristics of the sample are as follows: In terms of gender, there were 377 females (69.4%) and 166 males (30.6%), and the gender distribution of the sample was consistent with the group's objective characteristics. In terms of major categories, there were 194 students in fine arts (35.7%), 122 in music (22.5%), 93 in dance (17.1%), 105 in design (19.3%), and 29 in drama and film/television (5.3%), covering major art fields such as visual arts, performing arts, and design applications, which indicates that the professional structure of the sample is representative. In terms of grade distribution, there were 113 freshmen (20.8%), 140 sophomores (25.8%), 176 juniors (32.4%), and 114 seniors (21.0%); the age range was 18–26 years old, with a mean age (M) of 20.52 years and a standard deviation (SD) of 1.63 years.

2.3 Instruments

(a) Self-Concept Clarity Scale (SCCS). The original Self-Concept Clarity Scale (SCCS) was developed by Campbell et al. (1996), and the Chinese version adapted by Niu et al. (2016) was utilized in this study. It consists of 12 items with a single-dimensional structure, and is used to assess the consistency, stability, and definiteness of an individual's self-concept. A typical item is 'My views of myself often change' (reverse scoring). The items are rated on a 1–5 scale (1 = completely inconsistent, 5 = completely consistent), and a higher mean item score implies a clearer self-concept. In this study, the Cronbach's alpha coefficient (α) of this scale was 0.893.

(b) Tendency to Expect Rejection Scale (TERS). The version compiled by Jobe (2003) and revised by Li (2007) was adopted, which comprises 18 items across three dimensions: rejection anxiety, rejection anger, and rejection expectation. It uses a 5-point Likert scale (1 = completely inconsistent, 5 = completely consistent) to assess an individual's sensitivity to rejection from others. Typical items are 'When I ask a friend for help, I worry that the other person will reject me' and 'I feel nervous at the thought of possible rejection'; among them, items 1, 2, 4, 9, 10, and 17 are reverse-scored. A higher mean item score of the respon-

dents implies a higher level of rejection sensitivity. In this study, the Cronbach's α coefficient of this scale was 0.833.

(c) UCLA Loneliness Scale. The short Chinese version compiled by Russell et al. (1978) and adapted by Zhou et al. (2012) was employed. It contains 8 items with a single-dimensional structure, and is used to measure the frequency of an individual's subjective loneliness experience. Typical items are 'I lack companionship' and 'I feel disconnected from the people around me'. The items are scored on a 1–4 scale (1 = never, 4 = often), and a higher mean item score means a higher level of loneliness. In this study, the Cronbach's alpha coefficient (α) of the scale was 0.836.

(d) Interaction Anxiousness Scale (IAS). The version compiled by Leary and Kowalski (1993) and revised by Peng et al. (2004) was selected. It includes 15 items with a single-dimensional structure, focusing on measuring an individual's anxiety in daily social situations. Typical items are 'I feel nervous when talking to strangers' and 'I often feel uncomfortable in social situations'. The items are scored on a 1–5 scale (1 = completely inconsistent with me, 5 = completely consistent with me), and a higher mean item score indicates a higher level of social anxiety. In this study, the Cronbach's alpha coefficient (α) of the scale was 0.866.

2.4 Procedure

Questionnaire links were distributed through art-major teachers in colleges and universities, student clubs, and social platforms. On the recruitment page, the research purpose, content, participation duration, and anonymity principle were clearly stated, and it was emphasized that the data would only be used for academic research. After the questionnaires were collected, valid questionnaires were screened according to the preset standards. The valid data were imported into Excel 2021 (Microsoft Corporation, Redmond, Washington, United States) for preliminary sorting, and the consistency between the questionnaire number and the answers was checked. After confirmation of no errors, the data were imported into SPSS 26.0 (IBM Corporation (SPSS Inc.), Chicago, Illinois, United States), PROCESS macro program, and AMOS 26.0 (IBM Corporation (Amos Development Corporation), Chicago, Illinois, United States) for subsequent analysis. All participants remained anonymous. After reading the electronic informed consent form, they voluntarily clicked the 'Agree to Participate' button. This study strictly followed the relevant ethical guidelines of the Declaration of Helsinki, and the research protocol has been reviewed and approved by the Ethics Committee of Zhejiang University of Science and Technology.

2.5 Data Analysis

This study employed a multi-step data analysis method: since all data were self-reported by respondents, first, Harman's single-factor test was used to examine common method bias. All scale items were incorporated into

the exploratory factor analysis, and the results showed that 4 common factors with eigenvalues exceeding 1 were extracted without rotation, with the variance explained by the first common factor being 41.769% (below the 50% critical threshold), suggesting no severe common method bias; reliability and validity analyses were performed using SPSS 26.0, and confirmatory factor analysis (CFA) was performed with the help of AMOS 26.0 to test the construct validity, so as to complete the reliability and validity test; Pearson correlation analysis was utilized to examine the association between variables, while controlling for the potential impact of demographic variables such as gender and grade, and descriptive statistics and correlation analyses were conducted to lay the groundwork for the mediating effect test; based on the mediating effect test procedure by Wen et al. (2004) and the chain mediation theory by Hayes (2013), the PROCESS macro program (Model 6) was used to develop a model to examine the chain mediating path of 'X→M1→M2→Y'. The Bootstrap method with 10,000 resamplings was employed to estimate the 95% confidence interval (CI). If the CI did not contain 0, the mediating effect was significant, and the proportion of each path effect value within the total effect was computed to complete the chain mediating effect test.

3. Results

3.1 Descriptive Statistics and Correlation Analysis

Results of descriptive statistics and correlation analysis (see Table 1) showed that self-concept clarity (SCC) (mean (M) = 3.485, standard deviation (SD) = 1.172), loneliness (M = 3.413, SD = 0.562), and social anxiety (M = 3.954, SD = 1.219) were all above the midpoint of their respective scales, while rejection sensitivity (M = 2.416, SD = 1.265) was close to the scale midpoint. Overall, no group characteristics of extremely high or low levels were observed. Although the standard deviation of rejection sensitivity (SD = 1.265) is slightly larger than half of the mean ($1/2M = 1.208$), the data meet the normality assumption for Pearson correlation analysis when considering the skewness (0.764), kurtosis (−1.144), the histogram distribution, and the robustness of statistical methods with large samples (Cohen, 2013).

Correlation analysis results indicated that the direction and strength of associations between variables were consistent with the research hypotheses: self-concept clarity was significantly negatively correlated with rejection sensitivity ($r = -0.469, p < 0.01$), loneliness ($r = -0.344, p < 0.01$), and social anxiety ($r = -0.504, p < 0.01$); rejection sensitivity was significantly positively correlated with loneliness ($r = 0.259, p < 0.01$) and social anxiety ($r = 0.334, p < 0.01$); loneliness was significantly positively correlated with social anxiety ($r = 0.531, p < 0.01$). The above results provided a reliable basis for subsequent mediating effect testing.

Table 1. Results of descriptive statistics, correlation analysis (N = 543).

	M	SD	1	2	3	4
1. Self-concept clarity	3.485	1.172	1			
2. Rejection sensitivity	2.416	1.265	-0.469**	1		
3. Loneliness	3.413	0.562	-0.344**	0.259**	1	
4. Social anxiety	3.954	1.219	-0.504**	0.334**	0.531**	1

Note: ** $p < 0.01$. M, mean; SD, standard deviation.

3.2 Chain Mediating Effect Test

First, an overall fit test was conducted on the chain mediating model. The results showed that: $\chi^2/df = 1.635$, Goodness of Fit Index (GFI) = 0.881, Root Mean Square Error of Approximation (RMSEA) = 0.034 (90% Confidence Interval [0.032, 0.037]), Root Mean Square Residual (RMR) = 0.042, Comparative Fit Index (CFI) = 0.973, Normed Fit Index (NFI) = 0.934, Non-Normed Fit Index (NNFI) = 0.972, Tucker-Lewis Index (TLI) = 0.972, Adjusted Goodness of Fit Index (AGFI) = 0.871, Incremental Fit Index (IFI) = 0.973, Standardized Root Mean Square Residual (SRMR) = 0.025. All indicators met the ideal criteria ($\chi^2/df < 3$; CFI, NFI, NNFI, TLI, IFI > 0.9 ; RMSEA < 0.08 ; SRMR, RMR < 0.1), indicating a good fit between the model and the data.

To verify the multicollinearity among predictive variables in the regression model, this study conducted a test using the collinearity analysis module in SPSS. The results showed that the Variance Inflation Factor (VIF) values of self-concept clarity, rejection sensitivity, and loneliness were 1.375, 1.300, and 1.150, respectively (all < 10), and the tolerance values were 0.728, 0.769, and 0.870, respectively (all > 0.1). Additionally, the maximum absolute value of the correlation coefficient between variables was 0.469 (< 0.8). These results indicate that there is no severe multicollinearity among the variables in the model, and the research results are not interfered with by the high correlation between independent variables. Subsequently, Hayes' PROCESS macro (Model 6) was used for analysis, with Self-Concept Clarity (SCC) as the independent variable (X), social anxiety as the dependent variable (Y), rejection sensitivity as the first mediating variable (M1), and loneliness as the second mediating variable (M2). Gender and grade were controlled to test the chain mediating path of "Self-Concept Clarity $\rightarrow$ Rejection Sensitivity $\rightarrow$ Loneliness $\rightarrow$ Social Anxiety". Compared with structural equation modeling (SEM), the PROCESS macro was selected as the main inferential statistical method for the following reasons: first, it is more straightforward and efficient in testing specific chain mediating paths, with built-in Bootstrap procedures that can directly and accurately estimate the confidence intervals of mediating effects without complex model construction; second, it is more robust to the distribution characteristics of data, which is suitable for the current research scenario based on Likert scale data. A 10,000-resampling Bootstrap

method was adopted to estimate the 95% Confidence Intervals (95% CI) of each mediating path.

The results showed that there were three significant mediating paths (see Table 2, Fig. 2):

Path 1 (X $\rightarrow$ M1 $\rightarrow$ Y): Unstandardized effect value (B) = -0.036, Completely Standardized Effect (CSE) = -0.035, 95% CI [-0.071, -0.002]. Since the confidence interval did not contain 0, it indicated that the independent mediating effect of rejection sensitivity was significant, accounting for 6.87% of the total effect.

Path 2 (X $\rightarrow$ M2 $\rightarrow$ Y): B = -0.117, CSE = -0.112, 95% CI [-0.156, -0.069]. The confidence interval did not contain 0, indicating that the independent mediating effect of loneliness was significant, accounting for 22.33% of the total effect.

Path 3 (X $\rightarrow$ M1 $\rightarrow$ M2 $\rightarrow$ Y): Unstandardized chain mediating effect (B) = -0.023, CSE = -0.022, 95% CI [-0.041, -0.004]. The confidence interval did not contain 0, confirming that the chain mediating effect of rejection sensitivity and loneliness was significant, accounting for 4.39% of the total effect. Total unstandardized indirect effect (B) = -0.176, total CSE = -0.169, accounting for 33.59% of the total effect (B = -0.524, CSE = -0.504). The direct effect was significant: unstandardized direct effect (B) = -0.348, direct effect CSE = -0.335 ($p < 0.001$, 95% CI [-0.427, -0.269]), accounting for 66.41% of the total effect.

The above results indicated that the association between self-concept clarity and social anxiety was mainly a direct association, and at the same time, additional associations were produced through three indirect paths: the negative association with rejection sensitivity, the negative association with loneliness, and the chain association path of "rejection sensitivity $\rightarrow$ loneliness". In addition, the path coefficients between variables showed that: self-concept clarity significantly negatively predicted rejection sensitivity (B = -0.503, SE = 0.040, $t = -12.452$, $p < 0.001$, 95% CI [-0.582, -0.424], CSE = -0.467) and loneliness (B = -0.135, SE = 0.021, $t = -6.328$, $p < 0.001$, 95% CI [-0.176, -0.093], CSE = -0.282); rejection sensitivity significantly positively predicted loneliness (B = 0.055, SE = 0.019, $t = 2.812$, $p = 0.005$, 95% CI [0.017, 0.094], CSE = 0.123) and social anxiety (B = 0.072, SE = 0.036, $t = 2.015$, $p = 0.044$, 95% CI [0.002, 0.143], CSE = 0.075); loneliness significantly positively predicted social anxiety (B = 0.861, SE =

Table 2. Results of chain mediation effect test (N = 543).

Effect	Item	Effect	SE	t	p	LLCI	ULCI	CSE
Direct effect	X⇒Y	−0.348	0.040	−8.625	<0.001	−0.427	−0.269	−0.335
Indirect effect process	X⇒M1	−0.503	0.040	−12.452	<0.001	−0.582	−0.424	−0.467
	X⇒M2	−0.135	0.021	−6.328	<0.001	−0.176	−0.093	−0.282
	M1⇒M2	0.055	0.019	2.812	0.005	0.017	0.094	0.123
	M1⇒Y	0.072	0.036	2.015	0.044	0.002	0.143	0.075
	M2⇒Y	0.861	0.076	11.225	<0.001	0.712	1.010	0.397
Total effect	X⇒Y	−0.524	0.039	−13.556	<0.001	−0.600	−0.448	−0.504
Specific Indirect Effect	X⇒M1⇒Y	−0.036	0.017	−2.105	0.035	−0.071	−0.002	−0.035
	X⇒M2⇒Y	−0.117	0.022	−5.283	<0.001	−0.156	−0.069	−0.112
	X⇒M1⇒M2⇒Y	−0.023	0.008	−2.786	0.006	−0.041	−0.004	−0.022
Total indirect effect	X⇒Y	−0.176	0.026	−6.803	<0.001	−0.225	−0.120	−0.169

Note: X = Self-Concept Clarity, Y = Social Anxiety, M1 = Rejection Sensitivity, M2 = Loneliness. SE, Standard Error; LLCI, Lower Limit of the Confidence Interval; ULCI, Upper Limit of the Confidence Interval; CSE, Completely Standardized Effect.

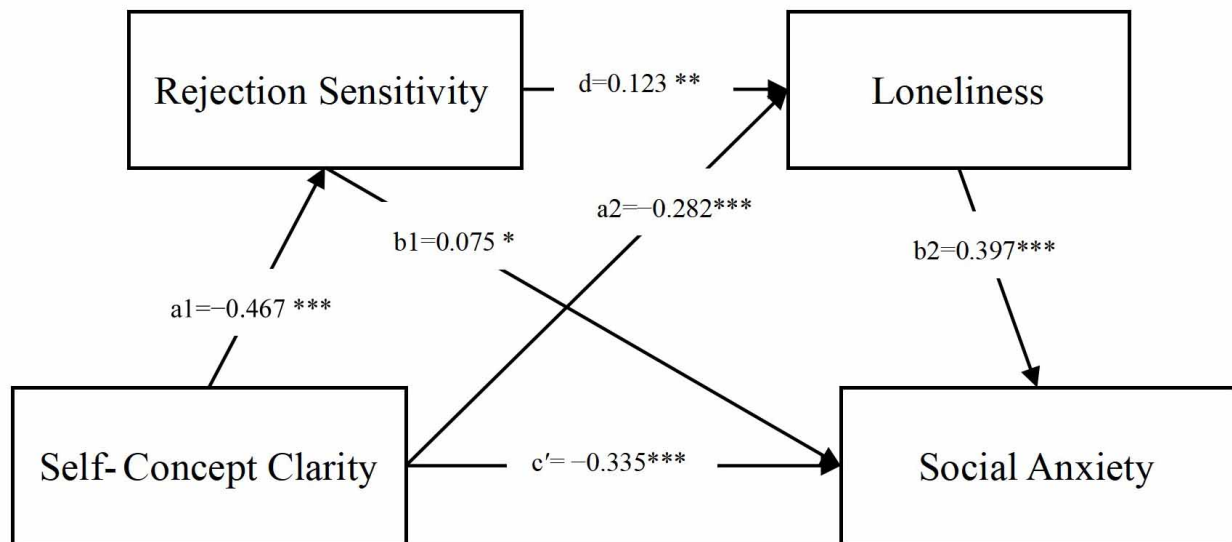


Fig. 2. Resulting structural model (N = 543). Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

0.076, $t = 11.225$, $p < 0.001$, 95% CI [0.712, 1.010], CSE = 0.397). These significant predictive relationships further supported the existence of mediating associations.

4. Discussion

This study recruited 543 art-major college students as research subjects to systematically examine the relationships between Self-Concept Clarity (SCC), rejection sensitivity, loneliness, and social anxiety, with a primary focus on verifying the chain mediating pathway of SCC → rejection sensitivity → loneliness → social anxiety. The following analysis integrates the research results with the theoretical frameworks and empirical literature presented in the main text.

4.1 Core Findings

The results supported Hypothesis 1, indicating a significant negative correlation between SCC and social anxiety among art-major college students ($r = -0.504$, $p < 0.01$), and SCC could directly and negatively predict social anxiety (unstandardized effect value $B = -0.348$, CSE = -0.335 , $p < 0.001$). This finding is consistent with the core proposition of the cognitive-behavioral theory of social anxiety, which posits that individuals' negative perceptions of self-image are the core inducement of social anxiety (Clark and Wells, 1995). It also confirms the conclusions of Hume Figueroa et al. (2025), Chen et al. (2025), and Pang et al. (2024) that SCC is a key protective factor for social adaptation. Notably, the correlation strength between the two variables in this study was significantly higher than that reported in Li and Xu's (2022) research on general college students ($r = -0.33$). This difference is not merely a varia-

tion in correlation magnitude but stems from the unique professional attributes and social evaluation logic of art-major college students. The mechanisms underlying this group-specific effect can be analyzed from three aspects.

First, there is a difference in the depth of connection between evaluation objects and the self. Social evaluations of general college students mostly target separable daily behaviors or general abilities (e.g., communication, collaboration), which have weak associations with core self-worth. In contrast, evaluations of art-major college students directly target artistic works that are deeply bound to the self. Artistic works are external projections of individuals' aesthetic preferences, creative concepts, and even personality traits (Mansour et al., 2018), so related evaluations are more likely to reach core self-worth, thereby amplifying the impact of SCC on social anxiety.

Second, there is a difference in the subjectivity of evaluation criteria. Evaluations of general college students are mostly based on objective standards with limited room for interpretation. In contrast, art evaluations are highly subjective and uncertain. Art-major students with vague self-concepts are more likely to interpret neutral feedback (e.g., "style needs refinement") as implicit denial (Pietrzak et al., 2005), which further strengthens self-doubt and anxiety, exacerbating the correlation between SCC and social anxiety.

Third, there is a difference in the singularity of self-worth realization pathways. General college students can gain self-identity through multiple pathways such as academic performance, club activities, and interpersonal relationships, which can buffer the impact of negative evaluations in a single domain. In contrast, the self-worth of art-major college students is highly dependent on professional creation and work recognition (Burleson et al., 2005). This singularity makes the impact of professional evaluations on self-perception more concentrated and intense, and individuals with low SCC are more likely to experience high social anxiety.

The results also verified Hypotheses 2 and 3, showing that both rejection sensitivity ($B = -0.036$, $CSE = -0.035$, accounting for 6.87% of the total effect) and loneliness ($B = -0.117$, $CSE = -0.112$, accounting for 22.33% of the total effect) play independent mediating roles between SCC and social anxiety. The differences in their effect sizes further highlight the particularity of the art-major college student group. Although the mediating pathway of rejection sensitivity is consistent with the findings of Li and Xu (2022) and Park et al. (2022), its effect ratio is significantly lower than the 25.94% reported in Li and Xu's (2022) study on general college students. This may be related to the emphasis on the tolerance of diverse styles in art education (Özaltun, 2025); teachers' evaluations mostly combine specific improvement suggestions with affirmation of strengths, buffering the direct impact of rejection sensitivity. However, the subjectivity of art evaluations still makes individuals with vague self-concepts prone to interpreting

neutral feedback as implicit rejection (Pietrzak et al., 2005), so rejection sensitivity still plays a significant mediating role.

The mediating effect of loneliness is consistent with the core view of Peplau and Perlman's (1982) loneliness theory, which defines loneliness as an individual's subjective experience of lack of social connection. It is also directly related to the core contradiction between the independence of creation and the high frequency of social interaction among art-major college students. The learning scenarios of general college students are mainly focused on collective teaching and general ability training, where social interaction is naturally integrated with the learning process, and the establishment of social connections is passive and inevitable. Therefore, loneliness among general college students is more likely to stem from individual personality traits (e.g., introversion, avoidant personality). In contrast, the learning scenarios of art-major college students have both the closed nature of independent creation and the high demand for professional social interaction: on the one hand, artistic creation requires long-term independent thinking and focused investment, which easily leads to a state of self-isolation; on the other hand, professional activities such as course reviews, collective creation, and exhibition exchanges require high-frequency social interaction. This contradiction puts individuals with vague self-concepts in a dilemma of desiring recognition through social interaction yet avoiding it due to fear of negative evaluations. They actively reduce social behaviors such as interdisciplinary collaboration and work sharing, leading to a lack of social connection, which in turn exacerbates social anxiety through loneliness. This finding extends Pang et al.'s (2024) research, which only identified fear of negative evaluation and self-disclosure as mediators between SCC and loneliness. This study further links loneliness to social anxiety, confirming loneliness as a key mediating variable in the pathway from self-concept to social anxiety.

The results also verified Hypothesis 4, indicating that the chain mediating pathway of $SCC \rightarrow$ rejection sensitivity $\rightarrow$ loneliness $\rightarrow$ social anxiety is significantly established (unstandardized chain mediating effect $B = -0.023$, $CSE = -0.022$, accounting for 4.39% of the total effect). Combining the actual creation and social behaviors of art-major college students, the progressive deterioration mechanism can be clarified: art-major students with vague self-concepts (e.g., painting majors who are uncertain about their creative style positioning) will have overly sensitive responses to evaluation signals in professional social scenarios. On this basis, such students will also exhibit explicit avoidance behaviors, such as evading the submission of works to university-level art exhibitions or being unwilling to share their creative process in classes, leading to a significant decrease in the frequency of social interaction. The professionalism of artistic creation determines that their social needs cannot be met through non-professional scenarios. Active avoid-

ance behaviors directly trigger feelings of loneliness, such as lacking partners with creative resonance and struggling to expand creative ideas. This loneliness further strengthens their negative expectations of professional social interaction, making their anxiety significantly worse when facing work evaluations or collaboration invitations next time, forming a complete behavioral cycle of vague self-perception → evaluation sensitivity → avoidance of creative social interaction → loneliness → anxiety reinforcement.

Compared with the chain model of parental psychological control → SCC → social anxiety proposed by Zhou et al. (2024) for adolescents, both recognize that SCC is the core hub. However, the starting point of the pathway in this study is individual self-perception, and the transmission logic is vague self-perception → active perceptual sensitivity → behavioral avoidance → emotional deterioration → anxiety reinforcement. In contrast, the starting point of the pathway in Zhou et al. (2024) is external family factors, and the transmission process tends to be a passive response to external influences. This difference may be due to the fact that art-major college students are in a stage of independent self-development, and their social anxiety is more derived from the need for self-worth confirmation related to professional characteristics, rather than external constraints during adolescence. This pathway forms a complete chain of cognition → perception → emotion → anxiety, laying a theoretical foundation for multi-targeted interventions addressing art students' social anxiety.

4.2 Practical Implications

Based on the above research results and combined with the characteristics of art education, this study proposes creative process-integrated intervention suggestions for social anxiety among art-major college students:

In the creative preparation stage, organize thematic workshops on style tracing and self-positioning integrated into relevant professional courses. Guide students to sort out their representative works, clarify the connection between creation and self-traits, establish stable self-evaluation standards through simulated creative presentation training, distinguish between work flaws and self-worth, and improve acceptance of professional suggestions.

In the creative process stage, implement a collaborative model of creative companion groups. Form groups by major to conduct phased sharing and mutual improvement; strengthen professional connections through creative resonance journals, introduce interdisciplinary micro-projects to reduce social avoidance, and include collaboration participation in course regular grades to ensure implementation effects.

In the work exhibition stage, construct a stepped desensitization system for work display, advancing hierarchically through class, grade, and university-level exhibitions. Gradually transition from anonymous group sharing to public exhibition guidance; provide interactive guidance and

simulation training, with psychological counselors offering emotional regulation support.

In the feedback reception stage, implement a three-dimensional feedback and separation training model. Teachers use feedback language that combines strengths, suggestions, and recognition; guide students to distinguish between improvement signals and rejection signals through thematic workshops, carry out self-separation training with the help of feedback journals; invite artists to share experiences in transforming criticism to enhance intervention professionalism.

4.3 Limitations and Applicability Boundaries

This study has several limitations: First, the cross-sectional design cannot clarify the causal order of the chain pathway, only revealing the correlational relationships between variables, making it difficult to infer the dynamic development process of SCC → rejection sensitivity → loneliness → social anxiety. Second, the sample is limited to art-major college students in Zhejiang Province with an unbalanced gender distribution (69.4% female), which may affect the external validity of the research conclusions. Future studies need to expand the sampling scope and balance the gender distribution. Third, the study relies on self-reported data. Although Harman's single-factor test ruled out severe common method bias, subjective biases may still exist. Subsequent studies can integrate multi-source data (e.g., teacher evaluations, work analysis, observations of social behaviors) to improve the objectivity of measurements. Fourth, the scales used are general versions. Although adjusted for professional scenarios to meet research needs, they lack art-specific items, making it impossible to accurately capture subtle differences in rejection sensitivity and loneliness among art students in professional scenarios. The inference of group-specific performance in this study still requires verification with subsequent specific scales. Fifth, the study did not explore the impact of potential moderating variables such as creative self-efficacy and social support, making it impossible to clarify the regulatory role of these variables in the chain pathway.

These limitations also determine the applicability boundaries of the research conclusions: At the group level, it applies to undergraduate art students with high professional social needs, such as visual arts (fine arts, design) and performing arts (music, dance). Its applicability to theoretical majors such as art history needs further verification. At the scenario level, it focuses on professional social scenarios such as work evaluation, collaborative creation, and exhibition exchanges, and the research conclusions are more suitable for explaining the anxiety mechanism of art students in professional scenarios. At the cultural level, it is based on the atmosphere of collective evaluation and style tolerance in art education in Zhejiang Province, China, and its generalizability to other regions or countries requires cross-cultural verification.

Future research can adopt longitudinal tracking or experimental designs to clarify the causal relationships between variables. It should expand the sampling scope and balance gender distribution to improve external validity, integrate multi-source data to enhance measurement objectivity, and develop art-specific scales to accurately measure rejection sensitivity and loneliness in professional scenarios. Additionally, incorporating moderating variables such as creative self-efficacy and social support will help construct a more comprehensive theoretical model, offering a stronger empirical basis for precise interventions targeting art-major college students' social anxiety.

5. Conclusions

Empirical analysis of 543 art-major college students shows that SCC is significantly negatively correlated with social anxiety among art-major college students; rejection sensitivity and loneliness respectively play independent mediating roles between them, and the three together form a significant chain mediating pathway of $SCC \rightarrow$ rejection sensitivity $\rightarrow$ loneliness $\rightarrow$ social anxiety. This result not only enriches the research on group specificity in the field of self-perception and social adaptation but also provides a clear theoretical basis and practical direction for the targeted intervention of social anxiety among art-major college students. Improving SCC is the core entry point. At the same time, it is necessary to reduce rejection sensitivity and alleviate loneliness to break the vicious cycle of anxiety $\rightarrow$ avoidance $\rightarrow$ loneliness $\rightarrow$ increased anxiety, ultimately promoting the social adaptation and mental health development of this group.

Availability of Data and Materials

The dataset used in this paper has been uploaded to the submission system as an attachment, and can also be obtained via the official website or by contacting the corresponding author via email.

Author Contributions

YW and RM designed this study. XX assisted in data collection and statistical analysis, and revised the manuscript for important intellectual content. MS participated in study design and data verification, and provided critical comments on the manuscript. YW and RM wrote the manuscript. All authors contributed to the editorial revision of the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

This study has been reviewed and approved by the Ethics Committee of Zhejiang University of Science and Technology (Review Type: Rapid Review for Low-Risk Social Science Projects), and the research process complies with the relevant requirements of the Declaration of

Helsinki. In accordance with the university's ethical review standards, low-risk anonymous questionnaire survey projects are exempt from being assigned separate approval numbers. The review process and results can be verified through the university's Office of Humanities and Social Sciences (Contact Person: Teacher Zeng Linsen; Tel: 0571-85070625). All participants provided electronic informed consent by clicking the 'Agree to Participate' button after reading the electronic informed consent form.

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Conflicts of Interest

The authors declare no conflicts of interest.

Declaration of AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work the authors used ChatGPT-3.5 in order to check spell and grammar. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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