The Relationship Between Social Cognition and Loneliness in Gifted Underachievers: The Mediating Role of Rejection Sensitivity

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A r t i c l e   I n f o

A B S T R A C T

This study aimed to examine the relationship between social cognition and loneliness in gifted underachievers, with a specific focus on the mediating role of rejection sensitivity. A descriptive correlational design was employed with a sample of 399 gifted underachieving adolescents from Argentina, selected according to Morgan and Krejcie's (1970) sample size table. Standardized tools were used to assess social cognition, rejection sensitivity, and loneliness. Data analysis was conducted using SPSS-27 and AMOS-21. Pearson correlation was used to evaluate bivariate relationships between variables, and Structural Equation Modeling (SEM) was applied to test the proposed mediational model. Fit indices, including χ^2, RMSEA, GFI, CFI, and TLI, were reported to evaluate model adequacy. Results indicated that social cognition was significantly and negatively correlated with both rejection sensitivity ($r = -.43$, $p < .01$) and loneliness ($r = -.39$, $p < .01$). Rejection sensitivity showed a significant positive correlation with loneliness ($r = .58$, $p < .01$). SEM analysis confirmed the mediating role of rejection sensitivity in the relationship between social cognition and loneliness. The indirect path from social cognition to loneliness via rejection sensitivity was significant ($\beta = -.28$, $p < .001$), and the total effect of social cognition on loneliness was substantial ($\beta = -.49$, $p < .001$). Model fit indices indicated a good fit ($\chi^2/df = 2.22$, CFI = 0.96, RMSEA = 0.054). These findings suggest that deficits in social cognition contribute to heightened feelings of loneliness in gifted underachievers, primarily through increased sensitivity to perceived rejection. Interventions aimed at reducing rejection sensitivity may mitigate the impact of social cognitive difficulties on emotional well-being in this vulnerable group.
Keywords: Gifted underachievers; social cognition; rejection sensitivity; loneliness; structural equation modeling.

1. Introduction

The construct of social cognition, which refers to the ability to perceive, interpret, and respond to social information, plays a central role in adaptive interpersonal functioning. Impaired or delayed development in social cognition has been linked to challenges in forming and maintaining social relationships, thereby increasing vulnerability to loneliness. Although most studies on social cognition have focused on clinical populations such as individuals with autism spectrum disorders or schizophrenia, its role in non-clinical yet socially vulnerable groups—such as gifted underachievers—remains underexplored. As social cognition serves as a foundation for interpreting peer behavior and understanding social nuances, deficits or biases in this domain can heighten perceptions of rejection and exclusion. For instance, studies show that difficulties in reading emotional cues or attributing intent may result in overestimating social threats, fueling social withdrawal and loneliness (Fan et al., 2022; Kong et al., 2025).

Simultaneously, the concept of rejection sensitivity (RS)—defined as the tendency to anxiously expect, readily perceive, and overreact to social rejection—has received growing attention as a psychological vulnerability that exacerbates feelings of loneliness (Xu et al., 2025). Individuals high in RS are more likely to misinterpret ambiguous social cues as signs of exclusion, leading to emotional dysregulation, self-isolation, and interpersonal conflict. Notably, gifted underachievers, due to heightened self-awareness and a critical internal narrative, may be especially prone to such hypervigilant reactions. RS not only reflects a dispositional sensitivity to social evaluation but also often originates from prior negative social experiences, including academic or peer-based rejection. Research has confirmed that rejection sensitivity is positively associated with loneliness across developmental stages and cultural contexts (Heu, 2023; Park & Yoo, 2025).

Emerging theoretical and empirical work suggests a mediational role of rejection sensitivity in the relationship between social cognition and loneliness. For instance, individuals with lower social cognitive abilities may fail to accurately decode social interactions, increasing misperceptions of rejection and thereby intensifying loneliness. Studies examining this pathway confirm that RS can act as a psychological amplifier, transforming cognitive misjudgments into emotional distress and social withdrawal (Du et al., 2022; Lyu et al., 2024). This dynamic interplay has been observed in multiple contexts, including clinical settings, school environments, and among populations with specific developmental profiles. In particular, Du et al. (2022) found that rejection sensitivity significantly mediated the association between social cognitive impairments and loneliness, suggesting an indirect but powerful mechanism that reinforces social-emotional dysfunction (Du et al., 2022).

Several studies further support the co-occurrence and interaction of these three variables. He et al. (2024), for instance, demonstrated that parental phubbing was associated with cyberloafing in adolescents, with rejection sensitivity and loneliness serving as sequential mediators, thereby indicating a broader psychological pattern in which social misattunement and hypersensitivity jointly predict loneliness (He et al., 2024). Similarly, Fan et al. (2022) identified a sequential mediation model wherein rejection sensitivity and loneliness explained the effect of low self-control on problematic internet use among college students (Fan et al., 2022). These findings align with the notion that RS may serve as a critical intervening variable, converting cognitive-perceptual vulnerabilities into psychosocial distress.

Beyond theoretical models, the practical relevance of studying loneliness in gifted underachievers is increasingly evident. Gifted students who underperform academically often find themselves marginalized within both gifted and non-gifted peer groups, further aggravating feelings of not belonging (Razvaliaeva & Polskaya, 2021). Studies suggest that such students may experience social frustration, which, when combined with heightened RS, reinforces maladaptive social patterns (Vasyura & Byakova, 2024). Moreover, the experience of chronic loneliness is not merely an emotional state but is correlated with a range of adverse outcomes including depression, anxiety, and decreased academic motivation (Reinhard et al., 2022). This is particularly concerning for educational and psychological practitioners who aim to support holistic student development.

Cultural context further complicates this dynamic. Research has shown that cultural norms around emotional expression and conformity can intensify loneliness in individuals who deviate from these norms. For example, Heu (2023) observed that individuals perceived as different from the social majority—due to either personality or ability—are more prone to experience exclusion and loneliness in collectivist societies (Heu, 2023). In similar vein, Seewer et al. (2024) found that guided or automated interventions aimed at alleviating loneliness online were variably effective depending on users' sensitivity to rejection and social

expectations, suggesting that RS may also modulate treatment outcomes (Seewer et al., 2024).

Gifted underachievers also frequently exhibit internalizing tendencies such as anxiety, ruminative thinking, and emotional withdrawal, which intersect with rejection sensitivity to deepen their sense of loneliness (Noda et al., 2022; Schulze et al., 2024). As Schulze et al. (2024) emphasize, even when external explanations for rejection are provided, individuals with high RS tend to internalize negative interactions, interpreting them as a reflection of personal inadequacy. In such cases, social cognitive biases (e.g., hostile attribution, overgeneralization) may reinforce maladaptive schemas that sustain chronic loneliness (Zhang et al., 2024).

While existing studies have predominantly examined these constructs in isolation, a more integrative approach is warranted. Xu et al. (2024) advanced this integration by showing that rejection sensitivity and loneliness jointly mediated the effect of self-control on internet addiction, emphasizing the utility of multi-variable models (Xu et al., 2024). Park and Yoo (2025) also proposed a moderated mediation model wherein emotional clarity influenced the mediating role of experiential avoidance between RS and loneliness (Park & Yoo, 2025). These findings collectively suggest that multi-layered psychological mechanisms are at play and that single-variable studies may miss critical pathways. The proposed model of the current study thus seeks to fill this gap by examining social cognition as a predictor, rejection sensitivity as a mediator, and loneliness as an outcome, with specific attention to their manifestation in gifted underachieving adolescents.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a descriptive correlational design to examine the relationship between social cognition and loneliness in gifted underachievers, with rejection sensitivity as a mediating variable. The sample consisted of 399 gifted underachieving students from various secondary schools across Argentina, selected based on the sample size recommendations of the Morgan and Krejcie (1970) table for a population exceeding 10,000. Participants were identified as gifted underachievers based on a combination of standardized intelligence testing (IQ ≥ 120) and academic performance below expected levels (GPA below the 50th percentile in at least two core subjects). Stratified random sampling was used to ensure adequate representation across

gender and grade levels. Inclusion criteria required participants to be between the ages of 12 and 18, enrolled in formal education, and not diagnosed with any neurological or psychiatric disorders.

2.2. Measures

To assess the dependent variable of loneliness, the UCLA Loneliness Scale (Version 3), developed by Russell (1996), was utilized. This widely used self-report instrument consists of 20 items designed to measure subjective feelings of loneliness and social isolation. Respondents rate each item on a 4-point Likert scale ranging from 1 (Never) to 4 (Often), with higher total scores indicating greater perceived loneliness. The scale includes both positively and negatively worded items, which are reverse scored where necessary. The UCLA Loneliness Scale has demonstrated strong psychometric properties, with high internal consistency (Cronbach's alpha values typically above 0.90) and confirmed construct validity in diverse populations, including adolescents and gifted individuals. Numerous studies have validated its reliability across cultures and educational contexts.

To measure social cognition, the Reading the Mind in the Eyes Test (RMET) developed by Baron-Cohen, Wheelwright, Hill, Raste, and Plumb (2001) was employed. This test assesses theory of mind—the ability to infer others' mental states—by asking participants to view 36 photographs showing only the eye region of different faces and to choose which of four mental-state terms best describes what the person in the photo is thinking or feeling. Each correct answer scores one point, with the total score ranging from 0 to 36. The RMET has been widely validated in developmental, clinical, and gifted populations, showing good internal consistency (Cronbach's alpha ≈ 0.70) and test-retest reliability. It is considered a reliable tool for evaluating subtle aspects of social cognition, particularly in high-functioning or intellectually advanced individuals.

Rejection sensitivity was assessed using the Rejection Sensitivity Questionnaire (RSQ) developed by Downey and Feldman (1996). This instrument evaluates individuals' disposition to anxiously expect, readily perceive, and intensely react to social rejection. The RSQ includes 18 hypothetical interpersonal situations where participants are asked to indicate (a) how anxious or concerned they would be about potential rejection (rated on a 6-point scale), and (b) how likely they think rejection would occur (also on a 6-point scale). A composite rejection sensitivity score is

calculated by multiplying the level of anxiety by the perceived likelihood of rejection for each scenario and then averaging across items. The RSQ has demonstrated high internal consistency (Cronbach's alpha values typically above 0.85) and predictive validity for interpersonal and emotional functioning. It is particularly useful in studies exploring emotional vulnerabilities in high-achieving yet socially challenged populations such as gifted underachievers.

2.3. Data Analysis

Data were analyzed using SPSS version 27 and AMOS version 21. Descriptive statistics (mean, standard deviation, frequency, and percentage) were computed to summarize the participants' demographic characteristics. Pearson's correlation coefficients were calculated to examine the bivariate relationships between loneliness (dependent variable), social cognition, and rejection sensitivity (independent and mediating variables). Furthermore, Structural Equation Modeling (SEM) was conducted using AMOS to assess the hypothesized mediating role of rejection sensitivity in the relationship between social cognition and loneliness. Goodness-of-fit indices, including Chi-square, RMSEA, CFI, and TLI, were used to evaluate model fit.

3. Findings and Results

Of the 399 participants, 204 (51.13%) were female and 195 (48.87%) were male. Participants' ages ranged from 12 to 18 years, with a mean age of 15.42 years (SD = 1.71). Regarding educational level, 87 students (21.80%) were in the first year of secondary school, 112 (28.07%) in the second year, 96 (24.06%) in the third year, and 104 (26.07%) in the final year. In terms of socioeconomic background, 143 participants (35.84%) reported low-income status, 178 (44.61%) reported middle-income status, and 78 (19.55%) reported high-income status.

Table 1

Descriptive Statistics for Study Variables (N = 399)

Variable	Mean (M)	Standard Deviation (SD)
Social Cognition	26.47	4.83
Rejection Sensitivity	54.32	7.29
Loneliness	46.75	8.41

Table 1 displays the means and standard deviations for the primary variables. The mean score for social cognition was 26.47 (SD = 4.83), suggesting moderate ability to interpret and understand social information. Rejection sensitivity had a mean of 54.32 (SD = 7.29), reflecting elevated levels of interpersonal sensitivity in the sample. Loneliness had a mean of 46.75 (SD = 8.41), indicating that participants, on average, experienced above-midpoint levels of perceived social isolation.

Prior to conducting the main analyses, all statistical assumptions for Pearson's correlation and SEM were assessed and confirmed. The data met the assumption of normality, as indicated by skewness values ranging from –0.42 to 0.31 and kurtosis values ranging from –0.67 to 0.58, all within the acceptable range of ±1. The assumption of linearity was examined using scatterplots, which showed linear relationships between the variables. Multicollinearity was not a concern, with variance inflation factor (VIF) values ranging from 1.11 to 1.38. Additionally, homoscedasticity was confirmed through visual inspection of residual plots. The Mahalanobis distance was used to detect multivariate outliers, and no cases exceeded the critical value of 16.27 (p < 0.001) for the number of variables used in the SEM.

Table 2

Pearson Correlation Coefficients Among Study Variables

Variable	1	2	3
1. Social Cognition	—		
2. Rejection Sensitivity	–.43**	—	
3. Loneliness	–.39**	.58**	—

As shown in Table 2, social cognition was significantly and negatively correlated with both rejection sensitivity (r = –.43, p < .01) and loneliness (r = –.39, p < .01). Rejection sensitivity, in turn, demonstrated a strong positive

correlation with loneliness (r = .58, p < .01). These results support the hypothesis that deficits in social cognition are associated with increased RS and higher loneliness.

Table 3

Fit Indices for the Structural Equation Model

Index	Value	Recommended Threshold
Chi-Square (χ^2)	142.31	—
Degrees of Freedom (df)	64	—
χ^2/df	2.22	< 3
GFI	0.94	≥ 0.90
AGFI	0.91	≥ 0.90
CFI	0.96	≥ 0.95
TLI	0.94	≥ 0.90
RMSEA	0.054	≤ 0.08

The model demonstrated a good fit to the data as indicated in Table 3. The χ^2/df ratio was 2.22, below the recommended maximum of 3. Fit indices met or exceeded conventional thresholds (GFI = 0.94, AGFI = 0.91, CFI = 0.96, TLI = 0.94), and the RMSEA was 0.054, well within the acceptable range. These results suggest that the structural model adequately explains the observed data relationships.

Table 4

Standardized and Unstandardized Path Coefficients for the Structural Model

Path	b	S.E	β	p
Social Cognition → Rejection Sensitivity	−0.52	0.07	−.43	< .001
Rejection Sensitivity → Loneliness	0.68	0.09	.52	< .001
Social Cognition → Loneliness (direct)	−0.24	0.08	−.21	.004
Social Cognition → Loneliness (indirect via RS)	−0.35	0.06	−.28	< .001
Social Cognition → Loneliness (total effect)	−0.59	0.07	−.49	< .001

As shown in Table 4, the direct effect of social cognition on loneliness was significant (β = −.21, p = .004). Social cognition also had a strong negative effect on rejection sensitivity (β = −.43, p < .001), while rejection sensitivity positively predicted loneliness (β = .52, p < .001). The indirect effect of social cognition on loneliness through rejection sensitivity was also significant (β = −.28, p < .001), contributing to a substantial total effect of −.49. These findings confirm the mediating role of rejection sensitivity in the relationship between social cognition and loneliness.

Figure 1

Structural Model of The Study

Structural Model of Social Cognition, Rejection Sensitivity, and Loneliness
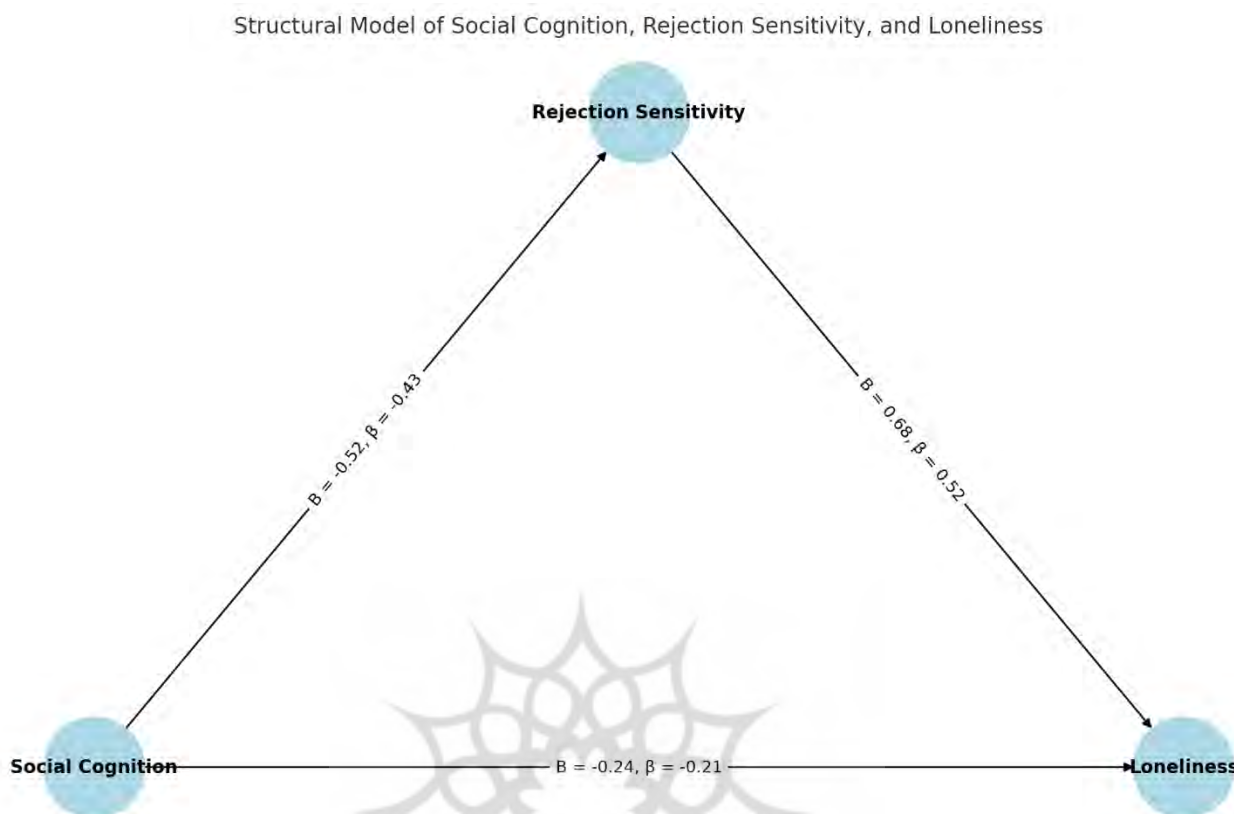
4. Discussion and Conclusion

The present study investigated the relationship between social cognition and loneliness in gifted underachieving adolescents, with rejection sensitivity proposed as a mediating variable. The findings revealed a significant negative correlation between social cognition and loneliness, indicating that lower levels of social cognitive ability are associated with higher feelings of loneliness among gifted underachievers. Furthermore, rejection sensitivity was found to mediate this relationship, suggesting that impaired social cognition may increase vulnerability to perceived rejection, which in turn contributes to heightened experiences of loneliness. These results support the proposed conceptual model and extend existing theoretical frameworks on the emotional and interpersonal challenges facing gifted but academically underperforming youth.

The direct negative relationship between social cognition and loneliness aligns with prior research emphasizing the importance of accurate interpretation of social cues in preventing social withdrawal and emotional isolation. Individuals with heightened social cognitive skills are generally more adept at navigating complex social interactions and resolving interpersonal conflicts, thereby reducing their risk of social disconnection (Kong et al., 2025). In contrast, deficits in social cognition may lead to misperceptions of social feedback, inaccurate inferences about others' intentions, and diminished confidence in social situations, all of which contribute to the development of loneliness (Fan et al., 2022). This dynamic is particularly pronounced in gifted underachievers, whose asynchronous cognitive and emotional development may predispose them to both overanalysis and misinterpretation of social exchanges. The current findings are consistent with He et al. (2024), who found that adolescents with impaired social attunement were more susceptible to the compounding effects of interpersonal neglect and internalizing symptoms (He et al., 2024).

Moreover, the findings indicate that rejection sensitivity plays a crucial mediating role between social cognition and loneliness. Gifted underachievers with limited social understanding may be more prone to anxiously expect and overinterpret rejection, leading to increased feelings of exclusion even in ambiguous or neutral situations. This

finding resonates with the rejection sensitivity model proposed by Downey and Feldman and is corroborated by multiple recent studies demonstrating the predictive value of RS in loneliness outcomes (Park & Yoo, 2025; Xu et al., 2025). For example, Lyu et al. (2024) illustrated that adolescents high in rejection sensitivity are not only more reactive to perceived slights but also experience longer-lasting emotional repercussions, intensifying their sense of loneliness (Lyu et al., 2024). These mechanisms help explain why even minor social cues can trigger disproportionate emotional distress in gifted underachievers, especially those with elevated RS.

The current study also confirms prior evidence that rejection sensitivity serves as a psychological amplifier, transforming cognitive vulnerability into affective outcomes. In line with the findings by Du et al. (2022), who demonstrated the mediating role of RS between maladaptive coping and loneliness, the present study underscores the indirect pathway through which interpersonal anxiety contributes to chronic feelings of social disconnection (Du et al., 2022). Similarly, research by Fan et al. (2022) affirmed that RS, alongside loneliness, served as a key mechanism linking self-regulatory deficits to problematic behaviors like excessive internet use, suggesting a broader spectrum of dysfunction associated with these emotional vulnerabilities (Fan et al., 2022).

Notably, the observed mediating effect of RS reinforces the growing consensus that social-emotional difficulties in youth are best understood through integrated models rather than isolated constructs. Xu et al. (2024) proposed a moderated mediation model demonstrating that loneliness and RS could co-function as sequential or parallel mediators in predicting psychological problems, a framework that the current findings partially replicate (Xu et al., 2024). Further extending this idea, Rowney-Smith et al. (2024) explored the lived experience of RS in individuals with ADHD and found that heightened emotional sensitivity often coexists with social skill deficits, resulting in persistent interpersonal problems (Rowney-Smith et al., 2024). This interplay is especially pertinent for gifted underachievers, who often internalize academic and social failure, thereby intensifying both their RS and loneliness.

The findings also lend support to the cultural and contextual factors shaping loneliness and its antecedents. Heu (2023) emphasized that deviations from social norms—such as emotional over-intensity or underachievement despite high intelligence—can lead to increased social exclusion and thus deeper loneliness (Heu, 2023). This is particularly relevant for gifted underachievers, who often occupy a liminal social space, perceived as neither academically successful nor socially typical. Katulis et al. (2023) suggested that a positive classroom climate could buffer against loneliness in emotionally reactive students, hinting at the potential protective role of environmental moderators, though these were beyond the scope of the present study (Katulis et al., 2023). Nevertheless, the interplay between social cognition and emotional environment remains a key area for future investigation.

In terms of clinical relevance, the results affirm the theoretical framework advanced by Borawski and Nowak (2022), who demonstrated that self-compassion moderates the relationship between RS and loneliness (Borawski & Nowak, 2022). Although self-compassion was not directly measured in this study, the implication is clear: internal psychological resources can attenuate the effects of RS and reduce loneliness. Similarly, Noda et al. (2022) linked RS to anxiety and depressive symptoms through the mediating roles of rumination and loneliness, providing further evidence that RS acts as a central node in various maladaptive psychological pathways (Noda et al., 2022). Interventions targeting RS may thus yield broad benefits beyond loneliness reduction.

An existential layer of loneliness was also touched upon in this study's theoretical framing. As Souza (2025) articulated, loneliness may not only be the result of interpersonal gaps but also a manifestation of existential disconnection and lack of meaning (Souza, 2025). While this study focused on interpersonal loneliness, future research may benefit from exploring whether gifted underachievers, due to their metacognitive depth and sensitivity, are particularly vulnerable to existential loneliness as well.

Finally, the implications of these findings for intervention design are significant. As Seewer et al. (2024) found in their trial of online interventions, the effectiveness of anti-loneliness strategies may depend heavily on individuals' RS levels (Seewer et al., 2024). Similarly, Schulze et al. (2024) noted that even when rejection is externally attributed, individuals high in RS often internalize these experiences, complicating recovery efforts (Schulze et al., 2024). This suggests that cognitive-behavioral strategies may need to be complemented by emotion-focused or schema-based therapies that target core beliefs about worthiness, social value, and vulnerability to rejection.

Despite its valuable contributions, the present study is not without limitations. First, the cross-sectional design precludes any conclusions about causality among the

variables. Longitudinal studies are needed to clarify the temporal sequence between social cognition, RS, and loneliness. Second, the sample was composed exclusively of gifted underachieving students from Argentina, which limits the generalizability of findings to other populations and cultural settings. Third, all data were collected via self-report instruments, which may be subject to social desirability and response biases. Additionally, the study did not control for comorbid conditions such as anxiety or depression, which are known to correlate with both RS and loneliness. These variables may have confounded the observed relationships.

Future research should adopt a longitudinal or experimental design to explore causal relationships and directional pathways among social cognition, RS, and loneliness. It would also be beneficial to explore these dynamics in other high-risk student populations, such as neurodiverse learners or students with emotional and behavioral disorders. Cross-cultural studies could reveal whether cultural values around achievement and belonging modulate the observed relationships. Furthermore, incorporating physiological or behavioral assessments (e.g., eye-tracking, neuroimaging, observational coding) would enrich our understanding of the implicit mechanisms underlying RS and social cognition. Finally, testing the moderating role of protective factors such as self-compassion, parental support, or classroom climate could offer a more nuanced perspective and suggest points of intervention.

Educational psychologists, school counselors, and teachers should pay greater attention to the social-emotional needs of gifted underachievers. Screening tools for RS and loneliness can be integrated into routine assessments to identify students at risk of chronic social disconnection. Intervention programs should focus not only on enhancing academic engagement but also on improving social cognitive skills and addressing maladaptive schemas related to rejection. Strategies such as social-emotional learning (SEL), peer mentoring, and resilience training may help students reinterpret social feedback and reduce their hypervigilance to rejection. Therapeutically, interventions should address both cognitive biases and emotional regulation strategies to disrupt the RS–loneliness cycle and promote healthier peer interactions and self-perceptions.

Authors' Contributions

Authors contributed equally to this article.

Declaration

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

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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