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Article

Emotion Expression, Regulation and Psychological Outcomes among Highly Sensitive Adolescents in Internationalized Education Contexts

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Abstract: This study examines how sensory processing sensitivity (SPS) influences emotional expression, regulation, and psychological well-being among Chinese adolescents enrolled in internationalized educational settings. Grounded in Gross's process model of emotion regulation and cross-cultural theories of emotional expression, the study addresses how highly sensitive youth navigate emotional demands in culturally hybrid contexts. Independent t-tests were used to compare highly sensitive and non-highly sensitive adolescents across six psychological variables: emotion regulation, emotional expressivity, perceived stress, self-esteem, social support, and subjective well-being. Significant group differences were found in emotion regulation and subjective well-being, with highly sensitive individuals reporting stronger regulatory capacity and greater life satisfaction. Within the highly sensitive group, further analyses using Pearson correlations and linear regression revealed a significant positive association between emotion regulation and well-being, though group-based comparisons of high and low regulators did not reach statistical significance. These findings suggest that emotion regulation may serve as a protective factor supporting well-being among sensitive youth. The study underscores the importance of culturally sensitive emotional support systems and recommends future research employing larger samples and formal mediation models to validate these exploratory insights.

Keywords: highly sensitive adolescents; emotion expression; emotion regulation; perceived stress; self-esteem; subjective happiness; social support

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1. Introduction

Emotional expression and regulation are central components of adolescent psychological functioning. How individuals expressed or manage their emotions significantly impacts their levels of stress, self-esteem, and subjective well-being. During adolescence, a period marked by emotional volatility and identity formation, effective emotional regulation and healthy expression are particularly crucial.

Highly Sensitive Persons (HSPs), characterized by the trait of Sensory Processing Sensitivity (SPS), exhibit heightened sensitivity to emotional and sensory stimuli, deeper cognitive processing, and stronger emotional reactivity [1]. While these individuals often possess strong empathy and perceptual awareness, prior research suggests they may also be more vulnerable to psychological distress, particularly depression due to variation in genes, epigenetic and negative early life experiences that can contribute to this sensitivity by amplifying emotional reactivity and stress responses [2]. While research also shows this vulnerability can be mitigated by supportive conditions — a pattern consistent with the differentiated susceptibility theory, highlighting emotional regulation as key protective factors for highly sensitive individuals [3].

Despite growing evidence that Highly Sensitive Persons (HSPs) exhibit heightened emotional reactivity and perceptual sensitivity, existing research has largely concentrated on their sensory processing and internal responses, while overlooking how these individuals express and regulate their emotions externally. In particular, questions remain as to whether HSPs tend to suppress or internalize emotional expression, and whether they possess effective strategies to manage anxiety and environmental overwhelm. These expressive and regulatory dimensions are crucial for understanding how high sensitivity translates into psychological outcomes such as stress, self-esteem, and well-being.

Moreover, most studies in this area have focused on adults in general populations, leaving a significant gap in understanding highly sensitive adolescents, especially those in internationalized educational contexts. These youth often face a unique combination of academic pressure, emotional volatility, and cross-cultural adjustment, all of which may complicate their emotional development and identity formation. Recognizing that disruptions in emotional functioning during adolescence can have lasting effects on confidence and psychological health, this study focuses on Chinese adolescents attending international schools to investigate how emotional expression and regulation unfold in such culturally complex environments.

This study aims to investigate how adolescents with high sensitivity differ from their non-highly sensitive peers in terms of emotional expression and regulation, and how these differences are associated with prepsychological well-being, specifically in relation to their well-being as defined by perceived stress, self-esteem, subjective happiness, and social support. In exploring these emotional processes, the study will address the following core research questions:

1) How do high sensitivity traits influence emotional expression among Chinese adolescents in internationalized education contexts?
2) How are high sensitivity traits related to emotional regulation strategies among Chinese adolescents in internationalized education contexts?
3) How are emotional expression and regulation related to key dimensions of psychological well-being, such as perceived stress, self-esteem, subjective well-being, and social support among these adolescents?

2. Literature Review

2.1. Sensory Processing Sensitivity (SPS) in Adolescents

Sensory Processing Sensitivity (SPS) is a temperamental trait characterized by heightened awareness of environmental subtleties, deep cognitive processing, and intense emotional reactivity [1]. While SPS includes emotional sensitivity, it is distinct from general emotional reactivity or moodiness. Emotional sensitivity may reflect temporary states or personality tendencies, whereas SPS represents a stable and innate disposition influencing how individuals perceive, process, and respond to stimuli [4].

This conceptual clarity is essential in adolescent research, where high reactivity and emotional fluctuation is common, but only some individuals show the depth of processing and overstimulation typical of HSPs. Pluess further this understanding through the theory of differential susceptibility, sensitivity can confer both vulnerability and adaptability, depending on environmental context [3].

Moreover, it is important to distinguish SPS from historically pathologized emotional conditions. Unlike hysteria, which was historically viewed as a dysfunctional, SPS is now recognized as a normal temperamental variation with potential benefits and challenges [5]. Rather than being suppressed, sensitivity should be supported through strategies such as adaptive emotional regulation and social-emotional support especially relevant in international educational and emotional demands.

2.2. Emotional Expression of Highly Sensitive Persons (HSPs)

Building on SPS's definition and implications, a key manifestation of this sensitivity lies in emotional expression. Research on HSPs' expression patterns reveals mixed findings, suggesting heterogeneity in how emotional sensitivity is outwardly displayed.

Some studies report that individuals with higher SPS scores — indicating HSP tendencies show stronger and more noticeable facial expressions especially in response to positive emotions like happiness, indicating heightened reactivity and empathic mirroring [6]. This finding suggests that HSPs are not only more sensitive but also more expressive in the face of positive emotions.

However, other findings emphasize the covert emotional expression tendencies of HSPs. For example, research on HSPs in literary works (e.g., characters in The Perks of Being a Wallflower and All Too Much for Oliver) highlights how these individuals often exhibit less overt emotional expression, with their emotions being internalized or expressed through subtle psychological cues [7]. This perspective emphasizes the deep inner processing of HSPs, who may not outwardly express their emotional intensity but experience heightened sensitivity and complexity in their emotional states.

Despite these differing views, both lines of research agree on several fundamental characteristics of HSPs. HSPs are characterized by deep cognitive processing, a tendency to become easily overwhelmed by stimuli, heightened empathy, and a sensitivity to environmental subtleties. These traits often lead to intense emotional experiences, but the way HSPs express these emotions may vary significantly, depending on the context and individual coping mechanisms.

Based on previous findings that highly sensitive individuals show distinctive patterns in emotional expression. It is hypothesized that highly sensitive adolescents will exhibit lower emotional expressivity measures in emotional expression compared to their non-highly sensitive peers (H1).

2.3. Emotion Regulation of Highly Sensitive Persons (HSPs)

Given the emotional intensity and variation in expression described above, emotion regulation becomes a central mechanism through which HSPs manage their affective experiences.

Highly Sensitive Persons (HSPs) often rely on maladaptive emotion regulation strategies such as rumination, emotional suppression, and avoidance, which can amplify emotional distress and contribute to negative mental health outcomes [8]. These strategies are frequently employed by individuals who experience heightened emotional sensitivity and find it difficult to cope with intense emotional stimuli. Although these responses may provide short-term relief, they do not resolve the underlying emotional arousal, often leading to increased stress and psychological vulnerability in the long run.

In contrast, adaptive strategies such as cognitive reappraisal have been shown to be particularly useful for HSPs. By reinterpreting emotionally charged situations to alter their emotional impact, HSPs can manage their heightened emotional states more effectively, as it allows individuals to view stressful or overwhelming stimuli in a new light, reducing the intensity of their emotional reactions and fostering emotional resilience [9].

This dual pattern of regulatory behavior (maladaptive vs. adaptive) is critical to understanding how HSPs navigate emotional challenges. Therefore, this study hypothesizes that highly sensitive adolescents will report greater use of maladaptive strategies (e.g., suppression) and lower use of adaptive ones (e.g., reappraisal) (H2).

2.4. Psychological Wellbeing of HSPs

Having examined regulation strategies, the next step is to explore how these emotion-related processes impact psychological well-being among HSPs. Latent profiles within highly sensitive individuals reveal distinct emotional and cognitive responses to stimuli.

Certain HSP subtypes, particularly those high in emotional suppression and dysfunctional attitudes, report elevated levels of anxiety, depression, and stress. In contrast, individuals employing adaptive strategies, such as cognitive reappraisal, experience more favorable psychological outcomes [10]. These differences highlight the importance of examining emotional regulation tendencies in highly sensitive individuals, as their ability to employ adaptive regulation strategies plays a crucial role in managing emotional intensity and promoting better psychological well-being.

The Structural Equation Model (SEM) has been used to further explore the links between SPS and mental health outcomes, showing that high SPS is positively correlated with depression, anxiety, and stress. These findings suggest that highly sensitive individuals are more prone to extreme emotional, cognitive, and behavioral reactions, particularly in situations that elicit overstimulation, such as exposure to emotional stimuli [1].

Physiological research further supports the link between high sensitivity and emotional vulnerability. Jagiellowicz et al. found that higher HSPS scores were associated with changes in alpha wave band power and event-related desynchronization (ERD) during facial expression processing, indicating enhanced neural responsiveness to emotional cues [11]. However, this heightened sensitivity also makes them more susceptible to emotional overwhelm, potentially leading to psychological difficulties such as stress, anxiety, and depression [12].

Thus, regulation strategy use is a likely mediator between SPS and psychological well-being. This study hypothesis that among highly sensitive adolescents, those who use adaptive emotion regulation strategies (such as cognitive reappraisal) tend to exhibit better psychological well-being (e.g., lower stress, higher self-esteem, greater subjective happiness and social support), whereas those who rely on maladaptive strategies (such as emotional suppression) tend to experience poorer psychological outcomes. (H3)

2.5. Measurement Frameworks and Theoretical Basis: A Cross-Cultural Perspective

The selection and design of questionnaire items in this study are grounded in existing theoretical models and validated instruments related to sensory processing sensitivity (SPS), emotional expression, regulation, cultural orientation, and psychological well-being.

First, high sensitivity is measured using an adolescent-adapted version of the Highly Sensitive Person Scale (HSPS). While previous studies have employed HSPS and the Adolescent Sensory Profile (ASP), concerns about their length and age-appropriateness prompted the use of a shortened, culturally adapted scale tailored to Chinese international school students.

Second, emotional expression and emotion regulation are assessed using self-designed items inspired by prior instruments. The construction of these items is informed by Gross's process model of emotion regulation, which conceptualizes regulation as occurring at various stages of emotional response [12]. This model highlights the relevance of both maladaptive strategies (e.g., suppression, avoidance) and adaptive strategies (e.g., reappraisal), particularly among highly sensitive individuals.

Third, cultural orientation is included to account for the potential interaction between sensitivity and emotional functioning in cross-cultural contexts. Emotional restraint is emphasized in collectivist cultures like China, whereas individualistic cultures encourage expression [13,14]. This dual exposure can cause tension or internal conflict, especially among HSPs, who are more reactive to such social cues.

Finally, psychological well-being is operationalized through multi-dimensional indicators, including perceived stress, self-esteem, subjective well-being, and perceived social support, which are core constructs frequently associated with both SPS and emotional regulation in prior research [4,10].

Together, these theoretical foundations provide a coherent basis for the measurement model and ensure content validity in assessing the psychological profiles of highly sensitive adolescents in internationalized education environments. The questionnaire structure is thus theoretically informed and empirically grounded, combining validated scales with culturally adapted, developmentally appropriate self-constructed items.

In sum, while much research has focused on the perceptual and emotional sensitivity of HSPs, fewer studies have addressed how sensitivity traits affect emotional expression and regulation in adolescent populations, particularly within cross-cultural educational environments. This study seeks to address this gap by examining how highly sensitive Chinese adolescents in international schools' experience, express, and manage emotions, and how these emotional processes relate to their psychological outcomes.

3. Research Method

3.1. Data Collection

To investigate emotional expression, regulation, and psychological well-being among highly sensitive adolescents in international school contexts, a combination of self-report questionnaires (in Chinese) was used. A total of 123 participants were recruited from various regions across China, all with an international education background. In addition, students from the author's own school were included, using a mixed sampling strategy combining random and cluster sampling.

The survey consisted of three main sections, each targeting a different aspect of the research: sensory processing sensitivity (SPS), emotional expression and regulation, and psychological well-being. Section One focused on Sensory Processing Sensitivity (SPS). The author employed a shortened Chinese version of the Highly Sensitive Person Scale (HSPS), comprising 11 items selected from Aron's original scale. This version measured core dimensions of sensory processing sensitivity, including emotional reactivity, deep cognitive processing, and heightened sensitivity to environmental stimuli.

Section Two focused on Emotional Expressivity and Regulation. To assess emotional expression, a 12-item scale was adapted from the Berkeley Expressivity Questionnaire (BEQ) and the Emotional Expression Questionnaire (EEQ), measuring the expression of both positive and negative emotions in terms of intensity, frequency, and visibility across various social contexts. The original BEQ assesses impulse strength, positive/negative emotion expression, and behavioral cues. The original EEQ, measures the visibility and interpersonal perception of emotional expression. By combining features of both scales, the 12-item scale used in this study captured both overt and covert expressivity and helped identify tendencies such as emotional suppression or rumination, particularly in high-sensitivity individuals navigating socially complex environments.

Furthermore, Section Two includes a self-designed 9-item emotion regulation scale to evaluate the strategies participants used to manage their emotional responses. This tool was adapted from a shortened version of the Emotion Regulation Questionnaire (ERQ), the Adolescent Emotion Regulation Questionnaire (AERQ), and the Adolescent Cognitive Emotion Regulation Questionnaire (ACERQ). The original ERQ assesses cognitive reappraisal and emotional suppression, and the original AERQ measures contextual variations in adolescents' regulation strategies, and the ACERQ assesses specific cognitive strategies such as positive reappraisal, self-blame, and catastrophizing. The scale aimed to explore how highly sensitive adolescents regulate emotional intensity, especially in demanding educational settings.

Additionally, a brief self-designed 4-item cultural influence scale was included to examine how cultural norms and values shape participants' emotional expression and regulation. This measure was particularly relevant in international school settings, where students must often reconcile conflicting cultural expectations about emotional behavior.

Section 3 focused on Psychological Outcomes. To assess participants' psychological well-being, this study adopted four well-established scales to capture distinct but interrelated outcome dimensions. Perceived stress was measured using the 6-item Perceived Stress Scale (PSS-6), which evaluates the extent to which individuals feel overwhelmed or unable to cope. Self-esteem was assessed via a shortened 6-item version of the Rosenberg Self-Esteem Scale (RSES), reflecting participants global self-worth. Subjective well-being was measured using the Satisfaction with Life Scale (SWLS), a 5-item instrument that captures overall life satisfaction. Finally, perceived social support was assessed using the full version of the Multidimensional Scale of Perceived Social Support (MSPSS), which includes items covering support from family, friends, and significant others. All items were rated on a 7-point Likert scale, with higher scores indicating stronger perceived support.

3.2. Procedures

This study used surveys for data collection, with a random sampling strategy. To ensure a diverse sample, participants are recruited through online social media, and classmates from my own school. In total, 123 adolescent participants (aged approximately 16–18 years) with international education backgrounds volunteered to respond to the survey.

This approach aimed to represent Chinese adolescents with international education backgrounds from various regions, enhancing the generalizability of the findings within this population. While completing the survey, participants were informed of confidentiality and anonymity, and responses were collected independently to reduce social desirability bias.

The survey consisted of quantitative items measuring sensory sensitivity, emotional expression, emotion regulation, and psychological well-being, as well as optional open-ended prompts deeper insights into how highly sensitive adolescents navigate emotional experiences in international school environments.

The data from the surveys were analyzed using Excel, with particular attention to the relationships between sensory sensitivity, emotion regulation strategies, and key psychological outcomes (such as perceived stress, self-esteem, subjective well-being, and perceived social support).

3.3. Data Analysis Methods

3.3.1. Inferential Statistics Analysis

To examine the differences in emotional expression, emotion regulation strategies, and psychological well-being between two groups of adolescents — Group A (Highly Sensitive Adolescents) and Group B (Non-Highly Sensitive Adolescents) — an Independent Samples T-test was conducted. This statistical method was chosen to determine whether there were significant differences between the two groups in terms of emotional expressivity, use of regulation strategies (such as cognitive reappraisal and suppression), perceived stress, self-esteem, subjective happiness, and perceived social support.

Before conducting the t-test, assumptions of normality, homogeneity of variances, and independence of observations were checked to ensure the validity of the results. Levene's test for equality of variances was not significant ($p > 0.05$), indicating equal variances between groups; therefore, the standard independent samples t-test assuming equal variances was used. Prior to hypothesis testing, descriptive statistics including means and standard deviations were calculated for all variables within each group. Effect sizes (Cohen's d) were computed to evaluate the magnitude of group differences.

3.3.2. Explanatory Mediation Stimulated Path

To explore the potential mediating role of emotion regulation in the relationship between sensory processing sensitivity and psychological well-being, an exploratory subgroup comparison was conducted within the highly sensitive adolescent group. Rather than employing formal mediation analysis (e.g., structural equation modeling), this study

used a simplified approach suitable for limited sample size and methodological constraints.

Participants in the highly sensitive group were divided into two subgroups based on their emotion regulation scores, using a median split to define:

1) High Regulators (above-median scores).
2) Low Regulators (below-median scores).

A t-test was then performed to examine whether these two subgroups differed significantly in subjective well-being, as measured by the Satisfaction with Life Scale (SWLS). This approach was intended to simulate the logic of a mediation path (X → M → Y), where:

1) High sensitivity (X) is associated with differences in emotion regulation (M).
2) And emotion regulation (M) may be associated with differences in subjective well-being (Y).

This method does not establish causal mediation but provides preliminary insight into the potential mechanism through which sensitivity traits may influence well-being outcomes.

4. Results

4.1. Comparative Analysis of Highly Sensitive Adolescents and Non-Highly Sensitive Adolescents

Descriptive statistics and t-test results are presented in Table 1. In summary, Group A of Highly Sensitive Adolescents and Group B of Non-Highly Sensitive Adolescents differ significantly in only emotional regulation and subjective happiness.

Table 1. Group Comparison between Highly Sensitive and Non-highly Sensitive Adolescent on Psycho-Logical Variables (T-Test).

Variable	Group A: HSP (M ± SD)	Group B: Non-HSP (M ± SD)	T (df)	*p*-value	Cohen's d	Significance
Emotion Regulation	3.44 ± 0.62	3.13 ± 0.64	2.45	0.016	≈0.50	*
Subjective Well-being	24.31 ± 6.88	21.56 ± 6.32	1.98	0.0497	≈0.42	*
Emotional Expression	3.19 ± 0.67	3.06 ± 0.51	0.95	0.34	≈0.21	n.s.
Perceived Stress	11.16 ± 3.97	10.28 ± 2.92	1.15	0.25	≈0.25	n.s.
Self-esteem	12.34 ± 2.96	11.72 ± 2.59	1.06	0.29	≈0.23	n.s.
Perceived Social Support	3.19 ± 0.67	3.06 ± 0.51	0.95	0.34	≈0.21	n.s.

Note:

a) M = Mean, SD = Standard Deviation
b) HSP = Highly Sensitive Person, Non-HSP = Non-highly sensitive
c) Cohen's d values are approximate effect sizes.
d) *Significance: * = $p < 0.05$; n.s. = not significant.

Group A (Highly Sensitive Adolescents) showed significantly higher scores in emotion regulation (M = 3.44, SD = 0.62) compared to Group B of Non-Highly Sensitive Adolescents (M = 3.13, SD = 0.64), t (121) = 2.45, p = 0.016, Cohen's d ≈ 0.50, indicating a moderate effect size.

Similarly, subjective happiness scores significantly differed between groups, with Highly Sensitive Adolescents reporting higher well-being (M = 24.31, SD = 6.88) than Group B (M = 21.56, SD = 6.32), t (121) = 1.98, p = 0.05, Cohen's d ≈ 0.42, suggesting a moderate effect size. Although the result met the conventional threshold for statistical significant difference, the marginal p-value suggests that this difference should be interpreted caution.

No significant differences were found for emotional expression, perceived stress, self-esteem, or perceived social support (all $p > 0.05$), indicating that these variables did not distinguish between highly sensitive and non-highly sensitive adolescents in this sample.

An independent t-test was conducted to compare emotional expression between highly sensitive adolescents and non-highly sensitive adolescents. Results showed that Highly Sensitive Adolescents ($M = 3.19$, $SD = 0.67$) scored higher compared to Non-Highly Sensitive Adolescents ($M = 3.06$, $SD = 0.51$). This difference was not significant, $t(121) = 0.95$, $p = 0.34$. This suggests that there is no significant difference between the two groups.

An independent t-test was conducted to compare perceived stress level between highly sensitive adolescents and non-highly sensitive adolescents. Results showed that Highly Sensitive Adolescents ($M = 11.16$, $SD = 3.97$) scored higher compared to Non-Highly Sensitive Adolescents ($M = 10.28$, $SD = 2.92$). This difference was not significant, $t(121) = 1.15$, $p = 0.25$. This suggests that there is no significant difference between the two groups.

An independent t-test was conducted to compare self-esteem level between highly sensitive adolescents and non-highly sensitive adolescents. Results showed that Highly Sensitive Adolescents ($M = 12.34$, $SD = 2.96$) scored higher compared to Non-Highly Sensitive Adolescents ($M = 11.72$, $SD = 2.59$). This difference was not significant, $t(121) = 1.06$, $p = 0.29$. This suggests that there is no significant difference between the two groups.

An independent t-test was conducted to compare the extent of social support between highly sensitive adolescents and non-highly sensitive adolescents. Results showed that Highly Sensitive Adolescents ($M = 3.19$, $SD = 0.67$) scored higher compared to Non-Highly Sensitive Adolescents ($M = 3.06$, $SD = 0.51$). This difference was not significant, $t(121) = 0.95$, $p = 0.34$. This suggests that there is no significant difference between the two groups.

4.2. Sub-Group Comparison among Highly Sensitive Adolescents: Preliminary Exploration for Potential Mediation Path

To simulate a potential mediation mechanism between high sensitivity and psychological well-being, an exploratory subgroup analysis was conducted within the highly sensitive adolescent group ($n = 91$). Based on a median split of their emotion regulation scores, participants were classified as either High Regulators ($n = 35$) or Low Regulators ($n = 56$). An independent samples t-test was used to compare their subjective well-being scores shown in Table 2.

Table 2. Exploratory Comparison of Subjective Well-Being between High and Low Emotion Regulators within the Highly Sensitive Group ($n = 91$).

Group	N	Mean SWLS	Variance (SD^2)	t	df	p-value (2-tailed)
High Regulators	35	25.71	48.33			
Low Regulators	56	23.55	43.92	-1.48	89	0.141

Note: Emotion regulation groups were created via a median split. SWLS = Satisfaction with Life Scale.

Results indicated that the High Regulators reported higher subjective well-being ($M = 25.71$, $SD^2 = 48.33$) than the Low Regulators ($M = 23.55$, $SD^2 = 43.92$), though this difference did not reach statistical significance, $t(89) = -1.48$, $p = 0.14$.

Despite the non-significant result, this pattern aligns with the hypothesis that emotion regulation may serve as a pathway through which sensitivity traits influence well-being. Given that both emotion regulation and subjective well-being showed significant differences between highly sensitive and non-sensitive adolescents in earlier analyses, this subgroup comparison offers a plausible direction for future formal mediation testing.

4.3. Correlational Analysis between Emotion Regulation and Subjective Well-Being among Highly Sensitive Adolescents

A Pearson correlation analysis was conducted to examine the relationship between emotion regulation and subjective well-being among highly sensitive adolescents (n = 90). Results in indicated a significant positive correlation, r = 0.342, p = 0.001, suggesting that better emotion regulation is associated with higher levels of well-being within this population.

Figure 1 illustrates the relationship between emotion regulation and subjective well-being among highly sensitive adolescents. The scatterplot with regression line suggests a positive trend, indicating that individuals with higher emotion regulation scores may report higher levels of well-being. Although this finding does not imply causation, it supports the theoretical assumption that effective emotional regulation may play a role in enhancing subjective well-being among highly sensitive youth.

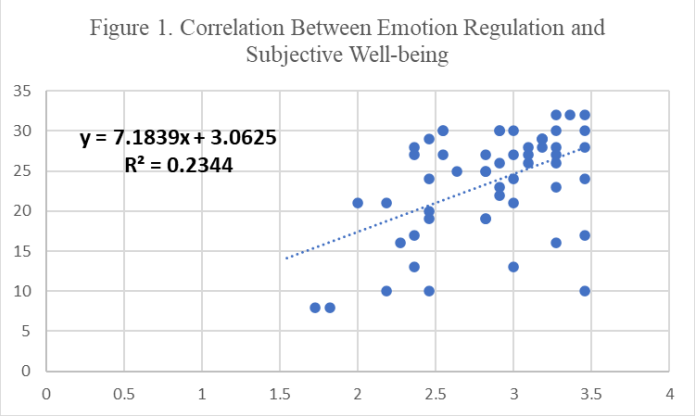

Figure 1. Correlation between Emotional Regulation and Subjective Well-Being among Highly Sensitive Adolescents.

4.4. Emotion Regulation as a Predictor of Subjective Well-Being among Highly Sensitive Adolescents

A simple linear regression analysis was conducted to examine whether emotion regulation predicts subjective well-being (SWLS scores) among highly sensitive adolescents (N = 90).

The results indicated that the model was statistically significant, F (1, 88) = 11.68, p < .001, explaining approximately 11.7% of the variance in subjective well-being ($R^2 = 0.117$). The regression equation was: SWLS = 12.68 + 3.59 × Emotion Regulation Score

This means that for each one-point increase in emotion regulation score, participants' subjective well-being score increased by approximately 3.59 points (β = 3.59), suggesting a positive and significant predictive relationship between emotional regulation and well-being within the highly sensitive group (Table 3).

Table 3. Regression Output.

Regression Statistics				
Multiple R			0.34	
R Square			0.12	
Adjusted R Square			0.11	
Standard Error			6.45	
N			90	
	DF	**SS**	**MS**	**F**	**Significance F**
Regression analysis	1	486.03	486.03	11.68	0.00

Residual		88	3661.93		41.61			
Sum		89	4147.96					
	Coefficients	**Standard Error**	**t Stat**	***P*-value**	**Lower 95%**	**Upper 95%**	**Lower 95.0%**	**Upper 95.0%**
Intercept	12.68	3.50	3.62	<.001	5.73	19.64	5.72	19.64
X Variable 1	3.59	1.05	3.42	<.001	1.50	5.68	1.50	5.68

4.5. Descriptive Statistics Analysis

Descriptive analyses revealed key emotional and psychological patterns among participants. Although no significant group difference emerged in emotional expressivity between highly sensitive and non-sensitive adolescents, several trends warrant attention. Approximately half of the participants reported a tendency to hide their emotions or dislike discussing them. Over 30% expressed difficulty conveying feelings, and many reported frequent concerns about how their emotional expressions would be perceived. While most students could recognize and label their emotions, a small subset (n = 4) never expressed emotions under stress, and 39 out of 123 reported frequent emotional outbursts, suggesting regulation challenges. Notably, emotional expressivity varied widely, with 37 participants rarely expressing emotions and 49 doing so frequently. The most common channels included conversations with peers and facial/body cues, though some mentioned less constructive outlets such as silence, sudden anger, or interacting with AI systems. These tendencies may reflect cultural norms emphasizing emotional restraint in East Asian collectivist contexts [14].

Regarding regulation strategies, nearly half of participants described their methods as inconsistent or limited. Cognitive reappraisal was used by 38 individuals, while seeking social support (n = 80) and relaxation techniques (n = 82) were the most commonly reported. Suppression (n = 68), exercise (n = 62), and creative outlets such as music or walking were also frequently mentioned. However, 67 participants expressed low confidence in their ability to manage emotions effectively.

Participants also reflected on the perceived impact of culture on their emotional experiences. Around 72% reported that cultural background had some or significant influence on their emotional expression, and over 65% believed that internationalized educational settings shaped their emotional identity. While 58% felt that international education provided more emotional support, others described occasional confusion in interpreting emotional cues within culturally diverse environments. These findings highlight the perceived relevance of cultural context in shaping emotional expression and regulation, particularly among highly sensitive youth.

Psychological screening indicators further revealed several areas of concern. On the Perceived Stress Scale (PSS), 19 participants scored above 15, indicating elevated stress that may impair sleep or emotional functioning. Among them, those scoring 19–24 were likely experiencing chronic high stress. On the Rosenberg Self-Esteem Scale (RSES), 33 participants scored 10 or below, reflecting low or very low self-esteem. Regarding life satisfaction, 38 participants scored 20 or below on the Satisfaction with Life Scale (SWLS), suggesting reduced subjective well-being and possible psychological difficulties. Finally, scores on the Multidimensional Scale of Perceived Social Support (MSPSS) showed that 12 participants reported low perceived support (below 36). These descriptive patterns indicate that a notable subset of adolescents — particularly those with heightened sensitivity — may be at elevated psychological risk, reinforcing the importance of emotional regulation and cultural adaptation as potential protective factors.

Together, these findings suggest that emotional vulnerabilities and strengths among highly sensitive adolescents are deeply embedded in both psychological capacities and socio-cultural environments.

5. Discussion

5.1. Summary and Interpretation of Key Findings

This study examined how sensory processing sensitivity (SPS) relates to emotional functioning and psychological well-being among Chinese adolescents in internationalized education settings. Highly sensitive adolescents reported significantly higher levels of emotion regulation and subjective well-being compared to their non-sensitive peers, while no significant group differences were found in emotional expression, perceived stress, self-esteem, or social support.

Within the highly sensitive group, emotion regulation showed a moderate positive correlation with life satisfaction ($r \approx .34$), and simple linear regression confirmed that regulation significantly predicted well-being, $F(1, 88) = 11.68$, $p < 0.01$, $R^2 = 0.117$. Each unit increase in regulation was associated with a 3.59-point rise in life satisfaction. Though a subgroup comparison between high and low regulators was not statistically significant ($p = 0.141$), the trend further supports the potential buffering role of regulation.

An exploratory subgroup analysis simulated a mediation-like pathway (SPS → Regulation → Well-being), echoing Greven et al.'s argument that emotional self-regulation can mitigate sensitivity-related risk. Gross's model also underscores the value of strategies like cognitive reappraisal in managing emotional intensity. By contrast, the lack of group differences in emotional expression may reflect collectivist cultural norms of restraint, even as internationalized settings expose adolescents to more expressive norms. These findings highlight the need for continued research on how sensitivity traits and regulatory mechanisms interact within culturally hybrid environments.

5.2. Theoretical and Practical Implications

This study contributes to the understanding of emotion regulation as a pivotal factor linking sensitivity traits and psychological well-being. For practitioners working with highly sensitive adolescents, these findings suggest the value of interventions that enhance cognitive reappraisal and mindfulness skills.

From a cross-cultural perspective, the findings imply that cultural adaptation and emotional socialization within international schools may offer both challenges and resources for emotional development. Programs that help adolescents navigate conflicting emotional norms and foster emotional literacy could improve their well-being.

5.3. Strengths and Limitations

This study contributes to the limited literature on emotional processes among highly sensitive adolescents in cross-cultural environments. Its use of validated scales and both group- and within-group analyses strengthens the findings. However, the modest sample size, reliance on self-report data, and absence of formal mediation models limit the generalizability and causal inference of the results.

5.4. Future Research Directions

To enhance the validity and generalizability of the current findings, future studies should aim to replicate this research using larger and more demographically diverse samples. This would improve statistical power and support broader applicability across adolescent populations. Additionally, the use of formal mediation models, such as the PROCESS macro or structural equation modeling (SEM), is recommended to rigorously test the hypothesized pathway from sensory processing sensitivity to psychological well-being through emotion regulation. Qualitative methods such as interviews or emotion diaries could be added to enrich understanding of adolescents' lived emotional experiences. Further attention should also be paid to the cultural dimension by using validated scales, particularly in international education contexts, where adolescents must navigate diverse emotional display rules. Finally, longitudinal research would be valuable in assessing

how emotion regulation capacities evolve over time and whether they act as protective factors or developmental assets in adolescence.

6. Conclusion

This study examined how sensory processing sensitivity (SPS) shapes emotional expression and regulation, and how these processes relate to psychological well-being among Chinese adolescents in international education settings. Significant group differences emerged in emotion regulation and life satisfaction, suggesting that internal regulatory strategies, rather than outward emotional expressivity, may play a more pivotal role in well-being among highly sensitive youth.

Within the highly sensitive group, both correlation and regression analyses revealed a positive association between emotion regulation and life satisfaction. Although exploratory subgroup comparisons did not reach statistical significance, the observed trends suggest that adaptive regulation may buffer psychological vulnerability in this population.

These findings underscore the protective potential of emotion regulation in sensitive youth and highlight the importance of fostering adaptive regulatory strategies in culturally complex environments. Continued research with larger, more diverse samples, formal mediation models, and longitudinal designs is needed to clarify how these dynamics unfold over time and to inform the development of culturally responsive emotional support systems for highly sensitive adolescents.

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