

The Influence of Alexithymia on Social Anxiety of Senior High School Students

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Abstract: To analyze the current situation of high school students' alexithymia and social anxiety, and on this basis, to explore the effect of alexithymia on social anxiety. The Toronto Alexithymia Scale (TAS-20) and the Social Anxiety Scale (SAS-A) was used as instruments to measure and analyze 1,736 high school students in the city of W. (1) The high percentage of high school students in the high subgroup of alexithymia difficulties was higher at 59.68%, and 66.65% of high school students had a social anxiety score > 30.11; (2) High school girls had significantly higher total alexithymia scores than boys ($p < 0.05$), non-only children had higher total alexithymia scores than only children ($p < 0.001$), and high school girls had significantly higher social anxiety scores than boys ($p < 0.001$); (3) High school students' alexithymia and social anxiety were significantly positively correlated ($r = 0.496$, $p < 0.01$), and all three dimensions of alexithymia were significantly positively correlated with all three dimensions of social anxiety; (4) The coefficient of determination of alexithymia on social anxiety was 0.284. Alexithymia is an important influence on social anxiety in high school students.

1. Introduction

In recent years, the rate of counseling for interpersonal problems among high school students has been increasing, and the number of counseling sessions for interpersonal problems is second only to those for academic problems [1]. Some studies have shown that interpersonal relationships are significantly negatively correlated with social anxiety in secondary school students [2]. Social anxiety refers to individuals who are in social situations that require contact with others, and who show fear of being noticed and evaluated and social avoidance due to irrational perceptions or negative automatisms such as low interpersonal self-efficacy, the belief that other people will notice their unnatural performance, or the belief that other people will give negative evaluations of themselves, and who generate corresponding and varying degrees of negative emotions and the negative emotions that come with the reactions [3]. The influences on social anxiety can be summarised in four areas: neurobiological aspects, cognitive aspects, environmental aspects, and personality traits. Difficulties experienced by high school students in identifying and describing their own or others' emotional feelings are a phenomenon that is caused by various influences and has become an important factor in social anxiety [4].

Alexithymia is a condition in which an individual lacks self-awareness of emotional states and has difficulty identifying and describing their own or others' emotional feelings. The distinguishing features are the individual's difficulty in identifying and describing his or her own and other people's emotions and feelings, difficulty in distinguishing between emotions and feelings and the bodily sensations that come with them, and an extroverted cognitive style of thinking [5]. Alexithymia suffers from deficits in emotion language schema, which leads to difficulties in assessing the validity of verbal emotional information in individuals with alexithymia, and as verbal communication is an important part of social interaction, deficits in emotion language schema constrain the production and expression of emotionally experienced emotions in social interaction in alexithymia [6]. High school students have limited social experience, limited education, and lack of psychological theories, which sometimes makes it difficult for them to accurately express their personal feelings and understand the causes and intentions of others' emotional changes, and they lack effective problem-solving skills [7], and leads to inefficiency in dealing with problems, and may experience frustration in social interactions, which gradually triggers in the individual manifestations of high neuroticism and low self-directedness, which is important influences on social anxiety.

The significant features of alexithymia are reflected in the various factors affecting social anxiety in high school students, so it can be hypothesised that there is a correlation between alexithymia and social anxiety; moreover, when high school students' alexithymia difficulties were effectively alleviated, it also reduced their social anxiety levels. Therefore, the purpose of this study is to analyze the current situation of alexithymia and social anxiety among high school students and to investigate the effect of alexithymia on social anxiety.

2. Research Objectives and Methods

2.1. Research Object

A total of 1, 867 scales was distributed to students in the first and second grades of a high school in city W. After excluding invalid scales, 1,736 valid scales were recovered, with a validity rate of 92.98%. The basic information is shown in Table 1.

Table 1: Basic Statistics on Sample Size

Variant	Form	Quorum	Percentages (%)
Sexes	Male	893	51.44
	Female	843	48.56
Only child or not	An only Child	1089	62.73
	Not only Child	647	37.27

2.2. Research Tools

The Toronto Alexithymia Scale developed by Taylor (1984) and later revised with Bagby (1997) was used [8]. The scale has 3 dimensions and 20 questions, with Dimension 1 representing difficulties in recognizing emotions and feelings, Dimension 2 representing difficulties in expressing emotions and feelings, and Dimension 3 representing extroverted thinking. A 5-point scale was used, with 1 being "very non-compliant" and 5 being "very compliant", and the higher the score, the higher the level of alexithymia. This study will use the TAS-20 as an instrument to measure the level of alexithymia among high school students, as well as the scoring criteria used by Zhu in his study on the Toronto Difficulty in Alexithymia Scale [9]. In this study, the Cronbach's alpha coefficient was 0.784.

The Social Anxiety Scale (SAS-A) developed by Greca (1998) and revised by Haidong Zhu (2008) was used [10]. The scale consists of 13 questions and contains 3 dimensions: Dimension 1 represents fear of negative evaluation, Dimension 2 represents social avoidance and distress in unfamiliar situations, and Dimension 3 represents social avoidance and distress in general situations. The scale was scored on a 5-point scale, with 1 representing "very non-compliant" and 5 representing "very compliant", and the higher the score, the higher the level of social anxiety. In the study, the Cronbach's alpha coefficient was 0.901.

2.3. Statistical Methods

After data recovery, data were statistically analyzed using SPSS 26.0.

3. Results

3.1. Overall Status of Alexithymia and Social Anxiety among High School Students

Table 2: Statistical Table on the Overall Situation of High School Students' Alexithymia and Social Anxiety

		<i>M</i>	<i>SD</i>	Min	Max	Mdn	M/Item
Alexithymia	TAS-20	58.57	10.52	24	89	59.00	2.93
	Difficulty in Recognizing Emotional Sentiments	18.52	6.25	7	35	19.00	2.65
	Difficulty in Expressing Emotional Feelings	13.91	3.11	5	23	14.00	2.78
	Extroverted Thinking	26.15	4.22	8	40	26.00	3.27
Social Anxiety	SAS-A	35.61	10.99	14	64	36.00	2.74
	Fear of Negative Evaluation	16.74	6.04	6	30	17.00	2.79
	Social Avoidance and Distress in Unfamiliar Situations	12.24	4.21	4	20	12.00	3.06
	Social Avoidance and Distress in General Contexts	6.63	2.86	3	15	6.00	2.21

According to Table 2, the overall mean value of high school students' alexithymia is 58.57. According to Zhu et al.'s scoring criteria, in this study, the proportion of the high group of high school students with alexithymia are 59.68%, the proportion of the middle group is 34.68%; and the proportion of low group is 5.65%, which indicates that the proportion of high group of high school students with alexithymia is higher among high school students.

In this study, the overall mean social anxiety score of high school students was 35.61, and 66.65% of the high school students' social anxiety scores were higher than the mean score of 30.11 of the total social anxiety scores of high school students by Haidong Zhu in his study, which indicates that the overall level of high school students' social anxiety is high.

3.2 Gender Differences in High School Students' Alexithymia and Social Anxiety

According to Table 3, the results of the independent samples t-test showed that there was a significant difference between the total scores of male and female alexithymia difficulties in terms of gender, and the total scores of female alexithymia difficulties were significantly higher than those of male alexithymia difficulties, with $t(1734) = -2.41$, $p < 0.05$, and $d = -0.12$; among the three alexithymia difficulties, there was no significant difference among the dimensions of "difficulty in recognizing emotional feelings" and "Difficulty in expressing emotional feelings" dimensions were not significantly different, $t(1734) = -0.48$, $p = 0.63$; $t(1734) = -1.44$, $p = 0.15$, and the "Extraverted Thinking" dimension girls scored significantly higher than boys, $t(1734) -4.24$, $p < 0.001$, $d = -0.20$.

There was a significant difference between the total social anxiety scores of boys and girls, with

girls' social anxiety scores significantly higher than boys' $t(1734) = -3.19, p < 0.001, d = -0.15$; among the three dimensions of social anxiety, the "Fear of Negative Evaluations" and the "Social Avoidance and Distress in Unfamiliar Situations". In the three dimensions of social anxiety, "fear of negative evaluations" and "social avoidance and distress in unfamiliar situations" scored significantly higher for girls than for boys, $t(1734) = -3.93, p < 0.001, d = -0.19$, and $t(1734) = -2.96, p < 0.01, d = -0.14$ respectively; there was no significant difference between girls and boys in the dimension of "social avoidance and distress in general situations, $t(1734) = -2.96, p < 0.01, d = -0.14$. There was no significant difference, $t(1734) = 0.39, p = 0.70$.

Table 3: Gender Differences in High School Students' Alexithymia and Social Anxiety

		Male($n = 893$)	Female($n = 843$)	t
		$M \pm SD$	$M \pm SD$	
Alexithymia	TAS-20	57.98 \pm 11.10	59.19 \pm 9.83	-2.41*
	Difficulty in Recognizing Emotional Sentiments	18.44 \pm 6.22	18.59 \pm 6.28	-0.48
	Difficulty in Expressing Emotional Feelings	13.80 \pm 3.22	14.02 \pm 2.97	-1.44
	Extroverted Thinking	25.73 \pm 4.44	26.58 \pm 3.93	-4.24***
Social Anxiety	SAS-A	34.80 \pm 10.85	36.47 \pm 11.08	-3.19***
	Fear of Negative Evaluation	16.19 \pm 5.93	17.32 \pm 6.10	-3.93***
	Social Avoidance and Distress in Unfamiliar Situations	11.95 \pm 4.14	12.55 \pm 4.26	-2.96**
	Social Avoidance and Distress in General Contexts	6.65 \pm 2.89	6.60 \pm 2.83	0.39

Note: * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, same below.

3.3. Differences in High School Students' Alexithymia and Social Anxiety on Whether or Not They Are Only Children

The independent samples t-test were used to investigate the differences between high school students' alexithymia and social anxiety and the dimensions of whether they were only children or not. The results showed that the total scores of high school students' alexithymia were significantly different on whether they were only children or not, and that the scores of non-only children on alexithymia were significantly higher than those of only children, $t(1734) = -4.64, p < 0.001, d = -0.23$; in this case, the scores of non only children scored significantly higher than only children on both the "Difficulty recognizing emotions" and "Difficulty expressing emotions" dimensions, $t(1734) = -5.01, p < 0.001, d = -0.25$; $t(1734) = -4.63, p < 0.001, d = -0.25$; $t(1734) = -4.63, p < 0.001$; $t(1734) = -0.25$; $t(1734) = -4.01, p < 0.001, d = -0.25$; and $t(1734) = -4.63, p < 0.001, d = -0.23$. Non-only children scored significantly higher than only children on the "social avoidance and distress in general situations" dimension of social anxiety, $t(1734) = -1.96, p < 0.05, d = -0.10$. See Table 4:

Table 4: Differences in High School Students' Alexithymia and Social Anxiety on Whether or Not They Are Only Children

		An Only Children ($n = 1089$)	Non-only children ($n = 647$)	t
		$M \pm SD$	$M \pm SD$	
Alexithymia	TAS-20	57.67 \pm 10.50	60.08 \pm 10.38	-4.64***
	Difficulty in Recognizing Emotional Sentiments	17.94 \pm 6.28	19.48 \pm 6.08	-5.01***
	Difficulty in Expressing Emotional Feelings	13.64 \pm 3.11	14.35 \pm 3.05	-4.63***
	Extroverted Thinking	26.09 \pm 4.20	26.24 \pm 4.26	-0.73
Social Anxiety	SAS-A	35.31 \pm 11.11	36.12 \pm 10.79	-1.49
	Fear of Negative Evaluation	16.52 \pm 6.11	17.10 \pm 5.90	-1.94
	Social Avoidance and Distress in Unfamiliar Situations	12.26 \pm 4.29	12.22 \pm 4.07	0.21
	Social Avoidance and Distress in General Contexts	6.52 \pm 2.83	6.80 \pm 2.90	-1.96*

3.4. An Analysis of the Correlation between Alexithymia and Social Anxiety in High School Students

Pearson's correlation analysis of the relationship between alexithymia and high school students' social anxiety was conducted, and the results are shown in Table 5. High school students' alexithymia scores and social anxiety scores showed a significant positive correlation ($p < 0.01$), which indicates that the higher the level of high school students' alexithymia difficulties, the more severe their social anxiety. The correlation analysis among the dimensions showed that there was a significant positive correlation among the three dimensions of alexithymia, emotional-emotional recognition difficulty, emotional-emotional expression difficulty, and extroverted thinking, and the three dimensions of social anxiety, namely, fear of negative appraisal, social avoidance and distress in unfamiliar situations, and social avoidance and distress in general situations.

Table 5: Correlation Analysis of Alexithymia with Total Score and Dimensions of Social Anxiety

Variant	1	2	3	4	5	6	7	8
1. Alexithymia	1							
2. Difficulty in Recognizing Emotional Sentiments	0.872**	1						
3. Difficulty in Expressing Emotional Feelings	0.784**	0.627**	1					
4. Extroverted Thinking	0.624**	0.231**	0.290**	1				
5. Social Anxiety	0.496**	0.507**	0.446**	0.157**	1			
6. Fear of Negative Evaluation	0.451**	0.476**	0.365**	0.149**	0.888**	1		
7. Social Avoidance and Distress in Unfamiliar Situations	0.355**	0.332**	0.342**	0.142**	0.829**	0.545**	1	
8. Social Avoidance and Distress in General Contexts	0.431**	0.453**	0.439**	0.081**	0.751**	0.501**	0.563**	1

3.5. Regression Analysis of Alexithymia and Social Anxiety in High School Students

Table 6: Regression Analysis of Alexithymia on Social Anxiety

Model	Non-Standardized Coefficient		Standardized Factor	t	Significance	VIF
	B	Standard Errors	β			
(Constant)	0.960	0.118		8.119	0.000	
Difficulty in Recognizing Emotional Sentiments	0.353	0.025	0.373	14.262	0.000	1.655
Difficulty in Expressing Emotional Feelings	0.285	0.036	0.209	7.858	0.000	1.710
Extroverted Thinking	0.016	0.034	0.010	0.482	0.630	1.096
R^2				0.284		
F				228.746		
p				< 0.001		
Dependent variable: Social Anxiety						

A hierarchical regression analysis was conducted with alexithymia and the dimensions as independent variables and social anxiety as the dependent variable, as shown in Table 6. This linear regression equation was significant, $F = 228.746$, $p < 0.001$, indicating that at least one of the three independent variables can significantly affect the dependent variable satisfaction. Difficulty in recognizing emotional affect ($\beta = 0.373 > 0$, $p < 0.001$), and difficulty in expressing emotional affect ($\beta = 0.209 > 0$, $p < 0.001$) could significantly and positively predict social anxiety; extroverted thinking could not significantly affect social anxiety ($p = 0.630 > 0.05$). The coefficient of determination of alexithymia on social anxiety was 0.284, indicating that difficulties in

recognizing emotional affect explained 28.4% of the variance in the overall level of social anxiety. The VIF was all less than 5, indicating that there was no multicollinearity among the three independent variables.

4. Discussion

4.1. Current Status of Alexithymia and Social Anxiety in High School Students

4.1.1. Current Status of Alexithymia in High School Students

According to the grouping of alexithymia difficulties by domestic scholars Zhu et al, low grouping (≤ 40), middle grouping (40~57), and high grouping (≥ 57), the average score of alexithymia difficulties of high school students in this study was $58.57 > 57$, which belonged to the level of the high grouping, indicating that the level of alexithymia difficulties of high school students was generally high, which was in line with Xiong Q. et al's stud.

First, high school students' difficulties in recognizing others' emotions may be related to social experiences and cognitive development. High school students have limited social experience and may lack experience in observing and judging others' emotions. At the same time, their cognitive abilities and emotional understanding are still developing, and they may not be able to accurately interpret nonverbal signals of others' emotions.

Secondly, there are various reasons why high school students encounter difficulties in emotional expression. High academic pressure and tight schedules cause them to be reluctant to invest too much time in emotional expression. Family environment, school education, and social concepts may also affect their emotional expression. Lack of communication and understanding in family education, conflict between school education and social ideas, and the phenomenon of "involution" among students may all lead to difficulties in emotional expression among high school students.

Finally, high school students are not self-aware and may not fully understand their emotions and needs. The busy pace of life and social pressures may cause them to neglect their inner feelings. At times, high school students may neglect their mental health, believing that focusing on their inner feelings is a sign of "weakness". They may have difficulty paying attention to their inner feelings when there is a lack of emotional support at home and school.

4.1.2. Current Status of Social Anxiety in High School Students

In this study, the overall mean score of social anxiety was 35.61, and 66.65% of the high school students' social anxiety scores were higher than the mean score of 30.11 of the total social anxiety scores of school students by Haidong Zhu in his study, which indicates that high school student's level of social anxiety is high in general.

The high school years are one of the most important stages of life, with pressures such as college entrance exams and future career planning, and these pressures may lead to social anxiety in high school students. They may worry about not performing well enough, being judged or blamed by others, or not being able to build good relationships with others; at the same time, with the popularity of social media, high school students use social media more to communicate and get information than face-to-face communication, and this virtual way of socializing may cause them to feel uncomfortable and anxious in real interactions [11]; Some high school students may lack interpersonal skills, do not know how to build rapport with others, or are unable to deal effectively with interpersonal conflicts. This may cause them to feel uneasy and anxious in their interactions; In the current group of high school students, in some families, parents are overprotective of their children, do not allow them to face problems independently, or inappropriately resolve interpersonal

conflicts in front of their children, which can easily lead to their children feeling anxious in socialization; during adolescence, high school students begin to form a self-identity, recognizing that they are different from others in terms of appearance, ability, and personality. This process of self-identification may cause them to feel unconfident and anxious in social situations.

4.2. Differential Analysis of Alexithymia and Social Anxiety on Demographic Variables

There was a significant difference in the level of alexithymia difficulty among high school students by gender, with girls' total alexithymia difficulty scores being significantly higher than boys', which is consistent with Ling Yu, Li Senpeng, et al [12-13]. Among the three dimensions within alexithymia, girls scored significantly higher than boys on the dimension of "Extraverted Thinking", which is consistent with the study of Tang Huiyi et al. With the gradual narrowing of the gender division of labor, people's views on gender, sexual orientation, and family roles have changed considerably. In some cases, women may be given a more caring and detail-oriented role [14]. This may cause them to pay more attention to the minutiae on the outside of things. "According to the Needs-Threat Model, when men face social exclusion, their efficacy needs (i.e., the intrinsic positive pursuit of self-efficacy, competitiveness, and autonomy) are particularly threatened, and therefore they focus more on self-improvement to enhance their sense of self-efficacy. When faced with social exclusion, women's relational needs (i.e., seeking harmonious, intimate, and stable social connections to gain social acceptance and a sense of belonging) are more threatened, so they are more likely to turn their focus to others to satisfy their relational needs by establishing new social relationships [15].

High school students' alexithymia difficulties differed significantly on whether or not they were only children, with non-only children having significantly higher levels of alexithymia difficulties than only children. In comparing non-only-child home environments to only-child home environments, we find that only children are more likely to receive focused care from parents and elders [16]. These factors contribute to good family relationships and make only children more willing to express their inner feelings. In families with non-only children, there is often more than one child, a situation that may expose them to competitive pressures from multiple sources [17]. In addition, in these families, parents and other elders may not pay equal attention to their children, and these factors may cause non-only children to avoid feelings, thereby increasing difficulties in recognizing and expressing emotional affect.

4.3. The Effect of Alexithymia on Social Anxiety

The results of this study show that there is a strong relationship between alexithymia and social anxiety and that high school students with more severe alexithymia conditions are likely to have high levels of social anxiety as well. Previous research has shown that individuals with alexithymia usually have some degree of deficits in their emotional schema. This deficiency is manifested in two main areas: the emotional-verbal schema and the emotional-nonverbal schema. First, deficits in the emotional language schema lead to difficulties for individuals with alexithymia to effectively express their emotional feelings in social situations [18], which further reduces their chances of communicating with others through speech. Second, deficits in the nonverbal schema of emotions make it difficult for these individuals to understand and interpret the external cues of their own or others' emotions, a performance that can lead to a lack of theory of mind [19], which leads to a reduced ability to perceive emotional states in social situations, which in turn affects their problem-solving abilities.

In social situations, individuals with alexithymia may be misunderstood and discriminated against by others due to their ineffective performance in dealing with social emotions. Such

misunderstandings and discrimination not only increases the psychological stress of individuals with alexithymia who fears negative evaluations but may also lead to their lack of interactional efficacy, which exacerbates their low self-esteem and ultimately triggers social anxiety.

5. Conclusions

In summary, the results of this study indicate the current situation of high school students' alexithymia and social anxiety, and reveal the impact of alexithymia on social anxiety, which to some extent achieves the validation and supplementation of previous theoretical studies on alexithymia and social anxiety. Moreover, this study provides insights into educational practices and interventions that can help high school students improve their social anxiety from the perspective of alexithymia, which can be used as a way to improve the current situation of alexithymia and social anxiety among high school students. In addition, educators should actively establish a partnership with parents, and both parties need to pay attention to and promote high school students' alexithymia situation, and create a favorable environment and conditions for high school students to solve their social anxiety situation by providing targeted support and assistance.

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