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Structural Equation Modeling Relationship between Symptoms of Social Anxiety Disorder Based on Early Maladaptive Schemas, Anxiety Sensitivity Components, and Perfectionism in Adolescents

Zahra Alibakhshi[1] (PhD), Zahra Solgi[1] (PhD)

1. Department of Psychology, Payame Noor University, Tehran, Iran

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Corresponding Author:
Zahra Solgi,
Department of Psychology,
Payame Noor University,
Tehran,
Iran
E-mail: khajeh8794@gmail.com

Abstract

Introduction: This study aimed to demonstrate that structural equation modeling of social anxiety disorder is based on Early Maladaptive Schemas (EMS), Anxiety Sensitivity (AS) components, and perfectionism in adolescents.
Method: The study was a descriptive correlation performed with path analysis. The statistical population comprised 250 female students who were selected by a cluster random sampling method in Kermanshah city in 2019. Data were gathered using the Social Anxiety Questionnaire for adults Young Schema Questionnaire-Short Form, Anxiety Sensitivity Index, and the Perfectionism Inventory. The data were analyzed using the path analysis method.
Results: The results showed that the Root Mean Square Error is 0.068 and the Square Root of the Mean Square root is 0.063, which is less than the criterion (0.08) and thus confirms the fit of the model. Moreover, the schemas of disconnection and rejection ($p < 0.01$, $\beta = 0.13$), impaired autonomy and performance ($p < 0.01$, $\beta = 0.14$), impaired limits ($p < 0.01$), $B = 0.13$), other-directedness ($p < 0.01$, $\beta = 0.29$), over vigilance and inhibition ($p < 0.01$, $\beta = 0.16$) and AS variables ($p < 0.01 = 0.01$, $\beta = 0.15$ and perfectionism ($p < 0.01$, $\beta = 0.17$) have a direct and significant effect on social anxiety.
Conclusion: Early maladaptive schema, AS components, and perfectionism have a predictive role in social anxiety disorder among adolescents.

Keywords: Social Anxiety Disorder, Early Maladaptive Schemas, Anxiety Sensitivity, Perfectionism, Adolescents

Introduction

Psychologists believe that social anxiety is one of the most prevalent mental health problems, constant and apparent fear of behavior in social or practical situations. Based on this belief, people expect that the circumstances will result in a person acting humiliatingly or embarrassingly. The feeling of social anxiety arises from a fear of situations and interactions with other people, which automatically induces feelings of self-awareness, judgment, evaluation, and criticism. Social anxiety refers to feelings of shame, inferiority, depression, and inadequacy resulting from previous assessments and negative judgments made by others [1]. The evidence indicates that students' social anxiety is one factor that impacts their ability to adjust to social situations. A study revealed that 20% of students have symptoms of social anxiety during their school years, and more than 12% suffer from social anxiety in their lifetime [2].

Social anxiety disorder appears as a discrete category in the DSM-5, with the threshold for diagnosis being persistent and extreme social fears associated with clinically significant distress and impairment. Researchers suggested that social anxiety is a continuum, from mild presentations such as slight shyness to severe and impairing forms, a namely social

anxiety disorder. Social anxiety disorder has an early onset compared to other anxiety disorders, usually developing between eight and 15-year-old [3]. Social anxiety disorder is associated with profound negative consequences and high levels of impairment even when compared to other psychiatric disorders. It actually affects all areas of life. For adolescents, academic attainment is curtailed, with individuals at risk of leaving school early and obtaining poorer qualifications [4]. Amongst a sample of 784 Finnish 13–17-year olds, those with a clinical or subclinical social anxiety disorder had a lower grade point average compared to those with no diagnosis [5, 6]. Social relationships are inevitably particularly challenging for socially anxious adolescents. They report having fewer friends, and the peer and romantic relationships they do have are of poorer quality. They are more likely to be victims of bullying [5, 6].

Clinical and epidemiological studies have established the role of biological, cognitive and social processes in the formation of social anxiety disorder [7]. There is also research supporting the claim that maladaptive schemas (EMS) are stable diathetic entities to psychopathology, not reducible to temporary cognitions accompanying current symptoms. In summary, EMSs have been found to be related to symptomatic distress across a wide range of psychological disorders, and changes in EMSs appear to be related to symptom-relief. In addition, there is evidence to support the claim that schemas are not merely by-products of current pathology, but are rather stable diathetic structures that can lie dormant and be reactivated to cause the recurrence of pathology [8-10]. The development of faulty cognitive structures named EMS is commonly observed in young people, and they have been implicated in provoking anxiety disorders [9]. The EMS may be developed by adolescence, which can predict future depressive and social anxiety symptoms. EMS operates relatively independently of stress levels [10]. The findings highlight schemas related to disconnection/rejection, impaired autonomy/performance, and other-directedness as particularly salient precursors of anxiety symptoms [9].

A growing body of evidence supports the contribution of Anxiety Sensitivities (AS) to anxiety disorders. According to AS, anxiety has many negative physiological, psychological, cognitive, and behavioral consequences [11]. A higher level of AS was associated with a higher anxiety level in the study[12]. It reveals that increased AS, or the fear of anxiety-related cognitive, social, and physical symptoms misinterpreted as harmful, is linked to substance use disorders [13]. In response to threat-induced hyper arousal, AS, a major risk factor for anxiety disorders, modulates anger. Results indicate that AS reductions mediate later reductions in anger, hostility, verbal aggression, and physical aggression [14].

According to research, Latinas are more likely to experience somatization of mental health symptoms, and AS is directly associated with mental health problems [15]. Researchers found that high AS people who consumed energy drinks exhibited interceptive bias, indicating possible interactions between physical states, interception, and anxiety [16]. Those with low physical activity levels are more likely to suffer from AS [17].

Cognitive models of social anxiety do not directly refer to perfectionism; however, these models emphasize the importance of the discrepancy between standards for performance and one's perceived ability to meet such standards [18]. According to the literature, this discrepancy is identified with perfectionism and relates to the discrepancy associated with perfectionist concerns. Therefore, the measurements used frequently in perfectionism can be indirectly but consistently summed up as their cognitive counterparts in social anxiety theory. According to various cognitive models, perfectionism correlates with social anxiety [3]. Several studies have suggested that social anxiety is correlated with perfectionist behavior [3, 19, 20]. Perfection is defined as having very high standards and expectations for oneself and others, worrying about mistakes and placing a great deal of importance on everything being perfect [21]. There is also a reciprocal relationship in which perfectionism and eating disorders are mediated through anxiety and depression in populations of children and adolescents [22, 23].

Damian et al. [24] found that perfectionistic concerns were positively related to anxiety symptoms in middle-to-late adolescents (16–19 years old). Compared to perfectionistic strivings, perfectionistic concerns predicted longitudinal increases in adolescents' anxiety symptoms. Additionally, identifying and targeting underlying elements could lead to more focused and efficient therapeutic efforts, with more lasting effects. Hence, this study aimed to demonstrate structural equation modeling of social anxiety disorder based on EMS, anxiety sensitivity components, and perfectionism in adolescents.

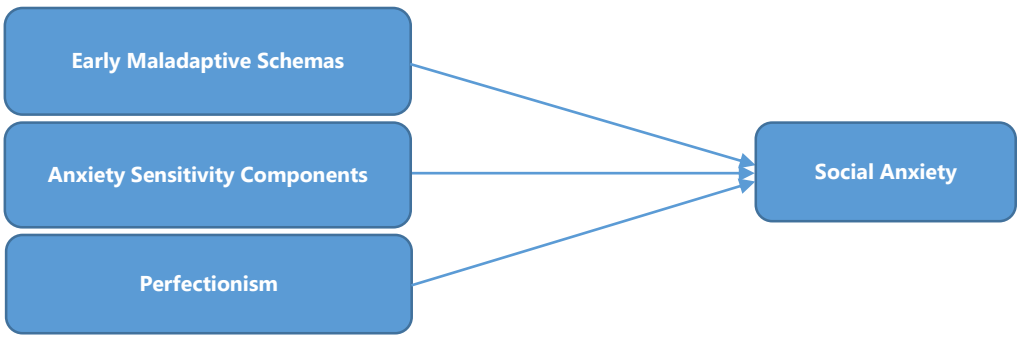

Figure 1. Conceptual Model

Method

The study was a descriptive correlation performed with path analysis. The statistical population comprised 250 female students aged between 16-18 years in Kermanshah city in 2019. The sample size was determined using Morgan's sample size table (n=180 if N>280). To select the participants, after obtaining permissions and coordination with the education departments of the mentioned city, a statistical sample was selected by a cluster random sampling method. To do so, we initially divided the population (regular high schools of city) into smaller regions (clusters). Afterwards, from each region, one of the existing schools was randomly selected and ultimately, from each school, students were randomly selected. They were asked to fill in the research questionnaires.

In this study, completing the questionnaires for students took 60 to 90 min. The inclusion criteria were included consent to participate in research, and the age range of between 16-18 years. The exclusion criteria included failure to completely answer all the questions. A total of 148 questionnaires were analyzed following the elimination of incomplete questionnaires. The willingness to participate in the research, information confidentiality (confidentiality principle), and observance of participants' rights were the ethical considerations of the research.

The path analysis method was conducted by using Amos18 software to evaluate the research model. Before using path analysis, the data set's outliers were analyzed with box diagrams, and multivariate outlier data were analyzed using Mahalanobis statistics and were excluded from the data set. A skewness and kurtosis calculation was performed on the variable scores using SPSS 26 software, and all values were less than 1%. The normality of the data was checked using the Kolmogorov-Smirnov test. The results showed that the distribution of scores in all four model variables is normal ($p < 0.05$). The alignment hypothesis between the variables was investigated using tolerance statistics and variance inflation factor. Results showed that none of the tolerance statistics values were less than the allowable limit of 0.1 and none of the variance inflation factor values exceeded the acceptable limit of ten.

The Social Anxiety Questionnaire for Adults (SAQ-A30): Caballo et al. developed this test which is divided into five components: 1) Speaking in public/talking with authority figures, 2) Interaction with people of the opposite sex, 3) Expressing displeasure, 4) Criticism and embarrassment, and 5) Interactions with strangers. There are six dimensions and each item is rated on a Likert scale of 1 (Not at all or very slight) to 5 (Very high or extremely high) levels of unease, stress, or nervousness [25]. Internal consistency was 0.91 and concurrent validity (paired with LSAS-SR) was 0.66. Significant differences were found between males and females, but there was scarce difference between the studied regions and subjects [25]. Cronbach's alpha for this questionnaire was 0.92 in Iran [26].

Young Schema Questionnaire-Short Form (YSQ-S3): The YSQ-S3 questionnaire has been developed by Young [27]. This scale is a 90 item self-report inventory comprised of 18 separate schemas. Domains of these schemas include the following: 1. Disconnection and Rejection, 2. Impaired Autonomy and Performance, 3. Impaired Limits, 4. Other-Directedness, and 5. Over vigilance and Inhibition. The responses are rated from 1 ("completely untrue of me") to 6 ("describes me perfectly"), with higher ratings reflecting stronger endorsement of beliefs tied to specific EMS (for example, "I don't fit in"). The validity of this questionnaire using Cronbach's alpha method was 0.964 for the whole test and higher than 0.80 for all subscales [27]. Coefficient alpha of .94 was observed for the YSQ-S3 domain, with alphas ranging from .86 (emotional deprivation) to .89 (defectiveness/shame) at the subscale level [28].

Anxiety Sensitivity Index (ASI): The Anxiety Sensitivity Questionnaire (ASI) is a 16-item self-report questionnaire. This questionnaire was developed by Reese and Patterson in 1985 [29]. Participants answer a list of questions on a 5-point Likert scale indicating whether they perceive anxiety sensations as causing embarrassment, illness, or additional anxiety. A high Cronbach's alpha of 0.88. and a high test-retest reliability of 0.75, for the ASI proves the instrument's high internal consistency. Cronbach's alpha coefficients for the whole scale and for the physical, cognitive, and social concerns factors were 0.90, 0.74, 0.79, and 0.78, respectively [30].

Perfectionism Inventory (PI): The PI is a 59-item measure used to test the multidimensional facets of perfectionism, which has been developed by Hill et al. [31]. PI assesses perfectionism as an eight-dimensional construct composed of Concern over Mistakes (CM), High Standards for Others (HSO), Need for Approval (NA), Organization (O), Perceived Parental Pressure (PPP), Planfulness (P), Rumination (R), and Striving for Excellence (SE). The scores are based on a 5-point scale (1 = strongly disagree to 5 = strongly agree). Hill et al. [31] have reported that the internal consistency is high, ranging from .83 to .91 for all of the subscales. The scale consists of six subscales: CM, which measures negative reactions to mistakes, PS, which reflects the setting of high standards, PE, which measures perceived parental expectations of excellence, PC, which assess levels of parental criticism, D, which indicates a person's self-doubt accomplishments, and O, which assesses the importance of orderliness. The total score is made up of the score of all subscales excluding O. Good internal reliability has been reported: F-MPS total= 0.90: CM=0.88; PS=83; PE=0.84; D=0.77; PC=0.84; and O=0.93 [32].

Results

In this study, 250 female students with anxiety disorders participated, the highest number of 90 (34.2) of whom were in Grade 11th and the lowest Grade was Grade 10. The minimum age was 16 years (27.2) and the maximum age was 17 (37.6).

Table 1 provides demographic information about the members of the study sample, including age and

educational background.

Table 1. Demographic Information of Research Sample Members

		F	Perrcent
Age	16 years	68	27.2
	17 years	94	37.6
	18 years	88	35.2
Grade	10th	75	30
	11th	90	34.2
	12th	85	35.1

Table 2 provides descriptive information about mean and standard deviation along with correlation coefficients between research variables. As shown, the correlation coefficients between EMS, AS, and perfectionism with social anxiety are positive and significant at the alpha level of 0.01. The positive coefficients obtained indicate a direct relationship between EMS, AS, and perfectionism with social anxiety.

To study the structural equation model, one of the most important assumptions in the model is the number of factors used in the model. Supported by the ultimate SEM model, structural equation modeling involves a family of multivariate statistical methods that simultaneously investigate the relationships between apparent and hidden variables or indirectly through the measured variables.

After examining the assumptions and ensuring their validity, path analysis was used to evaluate the model under study. The studied model along with the indicators related to the model fit are presented below.

Table 2. Mean, SD and Correlation between Research Variables

	Mean	SD	1	2	3	4	5	6	7	8
1- Disconnection and Rejection	51.62	9.64	1							
2- Impaired Autonomy and Performance	38.36	5.63	0.24**	1						
3- Impaired Limits	27.36	3.13	0.48**	0.28**	1					
4- Other-Directedness	29.32	3.12	0.57**	0.14**	0.51**	1				
5- Over vigilance and Inhibition	31.12	6.72	0.17**	0.33**	0.23**	0.10*	1			
6-Anxiety Sensitivity	32.82	6.31	0.54**	0.22**	0.54**	0.58**	0.26**	1		
7-Perfectionism	142.55	12.58	0.58**	0.38**	0.58**	0.58**	0.28**	0.63**	1	
8-Social Anxiety	79.11	9.50	0.51**	0.33**	0.50**	0.55**	0.32**	0.54**	0.58**	1

**. Correlation is significant at the 0.01 level.

*. Correlation is significant at the 0.05 level.

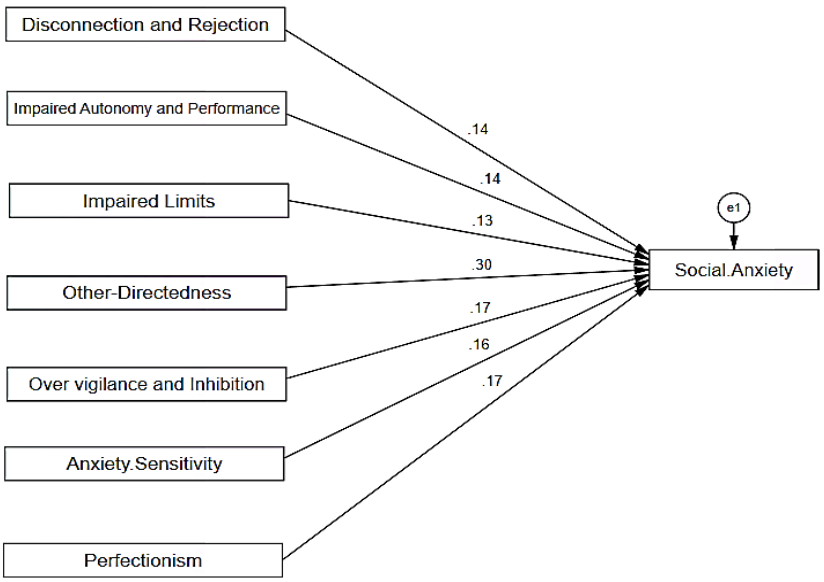

Figure 2. Standard coefficients of the proposed model to investigate the relationship between EMS, AS and perfectionism with social anxiety.

Table 2 presents the model fit indices. The RMSEA is 0.06 and the SRMR is 0.06, which is less than the criterion (0.08) and thus confirms the fit of the model. The IFI, CFI, GFI and NFI indices are also larger than the desired criterion (0.9). The obtained coefficients indicate the optimal fit of the model.

The results of Table 3 show that the schemas of disconnection and rejection (p <0.01, β = 0.13), impaired autonomy and performance (p <0.01, β = 0.14), impaired limits (p <0.01)., B = 0.13), other-directedness (p <0.01, β = 0.29), over vigilance and inhibition (p <0.01, β = 0.16) and AS variables (p <0.01= 0.01, β = 0.15 and perfectionism (p <0.01, β = 0.17) have a direct and significant effect on social anxiety.

Table 2. Model Fit Indices

Goodness of Fit Index	GFI	NFI	RMSEA	CFI	IFI	SRMR
Acceptable domain	>0.9	>0.9	<0.08	>0.9	>0.9	<0.08
Observed value	0.92	0.910	0.06	0.91	0.91	0.06

Table 3. Direct Effects between Research Variables

Path			β	t	P
1- Disconnection and Rejection	→	Social Anxiety	0.13	3.00	0.003
2- Impaired Autonomy and Performance	→	Social Anxiety	0.14	3.14	0.002
3- Impaired Limits	→	Social Anxiety	0.13	2.90	0.004
4- Other-Directedness	→	Social Anxiety	0.29	6.55	0.001
5- Over vigilance and Inhibition	→	Social Anxiety	0.16	3.64	0.001
Anxiety Sensitivity	→	Social Anxiety	0.15	3.39	0.001
Perfectionism	→	Social Anxiety	0.17	3.81	0.001

Discussion

The present study examined whether EMS, AS components, and perfectionism contribute to the symptoms of social anxiety disorder in a sample of nonclinical adults, and if these factors may represent potential pathways. Calvete et al. [10] found that five maladaptive schema domains were significantly associated with social anxiety [10]. The results of this study are consistent with those of previous research, which has found that EMS are associated with anxious behavior [8, 33].

According to current literature, there was a direct and indirect relationship between maladaptive cognitive schemas and social anxiety. Previous research has confirmed the findings of this study [33-36]. An investigation by Calvete et al. [37] examined the influence of anxious automatic thoughts on social anxiety symptoms in 1052 non-clinical adolescents on the relationship between schemas and future manifestations of anxiety. These results indicated that schemas predicted surface-level anxious thoughts, which then perpetuated the schemas[37]. A bidirectional relationship existed between disconnection and rejection, as well as beliefs regarding self-concept [38-40]. Therefore, schemas associated with other-directedness play a critical role in the development and maintenance of social anxiety. These studies support the theory that people with social anxiety exhibit more EMSs, such as a sense of feeling of being disconnected and rejected [41].

Furthermore, social anxiety and AS were significantly correlated. The results indicate that the severity of anxiety symptoms and AS are separate constructs. Similar to previous studies [38-40], the results of our study support the idea that AS can be viewed as a more general psychological construct that is related to the severity of anxiety symptoms [39]. AS appears to be related to anxiety and mood primarily through cognitive aspects but post hoc analyses found that a combination of physical and social-cognitive AS factors were associated with higher levels of anxiety symptoms, which coincides with a meta-analysis linking all AS factors to suicidal ideation [42]. It means that AS may become a factor during treatment. Among Wald's subjects with obsessive-compulsive disorders, social anxiety, general anxiety, and high sensitivity to anxiety-related symptoms is modulated by images and in vivo exposures [41].

The diagnosis of AS can cause a reluctance to participate in exposure exercises, preventing patients from achieving optimum therapeutic gains. Therapists should identify and address problems of this kind so that their treatments are effective. A study by Watt et al. [43] and Schmidt et al. [44] demonstrated that therapeutic interventions which have focused on AS can be effective. In summary, reducing someone's AS level may have another advantage in that it will reduce the likelihood of future anxiety psychopathology or anxiety disorders, as well as the possibility of other Axis I conditions [44]. Elevated AS can motivate perfectionists to seek perfection, in contrast to more realistic levels of achievement where reasonable degrees of failure are tolerated. The result is that increased anxiety tolerance might help you accept mistakes easier and focus on achieving realistic goals [45-47].

A structural model revealed a positive relationship between evaluative concerns and perfectionism. The findings of this study corroborate those of previous studies [3, 19, 20], which have suggested that perfectionism and social anxiety are positively related. The results of Limburg et al.'s [47] study partially replicates longitudinal findings showing that perfectionistic concerns are positively related to social anxiety. Limburg et al. [47] found that social anxiety negatively correlates with the perfectionistic striving, contrary to previous studies that found a correlation between perfectionistic striving and social anxiety. Further longitudinal studies in this area are urged as a result of the contrary findings [48, 49]. Most studies covering this topic employed a three-wave longitudinal study examining the relationship between perfectionist concerns, perfectionism, and anxiety symptoms in adolescents [3]. Damian et al. [24] investigated anxiety symptoms in general (including social anxiety, panic, separation anxiety, and school

anxiety) and not just social anxiety and revealed that perfectionist concerns contribute to social anxiety. However, Levinson and Rodebaugh [49] also provided preliminary evidence of a relationship between social anxiety and perfectionism dimensions. People with social anxiety often grow up in an environment that is not supportive and loving, they feel socially disadvantaged, they are afraid of being abandoned by others, or they feel isolated or different from the rest of the world. Cut-out/exclusion domain schema is very important in creating and perpetuating social anxiety. It can predict the subsequent changes in social anxiety syndrome over time, and therefore it seems that schemas in this area deserve the most attention in relation to social anxiety. Schemas in this area arise in families that are callous, harassing, harsh, and abusive. Dissatisfaction with needs such as security and empathy, which predicts communication and exclusion schemas, plays an effective role in creating avoidance [50].

The experience of loneliness, isolation and rejection in the individual leads to the consequence that the individual, without receiving love and control from the family, feels abandoned and suspended, loses his sense of worth and does not find a safe haven for critical times. Therefore, behavioral inhibition indicates that this is a predictor of his anxiety. Hence, the existence of this schema causes one to try to avoid social situations. Accordingly, these people seek to satisfy their unmet needs and experience great anxiety about not being able to meet these needs. These people are emotionally unstable and unpredictable, unreliable and irregular. Therefore, a person who has such a schema in his mind is prone to anxiety [51].

There are a few limitations in this study that deserve attention. In the first part of our study, we examined variables among high school students. Therefore, these results are specific to this group. Future research should take socioeconomic background into account. Furthermore, because the data were gathered using self-report questionnaires, there is a possibility that participants' answers may have been influenced by social desirability. Additionally, the study is cross-sectional and does not provide conclusive evidence of the association between interpretation and anxiety in childhood; extended longitudinal and experimental studies are needed. Researchers at mental health centers and counselors at schools may find this report helpful. Psychologists and counselors can minimize social anxiety in students by identifying and minimizing EMS, anxiety-related components, and perfectionism.

Conclusion

In general, it can be said that according to studies, social anxiety plays a very important role in adolescents' mental health. The results of this study showed that the dimensions of the initial schemas, which have their roots in the early development of adolescents, become incompatible schemas. The results showed that the schemas of disconnection and rejection, impaired autonomy and performance, impaired limits, other-directedness, over vigilance and inhibition, and AS variables, and perfectionism have a direct and significant effect on social anxiety.

Conflicts of interest

The authors report no conflicts of interest in this study.

Ethical Approval

This article took into account all ethical principles. Researchers informed the participants of the study's objectives. Participants were also assured that their information would remain confidential.

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