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# Predicting Social Anxiety Symptoms Based on Cognitive and Metacognitive Factors


## Abstract

Social anxiety disorder (SAD), as a disabling disorder, involves a majority of individuals and seriously decreases their quality of life. Given that cognition and metacognition play a significant role in developing SAD symptoms, the present study aimed to examine the relationship between these factors and SAD symptoms. To do so, 200 students from XXX University, Iran, were recruited using the random cluster sampling method. The data were analyzed using the stepwise multiple regression analysis. Results showed that there were significant relationships between fear of negative evaluation, behavioral inhibition, the external focus of attention as cognitive factors, and SAD. Furthermore, there were also significant relationships between the necessity of thought control, uncontrollability, and danger, positive beliefs about worry, cognitive awareness/self-awareness, trust in memory as metacognitive components, and SAD. However, the results of multiple regression analysis indicated that although both cognitive and metacognitive factors significantly explained the severity of SAD symptoms ($F = 55.67$, $R^2 = .60$, $p < .001$), most of such effects accounted by cognitive factors compared to metacognitive components ($R^2 = .53$ vs. .7). It can be concluded that cognitive factors play a more important role in predicting SAD symptoms than metacognitive factors.


**Keywords:** *Social anxiety disorder, cognitive factors, metacognitive factors, Fear of negative evaluation*


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## Introduction

Social anxiety disorder (SAD) is characterized by a marked and consistent fear of social situations involving being judged by others in the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013). SAD has been found to be one of the most common psychological disorders following depression and alcohol abuse (Stein, 2008). SAD has attracted the attention of many researchers not only because of its high prevalence (13%) but also its conflict with personal and professional life (Hofman & Barlow, 2002). Given the consequences of SAD on individuals' functions and quality of life (e.g., disability to work), it is among the first ten chronic mental or physical disorders (Alonso et al., 2004).

The stability of social fear is a mystery. Individuals with specific phobias, including claustrophobia, acrophobia, and zoophobia can successfully avoid exposure to the source of their fear. In this regard, such avoidance seems to be the main reason for the stability of their fear. In contrast, the nature of modern society obliges patients with social anxiety to enter social situations; however, the exposure appears not to lead to the removal of the disorder (Witchen, Fehm, et al., 2001). Although genetic and environmental factors have an impact on developing SAD (Erwin & Heimberg, 2006), contemporary theories have highlighted the role of cognitive processes in the continuity of the disorder (Hofman, 2007). Therefore, there are cognition-related factors that make a considerable contribution to such a disorder even after changing the behavior.

The advent of the cognitive theory in psychopathology has led to an interest in cognitive processes (Semerari et al., 2003). Contemporary cognitive models suggest that individuals with SAD consider social situations harmful. Such individuals believe that their behavior would have socially disastrous consequences (Hofmann & Barlow, 2002). According to Wells (2007), cognitive beliefs can have a significant effect on changing SAD symptoms. Cognitive pathology has dealt with the cognitive-behavioral aspects of SAD. Although some of the primary behavioral criteria of SAD have highlighted improving social skills among affected individuals, the cognitive criteria have recently focused on inefficient cognitions such as incompetence and being afraid of negative evaluation in such individuals (Taherifar, Fata, & Gharaie, 2010). Cognitive components of social anxiety that are supported by studies include selective attentional bias, social self-efficacy, behavioral inhibition, and fear of negative evaluation (FNE; Taherifar, Fata, & Gharaie, 2010). There have been plenty of studies showing the importance of cognitive factors in social anxiety. Research has shown that FNE (Bautista & Hope, 2015; Johnson, & Anderson, 2014; Yuniardi, 2019), and behavioral inhibition (Mokhber Dezfooli et al., 2015; Lahat et al., 2014) are positive and social self-efficacy negatively (Iancu, Bodner, & Ben-Zion, 2015) associated with SAD. However, although cognitive-behavioral therapy (CBT) is an effective therapy for SAD (Clark et al., 2006; Heimberg & Becker, 2002), there still needs more effort in this regard (Hofmann, 2007). As such, cognitive models have been criticized and the role of metacognition has been placed in high value (Capobianco & Nordahl, 2021; Leahy,

2007; Wells & Matthews, 1996). That is why other new forms of therapies such as metacognitive therapy (MCT) have recently been developed.

Recently, the metacognition approach has been examined as a basic foundation for many psychological problems (Wells, 2001). Flavell (1979) defined metacognition as cognitive processes involved in the evaluation, monitoring, or control of cognition. In this regard, the self-regulatory executive function (S-REF) is one of the first metacognition-related models that conceptualizes the role of metacognition in the etiology and persistence of mental disorders (Wells & Matthews, 1996). According to the S-REF, mental disorders continue when maladaptive coping strategies such as autistic thinking, worry, rumination, threat monitoring, avoidance, and thought repression lead to failure in correcting nonfunctional beliefs and increase the availability of negative information about the self. In fact, a mental disorder is considered the activity of the *cognitive attention syndrome* (CAS) that results from one's metacognition and is activated and processed in stressful situations (Wells & Matthews, 1996). The metacognition model claims that individuals struggle with emotional distress since their metacognition leads to a specific pattern of reaction to their internal experiences that results in the continuation of negative emotions and reinforces negative beliefs (Wells & Carter, 2001).

Wells (2004) found that individuals with SAD tend to have not only positive metacognitions about using worry to cope with stressful events but also negative metacognitions about controllability and the possibility of negative effects. A significant correlation exists between metacognition and social anxiety (Mirzaie, Abdollahi, & Shahgholian, 2014; Nordahl et al., 2022; Robat Mili & Karimi, 2018). In this regard, Gekika et al. (2017) found that there is a strong and positive relationship between social beliefs and SAD mediated by cognitive procedures. Moreover, they also showed that metacognitive beliefs, directly or indirectly, improve social anxiety via cognitive processes. Nordahl et al. (2017) documented that a change in negative cognitive and metacognitive beliefs decreases the SAD symptoms and improves the health conditions of the affected individuals. Ferdowsi, Babaei, and Behzadpoor (2019) showed that among metacognitive components, the symptoms of social anxiety can be predicted by negative beliefs about worry and cognitive confidence. Researchers have also shown that anxiety may result in selective choices that are influenced by metacognitive beliefs (Wells & Carter, 2001; Yilmaz, Gencoz, & Wells, 2011).

*The Current Study*

The multi-dimensional and complicated nature of SAD necessitates further investigations of the factors and roots of this disorder and its treatment. Although research has documented the importance of both cognitive and metacognitive factors on SAD, it has not been clear which factors (i.e., cognition or metacognition) are more important. In this regard, whether cognition or metacognition has a greater effect on SAD is debatable. Given the popularity of the metacognitive approaches to mental disorders, especially SAD, examining and comparing metacognitive components with cognitive components is necessary and could help clinicians and therapists to understand what underlying cognition and metacognition factors play a more significant role in SAD. Few studies have addressed and compared both cognitive and metacognitive factors on SAD simultaneously. Therefore, this study aimed to examine the roles of cognitive factors (i.e., fear of negative evaluation, behavioral inhibition, and locus of control) and metacognitive factors (e.g., the necessity of thought control and positive beliefs about worry) in SAD symptoms in students.

**Methods**

*Participants*

This research was cross-sectional. Two hundred students (61.2% female, mean age = 23.59, SD = 3.81, ranging from 18 to 47) were recruited from XXX University, Iran. Of those, 70.9% were undergraduates, and 29.1% were postgraduates. Data related to four participants were removed due to the outliers ($z > 3$), thus further analyses were done with 196 individuals.

The participants were selected using the cluster sampling method. Among the departments of Shiraz University, eight departments were randomly selected, from each of which two faculties and from each faculty two classes were randomly selected. We then distributed the questionnaires among voluntary students to complete after being informed how to do so. The size of the sample group was defined according to the number of predictor variables. The questionnaires were put together randomly and distributed among students to be completed. On average, it took about 35 minutes for each participant to complete the whole package of questionnaires. The informed consent form was read and signed by all participants. The materials and procedures were approved by the Ethics Committee of XXX University.

*Measure*

*Social Phobia Inventory* (SPIN; Connor et al., 2000): The SPIN includes 17 items rated on a 5-Likert scale from 0 (Not at all) to 4 (Extremely), which is used for screening and measuring the severity of social anxiety disorder. The SPIN has three subscales namely the fear of social situations, avoidance, and physiological symptoms. Connor et al. (2000) reported that it has reasonable test-retest and internal consistency reliabilities, and convergent and divergent validities. In their studies with 64 and 54 subjects, test-retest

reliability was .89 and .78, respectively. A very high Cronbach's alpha coefficient was reported for the full scale (*a* = .94). In Iran, in a study conducted on 1743 students, the psychometric properties of SPIN were examined. The research showed that SPIN was significantly correlated with anxiety and the symptom checklist SCL-90-R and the Cronbach's alpha coefficient was very high, at .94. (Hassanvand Amouzadeh, 2015).

*Fear of Negative Evaluation Scale* (BFNES; Leary, 1983): The BFNES was designed in 1983 by Leary to summarize a large-scale form (30 items) to describe frightening and disturbing beliefs. It includes 12 items and one shows their position in each question on a five-point range (1 = never true, 5 = almost always true; Leary, 1983). The results obtained from the psychometric properties of this scale indicated its optimal validity and reliability in the Iranian population. Shokri (2008) reported good convergent validity and internal reliability of the scale (*a* = .84).

*Perceived Social Self-Efficacy Scale* (PSSE; Smith & Betz, 2000): The PSSE consists of 25 items on a 5-Likert scale (1 = no confidence at all to 5 = complete confidence) which assesses self-efficacy expectations concerning a broad range of social behaviors. Smith and Betz (2000) confirmed its construct and discriminant validity based on their results. A high test-retest reliability was found, *r* = .82, over a 3-week interval. Similarly, a very high Cronbach's alpha coefficient was found for the PSSE (*a* = .94). In a study conducted in Pakistan to examine the psychometric properties of the PSSE two items were removed due to cultural issues, and an adapted version of the scale (Riaz, Yasien, & Khanam, 2011) consisting of 23 items was used in the current research. The Cronbach's alpha coefficient of the adapted version was .90.

*Adult Measure of Behavioral Inhibition* (AMBI; Gladstone & Parker, 2005): The AMBI consisting of 16 items rated on a 3-point scale (0 = no/hardly ever, 1 = some of the time, and 2 = yes/most of the time) measures a mental report of the current inhibition. The higher the scores the greater the degree of inhibition. Gladstone and Parker (2005) found that a four-factor solution of the AMBI namely fearful inhibition, non-approach, low sociability, and risk avoidance fits well with the data. The Cronbach's alpha coefficient for the total score was high (*a* = .87). A study in Iran has shown that the test-retest coefficient of the AMBI with a four-week interval was .82 and its Cronbach's alpha was .75 (Davoodi, Neshat Doost, Abedi, & Talebi, 2015).

*Focus of Attention Questionnaire* (FAC; Woody, Chambless, & Glass, 1997): The FAC was developed to especially assess the focus of attention during social interaction. It has 10 items with a 5-Likert scale from 1 (not at all) to 5 (totally). The FAC consists of two subscales namely self-focus and external-focus. The former measures the degree to which one focuses on themselves while the latter measures one's attention to things in a social situation. Woody, Chambless, and Glass (1997) reported reasonable Cronbach's alpha coefficients for the self-focus (*a* = .76) and external-focus (*a* = .72) subscales. In Iran, Khayyer, Ostovar, Latifian, Taghavi, and Samani (2008) found that the Cronbach alpha coefficients for the self-focus and external-focus were .75 and .86, respectively, among high-school students.

*Metacognition Questionnaire* (MCQ; Wells & Cartwright-Hatton, 2004): The MCQ includes 30 items rated on a 4-point scale (1 = Do not agree, 4 = Agree very much) and measures metacognitive-related beliefs, judgments, and monitoring propensities viewed as significant in mental disorders from the metacognitive model. The results of the factorial analysis supported a five-factor model, including lack of cognitive confidence, negative beliefs about uncontrollability and danger, positive beliefs about worry, the need to control thoughts, and cognitive self-consciousness. In the original study, The MCQ indicated good test-retest and internal consistency reliability and convergent validity. Shirinzadeh, Goudarzi, Rahimi, and Naziri (2009) found that the data supported the five-factor model of the MCQ in the Iranian population. The Cronbach alpha coefficients of the full scale and subscales ranged from .71 to .91.

*Data Analysis*

We first used descriptive statistics to describe both demographic and studied variables. Before analyzing data, we tested the normality of variables using skewness and kurtosis (between -2 to 2) and other assumptions of the multiple regression analysis, including examining linear relationships between predictors and the outcome variable using scatterplots, multicollinearity using the variance inflation factor method, homoscedasticity using scatterplots, and the autocorrelation of residuals using Durbin-Watson test. After making sure that all the assumptions were satisfactorily tenable, we applied the multiple regression analysis using SPSS 26.0 to analyze the data.

## Results

The descriptive characteristics of the studied variables are shown in Table 1.

**Table 1.** Mean, standard deviation, and minimum and maximum scores of the variables (*n* = 196)

| Variables | Mean | SD | Min | Max |
|---|---|---|---|---|
| Social anxiety | 17.50 | 12 | 0 | 63 |

| | | | | |
|---|---|---|---|---|
| Fear of negative evaluation | 33.05 | 4.64 | 22 | 45 |
| Social self-efficacy | 73.68 | 16.60 | 27 | 110 |
| Behavioral inhibition | 29.55 | 7.56 | 4 | 51 |
| Self-focus | 15.89 | 3.40 | 7 | 25 |
| Uncontrollability and danger | 18.15 | 5.32 | 9 | 32 |
| Positive beliefs about worry | 11.57 | 3.70 | 6 | 24 |
| cognitive awareness/self-awareness | 17.16 | 4.17 | 7 | 28 |
| Trust in memory | 8.20 | 3.12 | 4 | 20 |
| Necessity of thought control | 8.58 | 2.49 | 8 | 15 |
| External focus | 14.84 | 4.43 | 5 | 25 |

Pearson correlation coefficients between variables are shown in Table 2. Significant relationships were found between social anxiety and all of the predictors ($p_s < .05$), except self-focus. Social anxiety was strongly and positively correlated with fear of negative evaluation ($r = .51$), behavioral inhibition ($r = .53$), and some of the components of metacognition namely necessity of thought control ($r = .44$), trust in memory ($r = .43$), and uncontrollability and danger ($r = .44$). However, it was strongly and negatively related to self-efficacy ($r = -.46$).

**Table 2.** Pearson correlation coefficients among variables ($n = 196$)

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Social anxiety | 1 | | | | | | | | | |
| 2. Fear of negative evaluation | .51*** | 1 | | | | | | | | |
| 3. Social self-efficacy | -.46*** | -.05 | 1 | | | | | | | |
| 4. Uncontrollability and danger | .44*** | .39*** | -.17* | 1 | | | | | | |
| 5. Positive beliefs about worry | .16* | .11 | -.07 | .48*** | 1 | | | | | |
| 6. self-awareness | .17* | .29*** | .14* | .51*** | .32*** | 1 | | | | |
| 7. Trust in memory | .43*** | .22** | -.33*** | .40*** | .27** | .05 | 1 | | | |
| 8. Necessity of thought control | .44*** | .34*** | .16* | .68*** | .32*** | .48*** | .31 | 1 | | |
| 9. Self-focus | .05 | .15* | .22** | .04 | .01 | .29*** | -.07 | .12 | 1 | |
| 10. Behavioral inhibition | .53*** | .22** | -.36*** | .29*** | .02 | .13** | .14* | .29*** | .02 | 1 |
| 11. External focus | .26** | .26** | .09 | .21** | .03 | .29*** | .06 | .20** | .45*** | .27** |

*$p < .05$, **$p < .01$, ***$p < .001$

The results of the stepwise multiple regression model are shown in Table 3. The model was significant ($F = 55.67$, $R^2 = .60$, $p < .001$), and both significant cognitive and metacognitive factors explained 60 percent of the variance of SAD. Among all significant cognitive and metacognitive factors, the results of regression coefficients showed that behavioral inhibition ($\beta = .30$, $p < .001$), FNE ($\beta = .35$, $p < .001$), trust in memory ($\beta = .19$, $p < .001$), and necessity of thought control ($\beta = .13$, $p < .05$) significantly and positively predicted SAD, and that social self-efficacy ($\beta = -.25$, $p < .001$) significantly and negatively predicted SAD.

**Table 3.** The results of stepwise multiple linear regression analysis for predicting social anxiety based on cognitive and metacognitive factors ($n = 196$)

| Criterion variable | steps | Predictor variables | $F$ | $R$ | $R^2$ | $\beta$ | $t$ | $p$ |
|---|---|---|---|---|---|---|---|---|
| | 1 | | 79.19* | .53 | .28 | | | |
| | | Inhibition | | | | .53 | 8.89 | .001 |
| Social anxiety | 2 | | 79.44* | .67 | .44 | | | |
| | | Inhibition | | | | .44 | 8.03 | .001 |
| | | Fear of negative evaluation | | | | .41 | 7.56 | .001 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | | 75.20* | .73 | .53 | | | |
| | Inhibition | | | | .32 | 6.01 | .001 |
| | Fear of negative evaluation | | | | .43 | 8.57 | .001 |
| | Social self-efficacy | | | | -.32 | 6.11 | .001 |
| 4 | | 66.16* | 0.76 | 0.57 | | | |
| | Inhibition | | | | .33 | 6.37 | .001 |
| | Fear of negative evaluation | | | | .38 | 7.73 | .001 |
| | Social self-efficacy | | | | -.24 | 4.67 | .001 |
| | Trust in memory | | | | .22 | 4.32 | .001 |
| 5 | | 55.67* | 0.77 | 0.60 | | | |
| | Inhibition | | | | .30 | 5.74 | .001 |
| | Fear of negative evaluation | | | | .35 | 6.86 | .001 |
| | Social self-efficacy | | | | -0.25 | 4.84 | .001 |
| | Trust in memory | | | | 0.19 | 3.68 | .001 |
| | Necessity of thought control | | | | 0.13 | 2.53 | .05 |

*$p < .001$

**Discussion**

In the present study, we investigated and compared the effects of cognitive and metacognitive factors on the severity of SAD symptoms. In general, the findings revealed that some of the studied cognitive and metacognitive factors significantly predicted the symptoms of SAD. Our model explained 60% of the variance of the symptoms of SAD in students. This result not only supports the findings of previous studies but also shows that both cognitive and metacognitive factors play important roles in SAD symptoms which aligns with previous studies (e.g., Hofman, 2007; Wells, 2007; Wells, 2001; Wells & Matthews, 1996). In this regard, in a systematic review, Gkika, Wittkowski, and Wells (2018) found that both cognitive processes and metacognitive beliefs contribute to social anxiety directly or indirectly. What individuals with SAD symptoms think about (cognition: content) and how they think (metacognition: a procedure) can have considerable effects on their social anxiety-related symptoms. Therefore, both cognitive- and metacognitive-related theories about SAD can explain at least partly the severity of social anxiety. In fact, cognition-related factors, whether cognition or metacognition, play a crucial role not only in social anxiety but in anxiety itself as well because one of the core features of anxiety is worry viewed as a cognition and metacognition (being worried about worry) factor.

However, our result also showed that cognitive factors explained most of the variance of the SAD symptoms compared to metacognitive components ($R^2$ = .53 vs. .7). This result indicates that cognitive factors play a far more significant role in social anxiety than metacognitive components. As a result, it seems that cognitive factors have more impact on social anxiety. It appears that cognitive-behavioral therapists should pay more attention to the cognitive processes of individuals with SAD symptoms.

Although cognitive factors had more impact on the SAD symptoms, metacognitive components significantly predicted social anxiety beyond the cognitive factors. Therefore, our results partly supported the theory of S-REF (Wells & Matthews, 1996) that highlights the importance of metacognition's role in the persistence of psychological problems apart from cognitive processes. This shows that metacognition is an important part of SAD and they have their specific effects on social anxiety which cannot be accounted for by cognitive factors. The way individuals think about their symptoms can evoke their secondary negative thoughts and emotions, which can exacerbate the individual's symptoms of social anxiety.

More specifically, although all cognitive factors (behavioral inhibition, social self-efficacy, and FNE (except self-focus) and all metacognitive factors (cognitive awareness, positive beliefs about worry, trust in memory, uncontrollability and danger, and necessity of thought control) were significantly associated with the symptoms of SAD. The regression model results indicated that, among the aforementioned cognitive factors, in order of importance, behavioral inhibition, FNE, and social self-efficacy significantly predicted the SAD symptoms. These results are consistent with previous studies (Bautista & Hope, 2015; Johnson & Anderson, 2014; Iancu, Bodner, & Ben-Zion, 2015; Taherifar, Fata, & Gharaie, 2010). These results support a part of Hofmann's (2007) comprehensive model of cognitive factors that maintain SAD. Based on the evidence, he claimed that when facing a social situation, individuals with SAD see themselves as socially negative and overestimate the possible negative consequences of social situations, have less control over their emotional response, consider themselves socially incompetent, and then adopt ineffective coping strategies such as avoidance. Moreover, according to the DSM-5 (APA, 2013), the most important

criterion of SAD is extreme anxiety resulting from being judged by others which is related to individuals' cognition and judgment.

Among metacognitive components, only trust in memory and the necessity of thought control significantly predicted the SAD symptoms, which aligns with previous research (Behzadpoor, 2019; Gekika et al., 2017; Marino et al., 2020; Mirzaie, Abdollahi, & Shahgholian, 2014; Nordahl et al., 2022). Based on these results not being able to believe in memory (maybe themselves) and control thoughts are the underlying CAS that people who have high levels of SAD symptoms suffer.

## Conclusion

According to our results, the higher the behavioral inhibition and FNE, the more severe the SAD symptoms, and the higher the self-efficacy, the lower the social anxiety. Among the metacognitive factors, the higher the lack of trust in memory and the necessity of thought control are, the more severe the SAD symptoms would be. It can be concluded that not only does the individuals' content of thought play a role in the SAD symptoms in university students, but also thought procedures and metacognition are of paramount importance. However, our results also showed that cognitive beliefs can better predict severe SAD symptoms in comparison to metacognitive beliefs. These results may have some clinical implications for clinicians and cognitive-behavioral therapists when they work with individuals with SAD symptoms. Although both cognitive and metacognitive factors should be addressed in therapeutic sessions while working with individuals with SAD symptoms, therapists should pay more attention to their thought contents (cognitive factors) and collaborate to reduce their inhibition and fear of negative evaluation as well as increase social self-efficacy to help the clients to overcome their social anxiety.

Regarding the limitations of the current study, first and foremost, this study was cross-sectional and we are not allowed to infer causal relationships between variables. Therefore, all the abovementioned suggestions made should be supported by interventional studies. Secondly, given the sampling group of this study included healthy students, future studies should recruit a clinical sample, of patients diagnosed with SAD, as we may find different results and compare the findings between groups.

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