

SOCIAL ANXIETY CONNECTION WITH INDIVIDUAL CHARACTERISTICS: THEORY OF MIND, VERBAL IRONY COMPREHENSION, AND PERSONAL TRAITS

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Abstract

Social anxiety disorder (SAD) is one of the most common mental health problems not only in adults but also in adolescents. Individuals with SAD exhibit difficulties in interpersonal relationships, understanding emotions, and managing them as well. This prevents individuals from optimal functioning, as far as, it is crucial for social and emotional adaptation to identify, understand, accept, and manage emotions correctly. Researchers are still concerned about the factors that contribute to the development and maintenance of this condition. Therefore, the main purpose of this study is to acquire knowledge about the association between social anxiety and individual characteristics, such as theory of mind (ToM), verbal irony comprehension, and personal traits. The quantitative method of research was selected and the data from 112 adolescents were collected for this research. Adolescents aged from 12 to 18 years and 15 of them had a diagnosis of Social Anxiety Disorder. Statistical analysis was performed on the whole group, additionally, two groups: adolescents with and without SAD were compared separately. Social anxiety (Social Anxiety Scale for Adolescents, 1998) and personal traits (Der Münchner Persönlichkeitstest, 2012) were measured by questionnaires. Theory of mind (A Movie for Assessment for Social Cognition, 2006) and comprehension of verbal irony (Mewhort-Buist, & Nilsen, 2012) were assessed using psychological tests. Statistical analysis indicated a positive relationship between social anxiety and comprehension of verbal ironic criticism. Moreover, social anxiety was significantly positively correlated to neuroticism and isolation tendency, while it was negatively related to extraversion and frustration tolerance. On top of that, statistical analysis revealed a positive relationship between ToM and verbal irony comprehension. However, the relationship between social anxiety and ToM was not statistically significant. Two main explanations for this result are that hypermentalizing is related to social anxiety only when the social situation is self-referential (Ballespi et al., 2019) and theory of mind impairment may manifest only on the clinical and not subclinical level of social anxiety (Lenton-Brym et al., 2018).

Keywords: *Personal traits, social anxiety, theory of mind, verbal irony.*

1. Introduction

According to the American Psychiatric Association (2013), social anxiety disorder (SAD) is characterized by a constant and intense fear of social situations where an individual may become an object of observation. The cognitive basis of this fear is the thought that a person will be negatively evaluated by others. Furthermore, studies conducted on cognitive bias show that people with social anxiety disorder interpret neutral or ambiguous situations more negatively and consider them to be more dangerous than non-socially anxious individuals (Niels-Christensen, Stein, Means-Christensen 2003). It is worthy of note that such negative thinking tendencies show their inaccurate perceptions of how others view them. However, clarifying the cognitive factors that contribute to social anxiety disorder is still a matter of interest.

But one of the factors that should be considered is theory of mind. For a better understanding, theory of mind is the ability to understand the mental states of oneself and others, including thoughts, intentions, and emotions. This ability makes it possible to explain and predict people's behavior (Premack & Woodruff, 1978). Studies indicate that impairment in theory of mind is associated with several mental health problems, such as autism spectrum disorder, schizophrenia, and social anxiety (Baron-cohen, 1995; Montag et al., 2011; Hezel & McNally, 2014). However, studies conducted to find out the relationship between social anxiety and theory of mind are contradictory. Some of them indicate

that people with social anxiety have difficulties understanding people's mental states, while others do not (Hezel & McNally, 2014; Philippot & Douilliez, 2005; Öztürk, et al., 2020).

Interpretive biases of people with social anxiety are likely to affect their understanding of irony. People often use irony while communicating with others. Verbal irony is a form of figurative language when what is said is the opposite of the speaker's meaning (Dews & Winner, 1997). For understanding verbal irony is necessary to consider contextual references, intonation, and also, and the speaker's thoughts and intentions, i.e. theory of mind. Many studies indicate that people with autism spectrum disorder who have impairment in theory of mind at the same time have difficulties in comprehension of verbal irony (Happe, 1993). Also, children under 6, who have not developed theory of mind yet are unable to understand verbal irony (Dews & Winner, 1997). Therefore, theory of mind, on the one hand, and social anxiety, on the other, will make a significant contribution to the understanding of irony. Since irony is often expressed by evaluations of others and what is said is ambiguous due to inconsistency with the context, interpretive biases and the tendency of negative evaluation of ambiguous information may lead people with social anxiety to misinterpret verbal irony.

It has been established that social anxiety is positively related to neuroticism, while there is a negative relationship between SA and extraversion (Kaplan et al., 2015). According to meta-analytic research social anxiety is significantly associated with social isolation (Teo, Lerrigo, & Rogers, 2013), and low frustration tolerance is considered a risk factor for social anxiety (Harrington, 2006).

2. Method

2.1. Participants

Research data were collected from 112 adolescents, aged 12 to 18 years. Of adolescents 80 (71.4%) were girls and 32 (28.6%) were boys with an average age of 15 years. The current study also included 15 adolescents who met social anxiety disorder diagnostic criteria.

2.2. Measures

Social anxiety was measured using the eighteen items "Social Anxiety Scale for Adolescents" (La Greca & Lopez, 1998). This questionnaire consists of three subscales: 1) fear of negative evaluation, 2) social avoidance and distress in new situations, 3) social avoidance and distress in general. All items are measured on a 5-point Likert scale, ranging from 0 (*never*) to 4 (*always*).

Theory of mind was assessed by applying the following two measurements: 1) "A Movie for Assessment for Social Cognition" (Dziobek, et al., 2006) and 2) "The Strange Stories task" (White, et al., 2009). "A Movie for Assessment for Social Cognition" (2006) consists of 15 min movie show about a friendly meeting of four people. During the movie screening, it is stopped forty-eight times and each time appears a question. Participants need to understand the characters' thoughts, emotions, and intentions in order to answer forty-two questions with multiple choices. Besides these questions, six control questions assess memory and general understanding. In order to answer those questions participant needs to analyze the physical context.

As mentioned above, another assessment to measure theory of mind was "The Strange Stories task" (White, et al., 2009). Participants are requested to read 16 stories and answer one open-ended question that followed each story. Eight stories are about social situations, where participants need to understand the characters' intentions. The other half of the stories are control stories and do not require an understanding of other individuals' mental states.

Verbal irony comprehension was also measured using sixteen short stories (Mewhort-Buist, & Nilsen, 2012). Stories are divided into 4 groups depending on the type of criticism/compliment used. Some stories consist of literal/ironic compliments and literal/ironic criticism. Each story is followed by five closed questions, from which, three questions have a correct answer and are used to assess understanding, meaning, and intention of verbal irony, while another two questions are used to measure attitudes.

"The Munich personality test" (Der Münchner Persönlichkeitstest, Zerßen & Petermann, 2012) was used for the personality traits assessment. This measure consists of forty-nine items and eight subscales: Neuroticism, Extraversion, Isolation Tendency, Frustration Tolerance, Rigidity, Esoteric Tendencies, Orientation towards Social Norms, and Motivation. All items are measured on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

3. Results

3.1. Correlations

Spearman rank order correlation (ρ) was used to identify the relationship between social anxiety and personal traits. Analysis showed that social anxiety was negatively correlated with extraversion ($r_s = -.416, p < .01$) and with a tolerance of frustration ($r_s = -.410, p < .01$). There was a strong positive correlation between social anxiety and neuroticism ($r_s = .628, p < .01$), a small positive correlation between social anxiety and isolation tendency ($r_s = .278, p < .01$) (Table N1).

Social anxiety and theory of mind were not significantly correlated. The study found that there was a small positive correlation between social anxiety and ironic criticism comprehension ($r_s = .196, p < .05$), but the correlation between social anxiety and comprehension of ironic compliment do not reach statistical significance.

Table 1. A correlational network between social anxiety and personality traits.

variables	1	2	3	4	5	6
1. Social anxiety	–					
2. Extraversion	-.416**	–				
3. Neuroticism	.628**	-.261**	–			
4. Frustration tolerance	-.410**	.473**	-.382**	–		
5. Isolation tendency	.278**	-.103	.449**	-.1	–	
6. Rigidity	.098	.318**	.166	.237*	.04	–

* $p < .05$. ** $p < .01$.

Correlation analysis showed that theory of mind was positively correlated with verbal irony comprehension. ($r_s = .486, p < .01$). Specifically, there was a medium positive correlation between theory of mind and understanding of verbal ironic compliment ($r_s = .401, p < .01$), and also a medium positive correlation was revealed between theory of mind and understanding of verbal ironic criticism ($r_s = .463, p < .01$).

3.2. Standard multiple regression

A standard multiple regression was calculated to predict social anxiety based on personal traits. To predict social anxiety a model was made from extraversion, neuroticism, and frustration tolerance. The model explains 44 % of the variance in social anxiety. $R^2_{ADJ} = 44.4, F(3,104) = 29.44, p < .01$. Of these three variables, it was found that social anxiety is significantly predicted by neuroticism ($\beta = .53, p < .05$) and extraversion ($\beta = .23, p < .05$). Neuroticism explains 25% and extraversion 4% of the variance in social anxiety (Table N2).

Table 2. Regression analysis: predictors of social anxiety.

Variables	Social Anxiety		
	B	SE B	β
Extraversion	-.53	.19	-.23**
Neuroticism	1.11	.16	.53**
Frustration tolerance	-.4	.35	-.09
R2		.46	
F		29.44**	

* $p < .05$. ** $p < .01$

3.3. Groups comparison

As mentioned before, the current study included 15 adolescents who were diagnosed with social anxiety disorder. 13 of them were girls and 2 were boys. For comparison, a control group was created from the rest of the sample. These two groups were similar in terms of sex and age. The difference between social anxiety and without social anxiety group was investigated by the Wilcoxon Signed Rank Test. Analysis showed that social anxiety group scores on theory of mind tests did not significantly differ from control group scores.

Significant differences were found between these two groups on the personal traits scale. Participants without social anxiety had higher median scores on extraversion and frustration tolerance scales than participants with social anxiety. ($Md = 21$, $Md = 13$). $Z = -2.477$, $p < .06$. $Z = -2.502$, $p < .05$. $r = .45$, $r = .46$.

4. Discussion

A positive correlation was found between social anxiety and ironic criticism comprehension. In particular, adolescents who scored higher on the social anxiety scale demonstrated better performance in understanding ironic criticism than adolescents with lower scores on the social anxiety scale. This result can be explained by the nature of the anxiety. People with social anxiety are sensitive to the evaluations of others. Therefore, they are more attentive to social cues, which may lead to a better understanding of ironic criticism.

The connection between social anxiety and the development of theory of mind has not been proven. The result showed that participants who had social anxiety symptoms were able to correctly identify and reason about the mental state of others as well as participants without social anxiety symptoms. These findings are consistent with a previous study which found that individuals with higher and lower scores of social anxiety did not differ from each other on theory of mind test. This result, which is inconsistent with previous studies, researchers explained by the fact that theory of mind impairment may manifest only on the clinical and not subclinical level of social anxiety (Lenton-Brym et al., 2018).

There is another explanation for this result. When people with social anxiety are involved in social situations they are afraid of evaluations, focus on themselves, and are not able to attribute other people's mental state correctly. In the current study, the measures that were used for assessing theory of mind do not request participating in social situations, adolescents were just observers that may foster an understanding of social cues. This view is supported by a study, which found that theory of mind deficit in social anxiety is context-dependent. According to this study, hypermentalizing is related to social anxiety only when the social situation is self-referential (Ballespi et al., 2019).

It is important to consider two theoretical frameworks under which researchers explain the role of social cognition in social anxiety. According to social-cognitive deficit theory, difficulty in understanding of mental states of others is due to a deficit in theory of mind, that makes social situations unpredictable and uncomfortable which causes fear and anxiety toward social situations (Hezel & McNally, 2014; O'Toole et al., 2013).

According to the second approach, advanced theory of mind enhances the individual's self-awareness in social situations. Understanding others' mental states makes the person more sensitive to social cues, making it easier for them to understand that they might become the object of evaluation by others. And because this assessment can be negative, the individual may develop social anxiety. Therefore, cognitive features of social anxiety might be a result of a deficit in theory of mind as advanced theory of mind. Some studies support this idea. Previous research found that advanced mindreading is correlated with social anxiety (Sutterby et al., 2012; Nikolic et al., 2019). People with advanced mindreading can easily understand mental states of others, they are more attentive to other people's evaluations and give more meaning to what others think of them.

Social anxiety is negatively correlated with extraversion and frustration tolerance, while positively correlated with neuroticism and isolation tendency. Regression analysis has shown that neuroticism and extraversion are good predictors of social anxiety. These results are consistent with the results of previous studies (Kaplan et al., 2015, Teo, Lerrigo, & Rogers, 2013, Harrington, 2006).

5. Conclusions

According to the study, the hypothesis that social anxiety is negatively related to the level of development of theory of mind was not confirmed. No statistically reliable relationship between these two variables was revealed. Also, the second hypothesis, according to which social anxiety would be negatively related to the understanding of verbal irony, was invalidated. Instead, we obtained the opposite result: social anxiety is positively related to the understanding of verbal ironic criticism.

As for the third hypothesis, regarding theory of mind and understanding of verbal irony, the assumed positive relationship was confirmed. The level of theory of mind development is positively related to both verbal irony comprehension subscales. The obtained result is consistent with the results of the studies conducted so far.

The fourth hypothesis, according to which social anxiety is positively related to neuroticism, isolation tendency, and negatively related to extraversion and tolerance to frustration, was confirmed. The results are consistent with those of previous studies. In addition to the strong association between them, the

results reveal that neuroticism and extraversion are strong predictors of social anxiety, which is also consistent with other research findings.

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