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# Prediction of Defect in Theory of Mind According to Social and Generalized Anxiety Signs

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### A B S T R A C T

The present study has been conducted to predict the defects of theory of mind according to social and generalized anxiety signs among university students. The study was in a kind of descriptive –correlative one, sampling method was random having screening procedure. Population included female students of Tabriz University. Among them 30 had signs of social anxiety and other 30 participants had generalized anxiety. Data gathering tools were SPIN social anxiety questionnaire and Beck anxiety questionnaire (BAI). Obtained results showed that out of two mentioned variants, social anxiety was more able to predict mind theory defect while it was not true about generalized anxiety. Therefore according to social anxiety signs among individuals, we can predict defects in mind theory.

**Keywords:** Mind Theory Defect, Prevalent Anxiety, Social Anxiety.

### INTRODUCTION

Mind theory also called mind reading (Vogeley et al., 2001), mentalising (Gallagher & Frith, 2003), dennet (Blair, 2001), has been regarded as a constant reflection of self and others' mind condition and means a capability to reflect self and others' mind conditions (Gallagher & Frith, 2003). Like chess game, mind theory gives us a chance to reflect others' aims, thoughts, beliefs and tendencies in our mind and the respond properly (Baron-Cohen, 1997). In other words, mind theory is prediction of behaviours according to mental stats (Zimmer, 2003). Mental stats are propositional attitudes that include desires, excitements, beliefs and intentions (Doherty, 2008).

Flavell (1994), based on growth theory, believe that theory of mind acquires 3 levels. First level includes formation of primary mind theory. In second level, mind theory is authentic but initial. And third level includes advanced theory of mind like jokes and complicated judgments. Mind theory enables us to recognize excitements and desires and predict or explain others' behaviors (Bodden, Dodel, & Kalbe, 2010). Understanding mind theory can affect social skills (Jenkins & Astington, 2000). People have beliefs that can be either wrong or right and are not as same as ours. Understanding self and others' mental functions can help us to explain and predict others' manners. Therefore, as it was elaborated, mind theory is complicated and multi-

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dimensional cognitive ability that is responsible to deduce others' mental states like intentions, emotions, needs and beliefs. A child by his acquired information about others' mental states is able to interpret their manners and regulate his interaction with them (Barr, 2006). In case of defect in such ability, one would be unable to understand others' intentions and needs and naturally cannot predict their manners properly.

A simple ability upon which social interaction has been built is to understand a notion that people are qualified with knowledge and needs that are different from ours. Thus, people with initial or secondary defects in theory of mind have serious problems when they interact with others. It is important to know that theory of mind is only attributable to one dimension of social cognition (Adolphs, 2001; Brothers, 1990). Many scholars like Damon and Hart (1992), believe that the domain of social cognitive subjects is broader than rational cognitive subjects.

Broadness of this field of subjects has caused extended investigation. Social cognition means that how people think about their and others' thoughts, beliefs, motivations, and behaviours. According to Flavell (1994), social cognition means having knowledge and cognition about people and their actions. Bukatko and Daehler (2012), believes that from 1968 onward, social cognition became an independent field in psychology and it flourished from the 1980s. It was when theory of mind became an important sub-theory of developmental psychology and compromised great bulk of investigations to itself. One of the interesting research fields that connected mind theory with applied pathology were researches about the role of theory of mind defect in psychological disorders such as schizophrenia, autism, depression and anxiety disorders. But despite such researches, we need more investigations in this field. Based on the fifth edition of *Statistical and Cognitive Guide to Psychological Disorders* (American Psychiatric Association, 2013). Social anxiety disorders and generalized anxiety disorder are two common anxiety-related disorders. Social anxiety disorder (SAD) is diagnosable when adults have six months of fear and anxiety disorders in social situations. Patients would avoid social settings or suffer when they are within. People with SAD always have fear that their behaviors and actions would be embarrassing or attract negative response by the others. Those people acquire little psychological health because they are not benefited from help-seeking actions. So most of SAD people suffer from untreated anxiety in a specific range of their life (Goldin, Jazaieri, & Gross, 2014). Generalized Anxiety Disorder (GAD) also described as having excessive anxiety and fear, lasted at least for 6 months, and about one or several task works (e.g., job or educational performances) in which a person finds difficulty to have control on it. Anxiety has relationship with 3 (or more) of 6 below signs (in a way that at least some signs existed most of the days during 6 months period: 1) restlessness, nervousness or angeriness, 2) getting easily tired, 3) lack of concentration or mind emptiness, 4) excitability, 5) muscle tension, 6) sleeping disorders (American Psychiatric Association, 2013).

SAD and GAD can intervene in social cognition, intrapersonal relations and then suppress them. One of those abilities that are qualitatively reduced by disorders is the ability to understand others' emotions and beliefs that is the ability to mind reading. Today, some researches (Hezel & McNally, 2014; Washburn, 2012); points out that people with anxiety disorders especially SA has defects in their theory of mind which destroys their cognition and leads in to the emergence of false attitudes. It also leads them to overestimate dangers or to have falsified beliefs. Washburn (2012), in an investigation about mind theory defect in SAD showed that people with SAD have weak performance in decoding and reasoning theory of mind than the control group. Studies figured out that in some psychological disorders like depression, anxiety defects happens in theory of mind and social cognition and as a result reduces their social performances (Wolkenstein, Schönenberg, Schirm, & Hautzinger, 2011). Moreover the study by Mehl, Rief, Mink, Lüllmann, and Lincoln (2010), cleared out the fact that defect in

theory of mind and remembering process is correlated with social performance and interventions are influential to improve them. Carried out works suggest that in mental disorders such as depression and anxiety, some defects happen in theory of mind and social cognition which ultimately reduce people social performance level (Wolkenstein et al., 2011).

In conclusion, obtained results from various studies explains that in anxiety disorders, changes in socio-psychological performance, defect in understanding other people emotions, beliefs and aims are related with defects in theory of mind (Hezel & McNally, 2014; Morrison, 2010; Washburn, 2012). But as it was mentioned formerly. Most of the literature about defect in theory of mind has been conducted in terms of bipolar disorder and depression and we have few studies about the role of defects in theory of mind with regard to anxiety disorders. It seems to develop and deepen theoretical concepts, especially in the field of pathology and the treatment of defects of mind theory, we face many. Therefore, research in this field is important because if identified deficiency in the theory of mind these individual, can be taken effective steps to treat these defects and provide training to individuals. To overcome deficiency which have been mentioned and the benefits the issue has in health decision making and policy. Therefore, present study has been aimed to scrutinize the affinity between defects in theory of mind with SAD and GAD.

## METHODOLOGY

The study was descriptive-correlation to test the relationship between social anxiety, generalized anxiety (predictive variable) and theory of mind (criterion variable) in female students of Tabriz University in 2014-2015. The statistical population of this study consisted of students at the University of Tabriz University. The statistical population of this study consisted of female students of Tabriz University who were studying in colleges and dormitories of Tabriz University. The sampling method was simple random. A total of 300 questionnaires were prepared and taken to the dormitories and colleges of the University of Tabriz. And after two days the questionnaires were collected. After screening using the social anxiety questionnaire (SPIN) and the Beck anxiety questionnaire (BAI), the number of individuals has been reduced to 60. This research was univariate and multivariate regression to predict the defect theory of mind based on signs of social anxiety disorder and generalized anxiety with SPSS software.

**Social Anxiety Questionnaire (SPIN):** The questionnaire is a self-report and standardized tool set by Connor, Kobak, Churchill, Katzelnick, and Davidson (2001). It has 17 items aimed at measuring social anxiety that include three subscales of fear (6 items), avoiding (7 items) and assesses physiological discomfort (4 items). In this inventory participants answer to item on a 5-degree spectrum. The total score is between 0-68 which is a 34 scores cut-off point of the inventory. Connor et al. (2001), obtain reliability using the test-retest method in samples with anxiety disorder between 0.78 and 0.89. In addition, in the study of Connor et al. (2001), the internal consistency coefficient of the whole scale in a group of healthy individuals was 0.94.

**Beck Anxiety Inventory (BAI):** Beck Anxiety Inventory is a standardized and self-report tool designed by Beck 1987 to measure anxiety in adolescents and adults. A one-dimensional scale of 21 items in which each subject selects one of the options that reflect the severity of his or her anxiety and these four options are scored on a four-point scale of 0-3. Therefore, total score of this questionnaire goes from 0-63. Suggested cut-off points for this questionnaire were: 0-7 little anxiety, 8-15 mild anxiety, 16-25 average anxiety and 26-63 severe anxiety, however in BAI guidebook there was no cut-off point for lack of anxiety, in Beck's (1987) study. Cronbach's alpha coefficient was 0.92 and split-half reliability coefficient was 0.91.

**Eye test (adult version)– revised:** Eye test or mind reading test through eyes which was

designed to evaluate emotional mind theory was initially invented by Baron-Cohen (1997) to study recognition ability of exiting stats. This writer presented its revised version in (2001). The test included 36 black and white images from men and women. The images exactly described their eyes from middle part of the nose to eyebrows. The examinee, by observing each images would say that which word best described the image individual's emotional stats. Each right answer had one positive score. Total score obtained by calculating all scores from images. Scores ranged of 0-36, scores ranging of 22-30 indicating medium theory of mind and less than 22 indicating lower theory of mind and more than 30 indicating higher theory of mind. Testing time was not limited Baron-Cohen (1997). Correlation coefficient calculated to be 0.637 for this test. Cronbach's alpha coefficient was also obtained to be 0.712 for eye test.

**Statistical Analysis**

Data analysis was carried out by SPSS software. The analysis was in two parts. Descriptive part that included frequencies, averages, standard deviations, percentage and charts. And data analysis part that included Pearson correlation and multiple regression.

**RESULTS**

**Table 1.** Descriptive statistics of research variants

Variants	Number	Average	Standard deviation
Social Anxiety	30	27.36	7.69
Generalized Anxiety	30	27.56	11.47
Mind Theory defect	60	20.96	3.21

As it was pointed out in Table 1 the average of SAD is 27.36 that includes at least 19 and at most 42 variants. GAD average was 27.56 that has at least 16 and at most 58 variants the average for mind defect is also 20.96 that has 15 to 27 variants.

**Table 2.** Correlation coefficient of Mind theory defect with SAD and GAD

Social Anxiety	Pearson coefficient	p
Mind theory defect	0.671	0.001
Generalized Anxiety	0.531	0.003

According to table 2 correlation results showed that there is a direct and positive meaningful relation between defect in theory of mind and social anxiety ( $p < 0.01$  and  $r = 0.671$ ). It means that by increase in SAD signs we will have increase in defects of theory of mind. Also there is a meaningful and positive relation between GAD and theory of mind defect. It means that with increase in GAD we have increase in defects of mind theory ( $p < 0.01$  and  $r = 0.531$ ).

**Table 3.** Analysis of simultaneous regression of mind theory defect on SAD and GAD

meaningfulness	F	Standard error	(R <sup>2</sup> )	(R <sup>2</sup> )	(R)
0.000	11.930	2.42	0.430	0.469	0.685

According to multiple regression test and also table 3, it can be seen that multiple correlation coefficient was  $R = 0.68$ , coefficient of determination ( $R^2$ ) = 0.46 and pure coefficient of determination was  $\Delta R = 0.43$ . Effective predictive variants can demonstrate almost 30% of defect score variance in theory of mind. Based on standard  $\beta$  coefficient and meaningfulness level, effective predictor variant on defect in mind theory was social anxiety with  $\beta = 0.56$  ( $p < 0.05$ ). The relation between predictive variants and standard variants based on

variance analysis of regression was linear ( $F= 11.930$  and  $p<0.01$ ). Study of  $\beta$  coefficient showed that GAD is not properly able to predict and demonstrate mind theory defect.

## CONCLUSION

Present study Results shows that between two variants of social and generalized anxiety, only social anxiety is able to predict theory of mind defect, while generalized anxiety cannot predict it in a proper way. It means that if a person receives low scores in mind theory test he or she will have more signs of social anxiety. By decrease in theory of mind ability we will have increase in social anxiety. Thus, between theory of mind defect and social anxiety signs we have positive relationship. These findings are in parallel with that of Hezel and McNally (2014). Washburn (2012) and Mehl et al. (2010). These mentioned investigations also reported weak results of theory of mind ability and low social performance among people with social anxiety who didn't easily understand their and others' emotions, beliefs and aims. To demonstrate this finding, we can point out below issues: first, according to the obtained results, anxious people, when they are placed in judgments, are deviated from focusing outside and only focus on their selves. So, this issue results in low level of social signs perception and shows defects in their theory of mind.

Anxiety also brings cognitive changes not only about time and place but also about people and meaning of incidents. Such changes can decrease concentration, memory remembering processes and provide disorders in ability to connect one phrase to the other. Marx and Gelder explain situations in which person gets anxious when doing social work under the observation of others. It is clear that a person who is socially anxious thinks that he has low level of social skills. This low level has meaningful relation with mind theory defect. Meanwhile the cognitive deviations are common issues in such disorders; we can infer that anxious people are not able to understand that other people have mental states different from their beliefs and emotions. In addition, cognitive deviation is another important factor of theory of mind defect. Therefore, we can deduce that social anxiety signs are meaningfully related to mind theory defect.

Another finding of present study is that there is meaningful linkage between mind theory defect and generalized anxiety. When looking for the researches about this field, we can realize that there isn't any research about such issue or if it be it was not available. But when demonstrating the findings we can say that people with GAD have below signs: experiencing periods of anxiety, being under the tension, being haze, perspiration, lack of concentration and problems in attention. We should also be aware that patients probably have the sense of incompetence, self-complaining expressions and embarrassment. They usually have problems with sleeping; concentration and relaxing (Katzman, 2009). In fact, such problems cause them to have weak social performance. This performance can disturb their mind theory quality and make them to weakly understand others' attitudes. It is probable that these patients would project their fears and illogical attitudes to other people and by stimulating others' attitudes and emotions would attribute their own beliefs to others. Generalized anxiety has been remained unknown despite its prevalence and problems especially in terms of patients and public health.

Furthermore, compared to the other anxiety disorders we have few investigations about its pathology (Fisher, 2007; Mennin, Heimberg, Turk, & Fresco, 2005). The main finding of present study was to demonstrate the fact that SAD and GAD have important role in mind theory defect. Thus, in order to treat people with anxiety disorders especially those with SAD and GAD therapists should focus on this issue and reduce SAD and GAD signs by teaching them to improve their theory of mind. In another words it is suggested that during clinical interventions we should allocate a part of treatment to teach them others' beliefs, feelings and subjectivities.

Although, it is probable that by on-time and appropriate treating, their theory of mind gets improved remarkably.

Some of the important limitations of our study were: it was only conducted among university students and no in other parts of society, age range was only 20-30, findings were based on self-reported scales. It is suggested that further studies include other layers of society with different age range and apply interviews and observations as other as other research methods.

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