A Study of Interpretation Bias Correction and its Effect on Interpretation Bias and Anxiety Symptoms

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Abstract: Studies have indicated that anxious individuals are more likely to give spurious interpretation in which dangers are perceived in the absence of genuine clues. Therefore, the current study was carried out with the aim of determining the effect of interpretation bias correction on social anxiety symptoms and the effect of interpretation bias correction on individuals suffering from social anxiety. Methods: This is a semi-practical study in which 60 individuals with social anxiety were selected by sampling and put randomly in 3 groups of 20 including positive training group, not negative training group (case group) and neutral training group (control group). Laibovitez (1987) scale was used for studying the social anxiety symptoms. Moreover, training positive group and studying the effect of interpretation bias correction was carried out by the tools has been employed by Marfi, Hirtch, Metuz, Smith, and Clark (2007). Finally, data were analyzed by one sided variance analysis, as well as, variance analysis with repeated measures. Results revealed that in Results indicate that there is a meaningful relationship between the mean of scores achieved by individuals with social anxiety disorder both before and after training (p<0.01). in reality, interpretation bias correction abates social anxiety symptoms. Additionally, it increases null interpretation (positive and not-negative) on the one hand, and in comparison with control group, on the other hand, decreases negative interpretation in case groups.

Discussion and conclusion: Since the current paper is the only study that has been carried out on training individuals with social anxiety disorder in positive interpretation bias and training individuals with social anxiety disorder in not-negative interpretation bias via DSM-IV standards, these results can be a starting point for research into interpretation bias correction.

Key words: Social Anxiety • Interpretation Bias • Students

INTRODUCTION

Social anxiety disorder is defined as a constant phobia about one or more social situation, as well as social performances. Individuals' anxiety is usually aroused by social situations and leads to individual avoidance. However, the individual knows that his phobia is great and unreasonable [1]. Most people with social anxiety disorder necessarily have to visit situations they have a phobia about regularly.

Therefore it is believed that avoiding social situations cannot justify the social anxiety continuity lonely [2]. Interpreting the social situation as whether or not the situation is dangerous, exerts influence on individual's preparation to visit or revisit the situation. The meaning allocated to a social situation can put the individual's attention and processing phenomena. pointed out that overestimating and exaggerating the situation value, along with threatening activities can play an important role in preserving urgent disorders. They also stated that social anxiety is characterized by exaggerating the social situation negative outcomes estimation (I go blush crimson and every one finds that I'm anxious). Consequently, the situation is interpreted as a potential danger even before it had been considered [4]. Interpretation bias is a trend towards interpreting ambiguous data via threatening procedures that seems to have roles in social anxiety pathology and perseverance. Interpretation bias could have penetrated into individuals with social anxiety because social clues have been ambiguous and therefore, can be easily altered.
Interpretation bias is the tendency to interpret ambiguous information in a threatening manner. An interpretation bias may be particularly influential in individuals with social anxiety because social cues are often ambiguous and thus easily distorted [5]. For example, it is difficult to know if a conversation partner’s yawn indicates boredom (threat interpretation) or exhaustion (benign interpretation). Cognitive models [6], as well as empirical findings (see below) implicate interpretation biases in the maintenance of social anxiety. A number of studies have supported the role of interpretation bias in social anxiety. Most studies have found that socially anxious individuals favor threat interpretations compared to non-anxious controls [7]. Additionally, some studies have found that socially anxious individuals also lack a benign interpretation bias exhibited by non-anxious individuals [8]. Cognitive Bias Modification (CBM) procedures are well suited to modify interpretation bias. CBM refers to the experimental modification of cognitive biases, allowing researchers to examine the effect of modification on the constructs of interest (e.g., anxiety, depression, alcohol consumption, body dissatisfaction) [9]. For example, used homographs (i.e., words with multiple meanings, e.g., ‘mean’ can imply ‘average’ or ‘nasty’), to modify interpretation in non-anxious individuals. In one experiment, participants saw homographs followed by target words. Depending on a participant’s randomly assigned condition, the target word either implied a threat (‘nasty’) or a benign (‘average’) meaning of the homograph (‘mean’). Participants decided whether or not the two words were related. When tested later with new homographs, participants in the threat condition were faster to respond to threat interpretations in a lexical decision task. Similarly, participants in the benign condition were faster to respond to benign interpretations. Thus, the procedure successfully induced interpretation biases that generalized to novel stimuli.

Extending these findings, research suggests that inducing different interpretation biases can causally affect anxiety [10] participants completed either a threat or benign interpretation induction and then viewed stressful videos. Participants who received the threat induction displayed significant elevations of state anxiety in response to the stressor, whereas participants in the benign condition did not. These findings suggest that modifying interpretation can affect anxiety reactivity. The effect on state anxiety also suggests that similar procedures could be used to reduce anxiety in anxious individuals. The above studies demonstrated that a single CBM session can modify interpretation bias and that such modification can affect state anxiety in non-anxious individuals. Inducing a benign interpretational bias reduces trait anxiety [11].

Research has demonstrated that people with social anxiety have interpretation bias towards the threat of social evaluation and therefore interpret the ambiguous social feedback as negatively [12]. Interpreting these clues in a negative way cause the individual's ego to be perceived weak and this idea to come up that they lack the audiences' standards. Therefore these people experience an enormous stress. Anxiety will be preserved in these individuals because the social situations are proved to be dangerous and individuals have a more negative conception of themselves and it leads to avoidance or phobia about subsequent situations [13]. Cognitive Model presented at 1995 along with empirical findings demonstrated that interpretation bias exerts influence on preserving social anxiety [5].

So procedures that cause null interpretation bias in individuals with social anxiety or cause a decrease in threatening bias can also decrease social anxiety symptoms [5]. The objective of the current study is to correct the interpretation bias in people with social anxiety disorder and to consider the effect of such corrections on social anxiety symptoms and their interpretation bias. However, the current paper is the only study that has been carried out on training individuals with social anxiety disorder in positive interpretation bias and training individuals with social anxiety disorder in not-negative interpretation bias via DSM-IV standards. So the current study was carried out with the aim of determining the effect of interpretation bias correction on social anxiety symptoms and interpretation bias in individuals with social anxiety.

**METHODS AND MATERIALS**

This is a semi-practical study in which 60 individuals with social anxiety were selected by sampling among female students of Consulting Center located in University of Shiraz and put randomly in 3 groups of 20 including positive training group, not negative training group(case group) and neutral training group (control group). Training the interpretation bias was fulfilled by employing what was used before by Marphy et al. (2007) This test involves two training stories including positive and not-negative stories that designed with the aim of correcting interpretation bias and is appropriate enough for positive and not-negative training groups and one null
stories that don't change the interpretation bias and is employed in control group. Each of these three stories contains 95 short auditory stories about social events. The introductory part of all three stories was exactly the same and contained information about a social event. But each story ends differently. There was a related question on the screen of the computer after finishing each part. Not-negative training group was given the same story as positive training group and control group was given null story-related questions that didn't involve excitement. Participants checked yes/no questions and their answers were provided with feedback. Feedbacks were labeled according to the group type, being positive, not-negative, or null. In fact, if the individual's answer in training group indicated the individual's positive conception in the situation, this feedback appeared on the screen "YOUR ANSWER IS RIGHT" and if the answer showed that individual evaluated the situation he was in negative, this feedback appeared on the screen "your answer is wrong" after answering the questions, they listened to the next story. The recognition testing objects for evaluating the interpretation bias in new social situations were ambiguous. Items were presented visually written.

This test involves two stages of coding and recognition. In the coding stage, 10 ambiguous stories with different topics were presented about different social situations. Participants imagined themselves as the main character of the story, as they were reading the story. They were also asked to answer the yes/no questions provided at the end of each story. In the recognition stage that aimed at determining the effect of null training (positive and not-negative) on interpretation bias in new social scenarios, the topic of stories had presented in coding stage was revealed to participants. Participants first could see the topic of the story presented in coding stage and then 5 sentences appeared to be used in recognition. Three sentences of the interpretation that was available at the end of the story included positive, not-negative, and negative interpretation. Actually, in these three sentences, the ambiguity that could be seen in the last sentence of the coding stage story was being removed via positive, negative, and not-negative procedures and individual then, necessarily has to have determined how similar these sentences were to his conception. The other two sentences were improbable and included positive and negative interpretation. In reality, these sentences didn't have anything to do with removing the story ambiguity but played the role of a positive or negative story-related sentence in which the amount of similarity needed to be determined again.

The scores of positive probable sentences achieved in all 10 stories are added up. The same thing happens to other sentences (negative probable, not-negative probable, positive improbable, negative improbable). At last, a score of 10-40 was achieved for each of these five sentences and these scores were divided by ten for analysis.

In the next step, the social anxiety questionnaire which was developed by Laybovitez (1987) was used. This questionnaire measures the amount of social anxiety disorder and avoidance. This questionnaire contained 24 items among which 13 items belonged to performance anxiety and the other 11 appertain to social events anxiety. In Iran, the validity of this scale was examined by Hamiri in [14]. Retesting validity of the questionnaire was estimated 0.83 by coronbach fs alpha and together with Kanor social phobia questionnaire that was estimated 0.65 for the first test and 0.76 for retesting. In this study, first participants were granted a clinical interview and then patients were selected. Three to seven days before holding training course, participants completed the social anxiety questionnaire that contained social situations and participants were supposed to determined the ones made him provoked his anxiety and the extent to which he avoids them. Then participants were randomly put into 3 groups. Some days later, a three-hour computer assignment was given. Avoiding any stress, participants were told that there wouldn't be time limitation. The objective of the test was to remove the temperament moods and the scores achieved didn’t have any effects on the study. After that interpretation bias cognition test was given. And finally, participants were asked to complete the social anxiety questionnaire and determine the extent to which these situations provoked their anxiety and caused their avoidance. Finally, data were analyzed using descriptive and analytical statistic and also one sided variance analysis test and variance analysis with repetitive measures.

RESULTS

The samples of the current study were 60 female students who were found with social anxiety while visiting clinical psychology center of Shiraz University. All participants were literate and at list have diploma, and were between 18 to 28 years old. Results indicated that, as far as the social anxiety is concerned, there wasn’t a meaningful difference in pretests among groups. (F(2,57)=0.26,ns. The difference between scores achieved by individual in pretests and posttests of social anxiety were compared via one sided variance analysis and as shown in Table 1, there was a meaningful difference
between positive and negative training group in comparison with control group. \(F(2,57)=15.67, p<0.01\). In reality, this shows that training was successful in reducing social anxiety symptoms and at last facilitate the interpretation bias correction. Actually, this part of the study correspond the results indicated by Mobini et al. [15], Haphman &Oto [16], and as described above, training individuals with social anxiety disorder cause a considerable decrease in disorder and correction of interpretation. Tukey test was used to determine where the differences are. As shown in Table 2, there was a meaningful difference between both training groups i.e. the social anxiety symptoms in positive training group was fewer than not negative training group. \(p,0.01\).

As you can see from Table 3, the results achieved in this study for interpretation bias correction in anxious individuals, the social anxiety disorder cause null interpretation (positive and not-negative)to increase in probable article test of interpretation bias recognition of involved groups in comparison with control group. In fact, it can be stated that there was a meaningful difference between probable articles of recognition test including positive, not-negative and negative articles. \(F (2.6,57)=13.27,p<0.01\).

Besides, results indicts that interpretation bias correction cannot change the interpretation bias in probable articles of under-study groups in comparison with control groups in individuals with social anxiety disorder. These results correspond the results achieved by Mimerbue Juster and Tork 2000 who carried out their research for solving the scenarios with the aim of curing social anxiety disorder (17). As Table 4 shows, there wasn't a meaningful difference between scores achieved by individuals in recognition articles, in under-study and control groups. \(F (2.57)=2.05,ns\). This part of the study doesn't correspond the results achieved by Franklin et al. [18] and Stepa [19] and its reason should be sought in the shortage of sample volume, number of training classes and absence of pretesting and post-testing.

DISCUSSION AND CONCLUSION

Findings indicated that positive and not-negative interpretation bias training exerts influence on social anxiety symptoms. To be brief, there are a couple of mechanisms that can cause a reduction in social anxiety symptoms including: interpretive bias correction scheme, giving individuals positive feedback while they are interpreting the ambiguous story positively, and giving them negative feedback while interpreting social ambiguous information negatively. And this causes negative interpretation bias to reduce in individual and consequently, the individual interpreters the ambiguous clues positively and it itself brings the reduction of anxiety and avoidance. In positive and not-negative training groups, getting positive feedbacks during the interpretation bias correction plan has caused the individuals to gradually reduce their negative bias and this helps individuals to have less anxiety than before. Moreover, the interpretation bias training programs are likely to cause individuals to have a more positive conception of themselves and expect himself better performances and consequently experience less anxiety. In this study, there were two types of training programs including positive and not-negative. Positive training programs in which all auditory stories ended positively create a more positive conception within individuals.
towards not-negative training programs. For this, as the results indicated, participants had less social anxiety in positive training group than not-negative training group. Consequently, positive training programs could be more effective than not-negative training programs. Interpretation bias training programs can also change the individual's negative way of interpretation and makes him challenge their thoughts exactly like what happened in cognitive reconstruction. As a result, the individual will have less negative thoughts and accordingly, will experience less anxiety.

In conclusion, providing feedback during the test can cause individuals to change their interpretation bias. For this, individuals will be given a negative feedback when they interpret the ambiguous social situation and evaluate their performance negatively and vice versa. Some null stories were also included to prevent participants from paying attention to test trend. Gradually, and during the test, the individual is attracted to this direction and it can be result of the individual's negative conception. Therefore, the individual will have a more positive conception of his social situations and so his interpretation bias will be corrected. Both positive and not-negative training programs cause the creation of a positive conception within individual in social situations. Hence, both trial groups showed a reduction in interpretation bias in negative articles and an increase in positive and not negative articles. However, such interpretation bias correction cannot totally lead to correction of the individual's answer bias and so become generalized and cause the correction of a general answer bias and no need to say that it is only effective in social situation-related performances. For what mentioned, no difference was seen in improbable article recognition test in all three groups. A large number of studies like Franklin [18], Mimbergue Jaster [17], Mobini [15] and Halphman & Oto [16] have focused on correcting interpretation bias in individuals with high anxiety or high social anxiety and tried to study the effect of such corrections. However the current paper is the only research into people with social anxiety disorder who received positive and not-negative interpretation bias training via DSM-IV standards. This training program lasted only for 3 hours and led to a reduction in social anxiety symptoms and consequently in interpretation bias. Besides, this study used both probable and improbable articles in recognition test (which was used for measuring interpretation bias after training) that was a new method. Results in this part indicated that interpretation bias training doesn't have effects on positive interpretation increase or negative interpretation bias decrease. Consequently, interpretation bias correction cannot lead to the creation of a general positive answer. However, more research is required to prove this.

**Recommendations:** Although the current results are encouraging, there have been some limitations that need to be taken into consideration by researchers in future. Below are some of these limitations: In future research, post-test shouldn't be given immediately so that we can find the efficacy the training Everything should be cared for in future so that we can generalize the results. Participants who were in control group had the same assignments other groups and the instructions were similar to what given to groups and it increased their exception of training items. However, null items were included. The improvement or probable changes of the real life situations weren't studied and it needs to be considered in future studies. It is suggested that different control groups should be used like waiting list control group. Despite the abovementioned limitations, the current paper is the only study on training individuals with social anxiety disorder through positive and not-negative interpretation bias training programs based on DSM-IV standards. It needs to be mentioned that this paper is also the only study that was carried out on Iranian culture and since culture and community have important roles in social anxiety disorders. Therefore the results achieved in this study can be a starting point for studying the interpretation bias correction in our patients.

**REFERENCES**


