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Original Article

Interpretation bias towards vague faces in individuals with paranoid personality disorder traits

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Abstract

Introduction: According to the social cognitive theories, information processing biases can play an important role in social perception, interpretation of interpersonal relationships, and social interactions. These theories along with cognitive theories emphasize on information processing i.e. the way in which people perceive and interpret external stimuli in different ways. Therefore, the purpose of this study was to investigate interpretation bias towards vague faces in individuals with paranoid personality traits.

Materials and Methods: In this causal-comparative study (2012-13), 40 individuals with paranoid personality disorder traits and 40 normal individuals referred to the Counseling Center affiliated with Ferdowsi University of Mashhad in Iran were selected by using simple randomized sampling. The participants completed Millon Clinical Multiaxial Inventory (MCMI-III; 1994) and vague facial images for perceptive bias (2012). Data were analyzed by Mann-Whitney U test.

Results: The results showed that there was significant difference between individuals with paranoid personality disorder traits and normal individuals in terms of interpretation of vague faces (P=0.0001).

Conclusion: Individuals with paranoid personality traits have more biases than normal individuals in terms of interpreting vague faces. The results of this study indicated the importance of attention to cognitive biases among individuals with paranoid personality traits or paranoid personality disorder because such biases can significantly influence behavioral patterns in individuals, and consequently degrade their functioning. Also, bias towards the processing of negative signs appears to be the most important cognitive element is involved in interpersonal relationships.

Keywords: Interpretation bias, Paranoid traits, Vague faces

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Introduction

Personality disorders are known as long-term patterns of behavior and inner experiences that are pervasive and inflexible and also do not meet cultural expectations. Such disorders are established since adolescence or early adulthood and remain constant over time which can similarly bring about distress or disturbance (1).

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In this regard, paranoid personality disorder (PPD) with a prevalence rate of 2.1 to 4.4% is taken into account as one of the major causes of disability (2) which is as well associated with violent and criminal behaviors (3). The given disorder is characterized by a pattern of overwhelming distrust and suspicion towards others, so that people suffering from this impairment are likely to misinterpret others' intentions. This disorder sets off from early adulthood and it can be observed in various domains (1). In this regard, paranoia is defined as the tendency of a person or a group towards excessive or unreasonable suspicion and distrust towards others (4) which can have their own effects on cognition and social behavior (5). It also includes irrational thoughts and distrust towards others; thoughts that are accompanied by hostile interpretation of the actions performed by other individuals. Paranoid thoughts are partly shaped by the ability of people in the interpretation of others' verbal and non-verbal messages (6).

Although paranoia is placed on a continuum, the border between clinical and non-clinical paranoia is not currently clear (5). In this respect, Kraepelin in 1921 proposed three separate types of paranoia associated with the diagnosis of schizophrenia, delusional disorders, and the PPD. It should be noted that paranoia within the PPD does not represent delusional psychosis rather it is a distinctly paranoid cognitive style (3). Numerous theories and treatment methods have been put forward for personality disorders (2,7). However, cognitive theories and treatment methods assume that such personality disorders are created and then perpetuated through interpretation biases and this information processing style comes from individuals' maladaptive schemas (7).

The interpretation bias refers to the tendency of individuals to interpret ambiguous information in specific ways (7,8). The cognitive theories on the PPD also put stress on injudicious beliefs about oneself, attributive styles, and social cognition including biases (2). For example, it is believed that people with personality disorders including the PPD have underlying incorrect schemas or assumptions about others (e.g., others are malicious and deceitful) along with biases that can affect different aspects of their life (9). Thus; suspicion, distrust, as well as violent and criminal behaviors by such individuals can be influenced by biases from their hostile attributions. In this respect, bias refers to the tendency of people to interpret others' intentions as hostile ones in positions when the intentions behind behaviors are not ambiguous or not clearly hostile (10). Arntz, Weertman and Salet (3) in a literature review showed that biases in individuals suffering from personality disorders can occur in different dimensions including attention, meaning of images in Thematic Apperception Tests, implicit attributions, implicit relationships, priming effects, and elective strategic information processing in order to avoid mistakes. Social cognition also refers to the study of psychological processes involved in understanding, participation, remembering, thinking, and making sense of others in the social world (11).

Accordingly, two aspects of social cognition are the ability to interpret facial expressions in a fast and correct manner and the ability to display interpretable emotional demonstrations for a person's face (12). Thus, facial emotion recognition is among the utmost important aspects of social cognition because its existing defects can reduce social capacities and lead particularly to misunderstanding in individuals or inappropriate social behaviors (13).

Although numerous studies have been conducted on the recognition of facial emotions among people with schizotypal (12,14), borderline (14-17), and antisocial (17-19) personality disorders; little attention has been placed on facial emotion recognition and interpretation biases towards vague faces in individuals affected with the PPD. In this respect, Dickey et al. (12) found that people with schizotypal personality disorder had problems both in correct interpretation of facial expressions by others and in the creation of facial demonstrations that were socially attractive and unambiguous. Besides, they were slower and less accurate than healthy individuals in terms of recognizing facial emotion expressions. Moreover; Farsham et al. (14) observed a difference between people with borderline personality disorder as well as schizotypal disorder and normal individuals in terms of facial emotion recognition. As well, Fenske et al. (15)

reported that people with borderline personality disorder had significant deficits in recognizing neutral and positive facial expressions.

They found that such deficits were accompanied by a negative bias on perceiving neutral faces. Likewise; Daro et al. (16) suggested that individuals suffering from borderline personality disorder had significant problems from neutral face recognition to facial demonstration recognition of sadness and happiness. Furthermore, Smeijers et al. (17) reported that outpatient psychiatric patients with antisocial and borderline personality disorders could show hostile attributive biases associated with facial emotion expressions compared with healthy and non-aggressive control subjects.In addition to what was mentioned, Combs and Penn (20) in their study on a group of university students revealed that those obtaining a high score of subclinical paranoia had worse emotional perception than individuals with lower scores. In this respect, the colleagues graded the study as a more negative and less reliable one in which more behaviors indicating suspicion were demonstrated. The results of other investigations also showed that people with paranoid schizophrenia had more deficits and suffered from less attention than normal individuals in terms of the recognition of facial emotion expressions (21-24).

For example; Pinkham et al. (25) investigated the ability to recognize paranoid and non-paranoid patients' emotions found that they had less ability in labeling neutral faces. It should be noted that paranoid patients have more hostile and blamable attributions and grade others unreliable.

Comparing patterns of error processing on neutral stimuli, they similarly showed that paranoia was accompanied by a tendency towards extreme attribution of risks to vague faces. Finally and given the prevalence of the PPD symptoms in clinical and non-clinical populations as well as its consequences and considering scant attention to facial emotion recognition and interpretation bias towards vague faces in people affected with this disorder, the present study aimed at investigating the interpretation biases towards vague faces in individuals with paranoid personality disorder traits.

Materials and Methods

The present study was of basic research type adopting an ex-post facto (causal-comparative) design in terms of data collection method. This study was conducted following its approval by the Research Council at Shahid Chamran University of Ahwaz in Iran. The statistical population of this study included 1289 undergraduate and graduate male university students referred to the Counseling Center affiliated with Ferdowsi University of Mashhad in Iran in 2012-2013. The Millon Clinical Multiaxial Inventory (MCMI-III) was also used for screening and selection of the study samples. Thus, 57 university students who had obtained scores from 75 to 84 on the subscale of the PPD were diagnosed with the paranoid traits.

Then, using simple random sampling, 40 individuals were selected as the group with paranoid personality disorder traits and they were invited to participate in the present study. The ethical considerations in this study included obtaining informed consent to participate in this research from the subjects, emphasizing confidentiality of data, and avoiding any damage to them. The inclusion criteria for the participants included obtaining a score higher than 75 for the other subscales of the MCMI-III, no history of mental diseases and brain damage, as well as informed consent to participate in this investigation. The exclusion criteria were gaining the score higher than 75 from the PPD index, lack of informed consent to participate in this research, and incomplete answers to the questionnaires.

Accordingly, a total number of 40 individuals lacking scores higher than 75 on the subscale of the MCMI-III was selected as the normal group in this study via simple random sampling method.

Research instruments

A) Millon Clinical Multiaxial Inventory (MCMI-III): This 175-item research instrument was developed by Theodore Millon (26) for individuals aged over 18 years. This test is answered based on a Yes-No response format and it consists of 14 schizoid, avoidant, depressive, dependent, histrionic, narcissistic, psychopathic, aggressive, obsessive, negative, masochist, schizotypal, borderline, and paranoid personality patterns, and 10 clinical symptoms (anxiety,

physical form, bipolar, depressive, alcohol dependence, drug dependence, post-traumatic stress, thought disorder, major depression, and delusional disorder).

Based on Millon's dimensional or continual approach and the results of this test, the baseline above 85 indicates the presence of personality disorder, the baseline between 75 and 84 represents personality traits, and the baseline closer to 75 shows personality features. Million also reported the reliability of this test using internal consistency and test-retest reliability methods equal to 0.82-0.90 and 0.82-0.98 (26). In this respect; Sharifi, Mowlavi, and Namdari (27) also reported the reliability of the Farsi version of this test through internal consistency and test-retest reliability methods equal to 0.85-0.90 and 0.82-0.98, respectively. The positive predictive power of the scales was estimated at the range of 0.92-0.98 and the negative predictive power of the given scales was equal to 0.93-0.99. Moreover, the recognition power of all the scales was estimated at the range of 0.83-0.85.

B) Vague Facial Images for Perceptive Bias: In this study, 10 vague facial images that were emotionally neutral were employed. This means that the images were displayed to professors using the PowerPoint 2007 Software and they were asked to rate the appropriateness of the faces in terms of being emotional and neutral on a continuum (very good, good, average, poor, or very poor). The images were taken with a 10-megapixel digital camera from 10 actors based on one neutral image in the Paul Ekman Group website as the criterion image.

After that, the images were edited and reconstructed by an expert in the Photoshop Software using the standard image. The final images included only actors' faces and hair and the rest of the body and the background had been removed. Furthermore, the quality of images in black and white was high-resolution 24-bit and 1800*1800 and the pixel size of 146 to 200.

The given images had been provided in the research study by Doustkam, Pourheydari, Heidari and Shahidi (28) by five faculty members at Shahid Beheshti University, IRIB University, and Shahid Chamran University with expertise in the field of emotions. In addition, these images were used in the study by Donyawizadeh (28) with high reliability in the sense that they did not inspire any emotions in subjects.

The method used in the evaluation of perceptive bias towards vague faces was similar to the procedure employed in the study by Pollak et al. In their investigation, 20 facial images (10 images with emotional effects and 10 images with neutral effects) were shown to university students and they were asked to rate the emotions of each image on a numerical continuum from -100 (very aggressive) to +100 (very friendly). It should be noted that emotions such as anger and hatred (hostile) had been illustrated on one pole and emotions such as happiness (friendly) had been presented on another pole. There were also ten emotionally neutral images (29,30). In the present study, each of the images was displayed by a computer screen to participants and they were asked to mark the level of being hostile or friendly for the faces on a continuum.

The minimum and maximum scores obtained by participants in this task were -1000 and +1000, respectively. The sum of the scores constituted the scores obtained by participants. The more the final score was closer to zero, the less the bias in interpreting facial emotions. Moreover, the data for this study were analyzed using the SPSS software version 22 through descriptive statistics and Mann-Whitney U test. The following research instruments were used to measure the given variables.

Results

The descriptive results related to the variable of interpretation bias towards vague faces were presented in Table 1.

Table 1. Descriptive indices related to study variables

Group	Mean	Standard deviation
Group with paranoid personality disorder traits	53.68	2.66
Normal group	27.33	2.36

Given the non-normalization of the data distribution in this study (P>0.05), the Mann-Whitney U test was employed to determine the difference between the two groups in terms of the variable of interpretation bias towards vague faces. The results of the given test were presented in Table 2.

Table 2. Results of Mann-Whitney U test to evaluate the significance of differences between groups

Test	Test results
Mann-Whiney U test	273
Z	-5.123
Level of significance	0.0001

The results in Table 2 showed the difference between individual with paranoid personality disorder traits and normal individuals in terms of interpretation bias towards vague faces (P>0.05).

Discussion

The PPD is characterized with a pattern of pervasive distrust and suspicion towards others. Therefore, the purpose of this study was to investigate interpretation bias towards vague faces in individuals with paranoid personality traits. The results of this study showed that individual with paranoid personality traits had more biases than normal individuals in terms of interpretation of vague faces. Moreover, the review of the related literature revealed that few studies had investigated interpretation biases towards vague faces in people suffering from the PPD. However, the results of this investigation in line with the findings related to other personality disorders such as schizotypal personality disorder (12,14), borderline personality disorder (14- 17), and antisocial personality disorder (17-19) showed that with paranoid personality traits had problems in recognizing facial emotion expressions and interpretation biases towards neutral and vague faces. Other studies also revealed that people with higher scores of subclinical paranoid had worse emotional perception than those with lower scores. The colleagues also graded this study as a more negative and less reliable one in which more behaviors indicating suspicion were demonstrated. The results of other studies also suggested that people with paranoid schizophrenia had more deficits and less attention than normal individuals in terms of the recognition of facial emotion expressions (21-24). Cognitive theories and treatment methods have been also proposed to explain the above-mentioned results (2,7). Such theories and treatment methods assume that the given disorders are created and then perpetuated through interpretation biases and this information processing style comes from individuals' maladaptive schemas (7). The interpretation bias refers to the tendency of individuals to interpret ambiguous information in specific ways (2,7). This disorder is also characterized by an overwhelming pattern of distrust and suspicion towards others because people with paranoid personality disorder mostly interpret intentions by others as malicious and hostile ones. On the other hand, in explaining these results, the hostile attributive biases associated with facial demonstrations can be noted because individuals with the PPD have more hostile biases towards vague faces. Hence, they interpret vague stimuli as mostly hostile and threatening to perception. The results for other personality disorders as well as those on paranoid schizophrenia have also supported this view. For example, Smeijers et al. (17) reported that outpatient psychiatric individuals with antisocial and borderline personality disorders had shown hostile attributive biases associated with facial emotion expressions compared with those by healthy and non-aggressive control subjects. Pinkham et al. (25) investigating the ability to recognize paranoid and non-paranoid patients' emotions also found that they had more hostile and blameworthy attributions about vague faces and they had graded others more unreliable. Moreover; comparing patterns of error processing on neutral stimuli, they observed that paranoia was accompanied by a tendency towards extreme attribution of risks to vague faces. Given the social-cognitive theories, information

processing biases can play an important role in social perception, interpretation of interpersonal relationships, and social interactions especially in ambiguous social situations. The ability to interpret facial expressions correctly and quickly and the ability to display interpretable emotional demonstrations for an individual's face are two aspects of social cognition (12). Accordingly, the review of the related literature showed that social cognitive biases were at higher levels in vague situations (31). In addition, such defects or biases in interpretations can reduce social capacities and quality of social interactions and also disturb social ties and lead in particular to individual misunderstanding or inappropriate social behaviors (13,15). One of the limitations of this study was the lack of examination of the variable of gender. Given the related literature and considering the results of the present study, it was suggested to collect a series of symptoms of paranoid personality traits and features as well as other schizophrenic disorders within the continuum such as hostility, forgiveness, alexithymia, tendency to revenge, and other related variables through measurement instruments specific to this continuum.

Conclusion

Individual with paranoid personality traits have more biases than normal individuals in terms of interpreting vague faces which can lead to their hostile perceptions. The results of this study indicated the importance of attention to cognitive biases among people with paranoid personality traits or PPD because such biases can significantly influence behavioral patterns in individuals. In other words; these biases can reduce social capacities and quality of social interactions, disturb social ties in individuals, and consequently degrade their functioning. Since the PPD makes an individual prone to misinterpretation of facial expressions and such misinterpretation can have dramatic effects on individuals' behavioral patterns which may also lead to the destruction of their daily functioning; recognizing the domains of these misinterpretations and their treatments are of utmost importance.

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