

Gender Difference of Unconscious Attentional Bias in High Trait Anxiety Individuals

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Abstract

By combining binocular suppression technique and a probe detection paradigm, we investigated attentional bias to invisible stimuli and its gender difference in both high trait anxiety (HTA) and low trait anxiety (LTA) individuals. As an attentional cue, happy or fearful face pictures were presented to HTAs and LTAs for 800 ms either consciously or unconsciously (through binocular suppression). Participants were asked to judge the orientation of a gabor patch following the face pictures. Their performance was used to measure attentional effect induced by the cue. We found gender differences of attentional effect only in the unconscious condition with HTAs. Female HTAs exhibited difficulty in disengaging attention from the location where fearful faces were presented, while male HTAs showed attentional avoidance of it. Our results suggested that the failure to find attentional avoidance of threatening stimuli in many previous studies might be attributed to consciously presented stimuli and data analysis regardless of participants' gender. These findings also contributed to our understanding of gender difference in anxiety disorder.

Introduction

Generalized anxiety disorder (GAD) is a common mental disorder characterized by excessive and uncontrollable worry about a variety of events or activities [1]. It is associated with significant functional impairment and increased risk for comorbid depression and substance use disorders [2]. The pathogenesis of GAD is complex, involving genetic, environmental, and psychological factors [3,4].

One of the key features of GAD is attentional bias, which refers to the tendency to focus attention on threat-related stimuli [5,6]. This bias is thought to contribute to the maintenance and exacerbation of anxiety symptoms [7].

Recent research has shown that attentional bias is not only present in GAD but also in other anxiety disorders, such as panic disorder and agoraphobia [8]. Moreover, attentional bias has been found to be a transdiagnostic feature, meaning it is common to multiple anxiety disorders [9].

Understanding the mechanisms of attentional bias in anxiety disorders is crucial for developing effective treatments. One potential approach is to target attentional bias through cognitive-behavioral therapy (CBT) [10].

Individuals with anxiety disorders often exhibit attentional bias towards threat-related stimuli. This bias is thought to contribute to the maintenance and exacerbation of anxiety symptoms. Recent research has shown that attentional bias is not only present in anxiety disorders but also in other mental health conditions, such as depression and substance use disorders.

One of the key features of attentional bias is its automaticity. Individuals with anxiety disorders often find themselves drawn to threat-related stimuli without conscious awareness or intention. This automaticity is thought to be a result of heightened sensitivity to threat-related cues.

Understanding the mechanisms of attentional bias is crucial for developing effective treatments. One potential approach is to target attentional bias through cognitive-behavioral therapy (CBT). CBT aims to help individuals identify and challenge their automatic thoughts and beliefs, and to develop more adaptive coping strategies.

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Figure 1. A sample stimulus in the invisible condition. The left image was presented to the non-dominant eye and the right image was presented to the dominant eye.
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... (F(1, 2) = 1256, p < 0.001). ... (F(1, 44) = 3.75, p = 0.059), ...

Design. F ... (F(1, 44) = 6.59, p = 0.014), ... (F(1, 44) = 4.77, p = 0.034), ...

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... (F(1, 44) = 3.75, p = 0.059), ... (F(1, 44) = 6.59, p = 0.014), ... (F(1, 44) = 4.77, p = 0.034), ...

Results
Visible condition. A ... (F(1, 44) = 3.75, p = 0.059), ... (F(1, 44) = 6.59, p = 0.014), ... (F(1, 44) = 4.77, p = 0.034), ...

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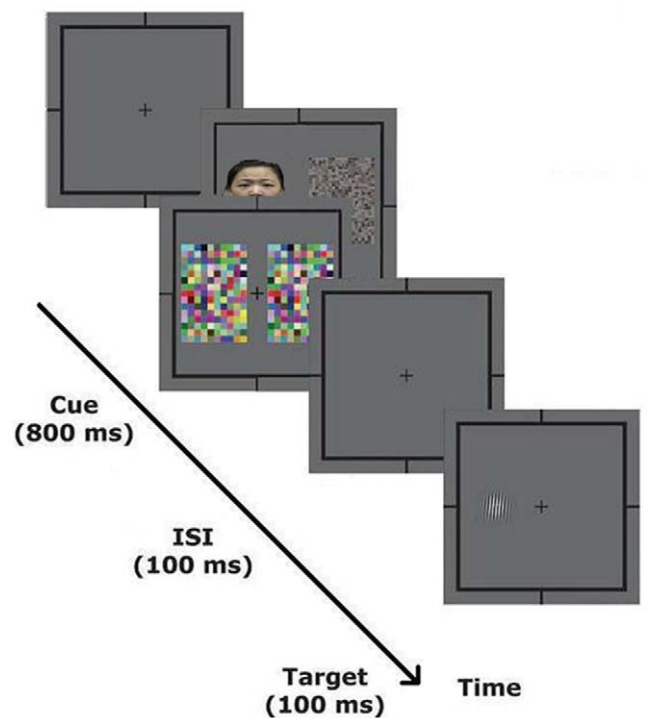


Figure 2. A schematic description of the experimental procedure in the invisible condition.
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Table 2. STAI-TAI scores of female and male participants in HTA group and T-Test between two genders.

	Female	Male	t	P
HTA	52.83(9.77)	52.83(6.64)	0.00	1.00

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Design.

The experiment was a 2 (Gender) × 3 (Face Expression) × 2 (Condition) × 2 (Task) factorial design. The dependent variable was the number of correct responses.

Results

A 2 (Gender) × 3 (Face Expression) × 2 (Condition) × 2 (Task) ANOVA revealed a significant main effect of Gender ($F(1, 34) = 8.62, p = 0.006$), Face Expression ($F(2, 33) = 5.6, p = 0.008$), and Condition ($F(1, 34) = 8.62, p = 0.006$). A significant interaction effect was found between Gender and Face Expression ($F(2, 33) = 5.6, p = 0.008$), and between Gender and Condition ($F(1, 34) = 8.62, p = 0.006$). Additionally, there was a significant interaction between Gender and Task ($F(1, 34) = 8.62, p = 0.006$).

Discussion

The results of the present study showed that female participants exhibited attentional bias to fearful faces, while male participants exhibited attentional avoidance of fearful faces. This result supported that there was gender difference in HTA population. Additionally, we did not find attentional effects by both neutral and happy faces.

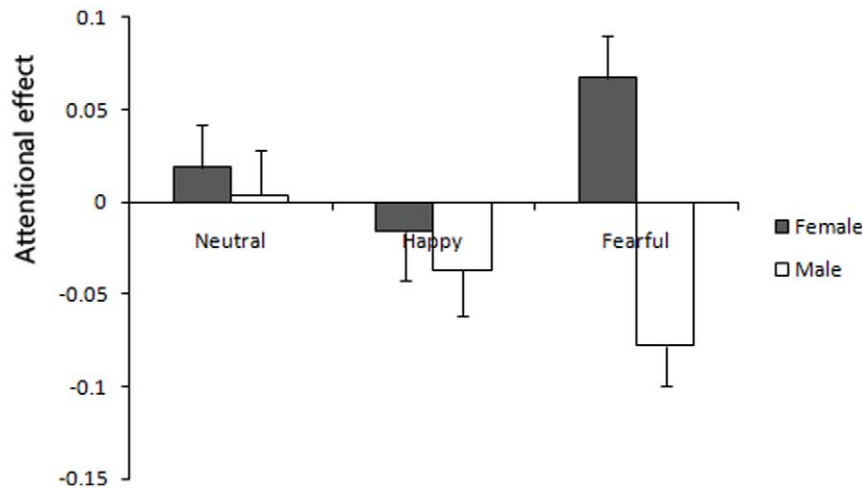


Figure 5. Attention bias and avoidance by neutral, happy and fearful faces in the invisible condition. Female participants exhibited attentional bias to fearful faces, while male participants exhibited attentional avoidance of fearful faces. This result supported that there was gender difference in HTA population. Additionally, we did not find attentional effects by both neutral and happy faces. Error bars denote 1 SEM calculated across subjects.

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K ... Bl ... 45 ... 19 ... I ... F ... J ... M ... C ... J ... M ... FF.

Author Contributions

C ... J ... M ... G. A ... J ... FF. ... J ... M ... C ... J ... M ... FF.

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