

Gender Difference of Unconscious Attentional Bias in High Trait Anxiety Individuals

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Funding: Work was funded by Natural Science Foundation of China (<http://www.nsf.gov.cn/> (31071001), National Natural Science Foundation of China (973) (www.most.gov.cn/ (2009CB320901)). The funders had no role in the study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Competing Interests: The authors have declared that no competing interests exist.

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Introduction

Generalized Anxiety Disorder (GAD) is a common mental disorder characterized by excessive and uncontrollable worry about a variety of events or activities. It is associated with significant functional impairment and is a leading cause of disability. The prevalence of GAD is approximately 5% in the general population. The pathogenesis of GAD is complex, involving genetic, environmental, and psychological factors. The disorder is often comorbid with other anxiety disorders, such as panic disorder and agoraphobia. The symptoms of GAD include persistent and excessive worry, restlessness, fatigue, difficulty concentrating, irritability, muscle tension, and sleep disturbance. The diagnosis of GAD is based on the presence of at least six of these symptoms for a period of at least six months. The disorder is typically treated with cognitive-behavioral therapy (CBT) and/or pharmacotherapy, such as selective serotonin reuptake inhibitors (SSRIs). The goal of this study was to investigate the gender difference of unconscious attentional bias in high trait anxiety individuals. We hypothesized that high trait anxiety individuals would show an unconscious attentional bias towards threat-related stimuli, and that this bias would be more pronounced in females than in males. To test this hypothesis, we conducted a series of experiments using a dot-probe task. In this task, a fixation cross is presented for a certain duration, followed by two probes. One probe is a neutral stimulus, and the other is a threat-related stimulus. The response time (RT) to the threat-related probe is measured. A shorter RT to the threat-related probe indicates an unconscious attentional bias towards threat. We found that high trait anxiety individuals showed a significant unconscious attentional bias towards threat-related stimuli, and that this bias was more pronounced in females than in males. These findings suggest that high trait anxiety individuals, particularly females, may have an unconscious attentional bias towards threat-related stimuli, which could contribute to the development and maintenance of GAD. This study has important implications for the understanding of the pathogenesis of GAD and for the development of targeted interventions for this disorder.

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18. A

.J . 19

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800

. I

20,21 . C

22

23 25

11,26,27 .

28

. H

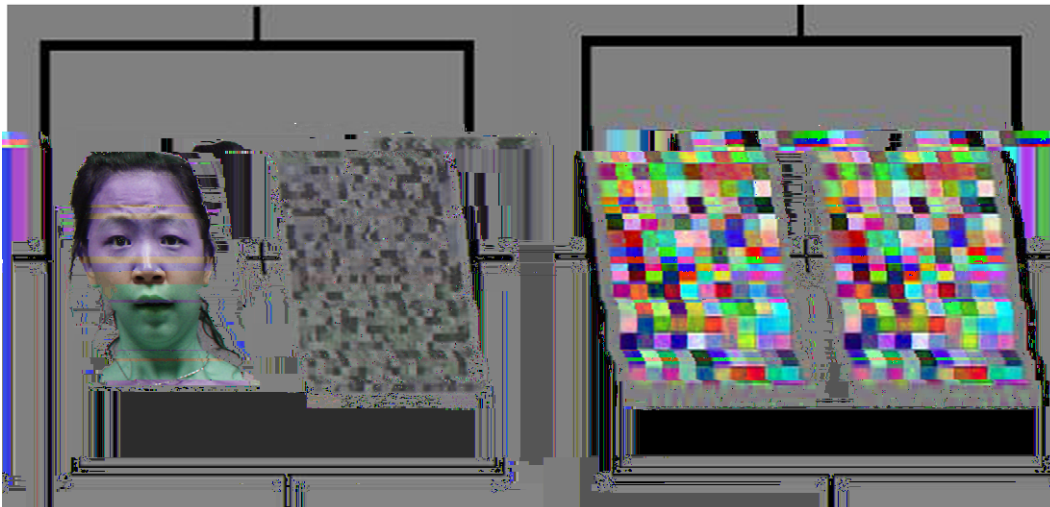


Figure 1. A sample stimulus in the invisible condition. The left image was presented to the non-dominant eye and the right image was presented to the dominant eye.
doi:10.1371/journal.pone.0020305.g001

256
(F 2).
,
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, 64
B , 50

Design. F
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()

A J (2006) 19 .
A

Results
Visible condition. A
H A L A F 3. A
2x2x2 - A A (/)
(/)

(F (1, 44) = 3.75, p = 0.059),
Invisible condition. A
H A L A F 4.
A 2 ()x2 ()x2 ()
A A (F (1, 44) = 6.59, p = 0.014),
(F (1,

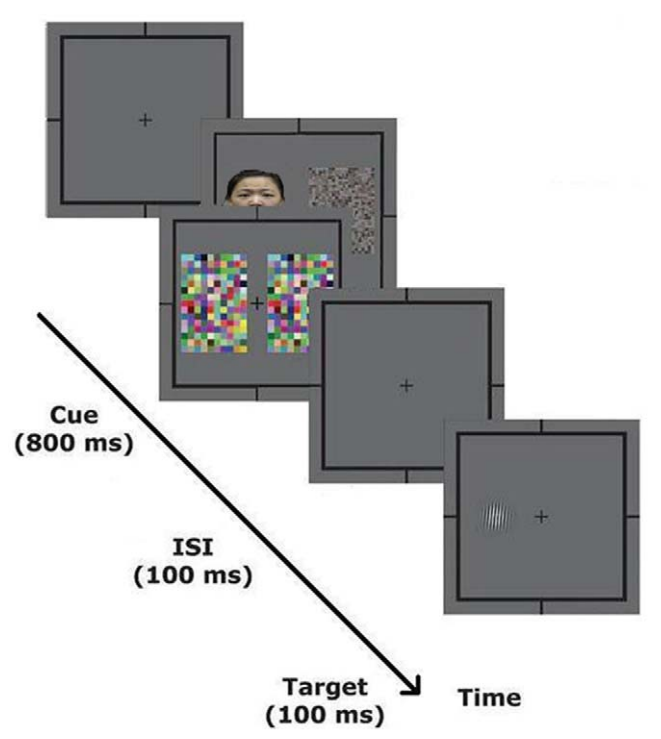


Figure 2. A schematic description of the experimental procedure in the invisible condition.
doi:10.1371/journal.pone.0020305.g002

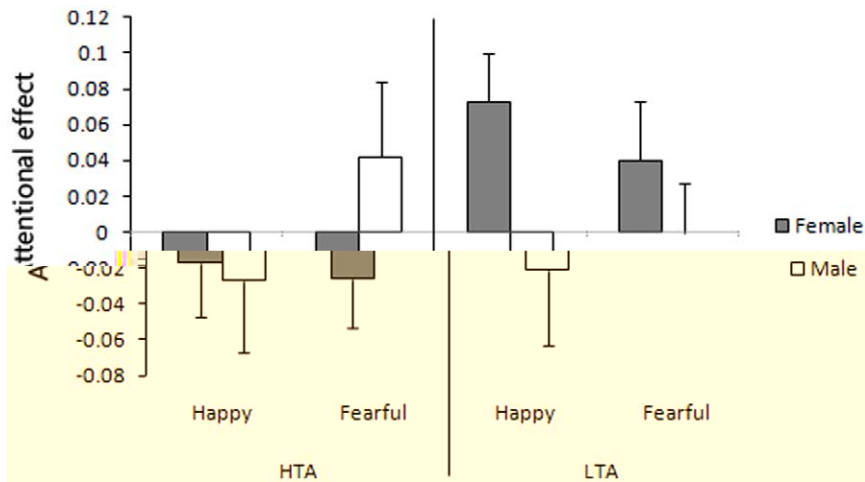


Figure 3. Attention bias and avoidance by happy and fearful faces in the visible condition. The results indicated no significant main effect or interaction. Error bars denote 1 SEM calculated across subjects. doi:10.1371/journal.pone.0020305.g003

2 () × 2 () A H A , H ,
 L A (F (1, 22) = 5.35, p = 0.031), L A (F (1, 22) = 1.89, p = 0.183). I H A (F (1, 22) = 4.11, p = 0.055). A
 H A ((11) = 2.66, p = 0.022). I H A ((11) = 2.01, p = 0.069).

Methods
Participant.

Stimuli and Procedure.

Experiment 2

I E 1, () H A (12

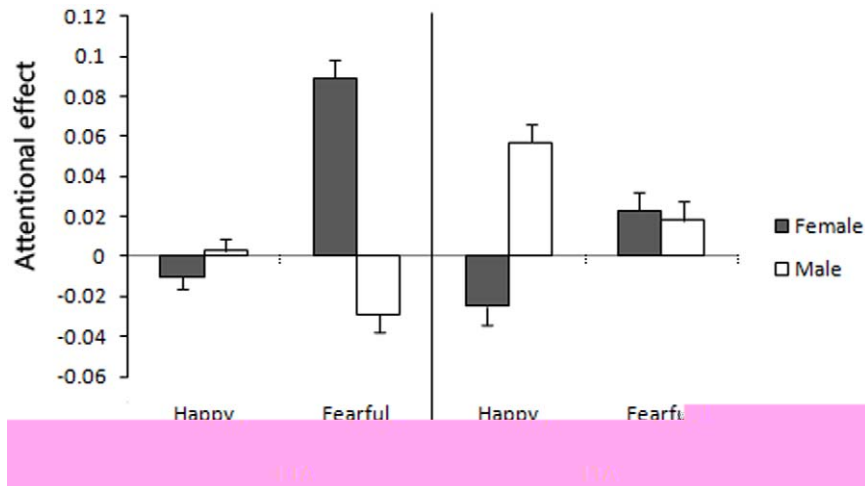


Figure 4. Attention bias and avoidance by happy and fearful faces in the invisible condition. The results indicated a gender difference of attentional effect induced by emotional pictures. And the (eff40.3e8-330.i(bias3i9Ap2.95.05358Bsc6.3(s)-21nsntional)48.9*05356(m(Fi7een)-633.8(d47.47ndent)-6339T5o

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

doi:10.1371/journal.pone.0020305.t002

Design.

(...) . D

Results

A H A (/ /) - F 5. A 2 (/) × 3 A A

(F (2, 33) = 5.6, p = 0.008),
(F (1, 34) = 8.62, p = 0.006). A

((17) = 2.89, p = 0.01),
((17) = -3.75, p = 0.002).

. A , (F 5).

Discussion

H A , H A , H A

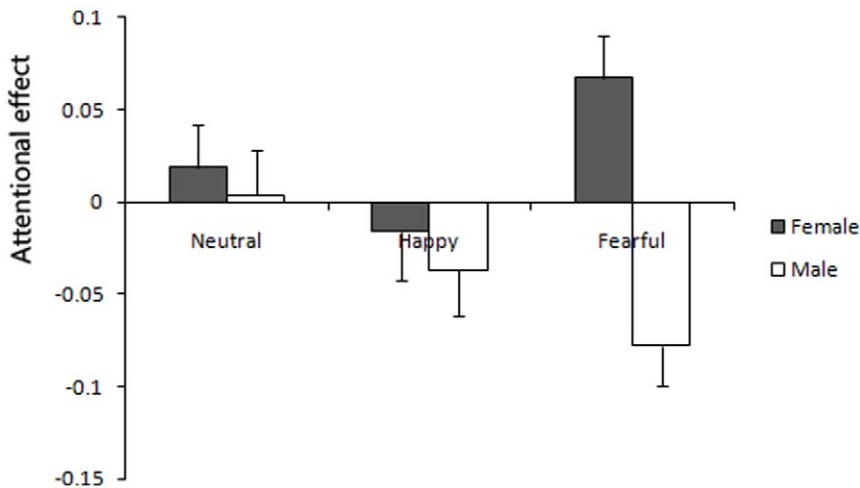


Figure 5. Attention bias and avoidance by neutral, happy and fearful faces in the invisible condition. Female participants exhibited attentional bias to fearful faces, while male participants exhibited attentional avoidance of fearful faces. This result supported that there was gender difference in HTA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

doi:10.1371/journal.pone.0020305.g005

H A

K B 45).

19. I

8,42,43

C

44. I

Author Contributions

C : J Z G. A : J Z . C
 FF. / / : J Z : J Z

References

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 5. B B , K, F J , H L (1998) A
 6. C E 12: 737 753.
 7. K, B B (1999) : C
 8. E 13: 713 740.
 9. K EH , B, C G, D (2005) : B
 43: 1087 1098.
 10. K, B B (1998) A : B
 36: 809 848.
 11. (1998) A . H :
 12. L C, A, (1986) A
 J A 95: 15 20.
 13. B D, B (1988) A :
 C E 2: 165 183.
 14. K, B B , F, D (2004) : C E
 18: 689 700.
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 19: 571 590.
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 304 311.
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 33: 927 935.
 18. I, (2005) E :
 38: 785 795.
 19. B , L K (2002) :
 3: 13 21.
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 8: 1380 1385.
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 17048 17052.
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 26: 27 41.
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 B 126: 424 453.
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 . B 55: 1047 1055.
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 129 146.
 26. F , A , F H, G (1996) G
 . B 34: 33 39.
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 . A J 29: 114 117.
 28. B , L, E (1995) :
 58: 1 12.
 29. E (2003) A ? J A D 77: 197 202.
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 E 40: 206 316.
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 1373 1382.
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 C J C 17: 60 62.
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 A -A 46 C . C
 H J 19: 719 722.
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 297 303.
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 . C A: I 215 265.
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