Does the Threat Advantage Hypothesis Extend to Static Body Postures?

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Background

The Threat-Advantage Hypothesis

- Evolutionary pressures have shaped the visual system so that threat-related information is detected and processed with greater efficiency[1].

Anger Superiority Effect

- In visual search displays, angry faces (a threat relevant stimulus) are detected faster than other emotional faces when depicted in photographs[2] and schematically[3]. The anger superiority effect has also been shown with the eyes alone[4].

Preferential Processing of Fearful Faces

- Fearful faces (also threat relevant) inhibit the processing of other emotional faces[5] and are processed faster than other emotional faces coming into consciousness[6].

Recognition of Emotional Body Postures

- Previous studies of emotional body posture recognition find that emotional postures are recognizable[7].
- However many studies using static body postures don't include norming information or whole hand shape.
- It is unclear if bodies are processed similarly to faces[8] but the work of Beatrice de Gelder suggests they are[9].

Question of Interest

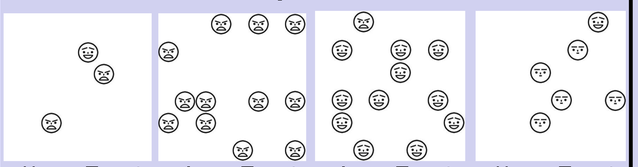
- Observers demonstrate enhanced visual sensitivity to angry and fearful faces in static displays. Might observers also demonstrate enhanced sensitivity to angry and fearful body postures in static displays?

Experiment 1

Approach

Confirm that angry faces are detected faster than other faces by replicating Horstmann & Ansorge, 2009.

Sample Stimuli

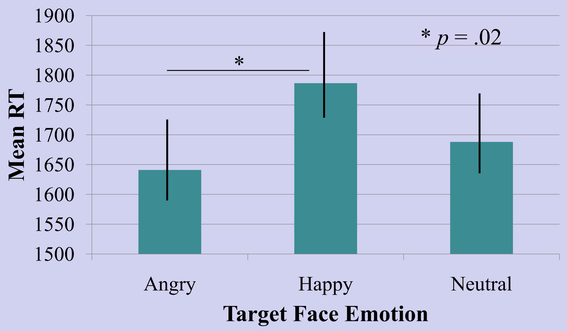


Happy Target Angry Crowd | *Angry Target Angry Crowd* | *Angry Target Happy Crowd* | *Happy Target Neutral Crowd*

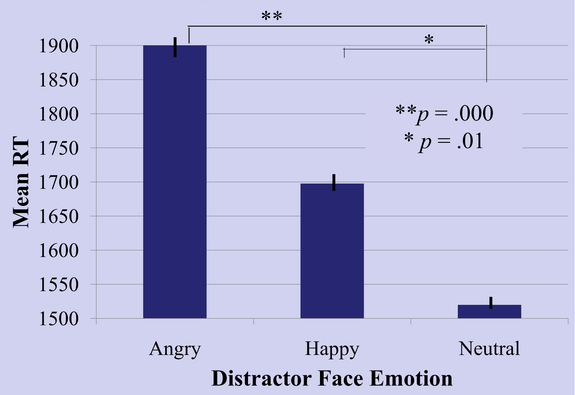
Methods

- 13 naïve observers participated in this visual search task.
- Within subjects design.
- 216 static, schematic faces (.91 DVA) in random order.
- ½ same displays; ½ different displays.
- Observers reported, as quickly as possible, whether or not there was a different face in the crowd.
- Target and crowd emotions (angry, happy, neutral) varied systematically across displays.
- Display sizes were: 6.7 DVA tall and 5.9 DVA wide.

Search RTs for Emotional Faces



Search RTs by Distractor Facial Emotion



Experiment 2

Approach

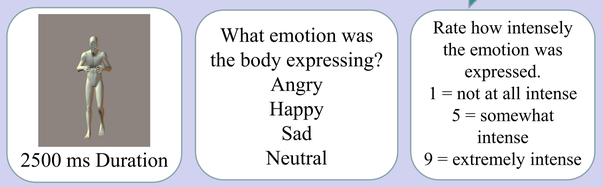
Is visual sensitivity enhanced for threat-relevant emotions depicted in static body postures? We started by developing and validating equally recognizable angry, fearful, sad and neutral body postures.

Angry | Fearful | Sad | Neutral

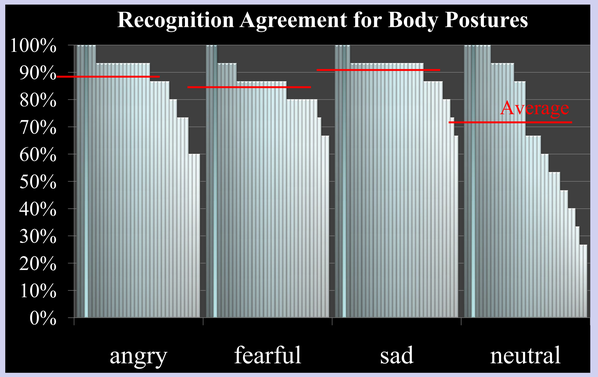
Methods

- 16 naïve observers viewed 128 static, emotional body postures sequentially presented in random order.
- Observers viewed each posture, identified its emotion with a button press, and then rated its intensity.

Sample Trial Timeline



Recognition Agreement for Body Postures



- Postures recognized by over 92% of subjects were used for Experiment 3.
- Displays in Experiment 3 were normed across agreement and intensity ratings.

Experiment 3

Question

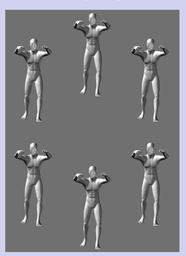
When presented in a crowd of distractor bodies, are angry and fearful body postures detected faster than sad and neutral body postures?

Caveat

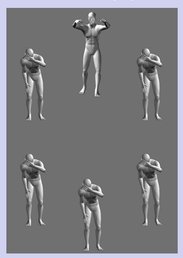
Although happy body postures were developed and validated, a confound of overall size and arm position was identified so they were not used for Experiment 3.

Methods

- 20 naïve observers participated in this search task.
- 288 displays of 6 bodies with angry, fearful, sad, and/or neutral postures normed in Exp 2.
- Body size ranged from 9.6 and 10.2 DVA.
- Observers reported with a button press whether or not each display contained a different body posture.

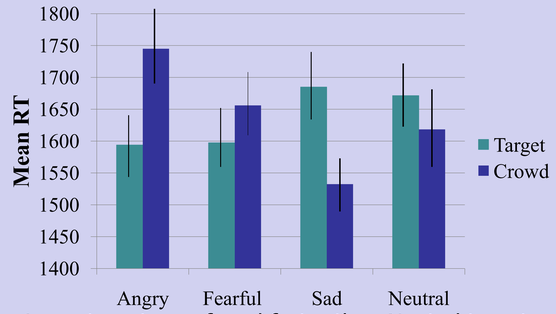


Angry Target Angry Distractors



Angry Target Sad Distractors

Search RTs for Emotional Bodies



- Angry targets are found faster than Neutral targets ($p = .05$).
- Finding targets amongst angry distractors is slower than finding them in sad/neutral distractors ($p < .01$).
- Finding targets in fearful distractors is slower than in sad distractors ($p = .007$).

Conclusion and Discussion

- Observers found angry targets the fastest and were slowest in finding targets in angry crowds.
- The anger superiority effect found with emotional faces does extend to static emotional body postures.
- However, data on fearful body postures are inconclusive. Although Exp. 2 and others find that fearful body postures are easily recognizable[7], fearful bodies may be less salient in visual search tasks than angry bodies.
- Finding similar results for emotional faces and body postures supports the integrative processing of bodies and faces[9].
- However, our experiences with happy body postures suggest that low level cues can be sufficient to swamp out effects of emotion.

References

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