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Relationship between Trait Anxiety, State Anxiety and Awareness in Processing of Threat

Submitted in total fulfilment of the requirements of the degree of

Doctor of Philosophy

6 July 2015
Declaration of Originality

This thesis is submitted to Bond University in fulfilment of the requirements of the degree of Doctor of Philosophy. This thesis represents my own original work towards this research degree and contains no material which has been previously submitted for a degree or diploma at this University or any other institution, except where due acknowledgement is made.

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Acknowledgements

I would like to extend my most sincere gratitude to everyone who has contributed to the completion of this thesis. Firstly, I would like to thank my primary supervisor, Dr. Mark Edwards, for introducing me to this research area and for his continuous support throughout this project. He always made himself available to provide guidance and advice, to discuss ideas, read drafts or just to debrief. I am forever grateful for all of his care and patience. He believed in me even when I questioned my belief in myself. Thank You! I would also like to thank my secondary supervisor, Dr. Mike Lyvers for his support and patience and for all the time he devoted to reading my final drafts. I am sincerely grateful for all his advice and feedback.

A very special thank you goes to my mama and tato. I cannot express my gratitude enough for all the sacrifices they have made to afford me this amazing opportunity. Their unconditional love and support means the world to me. And a special thank you to my little brother, Jay. I can only hope that I will be able to support him on his PhD journey with as much love, care and compassion as he has shown me. Thank you to Lisa Abel for her beautiful friendship and the endless compassion, care, support and much needed laughter.

Thank you to John Zong for his assistance in the experimental programming. Thank you to Paulina Guttormsen for her assistance with the research participants. I would also like to acknowledge Dr. Mark Bahr for his initial contribution to the programming. Thank you to all the research participants for your time and enthusiasm. Last but not least, this research was generously supported by the Pro Vice-Chancellor scholarship, the Humanities and Social Sciences Scholarship and the Deans Scholarship. Thank you to the Executive Dean and Pro Vice-Chancellor, Professor Raoul Mortley, the former Pro Vice-Chancellor, Emeritus Professor Robert Stable, and the Faculty for its unwavering support in this project.
Abstract

In five experiments, interference paradigms were employed to investigate the role of awareness in determining the automatic nature of attentional biases to threat in anxiety. To investigate whether attentional biases to threat occur outside of conscious awareness, participants were presented with masked and unmasked valanced stimuli. In Experiment 2.2 and 3.2 the presentation of masked and unmasked stimuli was intermixed. To investigate the role of priming in moderating these effects three experiments (Experiment 1, 2.1 and 3.1) blocked on the presentation order of exposure mode such that half of the participants received two blocks of masked trials first followed by two blocks of unmasked trials and half of the participants received the reverse order. In Experiment 1, 2.2 and 3.2, the stimulus onset asynchrony (SOA) between the target and the mask was individually determined during the SOA threshold setting trials, whereas in Experiment 2.1 and 3.1, the SOAs between the target and the mask were set at 15 msec for all participants. SOA of 15 msec was chosen because previous studies have shown that shorter SOAs have demonstrated selective attention for masked face stimuli (e.g., 14 msec & 17 msec, Mogg & Bradley, 1999a, Experiment 1 & Experiment 3, respectively; 14 msec, Mogg et al., 1993a 14 msec, Harvey et al. 1996; 20 msec, MacLeod & Rutherford, 1992). Awareness checks were conducted across all experiments by way of forced-choice decision task and Study 3.1 and 3.2 included a additional digit classification task, to ensure that participants did not become aware of stimuli on masked trials over the course of the experiment. Participants’ data was excluded from analysis if they performed above criterion on the awareness check trials.

To investigate the involuntary nature of the automaticity hypothesis, computerized versions of two interference paradigms were employed. On the emotional Stroop colour naming task (Experiment 1, 2.1 and 2.2) the central task and the distracting information were
an integrated feature of the same stimulus, whereas these stimuli were spatially separated on
the Flanker task in Experiment 3.1 and 3.2. These paradigms have been shown to be an
effective measure for the purpose of this investigation because they allow for competition of
attention between two features by asking participants to ignore distracting information while
attending to a central task. To investigate selective attention to threat, the following series of
studies employed threat-related and neutral words as stimuli in Experiment 1 and emotionally
toned schematic faces across four experiments (Experiment 2.1, 2.2, 3.1, 3.2).

To investigate the separate effects of trait and state anxiety in moderating these
effects, a sample of non-clinical high-trait anxious (HTA) and low-trait anxious (LTA)
individuals was employed across all five experiments. Allocation to trait anxiety group was
determined on the basis of questionnaire scores. To extend on previous research, Experiment
1 included a clinically anxious sample for comparison. To investigate the role of state anxiety
in moderating attentional allocation to threat, across all experiment, half of the HTA and half
of the LTA participants performed under the immediate threat of an electric shock and half
performed under shock safe conditions. In Experiment 1, the clinically anxious participants
performed under shock safe conditions.

Study 1 employed the emotional Stroop colour naming task. Clinically anxious and
non-clinical HTA and LTA participants were presented with threat related and non-threat
related words within and outside of conscious awareness. Mode of exposure presentation was
blocked so that half the participant received the masked exposure mode first followed by the
unmasked exposure mode, whereas others received the opposite exposure order. State anxiety
was manipulated by exposing half of the HTA and half of the LTA participants to a threat of
shock whereas the remaining half performed without the threat of shock. State anxiety was
not manipulated in the clinically anxious group. The results indicated that irrespective of
exposure mode, presentation order or shock condition group all participants demonstrated an attentional bias toward threat related words relative to neutral words. These results suggest that priming or awareness of threat is not a necessary precondition to establish effects for verbal materials that are presented using backward masking procedures.

Study 2.1 and Study 2.2 investigated attentional biases for pictorial stimuli using the emotional Stroop colour naming task. In Study 2.1, HTA and LTA participants performed a colour naming task with masked and unmasked angry, happy and neutral schematic faces under shock threat and shock safe conditions. Mode of exposure was blocked so that half the HTA and half of the LTA participant received two blocks of masked trials followed by two blocks of unmasked trials, whereas the other half of each group received the reverse exposure order. The results indicated that irrespective of presentation order, on the unmasked trials there was no difference in RT for threat, happy or neutral schematic faces across participants. On the masked trials, there was no difference in RT for the LTA participants, whereas the HTA participants took longer to colour name threat related relative to happy schematic faces but only while performing in the shock safe condition. These results suggest that HTA participants selectively attend to threat related relative to happy faces but only under stress free conditions. These results further suggest that priming is not a precursor for activating the mechanisms responsible for eliciting attentional biases to threat at preconscious levels. In Study 2.2, participants were presented with an intermixed sequence of masked and unmasked angry, happy and neutral schematic faces while performing under the threat of shock or in the absence of shock. The result failed to reveal any significant effects involving valence of pictorial stimuli. These results suggest that when the presentation of masked and unmasked trials was intermixed, attentional resources were not selectively recruited by either valence category in the HTA or LTA participants.
In Study 3.1 and 3.2 HTA and LTA individuals verbally identified a probe (either triangle or square) that was presented on the left or the right periphery of a computer screen while simultaneously, angry, happy or neutral schematic face pairs were displayed in the upper and lower centre of the computer screen. In Study 3.1 HTA and LTA participants performed the flanker task with masked and unmasked angry, happy and neutral schematic faces under shock threat and shock safe conditions. Mode of exposure was blocked so that half the participant in each trait anxiety group received two block of masked trials followed by two blocks of unmasked trials, whereas the other half of each group received the opposite order. The results indicated that when mode of exposure was blocked, attentional resources were not influenced by the valence of stimuli in either the HTA or LTA participants. In Study 3.2, HTA and LTA participants performed the flanker task under shock threat or shock safe conditions. Angry, happy and neutral face pairs were presented masked and unmasked in an intermixed sequence. On the unmasked trials, the result failed to reveal any differential attentional patterns as a function of valence between the HTA or LTA participants irrespective of shock conditions. On the masked trials, irrespective of trait anxiety group (both HTA and LTA) participants took longer to classify the probe when it was presented along with neutral compared to threat face pairs but only in the shock safe condition. Reaction times to classify the probe when presented with happy face pairs did not differ from either natural or threat stimuli. The results indicated that when mode of exposure was intermixed, there was no difference in threat processing between the HTA and LTA participants.
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