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Trait anxiety and reasoning under uncertainty

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Abstract

We explored the relationship between trait anxiety and reasoning under conditions of uncertainty. In our opinion, high trait anxious individuals (HTA) could have an implicit goal of uncertainty reduction. According to this, we predicted that in reasoning tasks HTA individuals would try to shorten the length of uncertain states by gathering less evidence prior to deciding, compared to low trait anxious ones (LTA). In Study 1 we employed several probabilistic reasoning tasks to examine the amount of data requested before making a decision. In Study 2, we investigated how evidence is weighed up and how hypotheses are tested. Results confirmed our prediction: HTA individuals gathered fewer pieces of evidence, thus jumping to conclusions, compared to LTA individuals. Groups did not differ in their reasoning if evidence was at their disposal from the start. Furthermore, the HTA group jumped to conclusions and provided incorrect answers in the hypothesis-testing task. We suggest that HTA individuals are particularly concerned with reducing uncertainty, even at the expense of correctness.

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1. Introduction

Anxiety can be divided into two categories: state anxiety and trait anxiety (Spielberger, 1972). State anxiety is defined as a person's current level of anxiety, which can be modulated by situa-

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tional factors and consists of feelings of tension and apprehension. On the other hand, trait anxiety (TA) is an individual's general disposition to become anxious, that is, an anxiety proneness.

According to cognitive models of anxiety (e.g., Eysenck, 1997), TA is associated with a number of cognitive biases regarding threat-related information, which lead to an exaggeration of the threat level of external and internal stimuli. TA has been reliably associated with a selective attentional bias and with an interpretive bias for threat-related information. To date, there appears to be good evidence that when presented with both threat-relevant and threat-irrelevant stimuli, high TA (HTA) individuals, compared to low TA (LTA) ones, show increased attention towards threat-relevant information (e.g., Mathews & MacLeod, 1994). Furthermore, several studies have found that when presented with ambiguous stimuli, HTA people make more threatening interpretations than LTA people (e.g., Byrne & Eysenck, 1993).

Overall, these results seem to point out that TA is associated with attention towards threat cues and with the likelihood of perceiving the threatening meaning of ambiguous events. HTA individuals are prone to locating threat and believe the world to be more dangerous compared to LTA: they watch out for danger and jump to the most threatening conclusion (Mathews & Mackintosh, 1998).

1.1. *The psychology of thinking*

On the other hand, while research has widely studied the influence of TA on selective information-processing, the relationship between TA, information-gathering and decision-making, in general, *reasoning*, has been explored to a lesser extent.

How we collect and/or use information in order to draw inferences, make decisions or test hypotheses is studied by the psychology of thinking. A traditional division in the fields of reasoning research is that between deductive and inductive thinking. Deduction involves arriving at conclusions on the basis of statements, called premises, the truth value of which can be assumed. Induction reasoning is used to arrive at a conclusion on the basis of *some* evidence: it increases information, but an induction conclusion cannot be guaranteed to be true. This is because a conclusion may be based on irrelevant evidence, relevant evidence may be ignored, new evidence may force one to change one's mind, or there may be bias in the way evidence is treated (Manktelow, 1999).

1.2. *Trait anxiety and reasoning under uncertainty*

To date, only a few empirical studies have explored if and how TA affects general reasoning processes, and knowledge about the thinking of anxiety proneness individuals is sparse. For example, some studies have found that HTA individuals, compared to LTA ones, display significantly longer solution times and lower accuracy scores for a series of different inferential reasoning tasks (e.g., Chiappelli & Giusberti, 2001; Mayer, 1977).

An interesting study of Leon and Revelle (1985) analysed thoroughly state/trait anxiety and analogical reasoning, that is, the process of finding systematic correspondences between a novel target situation and a more familiar source situation, thus using knowledge of the source to derive inferences about the target. These authors studied analogical reasoning under either relaxed (non-time-stressed/reassurance) or stressed (time-stressed/ego-threatened) conditions. The findings

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