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Trained interpretive bias: Validity and effects on anxiety

Elske Salemink[a],[*], Marcel van den Hout[a], Merel Kindt[b]

[a]*Department of Clinical and Health Psychology, Utrecht University, P.O. Box 80140, 3508 TC Utrecht, The Netherlands*
[b]*Department of Clinical Psychology, Amsterdam University, Amsterdam, The Netherlands*

Abstract

Mathews and Mackintosh [(2000). Induced emotional interpretation bias and anxiety. *Journal of Abnormal Psychology*, *109*, 602–615] developed a clever training procedure that enables the investigation of a causal relationship between interpretive bias and anxiety. The present study examined the validity of this paradigm by testing (1) the effects of interpretation training on two other tasks (homograph EAST and open-ended questionnaire) that are less closely related to the interpretation training itself as in previous studies and (2) the robustness of the training effects on state and trait anxiety. Results indicated that while the two original dependent measures (i.e., a reaction time and recognition measure) showed that the training procedure was successful in changing interpretations, the two additional measures (i.e., EAST and questionnaire) did not. This might reflect a measurement artefact, but other explanations for the findings are also possible. Moreover, evidence was found for effects of biased interpretations on anxiety. This demonstrates the viability of the present paradigm, which has implications for clinical practice.
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1. Introduction

Anxiety disorders are characterised by the selective processing of threatening information. Correlational studies evidenced that anxious individuals impose threatening

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*Corresponding author. Tel.: +31302537554; fax: +31302534718.
E-mail address: e.salemink@fss.uu.nl (E. Salemink).

interpretations on ambiguous information (Butler & Mathews, 1983) and subsequent prospective studies have indicated that maladaptive processing styles predict later emotional reactions to stress (MacLeod & Hagan, 1992). However, not until the beginning of the twenty-first century were experimental studies undertaken to determine whether or not processing biases causally contribute to anxiety (MacLeod, Rutherford, Campbell, Ebsworthy, & Holker, 2002; Mathews & Mackintosh, 2000). Mathews and Mackintosh trained participants to interpret ambiguous information negatively or positively and both a reaction time measure and a recognition test revealed that interpretations were indeed changed in the direction of the training. In addition, they found congruent effects of the training on anxiety. These findings provided evidence consistent with a causal relationship between interpretive bias (IB) and anxiety.

In the Mathews and Mackintosh (2000) study, the dependent variable measuring IB closely resembled the independent variable. During the training procedure (independent variable), participants read ambiguous social stories, which ended with a word fragment. Completion of the fragment resolved the ambiguity in a positive or negative way, depending on the assigned training condition. One of the dependent measures was a reaction time measurement: the time taken to solve the positive and negative word fragment. The second dependent measure was a recognition task, which followed training. Participants read social stories that remained ambiguous and were asked to indicate the level of similarity between the experimenter-provided interpretation and the original ambiguous story. Since both the training and IB test consist of social stories and are explicit tasks, the dependent and independent measures resemble each other in content and format. Owing to this overlap, the effects of training might be due to participants learning a method-dependent strategy, while interpretations need not necessarily be changed. It is therefore questioned whether participants simply learnt a task-specific strategy or whether the procedure is successful in really changing IB. If the latter is true and interpretations were changed, then the effects of training on interpretations should be evidenced on other tasks less similar to the independent variables. Thus, the first aim of the present study is to examine whether IB training effects are observable on other tasks by adding two IB assessment tasks, which are less similar to the training than the tasks used by Mathews and Mackintosh.

First, note that Mathews and Mackintosh (2000) used *explicit* tasks to examine change in interpretations and that these tasks are open to strategic influences. Recent results showed that participants are fully aware of the valence of their IB training (Salemink, van den Hout, & Kindt, in press). To examine the effect of training more stringently, a task that is less likely to be influenced by explicit knowledge of training or performance strategies was added. We employed a modified version of the extrinsic affective Simon task (EAST, De Houwer, 2003). The EAST was developed to indirectly assess psychological constructs and attitudes by assessing the interference between valence and colour classifications. First, participants learn to associate one response key (e.g., left) with positive words and another response key (e.g., right) with negative words by classifying the positive or negative valence of words presented in white. Secondly, participants learn to classify words on the basis of a meaning-irrelevant characteristic (e.g., colour). Participants have to press, for instance, the left key for green words and the right key for blue words. In the third phase, target words are presented in colour and are mixed with white words. It can be tested whether participants are faster to respond to a target word in green (which in this example requires a press on the positive button) or in blue (which in this case requires