Could cognitive interventions be useful in treating depression?

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Happy face morph (faces 3-5 on 15 face positive-neutral to negative-neutral spectrum) and a sad face (face 12) from Peters et al. (2017)'s CBM for facial interpretation training. Credit: University of Bristol

A new study by experimental psychologists from the University of Bristol has examined whether cognitive bias modification (CBM) for facial interpretation, a digital health intervention that changes our perception for emotional expressions from negative to positive, might be useful in treating depression.

The study, published recently in the journal *Royal Society Open Science*, also contributes to ongoing discussion over the viability of CBM in the clinic.

Have you ever walked away from a social interaction feeling uncomfortable or anxious? Maybe you felt the person you were talking to disliked you, or perhaps they said something negative and it was all you could remember about the interaction.

We all occasionally focus on the negative rather than the positive, and sometimes ruminate over a negative event, but a consistent tendency to perceive even ambiguous or neutral words, faces, and interactions as negative (a negative bias), may play a causal role in the onset and rate of relapse in depression.

A growing field of psychological interventions known as cognitive bias modification (CBM) propose that by modifying these negative biases it may be possible to intervene prior to the onset of depression.

Given that access to proven psychological and pharmacological treatments for mood disorders is limited, and that in countries like the UK public treatment for depression is affected by long waiting lists, high costs, and low overall response rates, there is a need for effective treatments which are inexpensive, and both quick and easy to deliver.

But following early excitement from promising CBM findings, considerable problems have been identified, not limited to publication bias (positive findings are more likely to be published) and small therapeutic effects.

The study, testing a new CBM paradigm, questions these previous positive findings.

The study's lead author, Sarah Peters, who is a Ph.D. student at the University of Bristol's School of Experimental Psychology and Biomedical Research Centre, said: "We wanted to test a novel CBM paradigm which has previously shown robust bias modification effects, but for which the impact on mood and mood-relevant measures was unclear."

Peters and her colleagues at the University of Bristol and University College London ran a proof of principle trial in a non-patient population.

She further explained: "We do these to test potential new interventions before we offer them to individuals seeking treatment. Even if we show that a task is shifting your bias and we think that's relevant to mood disorders, what matters is whether it impacts mood-related outcomes and shows clinical utility."

The authors had two specific aims. Firstly, they aimed to replicate previous findings to confirm that the intervention could indeed shift the emotional interpretation of faces; could they make their participants see negative faces as more positive. Secondly, they were interested in whether this shift in interpretation would impact on clinically-relevant outcomes such as self-reported mood symptoms.

Among these were self-report questionnaires of depressive and anxious symptoms and the interpretation of ambiguous scenarios and daily stressful events.

The cognitive tasks included a dot probe task to measure selective attention towards negative (versus neutral) emotional words, a motivation for rewards task which has been shown to measure anhedonia (the loss of pleasure in previously enjoyed activities), and a measure of stress-reactivity (whereby individuals complete a simple task under two conditions: safe and under stress). This final task was included because it

is thought that the negative biases they were interested in modifying are more pronounced when an individual is under stress.

While the intervention successfully shifted the interpretation of facial expressions (from negative to positive), there was only inconclusive evidence of improved mood and the CBM procedure failed to impact most measures.

There was some evidence that daily stressful events were perceived as less stressful by those in the intervention group post-CBM, weaker evidence for reduced feelings of pleasure in the intervention group, and some exploratory evidence for greater improvements seen by individuals with higher anxiety at baseline.

Peters added: "Overall, it's unlikely that this procedure in its current design will impact on clinically-relevant symptoms. However, the small effects observed still warrant future study in larger and clinical samples. Given the large impact and cost of mood disorders on the one hand, and the relatively low cost of providing CBM training on the other, clarifying whether even small effects exist is likely worthwhile."

Even if this procedure fails to result in clinical improvement, documenting and understanding the different steps in going from basic scientific experimentation to intervening in clinical samples is crucial for both the scientific field and the general public to know.

Additionally, the negative findings shown in this study offer a useful contribution to the field of CBM research. It is common for new clinical interventions to initially appear promising (as a result of early study methodologies and publication bias for positive results), but it's only over time that more robust studies are conducted and question these early findings.

In a body of research where positive results prevail and negative results remain unpublished, studies which are methodologically sound and question this status are necessary and informative.

More information: S. E. Peters et al. Cognitive bias modification for facial interpretation: a randomized controlled trial of transfer to self-report and cognitive measures in a healthy sample, *Royal Society Open Science* (2017). DOI: 10.1098/rsos.170681

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