Effects of Cognitive Defusion and Cognitive Restructuring on Exam Marks in Exam-Anxious Students

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Research hypotheses

Cognitive and behavioural therapies have been shown to reduce test anxiety and, less convincingly, improve exam performance of test anxious students. Cognitive and behavioural therapies arise from distinct, albeit complementary, theoretical paradigms. Each therapy contains multiple components predicted by theory to bring about change. There is little understanding of which components, among the many typically delivered in a treatment package, are responsible for change. Test anxiety was chosen as the "problem" of focus. It is prevalent and has a small but significant inverse relation with exam performance. Exam performance is readily measured.

The research was designed to explore the following questions: What is it about cognitive defusion and cognitive restructuring that facilitates change in people who are struggling? What are the mechanism of action? How are they different? How are they the same? Is one more effective than the other?

Research hypothesis

1. Both cognitive restructuring and cognitive defusion will produce greater improvement in exam performance relative to a no-treatment control condition.
2. The cognitive defusion intervention will be more effective for exam mark improvement than the cognitive restructuring.
3. Students in the cognitive restructuring intervention will increase the frequency of restructuring responding to bothersome exam-related thoughts, compared to the frequency of other types of responses.
4. Students in the cognitive defusion intervention will increase the frequency of their defused responding to bothersome exam-related thoughts, compared to the frequency of other types of responses.
5. The content of thoughts of students in the restructuring intervention will become less cognitively distorted following the intervention.
6. There will be no change in the content of thoughts of students in the defusion or control conditions.

Workshop content

Both workshops included psychoeducation about anxiety, rationale, experiential learning, practice and take-home materials. Component-specific techniques included those listed below.

Cognitive defusion workshop

"The Mind": treat "the mind" as an external event; almost as a separate person. "Your mind is not your friend AND you cant do without it"
Mental appreciation: thank your mind for its products.
Prefix thoughts with "I'm having the thought that….".
Just noticing: use the language of observation when talking about thoughts.
Titchener's repetition: Repeat the difficult thought until you can hear it as just sounds.
Physicalize the thought by labelling its physical dimensions & characteristics.
Who's in charge here? Treat thoughts as bullies.
Sing the thought to a simple tune (eg, Happy Birthday).
Say the thought in a silly voice (eg, Donald Duck).
Think-act opposite: engage in behaviour while trying to command the opposite (eg, walking around the room asserting repeatedly, "I cant walk").
Visualise yourself watching thoughts as leaves on a stream or clouds in the sky.
Try using "and" instead of "but"

Cognitive restructuring workshop

What am I thinking or imagining? How much do I believe this thought?
How does this thought make me feel? How strong is this feeling?
What makes me think the thought is true?
What is the evidence that this thought is true?
Is there any evidence that the thought might not be completely true?
Am I making unhelpful 'thinking errors'? If so, which?
What's the worst thing that could happen?
How likely is it that the thing I am worrying about could actually happen?
What could I do to cope *if* the worst case scenario actually happened?
Could I live through this? How much would it really matter?
What is likely to happen if I keep telling myself the same negative or catastrophic thoughts?
What is likely to happen if I try to use more realistic thinking?
What would be a more helpful thought?
How much do I believe the original negative thought now?
How strong is my feeling now?

Method

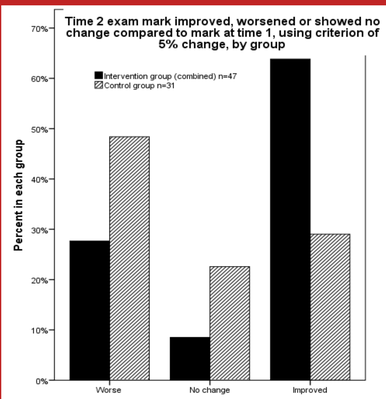
Participants n =78
University students identified as being worried about their exams attended were randomly assigned to a control condition or to either a cognitive defusion workshop or a cognitive restructuring workshop designed to improve exam performance. Predominantly female (72%) and in their first two years of study (73%) with a mean age of 27. Non-English first language in 30%. Representative of a wide range of academic disciplines. Workshop non-attenders re-assigned to control condition.

Intervention
Interventions delivered in a 2-hour workshop group-delivery format supplemented by take-home materials. Workshops conducted in the fortnight before university exam period.
Condition 1: cognitive restructuring (n = 27)
Condition 2: cognitive defusion (n = 20)
Condition 3: waitlist control (n = 31)

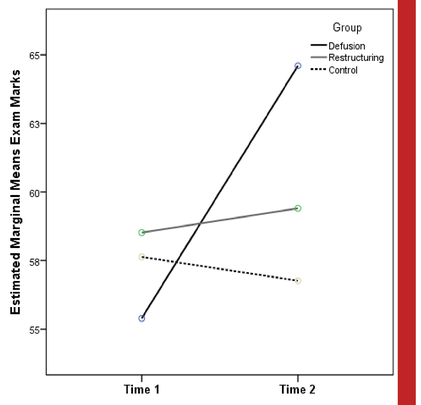
Measures
1. Change in exam marks (dependent variable): Mark in most worrisome exam in semester prior to intervention (time 1) compared to mark in present semester's most worrisome exam (time 2).
*2. Thought content. (*baseline and post-intervention): Free-text responses to question asking about most bothersome exam-related thoughts coded as cognitive distortions (including negative self-evaluation), task/ problem/ goal oriented (eg, worries), failure unspecified or thoughts about bodily sensations. Categorical variable.
*3. Response to thoughts (*baseline and post-intervention): Students asked what they do with their bothersome exam-related thoughts. Up to three responses selected from 16 options representing various forms of restructuring, defusion, rumination, distraction, action-oriented. Relative frequency of each response generated score out of 100 for each of the five responses.
4. Cognitive Fusion Questionnaire (CFQ13) (baseline and post-intervention)
5. Revised Test Anxiety Scale (Benson & El Zahhar, 1994) (baseline only)
6. Workshop knowledge review (at end of workshop): Students list techniques learnt, rate their willingness to use the technique and helpfulness

Other data collected from 130 students is being used in a separate exploratory modelling study. This data includes measures of interference of thoughts & distracting urges (frequency, distress, accuracy, not-want), on-task exam preparation time, in-exam behaviour, as well as GPA and time 2 exam marks.

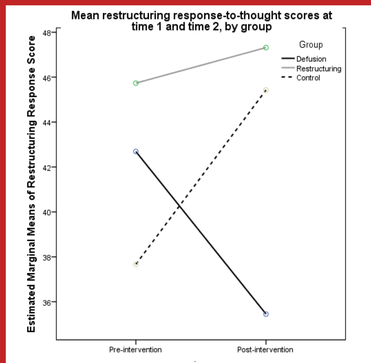
Results



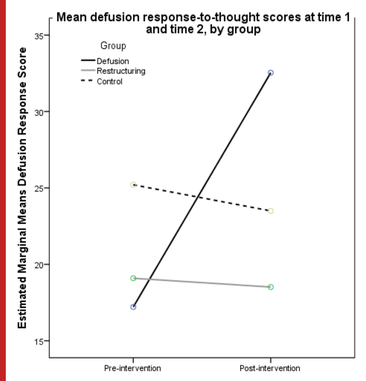
Hypothesis 1 partially supported.
Mean exam marks for combined intervention group tended to increase (time 1 M 56.72, SD 18.93, time 2 M 62.39, SD 17.32; t (46) = 1.904, p = .063) and the size of the effect was moderately large (partial eta squared = .081). No change in control group marks (time 1 M 57.63, SD 18.51, time 2 M 56.76, SD 17.43; t(30) = .291, p = .773). Using criterion of 5% change, students in control group significantly more likely to show no change or deterioration in exam mark. Students in the combined intervention group were significantly more likely to improve their exam mark χ^2 (2, n = 78) = 9.381, p = .009, phi = .347.



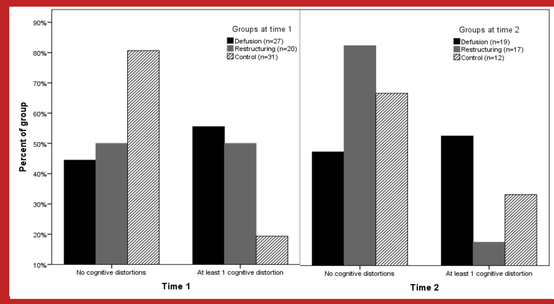
Hypothesis 2 supported.
Mean exam mark of students in the defusion group increased to a statistically significant degree (time 1 M 55.39, SD 20.35; time 2 M 64.60, SD 18.99), t(27) = .2.240, p = .034, eta squared 0.22. Mean marks of those in the restructuring group did not significantly change (time 1 M 58.52, SD 17.19; time 2 M 59.40, SD 14.70, t (20) = .214, p = .833) nor did mean marks of those in the control group (time 1 M 57.63, SD 18.51; time 2 M 56.76, SD 17.24) t (31) = .291, p = .773).



Hypothesis 3 not supported
There was no significant change in restructuring response-to-thought scores in the restructuring intervention group t(15) = -.278, p = .785.



Hypothesis 4 supported.
There was substantial & statistically significant change in defusion response-to-thought scores for those in the defusion group t (19) = -2.470, p = .024, partial eta squared = .253, and no change in the other groups.



Hypothesis 5 and 6 supported
The content of thoughts of students in the restructuring intervention became less cognitively distorted following the intervention. There was no significant change in the content of thoughts of students in the defusion or control conditions.

Conclusions

This study compared the effects of two different components of broader cognitive and behavioural therapies, each of which originate in different theories of human behaviour. We found that both components were beneficial for improving exam performance compared to a no-treatment control condition, and that the cognitive defusion component was more beneficial than the cognitive restructuring component. We confirmed that each component led to component-specific changes in behaviour. In the case of the cognitive restructuring intervention, students reported less cognitively distorted thoughts after the intervention. In the case of the cognitive defusion intervention, students reported more defusion responses to bothersome thoughts. I also found that neither component generated changes expected of the other component. That is, the cognitive restructuring intervention did not change defusion responses to thoughts, nor did the cognitive defusion intervention change contents of thoughts. The targets for restructuring and defusion were very specifically constrained to bothersome exam-related thoughts and distractions. In this context, there was no conclusive evidence that cognitive restructuring and cognitive defusion invoke similar meta-cognitive processes. Future research could overcome the limitations of the present study and expand understanding of any causal relationship between distorted cognitions, productive worries, fusion/defusion, test anxiety and exam performance.