Author's response to reviews

Title: Rumination, Anxiety, Depressive Symptoms and Subsequent Depression in Adolescents at Risk for Psychopathology: a Longitudinal Cohort Study

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Author's response to reviews:

Dear Editor

Thank you very much for sending the referees' suggestions of improving the manuscript, and for giving us the opportunity to revise our paper. I have addressed these point-by-point below, including the relevant bits of text. The main manuscript I am returning has changes tracked. I also enclose a version with these changes accepted, so you and the reviewers can choose which one you would rather read.

Yours sincerely

Dr Paul Wilkinson

Referee 1

We thank the referee for her positive comments on our manuscript and its importance, and for the helpful suggestions for how to improve the paper. We respond to the specific suggestions for improvement below:

1. We accept that the 'risk-enriched' sample put participants at risk for other disorders, and agree that it would helpful to discuss this more. We have discussed this more in the limitations section (pp 22/3):

‘Our risk enrichment strategy was designed to increase numbers of cases of psychopathology in general, not just depression. This was partly because risk factors for depression also have significant effects on other disorders (particularly anxiety disorders). It is possible that a more depression-specific set of criteria (for example family history of depressive disorder and loss life events only) would have increased the number of onsets of depression. However, this may have
reduced generalisability further.’

We have also added details from a recent paper by our group demonstrating validity of the risk-enrichment method in an independent community sample (pp 9/10):

‘We also recruited a smaller low risk sample in the present study. In addition, we applied the same risk criteria to an independent community sample of 1089 adolescents recruited without any enrichment by risk factors. In both samples, depressive symptoms were similar in the high-risk groups, and significantly higher in high-risk than low-risk adolescents’

2. We have re-written the section explaining our decision to pool items from all three questionnaires, and hope that this is clearer to the reviewers, the editor, and the readers (p6):

‘In this study a third methodological approach is considered that might better separate the rumination construct, from depressive and anxiety symptoms. If some items from the rumination questionnaire are in fact measures of depressive symptoms, they would be expected to correlate strongly with items from questionnaires measuring depressive symptoms. If items from both the rumination and depressive questionnaires were entered into the same factor analysis, we could identify whether such items (ie ‘depression’ items from the rumination questionnaire) load better with the depressive symptom items, the rumination items, or are in fact part of a separate construct. Likewise, the addition of items from an anxiety questionnaire would identify rumination questionnaire items that load better with anxiety symptoms. It is also possible that items from all questionnaires would inter-correlate strongly with each other, and the factor analysis would suggest just a single common factor as a parsionious solution. In this case, items would be best seen as measuring one common construct; this construct could be termed ‘negative cognitions’, and would be a risk factor for future depression (and possibly anxiety). Studies to date have made the prior assumption that items from rumination, depressive symptom and anxiety symptom questionnaires measure separate constructs, so should more appropriately be analysed separately. We propose that entering all items into a pooled factor analysis could explore whether this assumption is likely to be correct.’

Referee 2

We thank the reviewer for her positive comments about the manuscript and its merit, and for the helpful suggestions for how to improve the paper. We respond to the specific suggestions for improvement below:
1. We apologise for this mistake and thank the reviewer for picking it up. We have corrected the wording so it is the correct way around (p8):

‘We also hypothesized that a high ratio of rumination to distracting/problem-solving response styles would be associated with a higher risk of depression onset/symptoms, indicating that these adaptive response styles partially mitigate the effects of rumination.’

2. We decided on a threshold of 50% at the start of the analysis. We have given more details on amount of missing data, indicating that 99.7% of the sample had 91 or all 92 out of 92 items completed (p14):

‘645/658 (98%) participants had all 92 questionnaire items completed, 656/658 (99.7%) had 91 or 92 items completed. The remaining two participants had greater than 80% of total items completed and at least 50% of items of each questionnaire completed.’

3. We have acknowledge in the limitations section that the fit indices are not ideal (p23):

‘The fit indices of our final model were some way below current recommendations, therefore some caution is needed when interpreting the factor structure (despite our tendency to interpret overfactored solutions). However, the five factor solution interpreted was better fitting than others considered. This also does not alter the prospective results that the sum score measure of rumination significantly predicted depressive disorder and depressive symptoms.’

4. We have given more detail for our reasons for choosing a five factor model and cited other literature that supports our reasoning (p15):

‘The five factor model was chosen both because its latent structure appeared more interpretable and because under-factoring is more likely to lead to interpretation problems than over-factoring’

In addition, MPlus states that it is not valid to use chi-squared to compare models if we use WLSMV, the appropriate method for categorical data. Other articles that support our view that underfactoring is more likely to lead to error include:

5. We thank the error for pointing out the typo, which is now corrected.

Referee 3

We thank the referee for her positive comments on our manuscript and its interest, and for the helpful suggestions for how to improve the paper. We respond to the specific suggested revisions below:

Major Revisions

1. We have made the introduction more consistent, referring to a possible underlying ‘negative cognitions’ construct throughout. We also accept that the first draft did not make it sufficiently clear why rumination and depressive symptoms may overlap, and have expanded on this. In doing so, we have tried to make it clearer that rumination may falsely appear to increase the risk for depression because high rumination questionnaire scores capture high depressive symptoms, and the cognitive process of rumination is then potentially irrelevant; hence a ‘negative cognitions’ label is appropriate. For example, on pages 4 and 5 we now state:

'Self-rated rumination is strongly correlated with concurrent depressive [3] and anxiety [8-10] symptoms, which are themselves strong predictors of future depressive symptoms and disorder [1]. This may confound the association found in above studies between rumination and future depression. It has been argued that this is partly because high levels of depressive symptoms would themselves make scores on some rumination items higher. For example a score on the RSQ item ‘I think about how sad I feel’ may be high either because of a high tendency to ruminate on low mood, or the fact that the person is currently very sad so thinks about this a lot [11]. Therefore high RSQ scores may be associated with future onset of depression because high concurrent depressive symptoms lead to both high RSQ scores and high risk of depression; and it may be the case that the cognitive style of ruminating has no effect on depressive symptoms.'

2. We did consider using a rumination x distraction interaction term. However, Abela and colleagues (2007) discussed alternative approaches of using such an interaction term versus a rumination:distraction ratio. They argue that a ratio approach is more appropriate, and we have added details of this argument to the manuscript (p7):

'As high distraction/problem-solving in itself probably leads to reduced
depression risk (rather than just reducing the effects of high rumination), a linear ratio approach has been considered a better way to model this data than a rumination x distraction interaction’

6. We thank the reviewer for pointing out the mistake on page 7 where we stated that a high R:D/PS ratio would predict lower depression. We have corrected this (p8):

‘We also hypothesized that a high ratio of rumination to distracting/problem-solving response styles would be associated with a higher risk of depression onset/symptoms, indicating that these adaptive response styles partially mitigate the effects of rumination.’

3. We have analysed puberty at the suggestion of a peer reviewer of a previous draft of this paper – they suggested that this would be very interesting and is a strength of this dataset. We would be concerned that if we removed it, another reviewer may ask us to put it in. Although findings are negative, we think this is interesting and worthy of inclusion. However, we have reduced the amount of the manuscript that deals with this. We would be happy to remove the reference to puberty if the editor thought it would improve the paper. We believe it better to use dichotomous ratings, as the Tanner scale is ordinal, not interval, and so treating it as interval in an interaction term may give inaccurate results. Having dichotomous pubertal grouping also allowed us to have a good number of participants in the analysis on page 19, where we could compare the rumination regression coefficients in each pubertal group, thus enabling us to see if the negative rumination interaction term could have been a type 2 error.

Minor Revisions

1. We have removed mention of the dangerous scale apart from in one paragraph of the Methods – Measures section where we state they are not used (p10):

‘There are four groups of items that are scored as sub-scales, which estimate the tendency to use different mental strategies for dealing with low mood: rumination, distraction, problem-solving and dangerous (acts). The dangerous acts scale has shown poor psychometrics and validity, therefore items from this scale were not entered into the factor analysis, nor analysed in this study.’

2. We accept that the writing of the first draft was hard to read in places. We have tried to improve the readability, in particular shortening sentences. We have spelt out acronyms more, unless when recently spelt out. We have converted the factor names to lower case.