Reviewer's report

Title: Delayed school progression and mental health problems in adolescence: a population-based study in 10,803 adolescents.

Version: Date: 29 January 2014

Reviewer: Sarah Sullivan

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Minor Revisions
1/ Abstract - school-related what?
2/ Methods - confounders - school level what?
3/ family care, future perspective on life and parental involvement would not usually be classed as demographics
4/ Results line 1 - was should be were
5/ Results line 8 distribution OF variables
6/ Results Para 3 - reword "In the adjusted model..........." this sentence doesn't make sense to me

Major Compulsory Revisions
1/ The conclusion section of the abstract needs to be revised. After adjustment for confounders the 95% confidence interval includes 1 - this means that now DSP could be associated with either a reduction in mental health problems or an increase.

2/ A couple of comments about the Introduction - since the investigation is about adolescent mental health I feel that the Introduction should only review literature relevant to this - there should be no mention of childhood MH.

3/ There is a study missing from this literature review - Hameed et al 2013 Sz Res Vol 145 which investigates childhood literacy and later psychotic experiences - this may be worth mentioning here. It is also longitudinal and so would be important to acknowledge it. In fact, at the risk of self-promotion, there is also another paper Sullivan et al 2013 where I investigated one domain of the SDQ in childhood and adolescent psychotic experiences - this is in Cog Neuro 2013. Both of these papers should also be mentioned in the conclusion.

4/ I think the non-responders are crucial and that this should probably be better acknowledged in the paper, although the response rate was generally good. According to the Methods - 16% of all students did not respond and this was because of absence due to illness or truancy - these students are also probably more likely to have had DSP and MH problems - therefore the association may have been slightly stronger if it had been possible to include them.

5/ Use of the SDQ as dichotomous - I am aware that this is sometimes done but
there needs to be a reference included here to justify this cut off - this is also a crucial point - where this cut off comes can make extreme differences to the finding and therefore needs to be justified somehow. I am not sure why the SDQ was dichotomised in this way because of the loss of so much information - perhaps it would be wise to also present the findings using a continuous variable as well.

6/ Potential confounders - the issue of confounding or mediating is a crucial one but it is more a case of interpretation rather than caution as stated here - after all there is no statistical difference - more it depends on our interpretation of the associations between these variables

7/ Adverse life events - if these were self-report (and that is not really clear) would a 12 year old child know about a parental alcohol problem or domestic violence for instance?

8/ Statistically is not a good idea to include a large number of confounders in logistic regression models - where as it is more acceptable to do this in linear regressions. See point 5 above.

9/ Generally it is now poor practice to decide on the inclusion of a set statistically significant level - p values should only be used in conjunction with confidence intervals - especially with a sample this large. Very small associations and changes will be significant but also meaningless.

10/ There may be merit in looking at the individual domains of the SDQ (as continuous variables) which would give more information on the association between DSP and different kinds of MH problems i.e. peer problems, emotional problems, conduct disorder etc - these associations may also be different in boys and girls - which would also be interesting - i.e. DSP in boys may be associated with externalising disorders and with internalising in girls?

11/ Again the use of non-significant is not appropriate here. Also the assumption that the interpretation of confounding/mediating is not necessary because of the non-significance of associations.

12/ Would be interesting to discuss here the most influential mediators/confounders i.e. looks like it is economic factors?

13/ Discussion - first paragraph - we don't actually know that DSP is associated with MH because of the importance of the confounders or mediators - neither would we ever know from this study whether they are causally associated because of the cross-sectional design - this paragraph needs to be re-worded. The last sentence in this paragraph is strange and I think not necessary

14/ Interpretation of findings para 2 - elaborate more to make your meaning clear

Tables
I didn't understand some parts of Table 1- there seemed to be some missing variables here i.e. future perspective, family care etc. Didn't understand the N ratio in the brackets in the variables column. The column headings also were not clear - i.e. Association SDQ OR. It would be better practice to put the p values in the table rather than have asterisks to indicate those above 0.05 (which is too large for such a large sample anyway)
Table 2 - what is Low Age and how was this derived? It is interesting that a couple of the confounders look as if they may be protective.
There are a lot of unexplained abbreviations in the Appendix.

**Level of interest:** An article whose findings are important to those with closely related research interests.

**Quality of written English:** Acceptable.

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**
None.