Reviewer's report

Title: Mental health problems in the 10th grade and non-completion of upper secondary school: the mediating role of grades in a population-based longitudinal study

Version: 2
Date: 20 October 2013
Reviewer: Theis Lange

Reviewer's report:

General comments:
The paper is generally well written with clear objectives, results, and conclusions. The analysis combines a large high quality dataset with suitable statistical tools, including fairly recent tools for causal mediation analysis.

Major Compulsory Revisions
1) The conclusion as it is written in the Abstract promises more than the paper can deliver. The potential serious problem of reverse causation (which is discussed in the last paragraph of the subsection “Methodological Strengths and Limitations” in the Discussion section of the main text of the paper) should be acknowledged.

2) The causal mediation analysis is very depended on the causal connections between the two measures of mental health (ie. internalizing and externalizing). In the reported mediation analysis the two measures are controlled for each other; so that in the analysis with internalizing as the exposure the degree of externalizing is treated as a covariate and vice versa, however, no arguments for this choice are given. If in reality one of the measures causes the other controlling for the other measure might bias the mediation analysis. Unless the two measures of mental health problems are independent conditional on baseline covariates there is no easy solution to this problem, but it should at the very least be acknowledged and discussed.

3) The Tables 4 and 5 both consider the effect of internalizing and externalizing on the probability of non-completion. However, in Table 4 the effect of an increase of 10% of range is presented while in Table 5 the effect corresponding to a 2 point change is presented. This, as far as I can tell unnecessary difference, makes the tables hard to compare. The authors should consider sticking to one definition of change in internalizing and externalizing scores.

4) In the last part of the subsection “Statistics” in the methods section a sensitivity analysis of the causal mediation analysis is discussed, including a correlation parameter #. I was unable to understand what was done in this sensitivity analysis. This also applies to the reporting of the sensitivity analysis in second last paragraph of the result section. In both places extended explanation is needed.
Minor Essential Revisions
5) In background section: Change “Thus, adjusting for these predictors in important when causal models are tested” to “Thus, adjusting for these predictors in important when causal models are employed”.

6) The first sentence of the subsection “The present study” discusses internalizing and externalizing, but these concepts have yet not been defined.

7) In the second sentence of the method section is discussed that health surveys were conducted between 1999 and 2004, but it is not stated how many waves were conducted.

8) In the subsection “Measures” please explain what the “final 11 grades” are.

9) In the subsection on “Mental health problems” it would be great if the authors could provide some intuition for the two subscales (internalizing and externalizing).

10) In the subsection “Statistics” the concepts direct and indirect effects are used without any introduction or explanation. I would suggest adding a few lines on this.

11) In the legend to “Additional File 1” please change “tested” to “assumed”.

Discretionary Revisions
12) The Tables 4 and 5 both consider the effect of internalizing and externalizing on the probability of non-completion, but Table 5 reports absolute effects while Table 4 reports relative effects (ORs). This makes comparison unnecessarily difficult. I would suggest sticking to a single type of effect measure (e.g. OR). If the choice in Table 5 is dictated by the capabilities of the employed mediation-package (in R) alternative methods for causal mediation analysis should be considered. A possible reference is Lange et al (Am J o Epi, 2012;176(3):190-195).

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

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests: I declare that I have no competing interests.