Reviewer's report

Title: Educational health inequalities in 18,000 Norwegian couples. The Nord-Trøndelag Health Study

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Reviewer: Anton Kunst

Reviewer's report:

At first sight, this is a promising paper because an innovative methodology is applied to an excellent data base. The strong emphasis on methodology, however, is also the Achilles’ heel of this paper.

The introduction of this paper does not clearly specify, in substantive terms, what it contributes to the existing literature on health inequalities. In Background, the only argument given for this new paper is that the tendency of educational resemblance in couples “has generally not been properly accounted for” (page 3, lines 8-9 from below). This technical argument however comes without further explanation or references. In methods, the authors give a more statistical argument for their new approach (page 6, lines 7-8 from below) but this argument is unclear and refers only a review study on twins, not on health inequalities (ref 34). In Discussion, the only argument for this paper that is given in retrospect can be found on page 11 (lines 3 and 4) but again the reasoning is quite technical and the only reference is to the same paper on twins (ref 34). As a result, it is uncertain what this study would add to the many other studies that relate health to both the SES of subjects themselves and to the SES of their partners. The frequent reference to “educational resemblance” is in itself an insufficient justification, as we all know - and take into account - that the SES of subjects is strongly associated to the SES of their partners.

The application of the multi-level analysis may be a promising approach if the authors were able to identify a true couple-level effect as separate from direct effect of individual-level SES (of subject or of partner). It seems that the authors pretend to have identified couple-level effects (see e.g. the Conclusions at the end of the paper). However, to identify such a couple-level effect, the regression models would need to control for SES of the subject and for the SES of the partner. This is not done (and probably cannot be done). As a result, the existence of a couple-level effect is not shown, and all observed associations may be just due to the direct effects of individual-level SES (of subject and of the partner, respectively). And such effects have already been shown in previous studies.

The key findings of the paper are phrased in terms of educational differences “both between and within couples’. Even the words ‘within’ and ‘between’ may be simple to understand, and therefore be attractive, it is unclear what these terms actually mean in substantive terms. They seem to suggest a couple-level effect,
similar to area-level effects or nation-level effects. But, as argued above, this type of effects could not be demonstrated.

**Level of interest:** An article of limited interest

**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