Reviewer's report

Title: Coping and back problems: Part 1. Analysis of multiple data sources on an entire cross-sectional cohort of Swedish military recruits.

Version: 1 Date: 23 November 2005

Reviewer: Michael Höfler

Reviewer's report:

General

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. The Term "risk factor" should be used as in Kraemer HC et al "Coming to terms with terms of the risk" (Archives of General Psychiatry, 1997), that is, as a factor that precedes the outcome and can be shown to be associated with an increased risk of the outcome. It is difficult to establish temporal directions in cross-sectional studies as the present one. How can you know that e.g. obesity precedes back problems, not vice versa. Therefore, your paper does not contribute much to the distinction between risk factors and indicators.

2. Although the authors cannot establish temporality they even make conclusions on causality. They claim that back problems and ill health may have a similar causal mechanism because they have some shared risk factors. First, "ill health" is a summary of various diseases with different etiologies (to a smaller degree this is probably also the case for "back problems"). Second, the authors' findings can have various other explanations like common biases or common risk factors that affect these factors as well as illness/back problems. Avoid causal language throughout the entire paper. Finally, the AURs of the final models were: 0.66 for BP which corresponds with 32% explanatory power (0.66-0.5)/0.5 (AUR is 0.5 if the model has no explanatory value) but 78% for ill health.

2. Selection bias may take place anyway if you aim to draw conclusions on other populations than a cohort of Swedish recruits (you certainly have this aim).

3. The sample size is impressingly large. The prize of this, however, may be large measurement error because it is difficult to ensure proper measurement for in many individuals. Measurement error often causes the largest bias. In this respect the following questions are essential: Who conducted the intellectual capacity tests? What are the psychometric properties of these tests? Which structured interview was used to assess coping? Were weight and height self-assessed by the recruits or really measured?

4. Back problems (and maybe also "ill health") might be subject to large measurement error because the individuals have an interest to complain about health problems that may truly not exist in order to be excluded from military service. How was this possibility addressed?

5. The statistical interactions you are testing have nothing to do with causal synergy. Despite of the usual problems with bias in observational studies, interactions in terms of modified odds ratios have no logical relation with causal interactions. The only measure for which there exists such a relation is the risk difference. Moreover, your factors are correlated and you therefore cannot separate
correlation from co-action. Positive correlation can produce seemingly superadditive effects.

6. Pseudo R-square is known to have very bad mathematical properties. The results are strongly depending on the scaling. Only use AURs which have a straightforward interpretation as the probability that a true case (e.g. with back problems) has a higher model-based probability as a true non-case.

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. Abstract: Don't say "outcome factors". Factors are explanatory variables while outcomes are dependent variables.

2. What a confounder is depends on the temporal relationship between the variables. For instance, age might be a confounder for the effect of coping on back problems but it is not likely that coping is a confounder for the effect of age. Don't use this term.

3. You need to be more explicit to define "ill health". What medical conditions are sufficient to be excluded from military service? In Germany, for instance, you receive a degree from very good to bad health and depending on the need of recruits the threshold to be included raised recently.

4. Report confidence intervals of odds ratios. These contain important information about the power.

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What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

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

Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests:

I declare that I have no competing interests.