Reviewer's report

Title: Factor structure and psychometric properties of the Trier Inventory for Chronic Stress (TICS) in a cross-sectional, representative German survey

Version: 1 Date: 12 August 2011

Reviewer: Donald Sharpe

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Major Compulsory

1. Let me preface my comments by suggesting the authors have a native English speaker review the manuscript. I worry that some of the concerns I will raise can be attributed to language issues. I will also work through the document page by page although I will try to highlight the more important concerns.

2. Page 5, first paragraph: Because the TICS is based on a theoretical model, "the authors automatically saw content validity as a given"? That's a very odd way of putting it. And then the next sentence says that "Factor-analytical analyses showed good factorial validity". That's the point of this article as I understand it so far more needs to be said about that than this one statement. Especially given the next sentence says the factorial structure has not been replicated. So then how do the authors conclude the measure has good factorial validity? Furthermore, if factorial validity has been established, then I'm not clear as to why an EFA was required at all. The authors should have been able to move directly to a CFA.

3. Page 9, second paragraph: I'm lost in the EFA. The abstract speaks to a four factor structure. I don't see that in the results section! Rather, a solution between "seven to nine" is presented when there are eight eigenvalues greater than 1? However, the authors then move to a two factor model, albeit a model with 9 cross-loading items? I don't understand the jump from 7-9 to 2 factors. Furthermore, the amount of variance accounted for by the two factors is small.

4. Page 10: I'm not clear why a one factor solution is being tested. Yes, the nine-factor solution is a better fit than the two factor solution but the difference isn't very great --- isn't there something to be said for parsimony? More importantly, I'm not sure why the authors conclude there is moderate to good fit for any of the models. TLI and CFI for all three solutions are very poor and far below what the authors specified as acceptable earlier in the manuscript.

5. The authors need to provide somewhere the items, their loadings on ALL of the factors (with the loadings for the assigned factor) in bold. Otherwise, I do not believe the reader can verify (or make sense) of the results here. That would be far more useful than what is presented in Table 1 or the figures.

6. Page 11, I'm not sure what the authors mean by a two-way covariance analysis for age and gender? I'm assuming the authors compared genders and ages and education on the subscales of the TICS. But those would be
comparisons of MEANS. The authors need to demonstrate FIRST that the measure is invariant across genders and ages and education --- that the factor structure is the same. Only then is it appropriate to compare means --- that should be the last thing tested, not the first and not the only thing. The authors have the sample size to do this, especially if they do not do the EFA or if they combine the EFA and CFA data to do tests of invariance.

Minor Essential

1. Page 3, Introduction, first paragraph: I'm not clear what is meant by “as within two years” in the description of stress research. Two years from what? The appearance of a stressor?

2. Page 3, Introduction, second paragraph: I found the differentiation of chronic and acute stressor to be confusing. A definition is provided for chronic stress; no such definition is provided for acute stress. Furthermore, the definition of chronic stress is unnecessarily complicated. The first part of the definition speaks to repeated stressors or the absence of mechanisms to deal with stressors, but then we’re told chronic stress may also start slowly (compared to acute stressors?), last for a short or long time (but if it is a short time, is that chronic?) and it cannot be controlled (well yes, but that’s true of acute stressors too, and it is not so much whether they can be controlled but whether the response to the stressors can be moderated). And then satisfaction with one’s needs is added to the mix as well as acute stressors transforming into chronic stressors. I’m left thinking pretty much everything is a chronic stressor. And then the next paragraph introduces “experienced stress”; I’m not sure what that is.

3. Page 3, Introduction, fourth paragraph: We’re presented with the TICS. It is described as an area-specific instrument. I’m not sure what area-specific is in reference to? Later it is said that the “TICS focuses much more on stressful life experiences followed by chronic stress…and on area-specific stress reactions” compared to “other stress questionnaires” but I’m not familiar with the measure and the items for the measure are not provided so I’m not sure what that means.

4. Nine dimensions (subscales?) are listed but it is not clear to me why those nine dimensions. I take it those dimensions are drawn from the systematic requirement-resource model of health, but I’m not familiar with that model. A very brief description of this model follows and we’re told that model is captured by two TICS scales --- lack of need satisfaction and stress due to high demands --- but I’m not clear how those two “dimensions” related to the “nine dimensions” of the TICS.

5. Page 7, second paragraph: I’m confused by (a) the statement “at least one item of each scale must be completed for the questionnaire to be examined”, (b) why missing items were replaced by scale means --- that’s not a good way to handle missing data, (c) but then the statement “only completed questionnaires were included in the factor analyses” --- so there were no missing data? I do commend the authors for separating their large dataset into two samples --- not sure why they are called “partial samples”, though. Later we are told missing data are excluded “list by list” --- I don’t know what that means? Listwise?

6. I’m not familiar with Oblimin rotation but I would have thought one would have
gone with a fixed value rather than varying the parameter, but again I’m not familiar with that rotation. And why that rotation and not some other oblique rotation? A brief explanation here or elsewhere would be good.

7. Page 9, first paragraph: “Items were appraised by 55% to 84% of the participants”. Does appraised mean completed? And why such low numbers? My guess is that these items are specific to events that might occur in one’s life, but again without having access to the items, I’m not sure.

8. When conducting the CFA, the authors allow no cross-loading items --- but are there not nine complex items according to the EFA?

Discretionary

1. Page 4, second paragraph: Reliability is NOT a property of a scale but rather a characteristic of a scale in regards to a particular sample.

2. Page 6, first paragraph: I do not know what a random-route sampling method is?

3. Page 6, last paragraph: If I am correct, the chronic stress screening scale takes 12 items from some of the other scales. How does that work? I do not know what to make of that screening scale and what role it should or does play in subsequent factor analyses if any? Can it be omitted for the purposes of establishing factorial validity of the TICS?

4. Minor thing --- p is never really .000, there is always some chance of a Type I error so should be p = .001.

5. Page 10, last paragraph: Why split-half reliabilities as opposed to Cronbach’s alpha?

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

**Quality of written English:** Not suitable for publication unless extensively edited

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

**Declaration of competing interests:**

I declare that I have no competing interests.