Reviewer's report

Title: Psychometric properties and confirmatory factor analysis of the Jefferson Scale of Physician Empathy

Version: 1 Date: 5 May 2011

Reviewer: Kevin Wolfe

Reviewer's report:

This IRB approved study examines the psychometric properties and construct validity of the Jefferson Scale of Physician Empathy (JSPE) for use in measuring levels of empathy in UK medical students. The scale was administered to 853 medical students at a UK medical college. The data were analyzed to examine the dimensional structure of the form using Principle Components Analysis (PCA), and then to confirm this dimensional structure using Confirmatory Factor Analysis (CFA). A three component structure was identified by PCA representing the emotional intelligence, perspective taking, and emotional detachment. Three items with loadings < 0.45 were dropped from the scale. Results of CFA confirmed that the three factor model based on the PCA results demonstrated good fit for the total sample, and both males and females when examined separately.

Major Compulsory Revisions:

1. Page 4 - Since many readers may not be familiar with these concepts, it would be beneficial to include a brief discussion of factor validity (construct validity?) and known group validity.

2. Page 6 - Should include a brief description of Cronbach’s alpha and corrected item-total correlation for readers who are unfamiliar.

3. Page 6 – Principle components analysis (PCA) and exploratory factor analysis (EFA) are often confused with each other. The authors in this study describe their analytic approach as being EFA, however, they utilized PCA, which is a data reduction technique used to simplify a scale, not to examine the underlying constructs or factors. Though the resulting models often look similar, PCA and EFA are actually two fundamentally different techniques, as described in detail in Tabachnick & Fidell’s Using Multivariate Statistics (which the authors cited). Given that the purpose of the current study is to identify the underlying factors that influence responses to the JSPE, it would seem that the appropriate technique to use is EFA, not PCA. However, as explained in the next comment, I do not believe that either is necessary in this study.

4. Page 6 - It is unclear why the authors used both EFA (or in this case PCA) and CFA approaches in the analyses. As described in the bottom paragraph of page 4, EFA is usually used to identify the structure of a scale when the researcher does not have prior information or theory about the connections between observed and latent variables. Given that the structure of the JSPE has been
proposed by theory and identified through EFA in previous research (as described in the introduction), it seems that the use of EFA to identify the structure is not necessary. In general, the strength of the CFA approach is in testing a hypothesized model based on theory, or suggested by previous research, to examine the extent that the hypothesized model fits the current data. It seems that a better approach would have been to test the model described in the introduction by performing CFA on the data from UK medical students. It also seems inappropriate to perform PCA and CFA using the same sample. Given that PCA is a data-driven approach, it seems very unlikely that the resulting model when tested in the same sample using CFA would not have good fit. If the authors feel that the multidimensionality of the JSPE is not currently understood based on previous theoretical and EFA work, then it would be most appropriate to conduct EFA (not PCA) on the data, and CFA would not be appropriate. In summary, a thorough description (with citations) is needed to support the rationale behind the use of both PCA and CFA on the same sample.

5. Tables and Figures – Should also include the correlation matrix for the JSPE items, which should be briefly discussed prior to discussing the modeling results.

Minor Essential Revisions

1. Page 3 - “Nevertheless, its validity for use with medical educators has not been firmly established” – Please clarify this sentence. Do you mean to say “use by medical educators to assess medical students”?

2. Page 6 – Should specify how many students were excluded due to insufficient data

3. Page 6 – “Descriptive analyzes” should be “Descriptive analyses”

4. Page 6 – “Principle factor analysis (PCA)” should be “Principle components analysis (PCA)”

5. Page 7 – “No output was received from AMOS, indicating that the model was improperly specified” – Need to explain this statement.

6. Page 8 – “The KMO index was 0.89.” Need to add that this indicates the sample is adequate because it is greater than 0.5

7. Page 10 – rather than saying “the three factor model represents a best fit…” I would say “the three factor model represents very good fit…” Best fit would imply that alternative models were tested and that this one fit the best, which is not the case.


Discretionary Revisions

1. Page 11 – Alpha was calculated for the total scale, which as 0.76. However, as the variables that group with each component (referred to by authors as factors) form a subscale, it would have been interesting to calculate alpha for each of the three components separately.
2. Page 11 – Items 1, 15, and 8 were left out of the CFA as they did not load strong enough on any of the three components in the PCA. It would be interesting to know the item-total correlations for these items. Would also be interesting to include a table of the item-total correlations for each item.

3. Page 12 - Did the principle components identified in this study correspond at all to those identified in previous studies? Only one of the names that the authors gave to the three components corresponded directly to the names of the factors that were identified by previous research (i.e. ‘perspective taking’). Was this done deliberately to suggest that the other two components (i.e. ‘emotional intelligence’ and ‘emotional detachment’) are conceptually different from those identified in previous studies (i.e. ‘compassionate care’ and ‘ability to stand in patient’s shoes’)?

**Level of interest:** An article of importance in its field

**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