Reviewer's report

Title: Conjoint analysis methods to study physicians' medical decision behaviour: systematic review

Version: 1 Date: 12 September 2007

Reviewer: Robert Wigton

Reviewer's report:

General

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

This is a nice and timely review of studies of medical choice and judgment using linear models. It is clearly written and easy to follow.

Major revision

The introduction needs to be revised to better define conjoint analysis and to be more clear and specific about the research questions – what you hope to discover and the goals of the review. On reading the introduction, one could come away with the idea that almost any study that inferred cue weighting from answers to structured vignettes would be an example of conjoint analysis. It would be helpful to define it and put it in some perspective.

Comment

There have been two prominent methods of constructing linear models of medical judgments, each with their own literature and set of advocates. These are conjoint analysis, developed in the 1970s to study preference and choice (Green, PE. On the design of choice experiments involving multifactor alternatives. Journal of Consumer Research 1:61-68), and judgment analysis, also called social judgment theory, developed in the 1950s from Brunswik’s lens model (.Hammond KR, Hursch CJ, Todd FJ. Analyzing the components of clinical inference. Psychological Review 71:438-456, 1964 and Cooksey RW. Judgment Analysis: Theory, Methods, and Applications. 1996 Academic Press). The two have developed along very different theoretical lines and have developed somewhat different methodology, although there is considerable overlap. (You could make the point that Gigerenzer’s fast and frugal theories represent a 3rd approach. I certainly don’t see a connection with conjoint analysis, although in presentations he often contrasts them with judgment analysis.)

I think if you are to select articles about conjoint analysis, it is important to discriminate these from articles in the judgment analysis tradition. You have listed several that were, at the time they were written, clearly judgment analysis
articles based on their intent, their methodologic references, and where they were presented. An example is John Kirwan’s articles on rheumatoid arthritis. A disciple at that time of Ken Hammond, Kirwan was attempting to resolve questions within the paradigm of the lens model and was not, I believe, acquainted with conjoint analysis, which at that time was mostly found in the marketing literature.

I think it would be useful in your paper to define what you mean by conjoint analysis and indicate how one would distinguish a conjoint study from other linear models of physician judgment. I can give you my impression of the main differences early on:

Conjoint analysis Judgment analysis

cases / profiles 16 to 27 cases 50 - 150 cases
design fractional factorial design random, representative design
design fixed cue levels cues as continuous vars
matrix orthogonal, uncorrelated correlated
correlations among cues none many
analysis ANOVA multivariate regression
level of analysis nomothetic idiographic
outcome choice or ranking choice, probability or rating

There may now be more methodologic overlap, but the major issues with judgment analysis on idiographic analysis, vicarious functioning and representative design have not become issues with conjoint analysis.

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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)

Minor comments

Other differences: the judgment analysis approach would take issue with your assertion in the abstract that conjoint analysis has the potential to depict cognitive processes (see Hoffman PJ: The paramorphic representation of clinical judgment. Psychol Bul 57:116, 1960.) And I’m not sure that conclusion is supported by the data presented in the article.

In the first paragraph of the introduction, I believe that conjoint analysis (as opposed to conjoint measurement) was coined and developed by Green building on Luce’s work. He had wanted to develop a non-dimensional preference method (ranking) which they corrected by using monotonic transformation and a goodness of fit model.

On page 10, I don’t understand the section on accounting for correlated data. Some of the studies you cite were using orthogonal designs and shouldn’t need
correction for intercorrelation. I would rather see some discussion of the important methodological differences noted above.

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Discretionary Revisions (which the author can choose to ignore)

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, the manuscript does not need to be seen by a statistician.

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