Abstract

The issue of the dimensionality of negative symptoms is addressed. In reference to data reported by Lewine, Fogg, and Meltzer (1983), it is suggested that the nonsignificant correlation between a SADS-C negative symptom scale and a NOSIE negative symptom scale, both independently developed using the Rasch model, is evidence for the multidimensionality of negative symptoms. Additional data supporting the multidimensionality of negative symptoms using confirmatory factor analysis is also discussed (Gibbons et al. 1985). A new theory for the structure of negative symptoms is needed, which specifies the number of dimensions, their classification, and their pattern of intercorrelation.

Lewine, Fogg, and Meltzer (1983) addressed the issue of measuring the severity of negative and positive symptoms of schizophrenia. They used the Rasch model, a probabilistic latent trait model, to develop scales for both negative and positive symptoms. Negative symptom items were derived from the Schedule for Affective Disorders and Schizophrenia-Change Version (SADS-C) (Endicott and Spitzer 1978) and the Nurses Observation Scale for Inpatient Evaluation (NOSIE) (Honigfeld, Gillis, and Klett 1966), whereas positive symptom items were derived only from the SADS-C.

In view of the fact that Lewine, Fogg, and Meltzer (1983) derived two scales of negative symptoms (one from the NOSIE and one from the SADS-C), the question must be raised—how should a negative symptoms score be assigned to a patient? Should the two scores be summed? This approach would be unwise since the two scales of negative symptoms are not correlated ($r = .12$ for men; $r = .21$ for women). Should one of the scores be chosen? If so, which is the “true” negative symptoms score? Or should both scores be retained? If so, there would no longer be a single dimension of negative symptoms but, rather, at least two dimensions of negative symptomatology—symptoms assessed by the SADS-C and those assessed by the NOSIE or, alternatively, the “molecular affective-cognitive signs” and the “molar behavioral signs” (p. 374).

The above questions point to a fundamental difficulty in Lewine, Fogg, and Meltzer’s application of the Rasch model: the problem of dimensionality. When the Rasch model is applied to psychiatric data, the hypothesis tested is that all the symptoms of the syndrome (in this case, negative symptoms) lie along a single continuum and that all patients with the syndrome also lie along the same continuum. Important features of the Rasch model are item independence and sample independence. Item independence implies that any group of symptoms selected from the total set of symptoms that constitute the syndrome will assign the same scores (to within a linear transformation) to a particular sample of patients, as will any other group of symptoms of the same syndrome. Conversely, the severities (prevalence) assigned to a set of symptoms by a sample of patients from the specified population will be the same (to within a linear transformation) as the severities assigned by any other sample from the same population. The acceptance of the Rasch model has profound practical and theoretical implications: One may search for a functional mechanism.
that would generate unidimensional data, such as a single biological substrate or developmental pattern, and one may summarize any patient’s negative symptoms with a single number, facilitating comparisons among patients.

Is there evidence that negative symptoms are in fact unidimensional? The goodness-of-fit statistics for the three scales reported by Lewine, Fogg, and Meltzer were not statistically significant, leading the authors to accept the hypothesis of unidimensionality for negative symptoms and for positive symptoms. However, the negative symptoms scale developed from the SADS-C was not correlated with the scale developed from the NOSIE. The lack of correlation is contrary to what one would expect from the item independence of the Rasch model, and indicates that there are at least two dimensions of negative symptoms. Lewine, Fogg, and Meltzer tacitly acknowledge this possibility, and hypothesize that the lack of correlation is due either to differences in the content of the SADS-C and the NOSIE (signs of psychopathology vs. personal hygiene and global activity) or to differences in the method of data collection. In any case, the data indicate that negative symptoms cannot be measured on a single dimension, and that the Rasch model should accordingly be rejected for the domain of negative symptoms as a whole.

Although Lewine, Fogg, and Meltzer concluded that their application of the Rasch model to develop reliable and stable unidimensional measures of negative and positive symptoms was successful, the position taken by the authors vis-à-vis the dimensionality of negative symptoms is unclear. Because the hypothesis of unidimensionality must be rejected, a new theory about the structure of negative symptoms would be useful. How many dimensions of negative symptoms are there? How may they be classified? What is their pattern of intercorrelation? A reasonable first hypothesis is that there are two dimensions of negative symptoms: the personal-hygiene-and-global-activity dimension, and the affective-cognitive dimension. With more subjects and more items, the affective-cognitive dimension might split into two dimensions, as might the personal-hygiene-and-global-activity dimension. And each method of observation might provide a separate kind of dimension. In fact, there may be many dimensions of negative symptoms.

A recently published study provides additional support for the multidimensionality of negative symptoms (Gibbons et al. 1985). In a sample of 416 newly admitted schizophrenic inpatients who participated in a multihospital collaborative study sponsored by the National Institute of Mental Health, confirmatory factor analysis was performed on negative symptoms assessed with the Inpatient Multidimensional Psychiatric Scale (IMPS). The symptoms included in this analysis were selected from the IMPS by Lewine (p. 391) based on two theoretical views of negative symptoms: Kraepelinian items (reflecting an absolute loss of function) and Bleulerian items (reflecting a loss of goal orientation or organization). Contrary to the expectations of Gibbons et al., three factors fit the data best, which they named “apathy,” “retardation,” and “Bleulerian.” As we suggested earlier, more subjects and more items would likely yield additional negative symptoms dimensions. Future theories and research should further delineate the multidimensional structure of negative symptoms.

References


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