Method Factors Associated with Assessment of Child Behavior: Fact or Artifact?¹

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A sample of 64 phobic children between the ages of 6 and 16, with their general population matched controls, were rated by parents on the Louisville Behavior Check List and Louisville Fear Survey and by teachers on the School Behavior Check List. The analysis of ratings by factor analysis revealed three instrument factors while a multiple discriminant analysis elicited a multidimensional phobic trait that crossed observers, situations, and instruments. The results are discussed in terms of the implications for multivariate analysis of behavior change as well as for classification of psychopathological disorders of childhood. The thesis is advanced that instrument factors elicited by factor analysis in psychotherapy change studies are statistical artifacts and that a multiple discriminant analysis is a more appropriate technique for the study of change as well as for classification.

In a classic study attempting to isolate changes in personality due to psychotherapy, Cartwright, Kirtner, and Fiske (1963) found that when a number of measures are used, the resulting change factors are associated with the measuring instruments rather than with the traits that are under investigation. Instrument-related factors have been found repeatedly (Strupp & Bergin, 1969) and, most recently, have been reported for a series of studies by Garfield, Prager, and Bergin, (1971).

The statistical technique which most commonly yields method effects is factor analysis. We believe this technique is unusually sensitive to measuring instrument variance, that it obscures the traits that are being measured, and

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hence is an inappropriate technique for elucidating person variables related to change. Multiple discriminant analysis, however, appears to be an appropriate technique. Tatsuoka (1969) has cogently clarified the contributions of the two techniques; “discriminant analysis bears a strong resemblance to factor analysis except that the latter seeks a parsimonious description of individual differences whereas the former provides a parsimonious description of group differences” (p. 741).

The different objectives of the two techniques lead to different results, each of which has different consequences for personality theory and psychotherapy research. Since factor analysis maximizes individual differences, instruments that tap similar response modalities tend to cluster erroneously into instrument factors leading to the inference that personality constructs have little meaning beyond a specific measuring procedure. Such a conclusion makes it difficult to compare studies using different instruments and limits the extent to which research findings can be generalized. Ultimately, one would be forced to conclude that theory itself is instrument specific. Discriminant analysis, on the other hand, is less susceptible to instrument-based variance. Rather it produces differential descriptions of groups that have been previously established on the basis of a critical variable such as diagnostic outcome. An understanding of the limitations and specificity of each technique may enable investigators to establish substantive person characteristics that cross instruments and situations, thus freeing constructs from their yoked relationship to measuring instruments.

In this paper we report the results of a factor analysis and a multiple discriminant analysis of parent and teacher behavior ratings of a group of phobic and control population children. The purpose of the study is to demonstrate that factor analysis shows differences among tests resulting in test clusters (method factors) while discriminant analysis indicates personality attributes associated with group differences. We believe the latter technique is more appropriate not only when applied to classification problems but also when applied to problems of assessing change when multiple instruments and constructs are involved.

METHOD

Populations

Phobic Population. Over a 3-year period, 148 children between the ages of 6 and 15 years were carefully screened and studied by a clinical team to ascertain the presence of phobic behavior. The diagnostic process was extensive and included, in addition to the checklists used in the current study, interviews with parents and child, behavior ratings by the child, ratings by the clinical staff,