

# WHY AND HOW SHOULD WE CLASSIFY INDIVIDUALS? INTRODUCTION TO THE SPECIAL SECTION ON CATEGORIES AND DIMENSIONS

John Ruscio

*The College of New Jersey*

Like any science, mental health practice depends on an adequate classification of its subject matter. This requires an understanding of what is to be classified. In the domain of mental disorder, are there discrete classes into which people cluster together, or are the categories used by scientists and practitioners little more than a convenient fiction that reflects a human preference for thinking categorically? For example, are psychopaths a distinct group of people who differ qualitatively from non-psychopaths, or do individuals actually differ along one or more continua of psychopathic trait levels? Regardless of how one prefers to conceptualize or measure this construct, in reality individual differences in psychopathy are structured either categorically or dimensionally. Empirically determining whether a categorical or dimensional model better represents the underlying, or latent, structure of a construct has important implications for a number of theoretical and practical issues (Meehl, 1992; Ruscio, Haslam, & Ruscio, 2006), including the following:

1. *Causal theories.* Should we be trying to explain membership in groups or continuous variation along dimensions? All-or-nothing causal factors, such as a single dominant gene or a traumatic experience, might explain group membership. The additive effects of multiple causal factors—whether genetic, environmental, or based on the interaction of genes and environment—might explain continuous variation (Haslam, 1997; Meehl, 1977).
2. *Classification.* Should we assign people to groups or locate their positions along dimensions? A typology, such as the categories of mental disorder listed in the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2000), is very different from a dimensional system, such as the personality models that many psychologists would like to see extended to the classification of abnormal personality (Widiger & Trull, 2007).
3. *Assessment.* Should we measure variables with thresholds that identify group members or variables that help to locate individuals' positions along dimensions? A relatively small number of variables whose sensitivity is clustered near an important boundary might classify individuals into groups effectively, but a larger number of variables whose sensitivity is spread across the full range of trait levels might be

---

Author's Note: John Ruscio, Ph.D., Psychology Department, The College of New Jersey, 2000 Pennington Road, P.O. Box 7718, Ewing, NJ 08628. E-mail: Ruscio@tcnj.edu.

required to assess dimensional variation (Ruscio & Ruscio, 2002).

4. *Research design.* Should we select individuals for study who clearly meet criteria for group membership or sample broadly along the full range of trait levels? Sampling from the extremes of measured score distributions can be a simple and effective way to construct groups for comparison, but if a construct is dimensional it can be important to include individuals spanning the full spectrum of trait levels to determine whether relationships with other variables are linear or nonlinear (A. M. Ruscio, Borkovec, & Ruscio, 2001).
5. *Data analysis.* Should we compare group means or perform correlational analyses based on the full range of trait levels? Provided that group members are identified validly, comparing group means on variables of interest can be an effective way to study categorical constructs. If the construct is dimensional, however, lumping people together into groups rather than retaining fully continuous measures can substantially reduce statistical power (MacCallum, Zhang, Preacher, & Rucker, 2002).

Because there are so many reasons to empirically evaluate the latent structure of a psychological construct, many methods have been devised to help distinguish categories and dimensions. Meehl (1995) and his colleagues (e.g., Waller & Meehl, 1998) have developed a taxometric method that includes a set of data-analytic procedures that appear to make the fundamental distinction between categorical and dimensional structures effectively. To implement the method, one submits variables representing distinct facets of a target construct to a series of data-analytic procedures to determine whether the results provide clear and consistent support for a categorical model or a dimensional model (Ruscio, Walters, Marcus, & Kaczetow, 2010). Details of taxometric methodology are beyond the scope of this special section, but interested readers can consult seminal works by Meehl (1995) or Waller and Meehl (1998), or broader and more recent overviews by Ruscio (2007) or Ruscio et al. (2006).

The two papers included in this special section focus on what we can learn from applications of the taxometric method to study personality and psychopathology. Marcus, Sanford, Edens, Knight, and Walters (2010) examine the implications of knowing whether or not a psychopathic sexuality taxon exists. (In the taxometric literature, "taxon" refers to the focal group of primary interest to the investigators, as contrasted with its "complement" of individuals who do not belong to the taxon.) Marcus et al. review and critique the taxometric evidence that others have marshaled in support of the exist-

tence of a psychopathic sexuality taxon. Their discussion highlights the importance of implementing the taxometric method and interpreting the results in accordance with the best available empirical guidelines. Marcus et al. then provide a thoughtful discussion of the implications of latent structure for causal theories. In particular, they question the extent to which the existence of a psychopathic sexuality taxon supports the claim that such a taxon is the product of natural selection. Even for those with no special interest in psychopathy or evolutionary theory, this paper provides an excellent illustration of the significant issues that can be addressed by empirically testing categorical and dimensional structural models and the special care that must be taken to draw sound conclusions.

Haslam (2010) presents a big-picture overview of trends in taxometric research, the majority of which has involved the study of constructs in personality and psychopathology. He begins by documenting the increase in the number and scholarly impact of taxometric studies over the past three decades. More than 100 peer-reviewed journal articles have been published, most of them very recently, and the number of citations these studies receive is accelerating at a comparable rate. Perhaps the most interesting finding is that whereas early taxometric studies usually supported categorical structural models, more recent studies support dimensional models at least as often as categorical models. Haslam discusses potential explanations for this shift. Though he considers the possibility that researchers now tend to focus their attention on constructs that happen to be dimensional, he believes the shift has more to do with improvements in taxometric practice that prevent the mistaken identification of spurious categories. Haslam summarizes the conclusions reached by investigators who have studied dozens of constructs in personality and psychopathology and reviews the implications of this body of research for our understanding and classification of these variables. Extensive references are provided to the original research, where interested readers can learn more about the questions that prompted these studies, the methodology used and how it has evolved over time, and the consensus—or lack thereof—regarding the structure of particular constructs.

## REFERENCES

- American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.

- Haslam, N. (1997). Evidence that male sexual orientation is a matter of degree. *Journal of Personality and Social Psychology, 73*, 862–870.
- Haslam, N. (2011). The latent structure of personality and psychopathology: A review of trends in taxometric research. *The Scientific Review of Mental Health Practice, 8*(1), 17–29.
- MacCallum, R. C., Zhang, S., Preacher, K. J., & Rucker, D. D. (2002). On the practice of dichotomization of quantitative variables. *Psychological Methods, 7*, 19–40.
- Marcus, D. K., Sanford, G. M., Edens, J. F., Knight, R. A., & Walters, G. D. (2011). Taxometrics and evolutionary theory: The case of the psychopathic sexuality taxon. *The Scientific Review of Mental Health Practice, 8*(1), 6–29.
- Meehl, P. E. (1977). Specific etiology and other forms of strong influence: Some quantitative meanings. *Journal of Medicine and Philosophy, 2*, 33–53.
- Meehl, P. E. (1992). Factors and taxa, traits and types, differences of degree and differences in kind. *Journal of Personality, 60*, 117–174.
- Meehl, P. E. (1995). Bootstraps taxometrics: Solving the classification problem in psychopathology. *American Psychologist, 50*, 266–274.
- Ruscio, A. M., Borkovec, T. D., & Ruscio, J. (2001). A taxometric analysis of the latent structure of worry. *Journal of Abnormal Psychology, 110*, 413–422.
- Ruscio, J. (2007). Taxometric analysis: An empirically-grounded approach to implementing the method. *Criminal Justice and Behavior, 24*, 1588–1622.
- Ruscio, J., Haslam, N., & Ruscio, A. M. (2006). *Introduction to the taxometric method: A practical guide*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Ruscio, J., & Ruscio, A. M. (2002). A structure-based approach to psychological assessment: Matching measurement models to latent structure. *Assessment, 9*, 4–16.
- Ruscio, J., Walters, G. D., Marcus, D. K., & Kacetow, W. (2010). Comparing the relative fit of categorical and dimensional latent variable models using consistency tests. *Psychological Assessment, 22*, 5–21.
- Waller, N. G., & Meehl, P. E. (1998). *Multivariate taxometric procedures: Distinguishing types from continua*. Thousand Oaks, CA: Sage.
- Widiger, T. A., & Trull, T. J. (2007). Plate tectonics in the classification of personality disorder: Shifting to a dimensional model. *American Psychologist, 62*, 71–83.