The study of psychological constructs produces a voluminous database each year. In fact, the keywords *constructs* or *latent variable* appear in just over 14,000 articles within the PsycINFO database from years 2000–2009 inclusive. Susan E. Embretson, who edited this current volume, has contributed a mixture of approximately 50 articles, book chapters, and books to the study of psychological constructs. In such a busy field, Embretson stands as a qualified leader to take the editorial role for this text titled *Measuring Psychological Constructs: Advances in Model-Based Approaches*. 

The text contains 11 chapters written by 19 authors. Embretson wrote the first and final chapters in this text. In the first chapter, she gives a brief overview of item response theory (IRT) and classical test theory in addition to describing what one can expect in the upcoming chapters. The reader will get a sense of the intention to bring construct development to an entirely new level of complexity. Embretson does this during her discussions about the connections between test theory and psychological theory. In the final chapter, she attempts to make those connections herself through two of her own experiments. The text is written well and extends the field of psychometric modeling to novel techniques and analysis processes.

**What Does the Text Review?**

Of all the approaches to studying constructs, IRT is discussed the most within this text. This makes sense, of course, given the lengthy history of IRT in psychometrics. The IRT approach developed throughout the middle of the 20th century. During that time, it came together through various methodological developments and researchers (Bock, 1997; Embretson & Reise, 2000). Its use became much wider by the 1980s once personal computers gave more researchers access to the computing power needed to perform its operations.

The processes involved in IRT are rather complex. In short, however, it is one way to determine the degree of difficulty of an item on a test. That measure of difficulty is then used to determine how that particular test item influences the overall results of the test itself. It has an extensive history at the Educational Testing Service and in academia. Although it has served the psychometric community well for the past half century, psychometricians are continually attempting to develop techniques that outperform IRT. This is actually the main theme of this text: the use of alternative approaches to study psychological constructs. Varieties of new techniques are presented throughout the text, and their results are compared with those of IRT.

**Which Techniques Are Developed in the Text?**
The techniques investigated in this text follow a wide range of approaches. Three chapters assess the measurement of qualitative differences between individuals. Another two chapters address the issues of entangled constructs, and two more chapters address the measurement of personality, psychopathology, and attitudes from self-reports. The breadth of topics is well suited for this text, given that all these areas are influenced by test design issues. Improvements in test design and theory will result in better measurement in all those areas. Of all the chapters, my favorite section was on the use of cognitive psychometric models for designing new forms of test generation.

One of the approaches taken in this section was to use a random-effects extension of the linear logistic test model to characterize item design matrices within the traditional Rasch model process. The author, Rianne Janssen, attempted to develop a model that combines the roles of the nomothetic span and construct representation processes into a single method. Nomothetic span is related to construct validity, and construct representation is related to task interpretation decomposition (Embretson Whitely, 1983).

Construct representation requires one to evaluate the underlying components of the responses to test items. This includes the cognitive processes that guide decision making, test-taking strategies, and the subject’s skills for the test questions themselves. Test processes such as these represent a departure from previous methods in test development. One of the unique aspects of this design allows for a quantitative evaluation of both the nomothetic span and construct representations in the same analysis technique.

Janssen’s methodology still allows for the measurement of subjects on the same scale while they are exposed to different subsets of items. This technique also allows for the measurement of a wide range of test items that do not have to be finished by the subject. Janssen’s technique may be most promising for automatic item-generation studies. For certain, this technique addresses the problem of standard setting in a different manner from the way it has been traditionally conceived.

Conclusions

To read this text is to find that the field of psychology is full of high-level mathematical reasoning. Members of the mathematical psychology community—especially those involved in construct assessment and test design—will certainly benefit from reading this material. Anyone interested in the type of work that goes into creating exams such as the Scholastic Aptitude Test will also benefit from seeing how the analysis of test items is currently being developed.

To reach such a high level of analysis, however, one must be familiar with the design and mathematical issues related to construct assessment. The majority of the work in Measuring Psychological Constructs requires a professional level of experience to comprehend fully. It would help any reader to be both reasonably competent through calculus and to have an extensive background in test design to effectively follow along. I feel the text would open up to a much wider audience if there were lengthier descriptions of the field’s history and theoretical background information. Fortunately, those issues are cited so that interested readers can obtain that information at their own leisure.

References

