

# EDITORIAL INTRODUCTION

## Special Research Commentary Series on Advanced Methodological Thinking for Quantitative Research

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Quantitative research in the business and social sciences has made great strides since John Stuart Mill and the 19<sup>th</sup> century experimental positivists. Inferential statistics allows us to attribute causality even in the face of relatively low levels of deterministic cause and effect. Within recognized limits, we have been able to greatly strengthen theories that explain a plethora of complex business and societal problems.

One of the drawbacks of applying statistical tools, however, is that their use has become more and more complex, requiring even more specialization in how to understand and apply the techniques. Computerization has at once made the lives of researchers easier and, at the same time, made it more intricate with respect to knowing how and when to apply the tools.

Believing that quantitative methods have reached a new level of sophistication, especially with regard to distinctions between latent constructs that are being measured via reflective items and those being measured through formative items, the *MISQ* Editor-in-Chief and I began talking more than a year ago about the possibility of a series of research commentaries that would offer significant intellectual advances in our current methods. Through these discussions, we agreed to invite a highly selected set of methodologists to write a series of research commentaries on state-of-the-art quantitative methods. The EIC served as senior editor for the papers and I was assigned the task of managing the entire process as associate editor. The special series of papers that follows is the result of this initiative.

Research commentaries are a relatively new category of papers at *MISQ*, but have appeared in *Information Systems Research* and other top journals for many years. The key point is that these papers are rigorously reviewed, and thus true products of the peer-review process. But the second, critical condition is that senior scholars are initially solicited to write the targeted articles, handicapping that the inputs will be high quality to begin with.

We believe that the four commentaries that survived the rigors of the review process and follow in this issue are excellent examples of the value and purpose of this article category. What do the papers deal with?

Richard Bagozzi has written an excellent and philosophical overview of the issues involved with the emerging quantitative research paradigm, providing as part of his article constructive and useful advice for how to engage in the process. In particular, we think his detailed focus on a framework of meaning, in which context, not only that of guiding theories, but analyzed data and intervening errors, is particularly useful.

Scott MacKenzie, Philip Podsakoff, and Nathan Podsakoff have undertaken the daunting task of providing a paradigmatic compendium of research methods and philosophies that can be seen as a radical updating of the original Churchill article so widely cited, but lately dated. Their technical appendix takes on the form of tabular guides to the selection of model type, combined with the prescribed methods for fitting the format selected. Their tabular presentation, along with the exhaustive coverage of topical material, ensures that this resource will serve as a very useful reference for the practicing researcher deeply involved with measurement and modeling.

Adamantios Diamantopoulos writes about the process of fitting formative models in covariance-based structural equation modeling (CBSEM). Because of the issues related to model identification, formative models are quite challenging to fit in such environments, and for the intrepid modeler, his technical appendix provides a working version of a formative model, including all command lines and a data matrix, in the form of an extremely useful template for subsequent adaptation. The CBSEM approach has advantages that researchers may wish to utilize, particularly in terms of the provision of error estimates in measurement, which are not provided by the popular PLS modeling tool most currently used for fitting formative models in the IS field.

Kenneth Bollen provides very practical guidance on terminology; it is his own prior work that provides the basis for two sorts of non-effect indicators (non-reflective indicators, in essence) in measurement. One is the composite indicator, which we typically call *formative*. The term *composite* works well with the idea of the formative index, in which the construct is formed through the combined result of its group of indicators. But, more importantly, another non-effect indicator he discusses is the causal indicator, and his article makes the important distinction between the two types of measures, each non-reflective. This will be very important reading for those who are methodologically inclined, as the literature to this point has clearly not made this important distinction. He also discusses the processes through which indicators in such models can, in certain cases, be removed without harming the subsequent validity of the proffered measure.

The series raises some interesting issues for the consideration of quantitative researchers. For one, it spans the gap between those who prefer a methodological approach whereby instruments and scales can be “purified” (even in the presence of tools that allow us to identify and account for measurement error statistically, within the modeling itself) and those who believe that no such purification should be undertaken. As editors, we preferred not to take a stance on instrument purification or holistic modeling of error. We preferred, instead, to let the authors make their arguments directly to the research community and let that community itself weigh the various points of view.

In putting this special issue together, we relied heavily on the good nature and robust work ethic of this set of authors. We thank the authors for their contributions and are quite in their debt for the important work they have provided to quantitative researchers in the fields of the administrative and social sciences.