Exploratory Analyses for Missing Data in Meta-Analyses

Introduction

Systematic reviews of substance abuse literature hold great promise for unpacking correlates of effective substance abuse interventions. Methodological tools such as meta-regression can formally test relationships between the type or implementation of an intervention and how effective it is. However, such tools must contend with the real-world difficulties of modern research syntheses, including the fact that it is often impossible to extract relevant information from the literature.

The fact that not every study reports the information required to run a meta-regression means that many meta-analyses run into a missing data problem. Issues with missing data are not new. There is a large literature on methods for handling missing data in primary studies, as well as some work on related issues in meta-analysis. This literature highlights the ways that missingness can bias an analysis, examines conditions under which these biases can be corrected, and proposes various statistical procedures to adjust for bias.

A key assumption of most missing data methods is that the analyst has some idea about which of their data are missing and why. However, while much of the literature has focused on the implications of that assumption, considerably less attention is paid to approaches to examining it in a dataset. In fact, most work on summarizing missingness in a dataset and examining its sources arises in literature on graphical summaries of data.

This is inherently an exploratory data anlysis (EDA), wherein the analyst seeks to identify patterns of missing variables in their data and what those may be correlated with. As such, there is no single procedure or silver bullet for a given dataset. Instead, analysts...