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Title pages

STUDYING ORGANIZATIONS: Innovations in Methodology 4

META-ANALYSIS

CUMULATING RESEARCH FINDINGS ACROSS STUDIES

by
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Key passages

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Introduction

□ Scientists have known for centuries that a single study will not resolve a major issue. Indeed, a small sample study will not even resolve a minor issue. Thus, the foundation of science is the cumulation of knowledge from the results of many studies.

There are two steps to the cumulation of knowledge: (1) the cumulation of results across studies to establish facts and (2) the formation of theories to place the facts into a coherent and useful form. The focus of this book is the first of these, the resolution of the basic facts from a set of studies that all bear on the same relationship. For many years this was not an important issue in the social sciences since there was rarely more than one study dealing with a given issue. But that time has now past. There are now hundreds of studies that have sought to measure the extent to which we can predict job performance in clerical work from cognitive ability, hundreds of studies that seek to measure the

effect of psychotherapy, and so on.

With as many as one hundred studies on a relationship, one might think that there would be a resolution on the issue. Yet most review studies do not conclude with resolution but with a call for more research on the question. This has been especially frustrating to organizations that fund research in the behavioral and social sciences. Many such organizations are now questioning the usefulness of research in the social sciences on just this ground. If research never resolves issues, then why spend millions of dollars on research?

In this book, we will review all the methods that have been proposed for cumulating knowledge across studies including the narrative review, counting statisticaliy significant findings, and the averaging of quantitative outcome measures. Our critique will show that the narrative review has broken down in many cases (see also Jackson, 1978). We will note how significance counting can be done correctly (see also Rosenthal, 1978; Hedges & Olkin, 1980) in those limited conditions in which it is appropriate. Most of the book will be devoted to methods of averaging results across studies (as advocated by Glass, 1976, and Schmidt & Hunter, 1977). We will refer to the averaging methods as "meta-analysis" (we view the Glass procedure as only one such method). Most methods of meta-analysis have been concerned with one artifactual source of variation across studies: sampling error. Following the lead of work in personnel selection on "validity generalization," we will extend meta-analysis to consider two other major problems that create artifactual variation across studies: error of measurement and range variation (restriction of range in personnel selection).

The main focus of the book will be on methods of distinguishing between variance across studies due to artifacts (such as sampling error, error of measurement, and restriction in range) and variance across studies due to real moderator variables. We will also present a historical review of cumulation methods after the state-of-the-art methods have been described.