

THE **HANDBOOK**  
OF **RESEARCH**  
**SYNTHESIS**  
AND **META-ANALYSIS**

3RD EDITION

Edited by

**HARRIS COOPER, LARRY V. HEDGES,  
AND JEFFREY C. VALENTINE**

RUSSELL SAGE FOUNDATION

NEW YORK

# CONTENTS

About the Authors	ix
<b>PART I INTRODUCTION 1</b>	
1. Research Synthesis as a Scientific Process <i>Harris Cooper, Larry V. Hedges, and Jeffrey C. Valentine</i>	3
<b>PART II FORMULATING A PROBLEM 17</b>	
2. Hypotheses and Problems in Research Synthesis <i>Harris Cooper</i>	19
3. Statistical Considerations <i>Larry V. Hedges</i>	37
<b>PART III SEARCHING THE LITERATURE 49</b>	
4. Scientific Communication and Literature Retrieval <i>Howard D. White</i>	51
5. Searching Bibliographic Databases <i>Julie Glanville</i>	73
6. Retrieving Grey Literature, Information, and Data in the Digital Age <i>Dean Giustini</i>	101

## PART IV CODING THE LITERATURE 127

- |   |     |
|---|-----|
| 7. Incorporating Judgments About Study Quality into Research Syntheses      | 129 |
| <i>Jeffrey C. Valentine</i>   |     |
| 8. Identifying Potentially Interesting Variables and Analysis Opportunities | 141 |
| <i>Mark W. Lipsey</i>   |     |
| 9. Systematic Coding for Research Synthesis                                 | 153 |
| <i>David B. Wilson</i>  |     |
| 10. Evaluating Coding Decisions   | 173 |
| <i>Jack L. Vevea, Nicole A. M. Zelinsky, and Robert G. Orwin</i>            |     |

## PART V STATISTICALLY DESCRIBING AND COMBINING STUDY OUTCOMES 205

- |  |     |
|--|-----|
| 11. Effect Sizes for Meta-Analysis   | 207 |
| <i>Michael Borenstein and Larry V. Hedges</i>  |     |
| 12. Statistically Analyzing Effect Sizes: Fixed- and Random-Effects Models                                   | 245 |
| <i>Spyros Konstantopoulos and Larry V. Hedges</i>  |     |
| 13. Stochastically Dependent Effect Sizes  | 281 |
| <i>Larry V. Hedges</i>   |     |
| 14. Bayesian Meta-Analysis   | 299 |
| <i>Rebecca M. Turner and Julian P. T. Higgins</i>  |     |
| 15. Correcting for the Distorting Effects of Study Artifacts in Meta-Analysis and Second Order Meta-Analysis | 315 |
| <i>Frank L. Schmidt, Huy Le, and In-Sue Oh</i>   |     |
| 16. Model-Based Meta-Analysis and Related Approaches   | 339 |
| <i>Betsy Jane Becker and Ariel M. Aloe</i>   |     |

## PART VI DATA DIAGNOSTICS 365

- |   |     |
|---|-----|
| 17. Missing Data in Meta-Analysis                           | 367 |
| <i>Terri D. Pigott</i>                                      |     |
| 18. Publication Bias  | 383 |
| <i>Jack L. Vevea, Kathleen Coburn, and Alexander Sutton</i> |     |

## PART VII DATA INTERPRETATION 431

- |  |     |
|--|-----|
| 19. Interpreting Effect Sizes                                    | 433 |
| <i>Jeffrey C. Valentine, Ariel M. Aloe, and Sandra Jo Wilson</i> |     |
| 20. Heterogeneity in Meta-Analysis                               | 453 |
| <i>Michael Borenstein</i>  |     |

## PART VIII SUMMARY 469

21. Transparent Reporting: Registrations, Protocols, and Final Reports	471
<i>Evan Mayo-Wilson and Sean Grant</i>	
22. Threats to the Validity of Generalized Inferences from Research Syntheses	489
<i>Georg E. Matt and Thomas D. Cook</i>	
23. Potentials and Limitations of Research Synthesis	517
<i>Harris Cooper, Larry V. Hedges, and Jeffrey C. Valentine</i>	
Glossary	527
Index	539