Figure 1.1 Citations to Articles, per Document

Table 1.1 A Taxonomy of Literature Reviews

Characteristic	Categories
Focus	research findings
	research methods
	theories
	practices or applications
Goal	integration
	generalization
	conflict resolution
	linguistic bridge-building
	criticism
	identification of central issues
Perspective	neutral representation
	espousal of position
Coverage	exhaustive
	exhaustive with selective citation
	representative
	central or pivotal
Organization	historical
	conceptual
	methodological
Audience	specialized scholars
	general scholars
	practitioners or policy makers
	general public

Table 1.2 Research Synthesis Conceptualized as a Research Process

Stage	Research Question	Primary Function	Procedural Variation
		Stage Characteristics	
Define the Problem	What research evidence will be relevant to the problem or hypothesis of interest in the synthesis?	Define the variables and relationships of interest so that relevant and irrelevant studies can be distinguished	Variation in the conceptual breadth and detail of definitions might lead to differences in the research operations deemed relevant and/or tested as moderating influences
Collect the Research Evidence	What procedures should be used to find relevant research?	Identify sources (e.g., reference databases, journals) and terms used to search for relevant research and extract information from reports	Variation in searched sources and extraction procedures might lead to systematic differences in the retrieved research and what is known about each study
Evaluate the Correspondence between Methods and Implementation of Studies and the Desired Synthesis Inferences	What retrieved research should be included or excluded from the synthesis based on the suitability of the methods for studying the synthesis question or problems in research implementation?	Identify and apply criteria to separate correspondent from incommensurate research results	Variation in criteria for decisions about study inclusion might lead to systematic differences in which studies remain in the synthesis
Analyze (Integrate) the Evidence from Individual Studies	What procedures should be used to summarize and integrate the research results?	Identify and apply procedures for combining results across studies and testing for differences in results between studies	Variation in procedures used to analyze results of individual studies (narrative, vote count, averaged effect sizes) can lead to differences in cumulative results
Interpret the Cumulative Evidence	What conclusions can be drawn about the cumulative state of the research evidence?	Summarize the cumulative research evidence with regard to its strength, generality, and limitations	Variation in criteria for labeling results as important and attention to details of studies might lead to differences in interpretation of findings
Present the Synthesis Methods and Results	What information should be included in the report of the synthesis?	Identify and apply editorial guidelines and judgment to determine the aspects of methods and results readers of the synthesis report need to know	Variation in reporting might lead readers to place more or less trust in synthesis outcomes and influences others ability to replication results

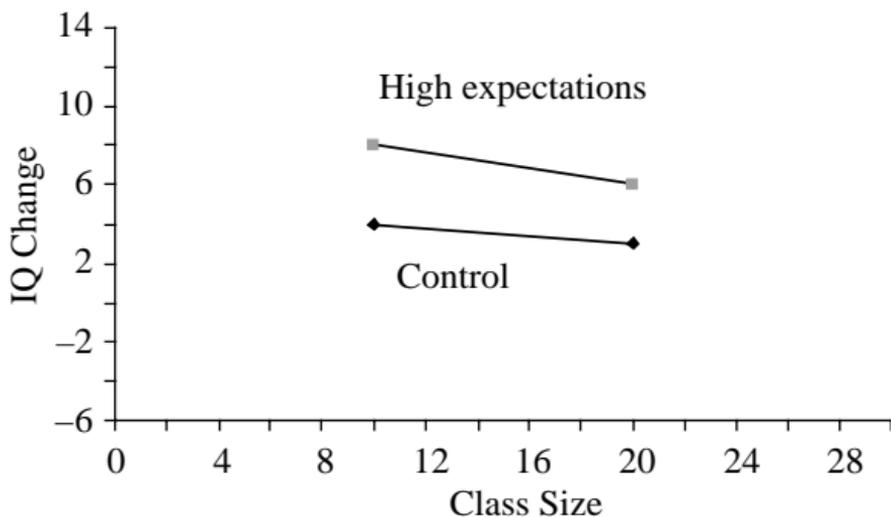SOURCE: Cooper 2007.

Study 1
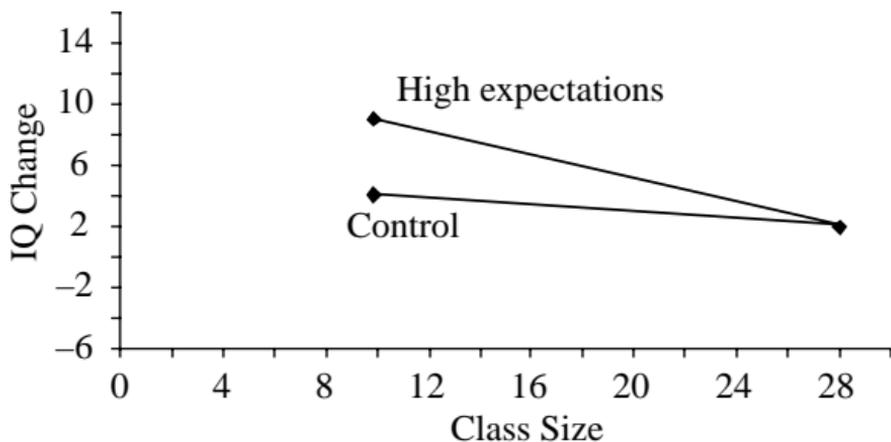
Study 2

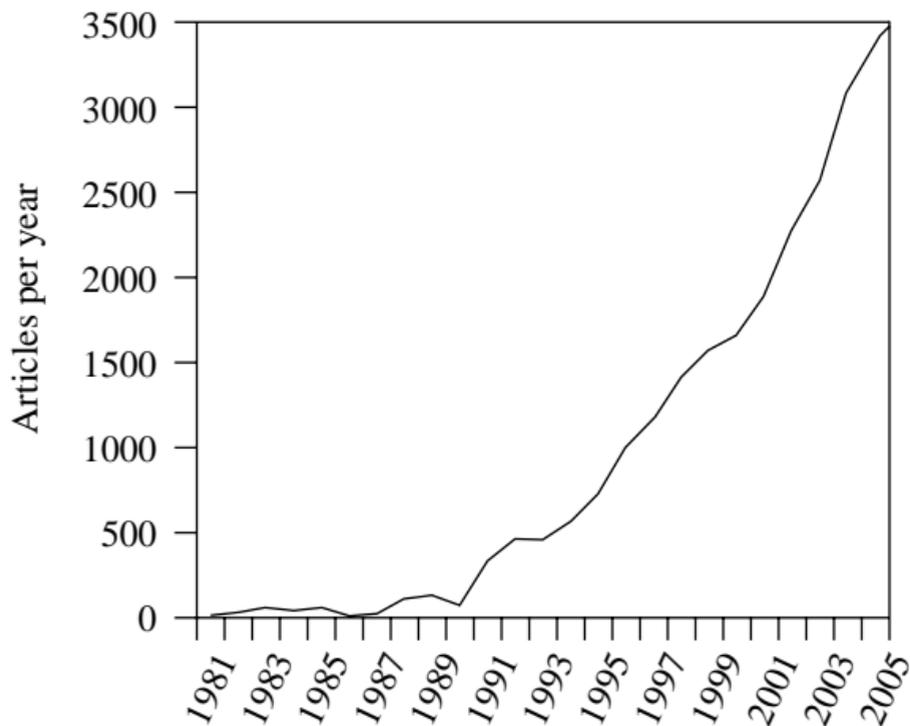**Figure 2.1** Effects of Teacher Expectations on IQ

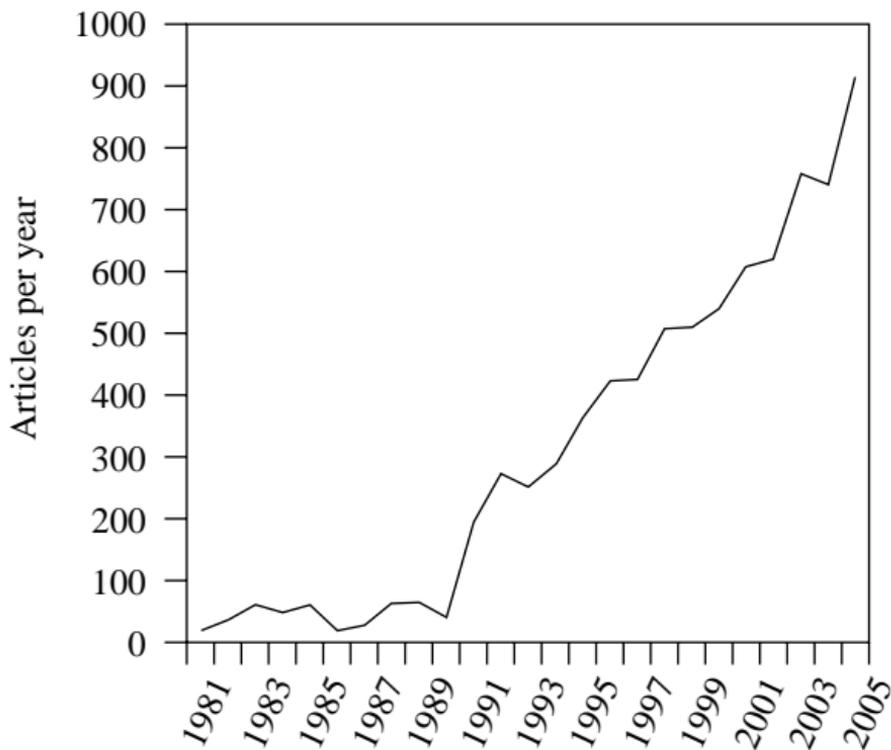**Figure 4.1** Growth of Meta-Analytic Literature in SCI and SSCI

Figure 4.2 Growth of Meta-Analytic Literature in SSCI

SOURCE: Author's compilation.

Table 4.1 SSCI Journals with More than Twenty-Five Articles Relevant to Meta-Analysis, 1981–2005

195 Psychological Bulletin	40 Perceptual and Motor Skills
179 Journal of Applied Psychology	39 Journal of Clinical Psychiatry
136 Schizophrenia Research Association	38 JAMA—Journal of the American Medical Association
84 Journal of Advanced Nursing	38 Journal of Vocational Behavior
82 Personnel Psychology	38 Nursing Research
76 Journal of Consulting and Clinical Psychology	35 International Journal of Psychology
68 Review of Educational Research	35 Psychological Medicine
67 American Journal of Psychiatry	34 American Psychologist
66 Addiction	34 Psychological Methods
64 Clinical Psychology Review	34 Psychology and Aging
58 British Journal of Psychiatry	32 Online Journal of Knowledge Synthesis For Nursing
55 British Medical Journal	31 Academy of Management Journal
54 Educational and Psychological Measurement	31 Health Psychology
51 Journal of Personality and Social Psychology	31 Medical Care
49 Clinical Psychology—Science and Practice	31 Sex Roles
49 Journal of Organizational Behavior	30 Personality and Social Psychology Bulletin
45 Acta Psychiatrica Scandinavica	29 Human Relations
44 Evaluation & the Health Professions	29 Journal of Psychosomatic Research
44 Journal of Management	28 American Journal of Public Health
44 Patient Education and Counseling	28 Australian and New Zealand Journal of Psychiatry
42 Psychological Reports	28 Journal of Parapsychology
42 Social Science & Medicine	28 Journal of Research in Science Teaching
42 Value in Health	28 Personality and Individual Differences
41 American Journal of Preventive Medicine	27 Child Development
41 Journal of Affective Disorders	27 Gerontologist
41 Journal of the American Geriatrics Society	27 Psychosomatic Medicine
40 Journal of Applied Social Psychology	26 Accident Analysis and Prevention
40 Journal of Occupational and Organizational Psychology	26 Journal of Business Research

Table 4.2 Five Major Modes of Searching

Footnote Chasing
Cooper 1985
   References in review papers written by others
   References in books by others
   References in nonreview papers from journals you
      subscribe to
   References in nonreview papers you browsed through
      at the library
   Topical bibliographies compiled by others
Mann 1993
   Searches through published bibliographies (including
      sets of footnotes in relevant subject documents)
   Related Records searches

Consultation
Cooper 1985
   Communication with people who typically share
      information with you
   Informal conversations at conferences or with students
   Formal requests of scholars you knew were active in
      the field (e.g., solicitation letters)
   Comments from readers/reviewers of past work
   General requests to government agencies
Mann 1993
   Searches through people sources (whether by verbal
      contact, E-mail, electronic bulletin board, letters, etc.)

Searches in Subject Indexes
Cooper 1985
   Computer search of abstract data bases (e.g., *ERIC,
      Psychological Abstracts*)
   Manual search of abstract data bases
Mann 1993
   Controlled-vocabulary searches in manual or printed
      sources
   Key word searches in manual or printed sources
   Computer searches—which can be done by subject
      heading, classification number, key word. . .

Browsing
Cooper 1985
   Browsing through library shelves
Mann 1993
   Systematic browsing

Citation Searches
Cooper 1985
   Manual search of a citation index
   Computer search of a citation index (e.g., *SSCI*)
Mann 1993
   Citation searches in printed sources
   Computer searches by citation
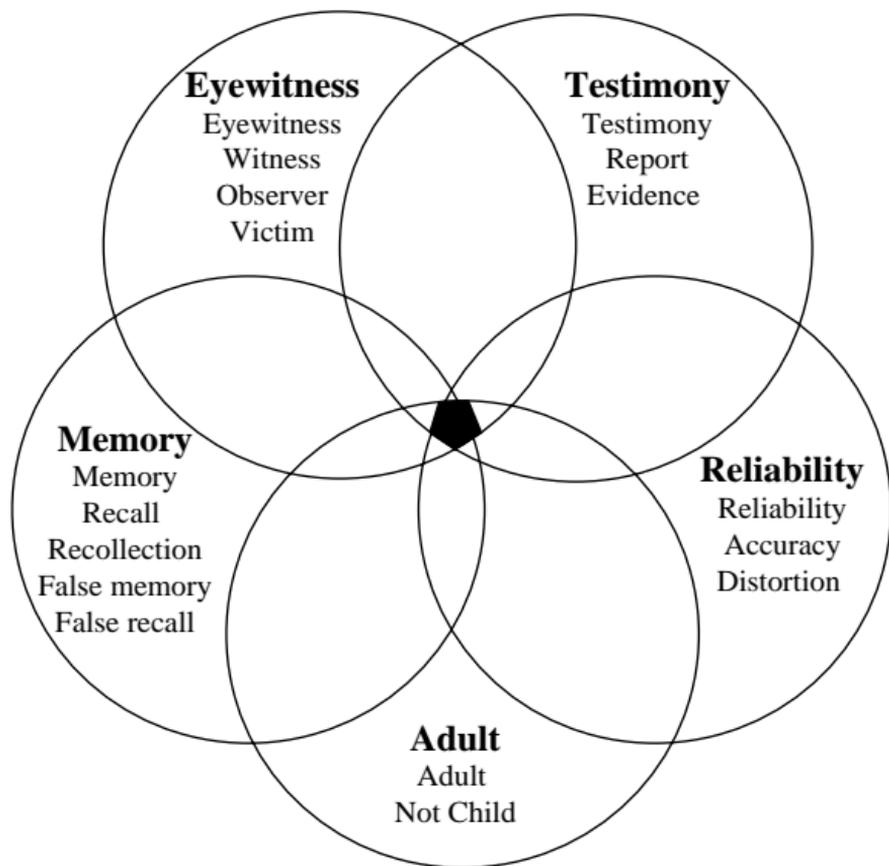
Figure 5.1 Venn Diagram Illustrating the Intersection of Five Concepts and Their Related Terms in Eyewitness Testimony Search Strategy

Table 5.1 Subject Terms in PsycINFO

Search	Citation	Subject Terms
Unitizing	Cohen, Ebbesen (1979)	Classification (cognitive process) Experimental instructions Impression formation Memory Personality traits
Chunking	Singer, Korienek, Ridsdale (1980)	Fine motor skill learning Imagery Retention Strategies Transfer (learning) Verbal communication

SOURCE: Authors' compilation.

Table 5.2 Citations to Documents in a Preliminary Search on Eyewitness Testimony

Document	Source	Subject Terms
Buckhout, Robert. 1974. "Eyewitness Testimony." *Scientific American* 231(6): 23–31. ISSN: 0036-8733. PsycINFO Accession # 1975-11599-001.	PsycINFO	Legal processes Social perception
Johnson, Craig L. 1978. "The Effects of Arousal, Sex of Witness and Scheduling of Interrogation on Eyewitness Testimony." *Dissertation Abstracts International* 38(9-B): 4427–4428. Doctoral Dissertation, Oklahoma State University. ISSN: 0419-4217. PsycINFO Accession # 1979-05850-001.	PsycINFO	Crime Emotional responses Human sex differences Observers Recall (learning)
Leinfelt, Fredrik H. 2004. "Descriptive Eyewitness Testimony: The Influence of Emotionality, Racial Identification, Question Style, and Selective Perception." *Criminal Justice Review* 29(2): 317–40. ISSN: 0734-0168. Wilson Web OmniFile Full Text Mega Accession # 200429706580003.	Wilson Web OmniFile	Identification Witnesses-psychology Eyewitness identification Race awareness Recollection (psychology) Witnesses
Loftus, Elizabeth F., and Guido Zanni. 1975. "Eyewitness Testimony: The Influence of the Wording of a Question." *Bulletin of the Psychonomic Society* 5(1): 86–88. ISSN: 0090-5054. PsycINFO Accession # 1975-21258-001.	PsycINFO	Grammar Legal processes Memory Sentence structure Suggestibility
Loftus, Elizabeth F., Diane Altman, and Robert Geballe. 1975. "Effects of Questioning Upon a Witness' Later Recollections." *Journal of Police Science & Administration* 3(2): 162–165. ISSN: 0090-9084. PsycINFO Accession # 1976-00668-001.	PsycINFO	Interviewing Memory Observers
Wells, Gary L. 1978. "Applied Eyewitness-Testimony Research: System Variables and Estimator Variables." *Journal of Personality and Social Psychology* 36(12): 1546–1557. ISSN: 0022-3514. PsycINFO Accession # 1980-09562-001.	PsycINFO	Legal processes Methodology

SOURCE: Authors' compilation.
NOTE: Examples identified on eyewitness testimony with associated subject terms assigned by source indexers.

Table 5.3 Subject Terms in PsycINFO Thesaurus

Initial Term Investigated	Preferred Term	Year Added	Related Term if any	Scope
Eyewitness	Witness	1985	—	Persons giving evidence in a court of law or observing traumatic events in a nonlegal context. Also used for analog studies of eyewitness identification performance, perception of witness credibility, and other studies of witness characteristics having legal implications.
Testimony	—	—	—	Term is NOT included in the PsycINFO Thesaurus
Legal testimony	Legal Testimony	1982	—	Evidence presented by a witness under oath or affirmation (as distinguished from evidence derived from other sources) either orally or written as a deposition or an affidavit.
Memory accuracy	—	—	Memory Early memories Short-term memory Visuospatial memory Autobiographical memory Explicit memory False memory Iconic memory Implicit memory etc.	Term is NOT included in the PsycINFO Thesaurus

Table 5.4 Subject Search Terms in Different Sources

Source	Memory Accuracy	Adult	Eyewitness	Testimony

PsycINFO (Use thesaurus)	Memory
	Narrower terms:
	    Autobiographical memory
	    Early memories
	    Episodic memory
	    Explicit memory
	    False memory
	    Implicit memory
	    Memory decay
	    Memory trace
	    Reminiscence
	    Repressed memory
	    Short-term memory
	    Verbal memory
	    Visual memory
	    Visuospatial memory
	Related terms:
	    Cues
	    Forgetting
	    Hindsight bias
	    Procedural knowledge
	    Serial recall
		Limit search by:
		Age Group:
		    Adult (18 years
		    & older) AND
		Population:
		    Human
			Witness	Expert testimony

MEDLINE (Use MESH – Medical Subject Headings)	—	—	"Eyewitness" not used "Witness" not used	"Testimony" not used "Expert testimony" used
Criminal Justice Periodical Index – ProQuest (No thesaurus available)	Memory	Adult	Eyewitness Witness	Testimony Report Evidence
Lexis-Nexis (No thesaurus available)	Memory Reliability Accuracy	—	Eyewitness Witness	—

SOURCE: Authors' compilation.

Table 5.5 Comparison of Eyewitness Testimony Search Results in PsycINFO

#	Search Terms	Field searched	Dates	Results
1	Eyewitness AND Testimony	All text fields	All	795 citations
2	Eyewitness AND Testimony AND Memory	All text fields	All	430 citations
3	Witness AND Testimony AND Memory	All text fields	All	244 citations
4	Eyewitness AND Testimony AND Adult	All text fields	All	142 citations
5	Eyewitness AND Testimony AND Memory accuracy	All text fields	All	8 citations
6	Witness AND Testimony AND Memory accuracy	Subject field	All	0 citations

SOURCE: Authors' compilation.

Table 5.6 Targeting a search of Eyewitness Testimony in PsycINFO

Search Parameters	Targeting	Results
Reference Database		
(Eyewitness OR Witness OR Observer OR Victim) AND (Testimony OR Report OR Evidence) AND (Memory OR Recall OR Recollection OR "False Memory" OR "False Recall") AND (Reliability OR Accuracy OR Distortion)	Age Group: Adult (18 years & older) AND Population: Human Methodology: Treatment Outcome / Clinical Trial	0 citations
(Eyewitness OR Witness OR Observer OR Victim) AND (Testimony OR Report OR Evidence) AND (Memory OR Recall OR Recollection OR "False Memory" OR "False Recall") AND (Reliability OR Accuracy OR Distortion)	Age Group: Adult (18 years & older) AND Population: Human Methodology: Quantitative Study	29 citations
(Eyewitness OR Witness OR Observer OR Victim) AND (Testimony OR Report OR Evidence) AND (Memory OR Recall OR Recollection OR "False Memory" OR "False Recall") AND (Reliability OR Accuracy OR Distortion)	Age Group: Adult (18 years & older) AND Population: Human Methodology: Empirical Study	153 citations

SOURCE: Authors' compilation.

Table 5.7 Eyewitness Testimony Search Results in Criminal Justice Periodical Index Pro Quest.

#	Search Terms	Field Searched	Dates	Results
1	Eyewitness AND Testimony	Citation Abstract	All	105 citations
2	Eyewitness AND Testimony AND Memory	Citation Abstract	All	13 citations
3	Witness AND Psychology	Citation Abstract	All	37 citations
4	Eyewitness OR Witness AND Testimony OR Report AND Memory AND Accuracy	Citation Abstract	All	6 citations
5	Eyewitness AND Reliability AND Memory	Citation Abstract	All	4 citations
6	Victim AND Testimony	Citation Abstract	All	205 citations

SOURCE: Authors' compilation.

Table 5.8 Comparable Eyewitness Testimony Searchers from Three Databases

Search Parameters	Results	Uniqueness
PsycINFO (Eyewitness OR Witness OR Observer OR Victim) AND (Testimony OR Report OR Evidence) AND (Memory OR Recall OR Recollection OR "False Memory" OR "False Recall") AND (Reliability OR Accuracy OR Distortion) AND Age Group: Adult (18 years & older) AND Population: Human	165 citations	Duplicated in Criminal Justice Periodical Index = 2 Duplicated in Dissertations & Theses = 13 Unduplicated = 150 (91%)
Criminal Justice Periodicals (Eyewitness OR Witness OR Observer OR Victim) AND (Testimony OR Report OR Evidence) AND (Memory OR Recall OR Recollection OR "False Memory" OR "False Recall" OR Reliability OR Accuracy OR Distortion)	196 citations	Duplicated in PsycINFO = 2 Duplicated in Dissertations & Theses = 0 Unduplicated = 194 (99%)
ProQuest Dissertations & Theses (Eyewitness OR Witness OR Observer OR Victim) AND (Testimony OR Report OR Evidence) AND (Memory OR Recall OR Recollection OR "False Memory" OR "False Recall") AND (Reliability OR Accuracy OR Distortion)	110 citations	Duplicated in PsycINFO = 13 Duplicated in Criminal Justice Periodical Index = 0 Unduplicated = 97 (88%)

SOURCE: Authors' compilation.

Table 6.1 Databases, Websites, and Gateways

Source	Type of Material	Cost
General		
British Library's Inside Web	Includes references to papers presented at over 100,000 conference proceedings.	Subscription
Dissertation and Theses Database http://www.proquest.com/ products_pq/descriptions/pqdt .shtml/.	PQDT—Full text includes 2.4 million dissertation citations from around the world from 1861 to the present day together with full text dissertartion that are available for download in PDF format.	Subscription
Evidence Network www.evidencenetwork.org.	A service provided by the ESRC U.K. Centre for Evidence Based Policy and Practice. The Resources section of the website covers six major types of information resource: bibliographic and research databases; internet gateways; systematic review centers; EBPP centers; research centers; and library services.	Free access
Index to Theses http://www.theses.com/	Claims to have all U.K. theses back to 1716, as well as a subset of Irish theses.	Subscription
NTIS (National Technical Information Service) http://www.ntis.gov/.	Has a heavy technical emphasis, but is the largest central resource for U.S. government-funded scientific, technical, engineering, and business related information available. Contains over half a million reports in over 350 subject areas from over 200 federal agencies. There is limited free access, and affordable 24-hour access.	Subscription
System for Information on Grey Literature in Europe (SIGLE)	A project of EAGLE (European Association for Grey Literature Exploitation), SIGLE is a bibliographic database covering European grey literature in the natural sciences and technology, economics, social sciences, and humanities. It includes research and technical reports, preprints, working papers, conference papers, dissertations and government reports. All grey literature held by the British Library in the National Reports Collection can be retrieved from here. This database has not been updated since 2004; the current status of this database is uncertain, and it may cease to be available.	Free access
Healthcare, Biomedicine and Science		
BiomedCentral www.biomedcentral.com/.	Contains conference abstracts, papers and protocols of ongoing trials.	Free access
U.S. National Library of Medicine (NLM) Gateway http://gateway.nlm.nih.gov/gw/Cmd	Gateway for most U.S. National Library of Medicine holdings and includes meeting abstracts relevant to health care and health technology assessment.	Free access
Social Science, Economics and Education		
ESRC Society Today http://www.esrc.ac.uk/ ESRCInfoCentre/index.aspx.	Contains descriptions of projects funded by the U.K. Economic and Social Research Council and links to researchers' websites and publications.	Free access

Table 6.2 General Bibliographic Databases

Source	Type of Material	Cost
General		
Science Citation Index http://scientific.thomson.com/products/sci/	Provides access to current and past bibliographic information, author abstracts, and cited references for a broad array of science and technical journals in more than 100 disciplines, and includes meeting abstracts that are not covered in MEDLINE or EMBASE.	Subscription
SCOPUS http://info.scopus.com/.	Claims to be the largest database of citations and abstracts with coverage of: Open Access journals, conference proceedings, trade publications and book series. Also provides access to many web sources such as author homepages, university websites and pre-print services. Currently has 28 million abstracts, and their references.	Subscription
Healthcare, Biomedicine and Science		
Database of Abstracts of Reviews of Effects (DARE) http://www.crd.york.ac.uk/crdweb/	Contains summaries of systematic reviews about the effects of interventions on a broad range of health and social care topics.	Free access
NHS Economic Evaluation Database (NHS EED) http://www.crd.york.ac.uk/crdweb/	Contains summaries of studies of the economic evaluation of healthcare interventions culled from a variety of electronic databases and paper-based resources.	Free access
Health Technology Assessment (HTA) Database http://www.crd .york.ac.uk/crdweb/	Contains records of the reviews produced by the members of the International Network of Health Technology Assessment, spanning 45 agencies in 22 countries.	Free access
Ongoing Reviews Database http://www.crd.york.ac.uk/crdweb/	A register of ongoing systematic reviews of health care effectiveness, primarily from the United Kingdom.	Free access
Social Science, Economics and Education		
Social Sciences Citation Index http://scientific.thomson.com/products/ssci/	Provides access to current and past bibliographic information, author abstracts, and cited references for a large number of social science journals in over 50 disciplines. Includes conference abstracts relevant to the social sciences from 1956 to date.	Subscription
SOLIS (Social Sciences Literature Information System) http://www.cas.org/ONLINE/DBSS/solisss.html	German language social science database including grey literature and books as well as journals – searchable in English. Access may be available via Infoconnex service at http://www.infoconnex.de/	Subscription
SSRN (Social Science Research Network) http://www.ssrn.com/index.html	Contains abstracts of over 100,000 working papers and forthcoming papers in accounting, economics, entrepreneurship, management, marketing, negotiation, and similar disciplines .Also has full text, downloadable text for about 100,000 documents in these fields.	Free access

Table 6.3 Subject- or Country-Specific Databases

Source	Type of Material	Cost
Healthcare, Biomedicine and Science		
Alcohol Concern http://www.alcoholconcern.org .uk/ servlets/wrapper/publications .jsp.	Holds the most comprehensive collection of books and journals on alcohol-related issues in the United Kingdom.	Free access
Biological Abstracts http://scientific.thomson.com/ products/ba/	Indexes articles from over 3,700 serials each year, indexes papers presented at meeting symposia and workshops in the biological sciences.	Subscription
CINAHL www.cinahl.com.	Includes nursing theses, government reports, guidelines, newsletters, and other research relevant to nursing and allied health.	Free access to some information
Computer Retrieval of Information on Scientific Projects (CRISP) http://crisp.cit.nih.gov/.	A searchable database of federally funded biomedical research projects, and is maintained by the U.S. National Institutes of Health. It includes projects funded by the National Institutes of Health, Substance Abuse and Mental Health Services, Health Resources and Services Administration, Food and Drug Administration, Centers for Disease Control and Prevention, Agency for Health Care Research and Quality, and Office of Assistant Secretary of Health.	Free access
DIMDI http://www.dimdi.de/dynamic/en/ index.html.	A gateway to 70 databases on medicine, drugs and toxicology sponsored by the German Institute of Medical Documentation and Information. Searchable in English and German.	Free access
DrugScope http://www.drugscope.org.uk/library/ librarysection/libraryhome.asp	Provides access to information and resources on drugs, drug misuse, and related issues.	Charge per individual article
Health Management Information Consortium Database (HMIC) http://www.ovid.com/site/catalog/ DataBase/99.jsp?top=2&mid= 3&bottom=7&subsection=10.	This database is updated bimonthly and contains essential information from two key institutions: the Library & Information Services of the Department of Health, England and the King's Fund Information & Library Service. It contains data from 1983 to the present.	Subscription
Social Science, Economics and Education		
British Library for Development Studies http://blds.ids.ac.uk/blds/	Calls itself 'Europe's largest collection on economic and social change in developing countries'	Free access
Cogprints http://cogprints.ecs.soton.ac.uk/.	Provides material related to cognition from psychology, biology, linguistics, and philosophy, and from computer, physical, social, and mathematical sciences. This site includes full-text articles, book chapters, technical reports, and conference papers.	Subscription, but provides free 30-day trial
Criminal Justice Abstracts http://www.csa.com/factsheets/cja- set-c.php?SID=c4fg6rpjg 3v5nmn09k2kml).	Contains comprehensive coverage of international journals, books, reports, dissertations and unpublished papers on criminology and related disciplines.	Subscription, but provides free 30-day trial
Education Line http://www.leeds.ac.uk/educol/.	Database of the full text of conference papers, working papers and electronic literature which supports educational research, policy and practice in the United Kingdom.	Free access

(Continued)

Table 6.3 (*Continued*)

Source	Type of Material	Cost
EconLIT http://www.econlit.org/	Provides a comprehensive index of thirty years worth of journal articles, books, book reviews, collective volume articles, working papers and dissertations in economics, from around the world.	Subscription
Education Resources Information Center (ERIC) http://www.eric.ed.gov/.	Contains nearly 1.2 million citations going back to 1966 and, access to more than 110,000 full-text materials at no charge. Includes report literature, dissertations, conference proceedings, research analyses, translations of research reports relevant to education and sociology.	Free access
International Transport Research Documentation (ITRD) http://www.itrd.org/.	A database of information on traffic, transport, road safety and accident studies, vehicle design and safety, and environmental effects of transport, construction of roads and bridges etc. Includes books, reports, research in progress, conference proceedings, and policy-related material.	Subscription
Labordoc http://www.ilo.org/public/english/support/lib/labordoc/index.htm	Produced by the International Labour Organisation, contains references and full text access to literature on work. Can be searched in English, French or Spanish.	Free access
National Criminal Justice Reference Service (NCJRS) http://www.ncjrs.gov/.	United States government funded resource policy, and program development worldwide. Includes reports, books and book chapters as well as journal articles.	Free access
Public Affairs Information Service (PAIS) http://www.csa.com/factsheets/pais-set-c.php	Contains references to more than 553,300 journal articles, books, government documents, statistical directories, research reports, conference reports, internet material from over 120 countries.	Subscription
Policy File http://www.policyfile.com.	Indexes research and publication abstracts addressing the complete range of U.S. public policy research.	Subscription
PsycINFO www.apa.org/psycinfo/.	Includes dissertations, book chapters, academic and government reports and journal articles in psychology, sociology and criminology, as well as other social and behavioral sciences.	Subscription
PSYNDEX http://www.zpid.de/retrieval/login.php	Abstract database of psychological literature, audiovisual media, and tests from German-speaking countries. Journal articles, books, chapters, reports and dissertations, are documented. Searchable in German and English.	Subscription
Research Papers in Economics (Repec) http://repec.org/.	International database of working papers, journal articles and software components.	Free access
Social Care Online http://www.scie-socialcareonline.org.uk/.	Includes U.K. government reports, research papers in social work and social care literature.	Free access
Social Services Abstracts & InfoNet http://www.csa.com/factsheets/ssa-set-c.php.	Includes dissertations in social work, social welfare, social policy and community development research from 1979 to date. This is a subscription-based compilation of content from U.K. databases Social Care Online, AgeINFO, Planex and Urbadoc, all of which include grey literature.	Subscription

Table 6.3 (*Continued*)

Source	Type of Material	Cost
Sociological Abstracts http://www.csa.com/factsheets/ socioabs-set-c.php.	Covers sociology as well as other social and behavioral sciences. It includes dissertations, conference proceedings and book chapters from 1952 to date.	Subscription
Other-Including Public Policy		
AgeInfo http://ageinfo.cpa.org.uk/scripts/ elsc-ai/hfclient.exe?A=elsc-ai&sk	Produced by the U.K. Centre for Policy on Ageing (free access, but there is also subscription-based version with better search facilities at http://www.cpa.org.uk/ ageinfo/ageinfo2.html.).	Free access
Australian Policy Online http://www.apo.org.au/.	This is a database/gateway of Australian research and policy literature.	Free access
ChildData http://www.childdata.org.uk/.	Produced by the U.K. National Children's Bureau.	Subscription
ELDIS http://www.eldis.org/.	This is a gateway to all kinds of full text grey literature on international development issues. It can be searched using simple Boolean logic, or sub-collections can be browsed.	Free access
IDOX Information Service database (formerly Planex) http://www.idoxplc.com/iii/ infoservices/idoxinfoservice/ index.htm.	Covers service areas of relevance to U.K. local government, especially in Scotland, including planning, transport, social care, education, leisure, environment, local authority management and soon.	Subscription
Directory Database of Research and Development Activities (READ) http://read.jst.go.jp/index_e.html	A database service due to promote cooperation among industry, academia, and government. A database service that provides information on research projects in Japan. Searchable in English and Japanese.	Free access
TRIS Online http://trisonline.bts.gov/search .cfm	Covers reports as well as journal papers in transportation and includes English language material from ITRD. It is mainly technical but also contains material relevant to, for example, transport-related health issues.	Free access
Urbadoc http://www.urbadoc.com/index .php?id=12&lang=en.	Similar to IDOX but focuses more on London and south of England.	Subscription

Table 6.4 Trial Registers

Source	Type of Material	Cost
Healthcare, Biomedicine and Science		
BiomedCentral www.biomedcentral.com/clinicaltrials/.	Publishes trials together with their International Standard Randomized Controlled Trial Number (ISRCTN) and publishes protocols of trials	Free access
ClincalTrials.gov http://clinicaltrials.gov	Covers U.S. trials of treatments for life-threatening diseases.	Free access
The Cochrane Central Register of Controlled Trials (CENTRAL) www.cochrane.org	Includes references to trial reports in conference abstracts, handsearched journals, and other resources.	Free access
Current Controlled Trials' metaRegister of Controlled Trials www.controlled-trials.com.	Contains records from multiple trial registers including the U.K. National Research Register, the Medical Editors' Trials Amnesty, the U.K. MRC Trials Register, and links to other ongoing trials registers.	Free access
Database of Promoting Health Effectiveness Reviews (DoPHER) http://eppi.ioe.ac.uk/cms/.	Produced by the U.K. EPPI-Centre and includes completed as well as unpublished randomized and nonrandomized trials in health promotion.	Free access
The Lancet (Protocol Reviews) www.thelancet.com	Contains protocols of randomized trials.	Free access
TrialsCentral www.trialscentral.org.	Contains over 200 U.S.-based registers of trials.	Free access
Social Science, Economics and Education		
The Campbell Collaboration Social, Psychological, Educational and Criminological Trials Register (C2-SPECTR and C-PROT) www.campbellcollaboration.org/	Includes references to trials reported in abstracts, handsearched journals, and ongoing trials.	Free access

Table 6.5 Other Electronic Sources

Source	Type of Material	Cost
General		
Association of College and Research Libraries http://www.ala.org/ala/acrl/acrlpubs/crlnews/backissues2004/march04/graylit.htm.	Reprints an article that lists websites about grey literature and how to search for it, as well as free websites that contain grey literature (some full-text). Mostly scientific and technical literature, but also some resources for other fields.	Free access
CERUK (Current Educational Research in the UK) http://www.ceruk.ac.uk/ceruk/.	Database of current or ongoing research in education and related disciplines. It covers a wide range of studies including commissioned research and PhD theses, across all phases of education from early years to adults.	Free access
DEFF http://www.deff.dk/default.aspx?lang=english	Denmark's Electronic Research Library is a partnership between Denmark's research libraries co-financed by the Ministry of Science, Technology and Innovation, the Ministry of Culture and the Ministry of Education.	Subscription
GreyNet (Grey Literature Network Service) http://www.greynet.org/.	Website founded in 1993 and designed to facilitate dialog, research, and communication in the field of grey literature. Provides access to a moderated Listserv, a Distribution List, and the Grey Journal (TGJ).	Free access to some information
Health Technology Assessment-www.york.ac.uk/inst/crd/htadbase.htm	Contains details of nearly 5,000 completed HTA publications and around 800 ongoing INAHTA (International Network of Agencies for Health Technology Assessment) projects.	Free access
INTUTE: Health and Life Sciences http://www.intute.ac.uk/healthandlifesciences/	Internet resources in health and life sciences (Formerly known as BIOME).	Free access
INTUTE: Medicine http://www.intute.ac.uk/healthandlifesciences/medicine/	Internet resources in medicine. (Formerly known as OMNI).	Free access
INTUTE: Social Sciences http://www.intute.ac.uk/socialsciences/	Internet resources in the social sciences.	Free access
NLH http://www.library.nhs.uk/Default.aspx	U.K. National Library for Health.	Free access to some information
NOD http://www.onderzoekinformatie.nl/en/oi/nod/.	Dutch Research Database contains information on scientific research, researchers and research institutes covering all scientific disciplines.	Free access
NY Academy of Medicine: Grey Literature Page http://www.nyam.org/library/pages/grey_literature_report	Focuses on grey literature resources in medicine. It features a quarterly "Grey Literature Report," that lists many items available online.	Free access
School of Health and Related Research (ScHARR) www.shef.ac.uk/~scharr/ir/netting/.	Evidence-based resources in health care.	Free access
Trawling the net www.shef.ac.uk/~scharr/ir/trawling.html	Free databases of interest to healthcare researchers working in the United Kingdom.	Free access.
UK Centre for Reviews and Dissemination www.york.ac.uk/inst/crd/revs.htm	Provides a basic checklist for finding studies for systematic reviews.	Free access
US Government Information: Technical Reports http://www-libraries.colorado.edu/ps/gov/us/techrep.htm.	Provides an annotated listing of U.S. government agencies and other U.S. government resources for technical reports.	Free access
Virtual Technical Reports Central http://www.lib.umd.edu/ENGIN/TechReports/Virtual-TechReports.html.	Contains a large list of grey literature—producing institutions and technical reports, research reports, preprints, reprints, and e-prints.	Free access

SOURCE: Authors' compilation.

Table 6.6 Citations for Grey Literature in Cochrane Reviews

Source	Number of trial references*
Unpublished information	1,259 (55 percent)
Conference abstracts	805 (35 percent)
Government reports	78 (4 percent)
Company reports	66 (3 percent)
Theses and dissertations	63 (3 percent)
Total (1,446 trials)	2,271 (100 percent)

SOURCE: Authors' compilation.
* Trials can be referenced by more than one grey literature source. 4,820/6,266 trials were referenced only by published journal articles. Seventeen trials had missing citations.

Table 7.1 Quality Assessment for Guide to Community Preventive Services

Quality Category	Example Items
Descriptions (study population and intervention)	Was the study population well described?
Sampling	Did the authors specify the sampling frame or universe of selection for the study population?
Measurement (exposure)	Were the exposure variables valid measures of the intervention under study?
Measurement (outcome)	Were the outcome and other independent (or predictor) variables reliable (consistent and reproducible) measures of the outcome of interest?
Data analysis	Did the authors conduct appropriate analysis by conducting statistical testing (where appropriate)?
Interpretation of Results: Participation	Did at least 80% of enrolled participants complete the study?
Interpretation of Results (comparability and bias)	Did the authors correct for controllable variables or institute study procedures to limit bias appropriately?
Interpretation of Results (confounders)	Describe all potential biases or unmeasured/contextual confounders described by the authors.
Other	Other important limitations of the study not identified elsewhere?
Study Design	Concurrent comparison groups and prospective measurement of exposure and outcome

SOURCE: Author's compilation; Zara et al. 2000.
NOTE: Adequacy of study design is assessed separately.

Table 7.2 Relevance Screen

Coder initials: ___ ___ ___

Date: _____

Report Characteristics	
1. First author (Last, initials)	
2. Journal	
3. Volume	
4. Pages	
Inclusion Criteria	
5. Is this study an empirical investigation of the effects of teacher expectancies?	0. No 1. Yes
6. Is the outcome a measure of IQ?	0. No 1. Yes
7. Are the study participants in grades 1–5 at the start of the study?	0. No 1. Yes
8. Does the study involve a between-teacher comparison (i.e., some teachers hold an expectancy while others do not)?	0. No 1. Yes

Table 7.3 Coding for Internal Validity

9. Sampling strategy	1. Randomly sampled from a defined population 2. Stratified sampling from a defined population 3. Cluster sampling 4. Convenience sample 5. Can't tell
10. Group assignment mechanism	1. Random assignment 2. Haphazard assignment 3. Other nonrandom assignment 4. Can't tell
11. Assignment mechanism	1. Self-selected into groups 2. Selected into groups by others on a basis related to outcome (e.g., good readers placed in the expectancy group) 3. Selected into groups by others not known to be related to outcome (e.g., randomized experiment) 4. Can't tell
12. Equating variables	0. None 1. Prior IQ 2. Prior achievement 3. Other _____ 4. Can't tell
13. If equating was done, was it done using a statistical process (e.g., ANCOVA, weighting) or manually (e.g., hand matching)?	0. n/a, equating was not done 1. Statistically 2. Manual matching
14. Time 1 sample size, expectancy group (at random assignment)	___ ___ ___
15. Time 1 sample size, comparison group (at random assignment)	___ ___ ___
16. Time 2 sample size, expectancy group (for effect size estimation)	___ ___ ___
17. Time 2 sample size, comparison group (for effect size estimation)	___ ___ ___

SOURCE: Author's compilation.

Table 7.4 Coding Construct Validity

18. IQ measure used in study	1. Stanford-Binet 5 2. Wechsler (WISC) III 3. Woodcock-Johnson III 4. Other _____ 5. Can't tell _____
19. Score reliability for IQ measure (If a range is given, code the median value)	____ ___
20. Metric for score reliability	1. Internal consistency 2. Split-half 3. Test-retest 4. Can't tell 5. None given
21. Source of score reliability estimate	1. Current sample 2. Citation from another study 3. Can't tell 4. None given
22. Is the validity of the IQ measure mentioned?	0. No 1. Yes
23. If yes, was a specific validity estimate given?	0. No 1. Yes
24. If yes, what was the estimate?	___ ___ ___
25. If a validity estimate was given in the report, what was the source of the estimate?	1. Current sample 2. Citation from another study 3. Can't tell 4. Validity not mentioned in report
26. What was the nature of the validity estimate?	1. Concurrent validity 2. Convergent validity 3. Predictive validity 4. Other 5. Can't tell (simply asserted that the measure is valid) 6. n/a, validity was not mentioned in the report

**Table 8.1 Correlation of Selected Study Characteris-
tics with Method of Subject Assignment
(Nonrandom Versus Random) in a Synthesis
of Cognitive-Behavioral Therapy for
Offenders**

Variables	Across-Studies Correlation ($N = 58$)
Academic author (no vs. yes)	.47*
Grant funded (no vs. yes)	.28*
Publication type (unpublished vs. published)	.26*
Practice versus demonstration program	.36*
Total sample size	−.26*
Manualized program (no versus yes)	.03
Brand name program (no versus yes)	.11
Implementation monitored (no versus yes)	.27*
Mean age of sample	−.36*
Sample percent male	.08
Sample percent minority	.20

SOURCE: Author's calculations.
* $p < .05$

EFFECT SIZE LEVEL CODING FORM

Code this sheet separately for each eligible effect size.

Identifying Information:

1. Study (document) identifier   StudyID |__|__|__|

2. Treatment-Control identifier   TxID |__|__|__|

3. Outcome (dependent variable) identifier   OutID |__|__|__|

4. Effect size identifier   ESID |__|__|__|

5. Coder's initials   ESCoder |__|__|__|

6. Date coded   ESDate |__/__/__|

Effect Size Related Information:

7. Pre-test, post-test, or follow-up (1 = pre-test; 2 = post-test; 3 = follow-up)   ES_Type |__|

8. Weeks Post-Treatment Measured (code 999 if cannot tell)   ES_Time |__|__|__|

9. Direction of effect (1 = favors treatment; 2 = favors control; 3 = neither)   ESDirect |__|

Effect Size Data—All Effect Sizes:

10. Treatment group sample size   ES_TxN |__|__|__|__|

11. Control group sample size   ES_CgN |__|__|__|__|

Effect Size Data—Continuous Type Measures:

12. Treatment group mean   ES_TxM |__|__.__|__|

13. Control Group mean   ES_CgM |__|__.__|__|

14. Are the above means adjusted (e.g., ANCOVA adjusted)? (1 = yes, 0 = no)   ES_MAdj |__|

15. Treatment group standard deviation   ES_TxSD |__|__.__|__|

16. Control group standard deviation   ES_CgSD |__|__.__|__|

17. *t*-value   ES_t |__.__|__|__|

Effect Size Data—Dichotomous Measures:

18. Treatment group; number of failures (recidivators)   ES_TxNf |__|__|__|__|

19. Control group; number failures (recidivators)   ES_CgNf |__|__|__|__|

20. Treatment group; proportion failures   ES_TxPf |__.__|__|

21. Control group; proportion failures   ES_CgPf |__.__|__|

22. Are the above proportions adjusted for pretest variables? (1 = yes; 0 = no)   ES_PAdj |__|

23. Logged odds-ratio   ES_LgOdd |__.__|__|__|

24. Standard error of logged odds-ratio   ES_SELgO |__.__|__|__|

25. Logged odds-ratio adjusted for covariates? (1 = yes; 0 = no)   ES_OAdj |__|

Figure 9.1 Sample Effect-Size Level Coding Form

SOURCE: Author's compilation.

Effect Size Data—Hand Calculated:

26. Hand calculated *d*-type effect size   ES_Hand1 |___.___|___|___|

27. Hand calculated standard error of the *d*-type effect size   ES_Hand2 |___.___|___|___|

Effect Size Data Location

28. Page number where effect size data found   ES_Pg |___|___|___|___|

Effect Size Confidence

29. Confidence in effect size value   ES_Conf |___|
    1. Highly Estimated—have N and crude p value only, e.g., $p < .10$, or other limited information
    2. Some Estimation—have complex but complete statistics; some uncertainty about precision of effect size or accuracy of information
    3. No Estimation—have conventional statistical information and am confident in accuracy of information

Figure 9.1 (*Continued*)

STUDY_ID	PUBYEAR	MEANAGE	TX_TYPE
001	1992	15.5	2
002	1988	15.4	1
003	2001	14.5	1

STUDY_ID	DV_ID	CONSTRUCT	SCALE
001	01	2	2
001	02	6	1
002	01	2	2
003	01	2	2
003	02	3	1
003	03	6	1

STUDY_ID	ES_ID	DV_ID	FU_MONTHS	TX_N	CG_N	ES
001	02	01	0	44	44	−.39
001	02	01	6	42	40	−.11
001	03	02	0	44	44	.10
001	04	02	6	42	39	.09
002	01	01	0	30	30	.34
002	02	01	12	30	26	.40
003	01	01	6	52	52	.12
003	02	02	6	51	50	.21
003	03	03	6	52	49	.33
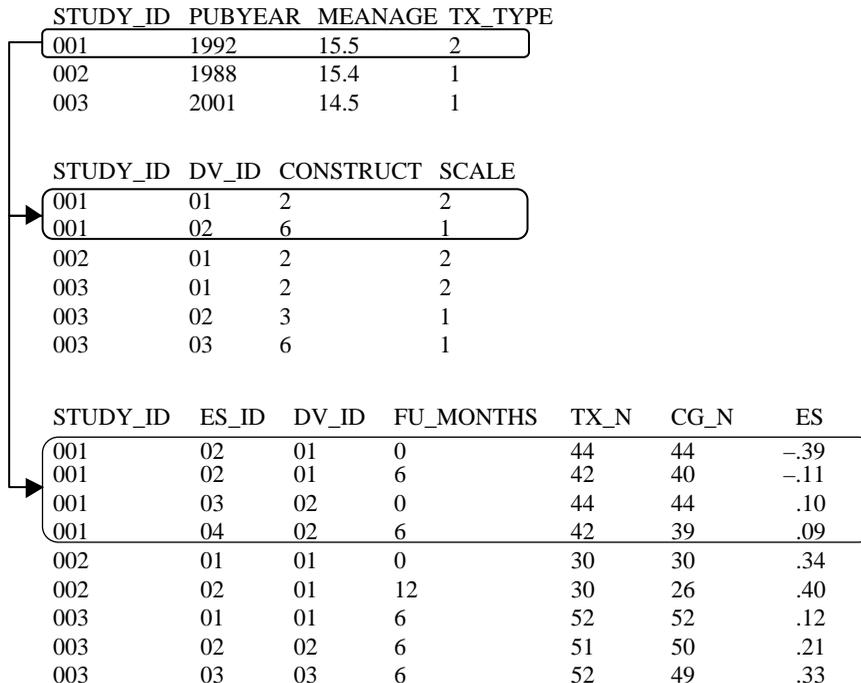
Figure 9.2 Hierarchical Data Structure

SOURCE: Author's compilation.

NOTE: Three data tables, one for study level data, one for dependent variable level data, and one for effect size level data. The boxes and arrows show the related data for study 001. The variables are: STUDY_ID = study identifier; PUBYEAR = publication year; MEANAGE = mean age of sample; TX_TYPE = treatment type; DV_ID = dependent variable identifier; CONSTRUCT = construct measured by the dependent variable; SOURCE = source of measure; ES_ID = effect size identifier; FU_MONTHS = months post-intervention; TX_N = treatment sample size; CG_N = control group sample size; ES = effect size.

```
┌─────────────────────────────────────────────────────────────────────────┐
│                                                                           │
│  **Sample Coding Items from Coding Form**                                 │
│                                                                           │
│  ___ ___ . ___ ___          4. Mean age of sample [MEANAGE]               │
│                                                                           │
│                                                                           │
│  ___                        19. Occur in a wilderness setting?            │
│                             (1 = yes; 0 = no) [WILDNESS]                   │
│                                                                           │
│  **Sample Coding Items from Coding Manual**                               │
│                                                                           │
│  4. Mean age of sample. Specify the approximate or exact mean age at the  │
│  beginning of the intervention. Code the best information available;      │
│  estimate mean age from grade levels if necessary. If mean age cannot be  │
│  determined, enter 99.99.                                                 │
│                                                                           │
│  19. Did the program occur in a wilderness setting? Code as yes if the    │
│  activities took place outdoors, even if the participants were camping in │
│  cabins or other buildings. Code as no if the activities that took place  │
│  indoors or used man-made contraptions.                                   │
│  (1 = yes; 0 = no)                                                        │
│                                                                           │
└─────────────────────────────────────────────────────────────────────────┘
```

Figure 9.3 Sample Coding Items

Effect Size Data:

1. Study ID |__|__|__|

2. Outcome ID |__|__|__| |__|__|__| |__|__|__| |__|__|__|

3. ES ID |__|__|__| |__|__|__| |__|__|__| |__|__|__|

. . .

30. Treatment N |__|__|__| |__|__|__| |__|__|__| |__|__|__|

31. Control N |__|__|__| |__|__|__| |__|__|__| |__|__|__|

32. Treatment mean |__|__.__|__| |__|__.__|__| |__|__.__|__| |__|__.__|__|

33. Control mean |__|__.__|__| |__|__.__|__| |__|__.__|__| |__|__.__|__|

34. Adjusted? |__| |__| |__| |__|

35. Treatment SD |__|__.__|__| |__|__.__|__| |__|__.__|__| |__|__.__|__|

36. Control SD |__|__.__|__| |__|__.__|__| |__|__.__|__| |__|__.__|__|

37. t-value |__|__.__|__| |__|__.__|__| |__|__.__|__| |__|__.__|__|

Figure 9.4 Matrix Layout

SOURCE: Author's compilation.
NOTE: Layout for a subset of items from an effect-size coding form allowing up to four effect sizes per form.

Figure 9.5 Database Coding Form

SOURCE: Author's compilation.

Table 10.1 Illustrative Data: Ratings of Studies

Study	Coder 1	Coder 2
1	3	2
2	3	1
3	2	2
4	3	2
5	1	1
6	3	1
7	2	2
8	1	1
9	2	2
10	2	1
11	2	2
12	3	3
13	3	1
14	2	1
15	1	1
16	1	1
17	3	3
18	2	2
19	2	2
20	3	1
21	2	1
22	1	1
23	3	2
24	3	3
25	2	2

Table 10.2 Illustrative Data: Cell Counts and Marginals

	Value	Coder 1			Sum
		1	2	3	
Coder 2	1	5	3	4	12
	2	0	7	3	10
	3	0	0	3	3
	Sum	5	10	10	25

SOURCE: Authors' compilations.

Table 10.3 Analysis of Variance for Illustrative Ratings

Source of Variance	Degrees of Freedom	Mean Squares
Between-studies (BMS)	24	.78
Within-study (EMS)	25	.44
Between-coders (CMS)	1	3.92
Residual (EMS)	24	.30

Table 10.4 Estimates of Interrater Agreement for Different Types of Data Distributions

Distributional Conditions	Kappa	Weighted Kappa	Agreement Rate	Average Correlation	Intraclass Correlation
Variations in ratings across jobs and high agreement among raters	.43	.45	.88	.79	.74
Variations in ratings across jobs and low agreement among raters	.01	.04	.16	.13	.05
Little variation in ratings across jobs and high agreement among raters	.04	.04	.77	−.01	−.03

SOURCE: Jones et al. 1983.

Table 10.5 Comparison of R^2 for Original Glass and Smith (1979) Class Size Regression (R_1^2) and Original with Accuracy Added (R_2^2)

	R_1^2	R_2^2	$R_2^2 - R_1^2$
Total sample ($n = 699$)	.1799	.1845	.0046, $F_{(1,694)} = 3.94$*
Well-controlled studies ($n = 110$)	.3797	.4273	.0476, $F_{(1,105)} = 8.73$*
Poorly controlled studies ($n = 338$)	.0363	.0369	.0006, $F_{(1,333)} = 0.65$

SOURCE: Cordray and Orwin 1981.
*$p < .05$

Table 10.6 Agreement Rate by Level of Confidence

	Low	Medium	High
Experimenter affiliation	1.00 (14)	1.00 (37)	.95 (75)
Blinding	.83 (6)	.91 (66)	.93 (44)
Diagnosis	—	1.00 (12)	.99 (114)
Client IQ	1.00 (11)	.18 (74)	1.00 (41)
Client age	1.00 (1)	.68 (50)	.83 (75)
Client source	—	1.00 (10)	.89 (116)
Client assessment	—	.53 (17)	.98 (103)
Therapist assessment	.00 (15)	.67 (18)	.75 (93)
Internal validity	—	.52 (27)	.88 (93)
Treatment mortality	.00 (4)	1.00 (1)	.94 (121)
Comparison mortality	.00 (4)	1.00 (1)	.93 (121)
Comparison type	—	—	1.00 (126)
Control group type	—	.00 (9)	.69 (114)
Experimenter allegiance	.10 (10)	.64 (36)	1.00 (80)
Modality	—	.33 (4)	1.00 (122)
Location	—	—	1.00 (126)
Therapist experience	.55 (55)	.56 (57)	1.00 (11)
Outcome type	.00 (1)	.00 (11)	.92 (114)
Follow-up	.00 (2)	.92 (47)	.83 (75)
Reactivity	.83 (6)	.28 (65)	.94 (47)
Client participation	1.00 (1)	.67 (3)	1.00 (122)
Setting type	—	.40 (15)	.99 (111)
Treatment integrity	.60 (10)	.83 (60)	1.00 (56)
Comparison group contamination	.30 (37)	.32 (50)	1.00 (39)
Outcome Rxx	.13 (150)	.56 (70)	.92 (38)

SOURCE: Orwin 1983b.

NOTE: Selected Variables from the Smith, Glass, and Miller (1980) Psychotherapy Meta-Analysis ($n = 126$) (sample sizes in parenthesis)

Table 10.7 Spearman Rank Order Correlations

	r_{RHO}
All Variables ($K = 25$)	
Agreement rate	.71
Variables for Which Kappa was Computed[a]	
($K = 20$)	
Agreement rate	.71
Kappa	.62
Variables for Which Intercoder Correlation was	
Computed ($K = 15$)	
Agreement rate	.81
Intercoder rate	.67
Variables for Which All Three Estimates Were	
Computed ($K = 10$)	
Agreement rate	.73
Kappa	.79
Intercoder correlation	.66

SOURCE: Authors' compilation.

NOTE: Between Confidence and Interrater Agreement for Selected Variables from the Smith, Glass, and Miller (1980) Psychotherapy Meta-Analysis

Table 10.8 Reliability Estimates

Variable	Run 1	Run 2	Run 3	Run 4
Diagnosis: neurotic, phobic, or depressive	.98	.98	.89	.89
Diagnosis: delinquent, felon, or habituée	1.00	1.00	1.00	1.00
Diagnosis: psychotic	1.00	1.00	1.00	1.00
Clients self-presented	.97	.57	.71	.71
Clients solicited	.93	.86	.81	.81
Individual therapy	1.00	1.00	.85	.85
Group therapy	.98	.96	.94	.94
Client IQ	.69	.69	.60	.60
Client age[a]	.99	.99	.91	.91
Therapist experience $\times$ neurotic diagnosis	.76	.75	.70	.70
Therapist experience $\times$ delinquent diagnosis	1.00	1.00	1.00	1.00
Internal validity	.76	.71	.42	.42
Follow-up time[b]	.99	.99	.95	.95
Outcome type[c]	.87	.70	.76	.76
Reactivity[d]	.57	.56	.57	.57
ES	1.00	1.00	1.00	.78

SOURCE: Orwin and Cordray 1985.
NOTES: Reliability-Corrected Regression Runs on the Smith, Glass, and Miller (1980) Psychotherapy Data
[a]Transformed age = $(age - 25)(|age - 25|)^{1/2}$.
[b]Transformed follow-up = $(follow-up)^{1/2}$.
[c]"Other" category removed for purpose of dichotomization.
[d]Transformed reactivity = $(reactivity)^{2.25}$.

Table 11.1 Experimental and Control Group Sample Sizes, Standardized Mean Differences, and Indicator Variable Values

Study	n^E	n^C	$\tilde{n} = n_i^E \times n_i^C / (n_i^E + n_i^C)$	d	X
1	77	339	62.748	0.03	1
2	60	198	46.047	0.12	1
3	72	72	36.000	−0.14	0
4	11	22	7.333	1.18	1
5	11	22	7.333	0.26	1
6	129	348	94.113	−0.06	0
7	110	636	93.780	−0.02	0
8	26	99	20.592	−0.32	0
9	75	74	37.248	0.27	1
10	32	32	16.000	0.80	1
11	22	22	11.000	0.54	1
12	43	38	20.173	0.18	1
13	24	24	12.000	−0.02	0
14	19	32	11.922	0.23	1
15	80	79	39.748	−0.18	0
16	72	72	36.000	−0.06	0
17	65	255	51.797	0.30	1
18	233	224	114.206	0.07	1
19	65	67	32.992	−0.07	0

SOURCE: Authors' compilation.

NOTE: n^E = experimental group sample size; n^C = control group sample size; d = sample standardized mean difference given in (15), and X = indicator variable given in (5).

Table 11.2 Log-Likelihood Function Values for δ

Coarse Grid		Fine Grid	
δ	$L(\delta)$	δ	$L(\delta)$
−0.50	−52.430	−0.10	−15.259
−0.40	−39.135	−0.09	−14.912
−0.30	−28.409	−0.08	−14.596
−0.20	−20.387	−0.07	−14.311
−0.10	−15.259	−0.06	−14.056
0.00	−13.170	−0.05	−13.831
0.10	−14.082	−0.04	−13.638
0.20	−17.733	−0.03	−13.475
0.30	−23.813	−0.02	−13.343
0.40	−32.149	−0.01	−13.241
0.50	−42.657	0.00	−13.170
		0.01	−13.129
		0.02	−13.118
		0.03	−13.136
		0.04	−13.185
		0.05	−13.263
		0.06	−13.370
		0.07	−13.505
		0.08	−13.669
		0.09	−13.862
		0.10	−14.082

SOURCE: Authors' compilation

NOTE: Based on data from nineteen studies of the effects of teacher expectancy on pupil IQ.

Table 11.3 Computations for Obtaining the Large-Sample Variance of $\hat{\delta}$

Study	p_i	$D_i^{(1)}$	$[D_i^{(1)}]^2/[p_i/(1-p_i)]$
1	0.563	3.121	39.583
2	0.554	2.682	29.119
3	0.548	2.376	22.799
4	0.522	1.079	4.664
5	0.522	1.079	4.664
6	0.577	3.798	59.100
7	0.577	3.792	58.893
8	0.536	1.803	13.070
9	0.549	2.417	23.585
10	0.532	1.591	10.162
11	0.526	1.320	6.992
12	0.536	1.785	12.805
13	0.528	1.379	7.626
14	0.528	1.374	7.576
15	0.550	2.495	25.159
16	0.548	2.376	22.799
17	0.557	2.842	32.728
18	0.585	4.167	71.507
19	0.546	2.276	20.903
			473.734

source: Authors' compilation.

note: From nineteen studies of the effects of teacher expectancy on pupil IQ.

Table 11.4 Sample Sizes, Correlations, and Indicator Variable Values

Study	n	r	X
1	10	.68	1
2	20	.56	1
3	13	.23	1
4	22	.64	1
5	28	.49	1
6	12	−.04	0
7	12	.49	1
8	36	.33	1
9	19	.58	1
10	12	.18	1
11	36	−.11	0
12	75	.27	1
13	33	.26	1
14	121	.40	1
15	37	.49	1
16	14	.51	1
17	40	.40	1
18	16	.34	1
19	14	.42	1
20	20	.16	1

source: Authors' compilation.

note: From twenty studies of the relation between student ratings of the instructor and student achievement.

n = sample size; r = Pearson product moment correlation coefficient given in (20); and X = indicator variable given in (5).

Table 11.5 Log-Likelihood Function Values for δ			

	Coarse Grid		Fine Grid	
ρ	$L(\rho)$	ρ	$L(\rho)$
-0.50	-159.677	0.10	-8.961
-0.40	-95.780	0.11	-8.640
-0.30	-59.089	0.12	-8.346
-0.20	-36.659	0.13	-8.079
-0.10	-22.568	0.14	-7.837
0.00	-13.863	0.15	-7.621
0.10	-8.961	0.16	-7.430
0.20	-6.900	0.17	-7.263
0.30	-7.108	0.18	-7.119
0.40	-9.552	0.19	-6.998
0.50	-14.990	0.20	-6.900
		0.21	-6.824
		0.22	-6.770
		0.23	-6.738
		0.24	-6.727
		0.25	-6.737
		0.26	-6.769
		0.27	-6.821
		0.28	-6.895
		0.29	-6.991
		0.30	-7.108

Table 11.6 Computations for Obtaining the Large-Sample Variance of $\hat{\rho}$			
Study	p_i	$D_i^{(1)}$	$[D_i^{(1)}]^2/[p_i/(1-p_i)]$
1	0.790	3.413	70.118
2	0.873	3.489	109.552
3	0.821	3.530	84.708
4	0.884	3.430	114.607
5	0.911	3.185	125.273
6	0.811	3.503	80.133
7	0.811	3.503	80.133
8	0.937	2.787	131.041
9	0.867	3.513	106.710
10	0.811	3.503	80.133
11	0.937	2.787	131.041
12	0.986	1.136	95.356
13	0.928	2.940	129.840
14	0.997	0.325	41.491
15	0.939	2.735	131.219
16	0.830	3.547	89.008
17	0.946	2.580	131.152
18	0.846	3.553	96.821
19	0.830	3.547	89.008
20	0.873	3.489	109.552
			2026.900

Table 11.7 Conditional Probability $p(\delta, n) = p\{t > 0 \mid |t| > C_t\}$

							Population Standardized Mean Difference δ						
n	0.00	0.02	0.04	0.06	0.08	0.10	0.15	0.20	0.25	0.30	0.40	0.50	0.70
2	0.500	0.516	0.531	0.547	0.562	0.577	0.615	0.651	0.685	0.718	0.777	0.827	0.900
4	0.500	0.528	0.556	0.584	0.611	0.638	0.700	0.756	0.805	0.845	0.906	0.945	0.982
6	0.500	0.537	0.573	0.609	0.643	0.676	0.751	0.814	0.863	0.901	0.950	0.976	0.994
8	0.500	0.544	0.586	0.628	0.668	0.706	0.788	0.852	0.899	0.932	0.971	0.988	0.998
10	0.500	0.549	0.598	0.644	0.689	0.729	0.816	0.879	0.923	0.952	0.982	0.993	0.999
12	0.500	0.555	0.608	0.659	0.706	0.750	0.838	0.900	0.940	0.964	0.988	0.996	1.000
14	0.500	0.559	0.617	0.672	0.722	0.767	0.857	0.916	0.952	0.973	0.992	0.998	1.000
16	0.500	0.564	0.625	0.683	0.736	0.783	0.872	0.929	0.961	0.979	0.994	0.998	1.000
18	0.500	0.568	0.633	0.694	0.749	0.796	0.886	0.939	0.968	0.984	0.996	0.999	1.000
20	0.500	0.572	0.640	0.704	0.760	0.809	0.897	0.947	0.974	0.987	0.997	0.999	1.000
22	0.500	0.575	0.647	0.713	0.771	0.820	0.907	0.954	0.978	0.990	0.998	1.000	
24	0.500	0.579	0.654	0.721	0.781	0.830	0.915	0.960	0.982	0.992	0.998		
50	0.500	0.614	0.716	0.800	0.864	0.910	0.970	0.991	0.997	0.999	1.000		
100	0.500	0.659	0.789	0.878	0.933	0.964	0.993	0.999	1.000	1.000			

SOURCE: Hedges and Olkin 1980.
NOTES: Proportions less than .500 correspond to negative values of δ.
Probability that a two-sample t statistic with n subjects per group is positive given that the absolute value of the t statistic exceeds the $\alpha = .05$ critical value.

Table 11.8 Conditional Probability $p(\rho, n) = p\{r>0\,|\,|t|>C_r\}$

n	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90
3	0.500	0.508	0.516	0.524	0.531	0.539	0.547	0.555	0.563	0.570	0.578	0.654	0.725	0.790	0.848	0.897	0.937	0.968	0.989
4	0.500	0.512	0.525	0.537	0.550	0.562	0.574	0.586	0.598	0.610	0.622	0.732	0.823	0.891	0.938	0.968	0.986	0.995	0.999
5	0.500	0.516	0.533	0.549	0.565	0.581	0.597	0.613	0.628	0.644	0.659	0.790	0.883	0.940	0.972	0.988	0.996	0.999	1.000
6	0.500	0.520	0.540	0.559	0.578	0.598	0.617	0.635	0.654	0.671	0.689	0.832	0.920	0.965	0.986	0.995	0.999	1.000	
7	0.500	0.523	0.546	0.568	0.590	0.612	0.634	0.655	0.675	0.695	0.714	0.864	0.943	0.978	0.993	0.998	0.999	1.000	
8	0.500	0.526	0.551	0.576	0.601	0.625	0.649	0.672	0.694	0.715	0.736	0.887	0.958	0.986	0.996	0.999	1.000		
9	0.500	0.528	0.556	0.583	0.610	0.637	0.662	0.687	0.711	0.733	0.755	0.906	0.969	0.991	0.997	0.999	1.000		
10	0.500	0.530	0.560	0.590	0.619	0.647	0.674	0.701	0.725	0.749	0.771	0.920	0.976	0.994	0.998	1.000			
11	0.500	0.532	0.565	0.596	0.627	0.657	0.686	0.713	0.739	0.763	0.786	0.932	0.981	0.995	0.999	1.000			
12	0.500	0.534	0.569	0.602	0.635	0.666	0.696	0.724	0.751	0.776	0.799	0.942	0.985	0.997	0.999	1.000			
13	0.500	0.536	0.572	0.607	0.642	0.674	0.706	0.735	0.762	0.788	0.811	0.950	0.988	0.998	1.000				
14	0.500	0.538	0.576	0.613	0.648	0.682	0.714	0.745	0.773	0.799	0.822	0.956	0.991	0.998	1.000				
15	0.500	0.540	0.579	0.618	0.655	0.690	0.723	0.754	0.782	0.808	0.832	0.962	0.992	0.999	1.000				
16	0.500	0.542	0.582	0.622	0.661	0.697	0.731	0.762	0.791	0.818	0.841	0.966	0.994	0.999	1.000				
17	0.500	0.543	0.586	0.627	0.666	0.704	0.738	0.770	0.800	0.826	0.850	0.970	0.995	0.999	1.000				
18	0.500	0.545	0.589	0.631	0.672	0.710	0.745	0.778	0.807	0.834	0.857	0.974	0.996	0.999	1.000				
19	0.500	0.546	0.591	0.635	0.677	0.716	0.752	0.785	0.815	0.841	0.865	0.977	0.997	1.000					
20	0.500	0.548	0.594	0.639	0.682	0.722	0.759	0.792	0.822	0.848	0.871	0.979	0.997	1.000					
21	0.500	0.549	0.597	0.643	0.687	0.728	0.765	0.798	0.828	0.854	0.877	0.981	0.998	1.000					
22	0.500	0.550	0.600	0.647	0.692	0.733	0.771	0.804	0.834	0.861	0.883	0.983	0.998	1.000					
23	0.500	0.552	0.602	0.651	0.696	0.738	0.776	0.810	0.840	0.866	0.889	0.985	0.998	1.000					
24	0.500	0.553	0.605	0.654	0.701	0.743	0.782	0.816	0.846	0.872	0.894	0.986	0.999	1.000					
25	0.500	0.554	0.607	0.658	0.705	0.748	0.787	0.821	0.851	0.877	0.898	0.988	0.999	1.000					
50	0.500	0.579	o.654	0.723	0.782	0.832	0.872	0.904	0.928	0.947	0.961	0.998	1.000						
100	0.500	0.613	0.715	0.799	0.863	0.909	0.941	0.962	0.976	0.985	0.990	1.000							
200	0.500	0.658	0.788	0.877	0.933	0.964	0.981	0.990	0.995	0.997	0.999	1.000							
400	0.500	0.717	0.866	0.943	0.977	0.991	0.996	0.999	0.999	1.000	1.000	1.000							

NOTES: Probability that a correlation coefficient r from a sample of size n is positive given that the absolute value of r exceeds the $\alpha = .05$ critical value for effect size ρ. Proportions less than .500 correspond to negative values of ρ.
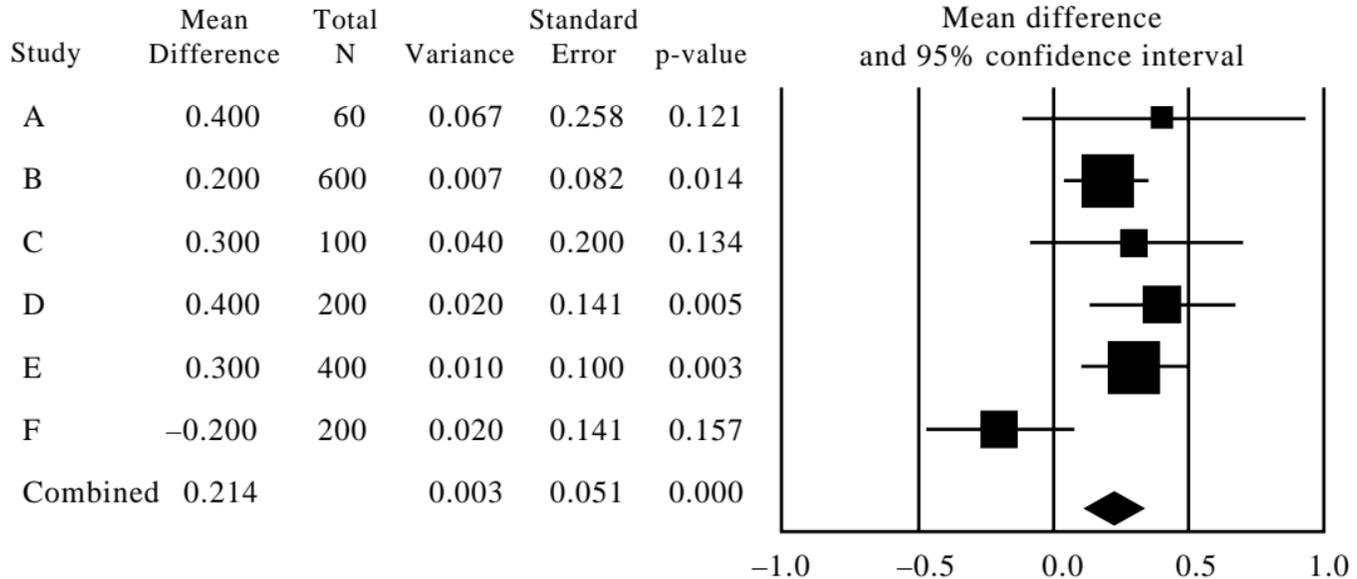
Impact of Intervention

Study	Mean Difference	Total N	Variance	Standard Error	p-value	Mean difference and 95% confidence interval
A	0.400	60	0.067	0.258	0.121	
B	0.200	600	0.007	0.082	0.014	
C	0.300	100	0.040	0.200	0.134	
D	0.400	200	0.020	0.141	0.005	
E	0.300	400	0.010	0.100	0.003	
F	−0.200	200	0.020	0.141	0.157	
Combined	0.214		0.003	0.051	0.000	

Figure 12.1 Fictional Meta-Analysis Showing Impact of an Intervention

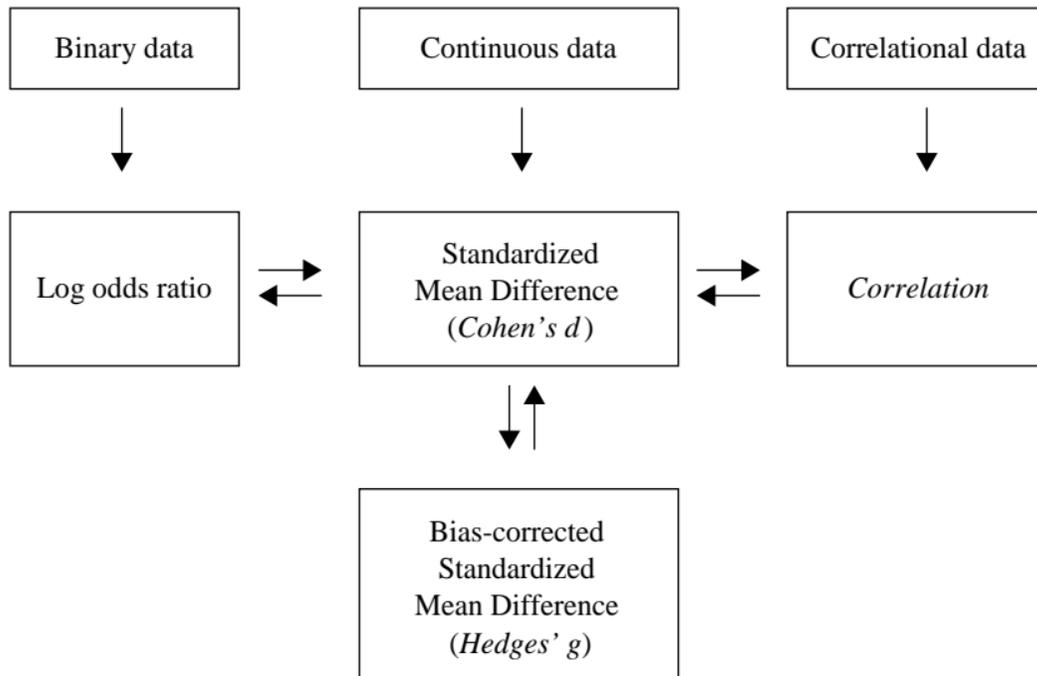**Figure 12.2** Converting Among Effect Sizes

NOTE: This schematic outlines the mechanism for incorporating multiple kinds of data in the same meta-analysis. First, each study is used to compute an effect size and variance in its "native" index – log odds ratio for binary data, d for continuous data, and r for correlational data. Then, we convert all of these indices to a common index, which would be either the log odds ratio, d, or r. If the final index is d, we can move from there to Hedges' g. This common index and its variance are then used in the analysis.

Table 12.1 Formulas for Computing d in Designs with Independent Groups

Reported	Computation of Needed Quantities
$\overline{Y}_1, \overline{Y}_2\ S_{Pooled},\ n_1, n_2$	$d = \dfrac{Y_1 - Y_2}{S_{Pooled}}, \quad v = \dfrac{n_1 + n_2}{n_1 n_2} + \dfrac{d^2}{2(n_1 + n_2)}$
$t,\ n_1, n_2$	$d = t\sqrt{\dfrac{n_1 + n_2}{n_1 n_2}}, \quad v = \dfrac{n_1 + n_2}{n_1 n_2} + \dfrac{d^2}{2(n_1 + n_2)}$
$F,\ n_1, n_2$	$d = \pm\sqrt{\dfrac{F(n_1 + n_2)}{n_1 n_2}}, \quad v = \dfrac{n_1 + n_2}{n_1 n_2} + \dfrac{d^2}{2(n_1 + n_2)}$
p(one-tailed), n_1, n_2	$d = \pm t^{-1}(p)\sqrt{\dfrac{n_1 + n_2}{n_1 n_2}}, \quad v = \dfrac{n_1 + n_2}{n_1 n_2} + \dfrac{d^2}{2(n_1 + n_2)}$
p(two-tailed), n_1, n_2	$d = \pm t^{-1}\left(\dfrac{p}{2}\right)\sqrt{\dfrac{n_1 + n_2}{n_1 n_2}}, \quad v = \dfrac{n_1 + n_2}{n_1 n_2} + \dfrac{d^2}{2(n_1 + n_2)}$

SOURCE: Author's compilation.

NOTE: The function $t^{-1}(p)$ is the inverse of the cumulative distribution function of student's t with $n_1 + n_2 - 2$ degrees of freedom. Many computer programs and spreadsheets provide functions that can be used to compute t^{-1}. Assume $n_1 = n_2 = 10$, so that df = 18. Then, in Excel™, for example, if the reported p-value is 0.05 (two-tailed) TINV(p, df) = TINV(0.05,18) will return the required value (2.1009). If the reported p-value is 0.05 (one-tailed), TINV$(2p, df)$ = TINV(0.10,18) will return the required value 1.7341. The F in row 3 of the table is the F-statistic from a one-way analysis of variance. In rows 3–5 the sign of d must reflect the direction of the mean difference.

Table 12.2 Formulas for Computing *d* in Designs with Paired Groups

Reported	Computation of Needed Quantities
$\overline{Y}_1,\ \overline{Y}_2\ S_{Difference},\ r,\ n$ (number of pairs)	$d = \left(\dfrac{\overline{Y}_1 - \overline{Y}_2}{S_{Difference}}\right)\sqrt{2(1-r)}, \quad v = \left(\dfrac{1}{n} + \dfrac{d^2}{2n}\right)2(1-r)$
t (from paired t-test), $r,\ n$	$d = t\sqrt{\dfrac{2(1-r)}{n}}, \quad v = \left(\dfrac{1}{n} + \dfrac{d^2}{2n}\right)2(1-r)$
F (from repeated measures ANOVA), $r,\ n$	$d = \pm\sqrt{\dfrac{2F(1-r)}{n}}, \quad v = \left(\dfrac{1}{n} + \dfrac{d^2}{2n}\right)2(1-r)$
p (one-tailed), $r,\ n$	$d = \pm t^{-1}(p)\sqrt{\dfrac{2(1-r)}{n}}, \quad v = \left(\dfrac{1}{n} + \dfrac{d^2}{2n}\right)2(1-r)$
p (two-tailed), $r,\ n$	$d = \pm t^{-1}\left(\dfrac{p}{2}\right)\sqrt{\dfrac{2(1-r)}{n}}, \quad v = \left(\dfrac{1}{n} + \dfrac{d^2}{2n}\right)2(1-r)$

SOURCE: Author's compilation.

NOTE: The function $t^{-1}(p)$ is the inverse of the cumulative distribution function of Student's t with $n-1$ degrees of freedom. Many computer programs and spreadsheets provide functions that can be used to compute t^{-1}. Assume $n = 19$, so that $df = 18$. Then, in Excel™, for example, if the reported p-value is 0.05 (2-tailed), TINV$(p,df) = $ TINV$(0.05,18)$ will return the required value (2.1009). If the reported p-value is 0.05 (1-tailed), TINV$(2p,df) = $ TINV$(0.10,18)$ will return the required value 1.7341. The F in row 3 of the table is the F-statistic from a one-way repeated measures analysis of variance. In rows 3–5 the sign of d must reflect the direction of the mean difference.

Table 12.3 Formulas for Computing *d* in Designs with Independent Groups Using Analysis of Covariance (ANCOVA)

Reported	Computation of Needed Quantities
$\overline{Y}_1$, $\overline{Y}_2$, S_{Pooled}, n_1, n_2, R, q	$d = \dfrac{\overline{Y}_1^{\text{Adjusted}} - \overline{Y}_2^{\text{Adjusted}}}{S_{Pooled}}, \quad v = \dfrac{(n_1 + n_2)(1 - R^2)}{n_1 n_2} + \dfrac{d^2}{2(n_1 + n_2)}$
t (from ANCOVA), n_1, n_2, R, q	$d = t\sqrt{\dfrac{n_1 + n_2}{n_1 n_2}}\sqrt{1 - R^2}, \quad v = \dfrac{(n_1 + n_2)(1 - R^2)}{n_1 n_2} + \dfrac{d^2}{2(n_1 + n_2)}$
F (from ANCOVA), n_1, n_2, R, q	$d = \pm\sqrt{\dfrac{F(n_1 + n_2)}{n_1 n_2}}\sqrt{1 - R^2}, \quad v = \dfrac{(n_1 + n_2)(1 - R^2)}{n_1 n_2} + \dfrac{d^2}{2(n_1 + n_2)}$
p (one-tailed, from ANCOVA), n_1, n_2, R, q	$d = \pm t^{-1}(p)\sqrt{\dfrac{n_1 + n_2}{n_1 n_2}}\sqrt{1 - R^2}, \quad v = \dfrac{(n_1 + n_2)(1 - R^2)}{n_1 n_2} + \dfrac{d^2}{2(n_1 + n_2)}$
p (two-tailed, from ANCOVA), n_1, n_2, R, q	$d = \pm t^{-1}\left(\dfrac{p}{2}\right)\sqrt{\dfrac{n_1 + n_2}{n_1 n_2}}\sqrt{1 - R^2}, \quad v = \dfrac{(n_1 + n_2)(1 - R^2)}{n_1 n_2} + \dfrac{d^2}{2(n_1 + n_2)}$

SOURCE: Author's compilation.

NOTE: The function $t^{-1}(p)$ is the inverse of the cumulative distribution function of student's t with $n_1 + n_2 - 2 - q$ degrees of freedom, q is the number of covariates, and R is the covariate outcome correlation or multiple correlation. Many computer programs and spreadsheets provide functions that can be used to compute t^{-1}. Assume $n1 = n2 = 11$, and $q = 2$, so that $df = 18$. Then, in Excel™, for example, if the reported p-value is 0.05 (2-tailed), TINV(p, df) = TINV(0.05,18) will return the required value (2.1009). If the reported p-value is 0.05 (1-tailed), TINV($2p$, df) = TINV(0.10, 18) will return the required value 1.7341. The F in row 3 of the table is the F-statistic from a one-way analysis of covariance. In rows 3–5 the sign of d must reflect the direction of the mean difference.

Table 12.4 Formulas for Computing *r* in Designs with Independent Groups

Reported	Computation of Needed Quantities
r, n	$v_r = \dfrac{(1-r^2)^2}{n-1}, \quad z = 0.5\ln\left(\dfrac{1+r}{1-r}\right), \quad v_z = \dfrac{1}{n-3}$
t, n	$r = \pm\sqrt{\dfrac{t^2}{t^2+n-2}}, \quad v_r = \dfrac{(1-r^2)^2}{n-1}, \quad z = 0.5\ln\left(\dfrac{1+r}{1-r}\right), \quad v_z = \dfrac{1}{n-3}$
t, r	$n = t^2\left(\dfrac{1-r^2}{r^2}\right) - 2, \quad v_r = \dfrac{(1-r^2)^2}{n-1}, \quad z = 0.5\ln\left(\dfrac{1+r}{1-r}\right), \quad v_z = \dfrac{1}{n-3}$
p(one-tailed), r	$n = [t^{-1}(p)]^2\left(\dfrac{1-r^2}{r^2}\right) - 2, \quad v_r = \dfrac{(1-r^2)^2}{n-1}, \quad z = 0.5\ln\left(\dfrac{1+r}{1-r}\right), \quad v_z = \dfrac{1}{n-3}$
p(two-tailed), r	$n = \left[t^{-1}\left(\dfrac{p}{2}\right)\right]^2\left(\dfrac{1-r^2}{r^2}\right) - 2, \quad v_r = \dfrac{(1-r^2)^2}{n-1}, \quad z = 0.5\ln\left(\dfrac{1+r}{1-r}\right), \quad v_z = \dfrac{1}{n-3}$

SOURCE: Author's compilation.

NOTE: The function $t^{-1}(p)$ is the inverse of the cumulative distribution function of Student's t with $n-2$ degrees of freedom. Many computer programs and spreadsheets provide functions that can be used to compute t^{-1}. Assume $n = 20$, so that $df = 18$. Then, in Excel™, for example, if the reported p-value is 0.05 (2-tailed), TINV(p, df) = TINV(0.05, 18) will return the required value (2.1009). If the reported p-value is 0.05 (1-tailed), TINV($2p$, df) = TINV(.10, 18) will return the required value 1.7341.

**Table 13.1 Mortality Rates from Lung Cancer
(Per 100,000 Person-Years)**

| | Exposed to Asbestos | |
Smoker	Yes	No
Yes	601.6	122.6
No	58.4	11.3

SOURCE: Authors' compilation.

Table 13.2 Underlying Probabilities Associated with Two Binary Characteristics

X	Positive	Negative	Total
		Y	
Positive	π_{11}	π_{12}	$\pi_{1\bullet}$
Negative	π_{21}	π_{22}	$\pi_{2\bullet}$
Total	$\pi_{\bullet 1}$	$\pi_{\bullet 2}$	1

Table 13.3 Observed Frequencies in a Study Cross-Classifying Subjects

X	Positive	Negative	Total
		Y	
Positive	n_{11}	n_{12}	$n_{1\bullet}$
Negative	n_{21}	n_{22}	$n_{2\bullet}$
Total	$n_{\bullet 1}$	$n_{\bullet 2}$	$n_{\bullet\bullet}$

Table 13.4 Hypothetical Frequencies in a Fourfold Table

X	Y		Total
	Positive	Negative	
Positive	135	15	150
Negative	40	10	50
Total	175	25	200

SOURCE: Authors' compilation.

Table 13.5 Hypothetical Fourfold Tables, Problems with Phi Coefficient

	Y		
X	Positive	Negative	Total
Second Study			
Positive	45	5	50
Negative	120	30	150
Total	165	35	200
Third Study			
Positive	90	10	100
Negative	80	20	100
Total	170	30	200

SOURCE: Authors' compilation.
NOTE: Data for the original study are in table 13.4.

Table 13.6 Stratified Comparison of Two Treatments

	Treatment	Outcome		Total
		Success	Failure	
Stratum 1	Experimental	4	0	4
	Control	0	1	1
	Total	4	1	5
Stratum 2	Experimental	7	4	11
	Control	3	8	11
	Total	10	12	22
Stratum 3	Experimental	1	0	1
	Control	4	9	13
	Total	5	9	14

SOURCE: Authors' compilation.

Table 13.7 Quantities to Calculate the Pooled Log Odds Ratio

Stratum	L_s	SE_s	L_s/SE_s^2	$1/SE_s^2$
1	3.2958	2.2111	0.6741	0.2045
2	1.3981	0.8712	1.8421	1.3175
3	1.8458	1.7304	0.6164	0.3340
Total			3.1326	1.8560

SOURCE: Authors' compilation.

Table 13.8 Notation for Observed Frequencies Within Typical Matched Set

| Group | Outcome Characteristic | | Total |
	Positive	Negative	
1	a_m	b_m	t_{m1}
2	c_m	d_m	t_{m2}
Total	$a_m + c_m$	$b_m + d_m$	$t_{m\bullet}$

SOURCE: Authors' compilation.

Table 13.9 Results of Study of Association Between Use of Estrogens and Endometrial Cancer

a_m	b_m	c_m	d_m	$t_{m\cdot}$	Matched Sets with Given Pattern
1	0	0	3	4	1
1	0	1	2	4	3
1	0	0	4	5	4
1	0	1	3	5	17
1	0	2	2	5	11
1	0	3	1	5	9
1	0	4	0	5	2
0	1	0	4	5	1
0	1	1	3	5	6
0	1	2	2	5	3
0	1	3	1	5	1
0	1	4	0	5	1

SOURCE: Authors' compilation.

Table 14.1 Effects of Typhoid Inoculations on Incidence and Fatality

	Inoculated		Not Inoculated			
	N	Cases	N	Cases	r	Odds Ratio
Incidence						
Hospital staffs	297	32	279	75	.373	3.04
Ladysmith's garrison	1,705	35	10,529	1,489	.445	7.86
Methuen's column	2,535	26	10,981	257	.191	2.31
Single regiments	1,207	72	1,285	82	.021	1.07
Army in India	15,384	128	136,360	2,132	.100	1.89
Average					.226	

	Lived	Died	Lived	Died		
Fatality Among Those Contracting Typhoid						
Hospital staffs	30	2	63	12	.307	2.86
Ladysmith garrison	27	8	1,160	329	−.010	.96
Single regiments	63	9	61	21	.300	2.41
Special hospitals	1,088	86	4,453	538	.119	1.53
Various military hospitals	701	63	2,864	510	.194	1.98
Army in India	73	11	1,052	423	.248	2.67
Average					.193	

Table 14.2 Computational Details of Standardized Mean Difference Example

Study	d_i	v_i	w_i	$w_i d_i$	$w_i d_i^2$
1	0.03	0.01563	64.000	1.9200	0.0576
2	0.12	0.02161	46.277	5.5532	0.6664
3	−0.14	0.02789	35.856	−5.0199	0.7028
4	1.18	0.13913	7.188	8.4813	10.0080
5	0.26	0.13616	7.344	1.9095	0.4965
6	−0.06	0.01061	94.260	−5.6556	0.3393
7	−0.02	0.01061	94.260	−1.8852	0.0377
8	−0.32	0.04840	20.661	−6.6116	2.1157
9	0.27	0.02690	37.180	10.0387	2.7104
10	0.80	0.06300	15.873	12.6982	10.1586
11	0.54	0.09120	10.964	5.9208	3.1972
12	0.18	0.04973	20.109	3.6196	0.6515
13	−0.02	0.08352	11.973	−0.2395	0.0048
14	0.23	0.08410	11.891	2.7348	0.6290
15	−0.18	0.02528	39.555	−7.1200	1.2816
16	−0.06	0.02789	35.856	−2.1514	0.1291
17	0.30	0.01932	51.757	15.5271	4.6581
18	0.07	0.00884	113.173	7.9221	0.5545
19	−0.07	0.03028	33.029	−2.3121	0.1618
Sum			751.206	45.3300	38.5606

SOURCE: Authors' compilation.

Table 14.3 Fourfold Table from Pearson's Hospital Staff Incidence Data

	Condition of Interest		
Group	Immune	Diseased	All
Inoculated	$A = 265$	$B = 32$	$M_1 = 297$
Not Inoculated	$C = 204$	$D = 75$	$M_0 = 279$
Total	$N_1 = 469$	$N_0 = 107$	$T = 576$

SOURCE: Authors' compilation.

Table 14.4 Effects of Psychological Intervention on Reducing Hospital Length of Stay (in days)

Study	Psychotherapy Groups			Control Group			Mean Difference
	N	Mean Days	SD	N	Mean Days	SD	
1	13	5.00	4.70	13	6.50	3.80	−1.50
2	30	4.90	1.71	50	6.10	2.30	−1.20
3	35	22.50	3.44	35	24.90	10.65	−2.40
4	20	12.50	1.47	20	12.30	1.66	.20
5	10	3.37	.92	10	3.19	.79	.18
6	13	4.90	1.10	14	5.50	.90	−.60
7	9	10.56	1.13	9	12.78	2.05	−2.22
8	8	6.50	.76	8	7.38	1.41	−.88

SOURCE: Adapted from Mumford et al. 1984, table 1.
Includes only randomized trials that reported means and standard deviations.

Table 15.1 Effect Size Estimates and Sampling Variances for *p* Groups of Studies

	Effect Size Estimates	Variances
Group 1		
Study 1	T_{11}	v_{11}
Study 2	T_{12}	v_{12}
.	.	.
.	.	.
.	.	.
Study m_1	T_{1m_1}	v_{1m_1}
Group 2		
Study 1	T_{21}	v_{21}
Study 2	T_{22}	v_{22}
.	.	.
.	.	.
.	.	.
Study m_2	T_{2m_2}	v_{2m_2}
Group p		
Study 1	T_{p1}	v_{p1}
Study 2	T_{p2}	v_{p2}
.	.	.
.	.	.
.	.	.
Study m_p	T_{pm_p}	v_{pm_p}

Table 15.2 Heterogeneity Summary Table

Source	Statistic		Degrees of Freedom
Between groups	Q_{BET}		$p-1$
Within groups			
Within group 1	Q_{W_1}		m_1-1
Within group 2	Q_{W_2}		m_2-1
.	.		.
.	.		.
.	.		.
Within group p	Q_{W_p}		m_p-1
Total within groups	Q_W		$k-p$
Overall	Q		$k-1$

SOURCE: Authors' compilation.
NOTE: Here $k = m_1 + m_2 + \cdots + m_p$.

Table 15.3 Data for Male-Authorship Example

Study	% Male Authors	Group	# Items	T	v	w	wT	wT^2
1	25	1	2	−.33	.029	34.775	−11.476	3.787
2	25	1	2	.07	.034	29.730	2.081	.146
3	50	2	2	−.30	.022	45.466	−13.640	4.092
4	100	3	38	.35	.016	62.233	21.782	7.624
5	100	3	30	.70	.066	15.077	10.554	7.388
6	100	3	45	.85	.218	4.586	3.898	3.313
7	100	3	45	.40	.045	22.059	8.824	3.529
8	100	3	45	.48	.069	14.580	6.998	3.359
9	100	3	5	.37	.051	19.664	7.275	2.692
10	100	3	5	−.06	.032	31.218	−1.873	0.112

Table 15.4 Quantities Used to Compute Male-Authorship Example Analysis

	w	wT	wT^2
Group 1 (25% studies)	64.505	−9.395	3.933
Group 2 (50% studies)	45.466	−13.640	4.092
Group 3 (100% studies)	169.417	57.458	28.015
Over all Groups	279.388	34.423	36.040

SOURCE: Authors' compilation.
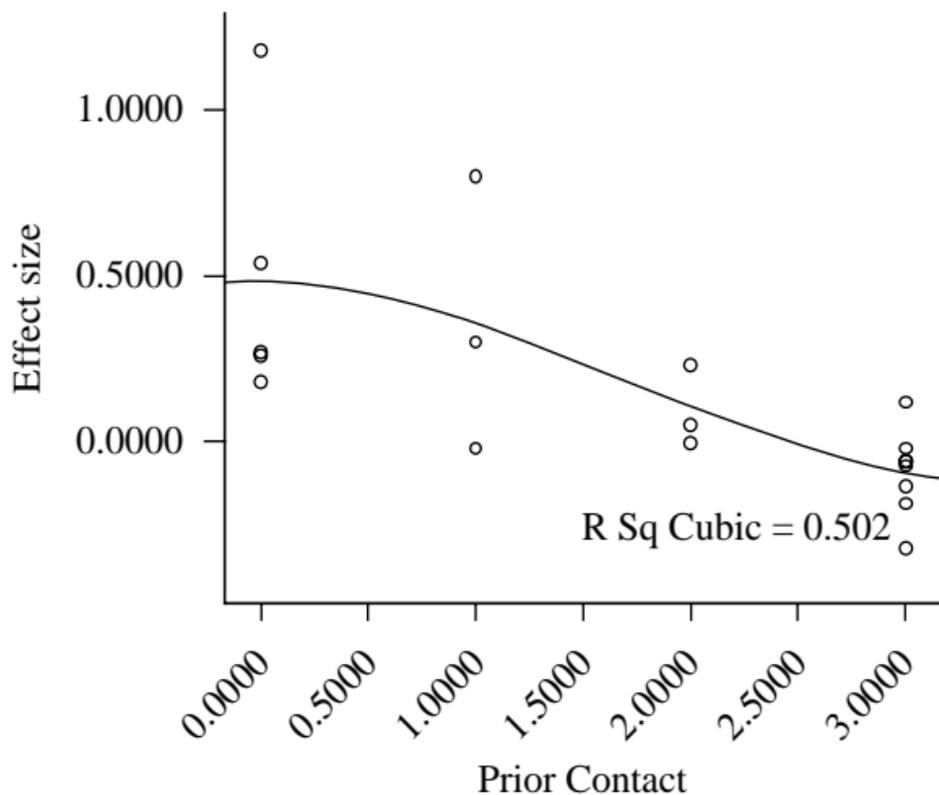
Figure 16.1 Estimated Effect Size T_i as a Function of X_i

Table 16.1 Effect of Teacher Expectancy on Pupil IQ

Study	T_i = effect size estimate	v_i = sampling variance of T_i	X_i = Weeks of Prior Teacher Student Contact
1	0.03	0.015625	2
2	0.12	0.021609	3
3	−0.14	0.027889	3
4	1.18	0.139129	0
5	0.26	0.136161	0
6	−0.06	0.010609	3
7	−0.02	0.010609	3
8	−0.32	0.048400	3
9	0.27	0.026896	0
10	0.87	0.063001	1
11	0.54	0.091204	0
12	0.18	0.049729	0
13	−0.02	0.083521	1
14	0.23	0.084100	2
15	−0.18	0.025281	3
16	−0.06	0.027889	3
17	0.30	0.019321	1
18	0.07	0.008836	2
19	−0.07	0.030276	3

SOURCE: Raudenbush and Bryk 1985.

Table 16.2 Statistical Inferences for Three Models

Parameter	Homogenous Effects Model[a]	Simple Random-Effects Model[b]	Mixed-Effects Model[c]
Intercept			
$\hat{\beta}_0$	0.060	0.083	0.407
$SE(\hat{\beta}_0)$	(0.036)	(0.052)	(0.087)
t-ratio	1.65	1.62	4.68
Coefficient for $X =$ Weeks			
$\hat{\beta}_1$			-0.157
$SE(\hat{\beta}_0)$			(0.036)
t-ratio			-4.90
Random-Effects Variance, σ_θ^2			
$\hat{\sigma}_\theta^2$		0.019	0.000
Q		35.83	16.57
df		18	18
p-value		(p < .01)	(p > .50)
Study-Specific Effects, θ			
min, max(T_i)[d]	$(-0.14, 1.18)$	$(-0.14, 1.18)$	$(-0.14, 1.18)$
min, max(θ_i^*)		$(-0.03, 0.25)$	$(-0.07, 0.41)$
95% P.V. Interval for (θ)		$(-0.19, 0.35)$	$(-0.07, 0.41)$

[a] $\theta_i = \beta_0$
[b] $\theta_i = \beta_0 = u_i$ $Var(u_i) = \sigma_\theta^2$
[c] $\theta_i = \beta_0 + \beta_1 X_i + u_i$ $Var(u_i|X_i) = \sigma_\theta^2$
[d] In all cases $T_i = \theta_i + e_i$ $Var(e_i) = v_i$

Table 16.3 Statistical Inferences for β_0

Method of Estimation	$\hat{\sigma}_\theta^2$	$\hat{\beta}_0$	SE	$t = \hat{\beta}_0/(SE)$	95% Confidence Interval for β_0
Fixed Effects MLE					
Conventional[a]	0.000[d]	0.060	0.036	1.65	$(-0.016, 0.136)$
Quasi-F[b]	0.000	0.060	0.051	1.17	$(-0.047, 0.167)$
Huber-White[c]	0.000	0.060	0.040	1.51	$(-0.024, 0.136)$
Full MLE					
Conventional[a]	0.012	0.078	0.048	1.64	$(-0.016, 0.136)$
Quasi-F[b]	0.012	0.078	0.061	1.27	$(-0.047, 0.167)$
Huber-White[c]	0.012	0.078	0.048	1.62	$(-0.024, 0.136)$
Restricted MLE					
Conventional[a]	0.018	0.083	0.052	1.62	$(-0.025, 0.193)$
Quasi-F[b]	0.018	0.083	0.063	1.32	$(-0.048, 0.216)$
Huber-White	0.018	0.083	0.050	1.68	$(-0.021, 0.189)$
Method of Moments					
Conventional[a]	0.026	0.089	0.056	1.60	$(-0.028, 0.206)$
Quasi-F[b]	0.026	0.089	0.064	1.40	$(-0.044, 0.222)$
Huber-White[c]	0.026	0.089	0.052	1.71	$(-0.020, 0.199)$

SOURCE: Authors' compilation.

NOTES: For the simple random effects model using three methods of point estimation and three methods of estimating uncertainty.

[a]Conventional $V\hat{a}r(\hat{\beta}_0) = \left(\sum_{i=1}^{k} (\hat{\sigma}_\theta^2 + v_i)^{-1} \right)^{-1}$.

[b]Quasi-F approach is equivalent to assuming $V\hat{a}r(\hat{\beta}_0) = q = \dfrac{\sum_{i=1}^{k} (\hat{\sigma}_\theta^2 + v_i)^{-1} (T_i - \hat{\beta}_0)^2}{(k-1) \sum_{i=1}^{k} (\hat{\sigma}_\theta^2 + v_i)^{-1}}$.

[c]Huber-White $V\hat{a}r(\hat{\beta}_0) = \dfrac{\sum_{i=1}^{k} (\hat{\sigma}_\theta^2 + v_i)^{-2} (T_i - \hat{\beta}_0)^2}{\left(\sum_{i=1}^{k} (\hat{\sigma}_\theta^2 + v_i)^{-1} \right)^2}$.

[d]For the fixed effects model, $\sigma_\theta^2 = 0$ by assumption.

Table 16.4 Statistical Inferences for σ_θ^2

Method of Estimation	$\hat{\sigma}_\theta^2$	Reliability, λ [a]	95% Plausible Value Interval for θ_i [b]
Full MLE	0.012	.29	$(-0.14, 0.30)$
Restricted MLE	0.018	.37	$(-0.19, 0.35)$
Method of Moments	0.026	.51	$(-0.23, 0.41)$

SOURCE: Authors' compilation.

NOTES: For the simple random effects model using three methods of point estimation.

[a] $\lambda = \sum_{i=1}^{19} \hat{\lambda}_i, \hat{\lambda}_i = \hat{\tau}^2/(\hat{\sigma}_\theta^2 + v_i)$

[b] 95% Plausible value interval for $\theta_i = \beta_0 \pm 1.96 * \hat{\sigma}_\theta$.
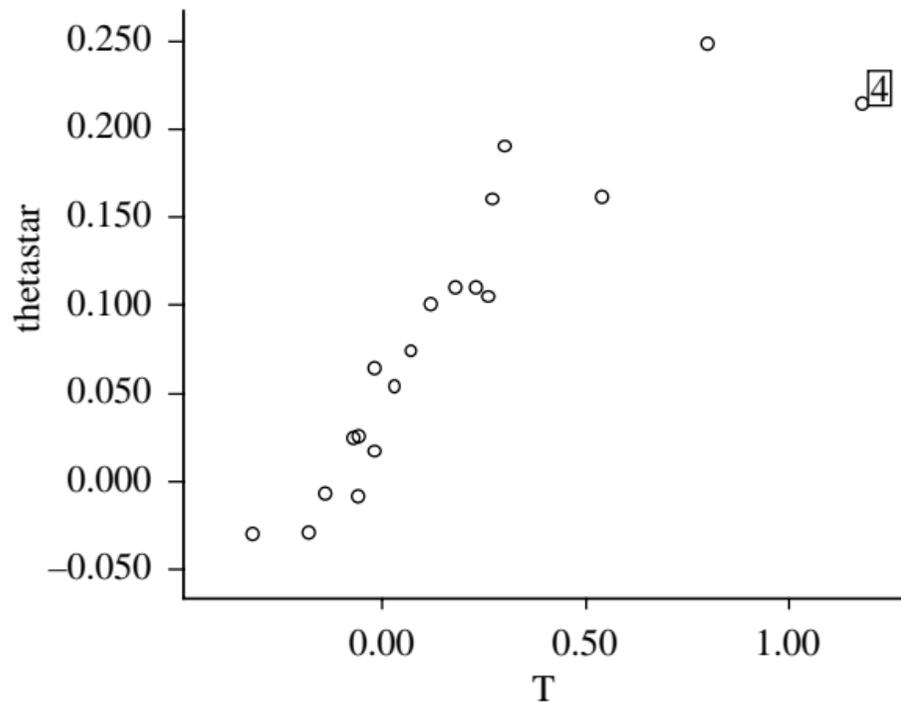
Figure 16.2 Empirical Bayes Estimates θ_i^* Against Study-Specific Estimates T_i (horizontal axis).

SOURCE: Author's compilation.
NOTES: Note that study 4 provided an unusually large study-specific estimate, $T_4 = 1.18$. However, the empirical Bayes estimate $\theta_4^* = 0.21$ is much smaller, reflecting the fact that T_4 is quite unreliable.
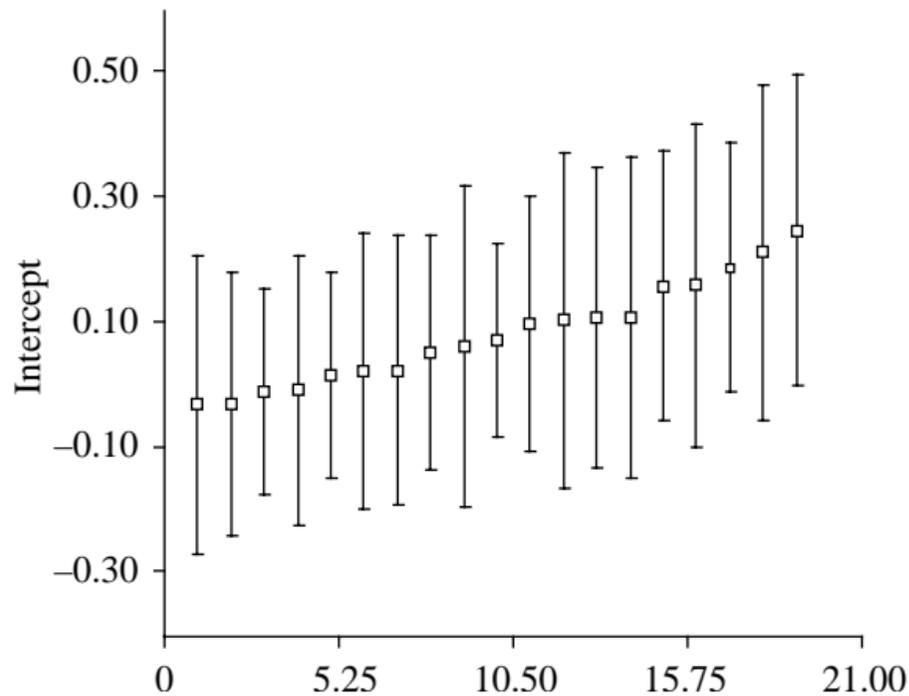

Figure 16.3 Bayes 95 percent Posterior Confidence Intervals, Simple Random-Effects Model
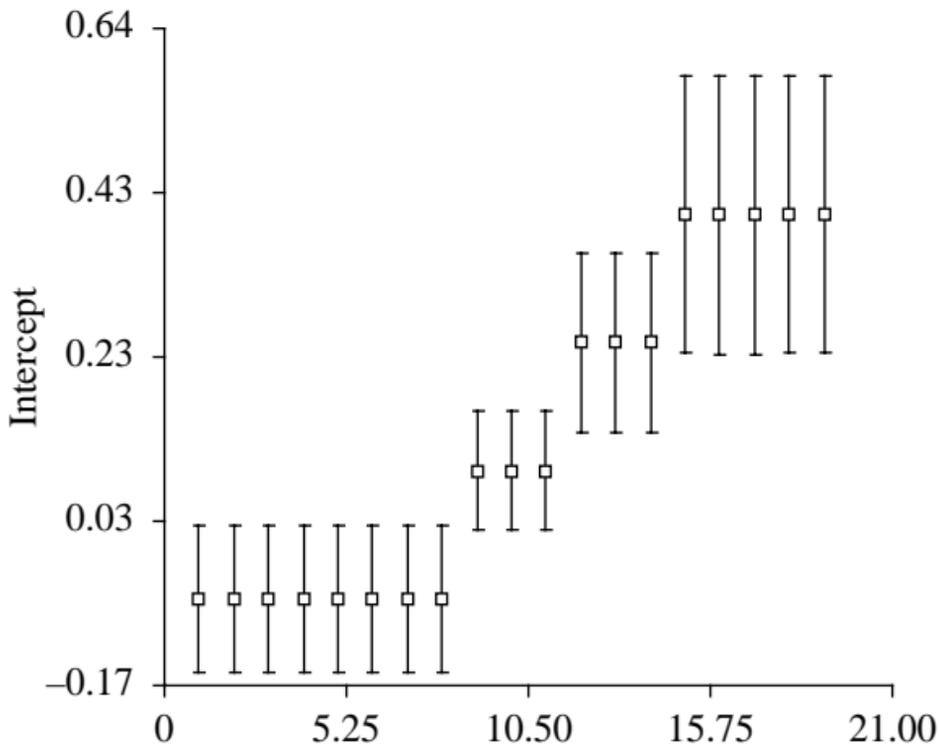
SOURCE: Author's compilation.

Figure 16.4 Bayes 95 percent Posterior Confidence Intervals, Mixed-Effects Model

SOURCE: Author's compilation.

Table 18.1 Variance Effect of Omitting Levels on the Variance of Effect Size d_{WT}

			Variance Computed				Estimated Variance / True Variance			
p	d_{WT}	v_{WT}	Ignoring Classes	Ignoring Schools	Ignoring Classes $\rho = \rho_S + \rho_C$	Ignoring Classes $\rho = \rho_S + \rho_C/p$	Ignoring Classes	Ignoring Schools	Ignoring Classes $\rho = \rho_S + \rho_C$	Ignoring Classes $\rho = \rho_S + \rho_C/p$
1	0.1482	0.0576	0.0385	0.0290	0.0576	0.0576	0.670	0.504	1.000	1.000
2	0.1485	0.0438	0.0343	0.0145	0.0538	0.0440	0.783	0.332	1.229	1.006
3	0.1486	0.0392	0.0329	0.0097	0.0525	0.0394	0.838	0.247	1.341	1.006
4	0.1487	0.0369	0.0321	0.0073	0.0519	0.0371	0.871	0.197	1.407	1.005
5	0.1487	0.0355	0.0317	0.0058	0.0515	0.0357	0.893	0.163	1.451	1.004
8	0.1488	0.0335	0.0311	0.0036	0.0510	0.0336	0.929	0.108	1.524	1.003
16	0.1488	0.0317	0.0305	0.0018	0.0505	0.0318	0.963	0.057	1.591	1.002

SOURCE: Author's compilation.

NOTE: These calculations assume $n = 20$, $\rho_S = 0.15$, $\rho_C = 0.10$, and $d_{WT} = 0.15$

Table 19.1 Proportions of Subjects Exhibiting Heart Disease for a Control and Three Therapies.

Study	Control		T_1		T_2		T_3	
	n	p	n	p	n	p	n	p
1	1000	0.0400	4000	0.0250	4000	0.0375	—	—
2	200	0.0500	400	0.0375	—	—	—	—
3	2000	0.0750	1000	0.0400	1000	0.0800	1000	0.0500

SOURCE: Authors' compilation.
NOTE: Here, n denotes the sample size and p the proportion.

Table 19.2 Effect Sizes (Differences of Proportions) from Table 1

Study	Treatment		
	T_1	T_2	T_3
1	0.0150	0.0025	—
2	0.0125	—	—
3	0.0350	−0.0050	0.0250

SOURCE: Authors' compilation.

Table 19.3 Summary Data for Four Studies of Exercise and Systolic Blood Pressure

	Control		Intensive Exercise		Light Exercise		Pooled Standard
	$\bar{y}_c$	n_c	$\bar{y}_{T_I}$	n_{T_I}	$\bar{y}_{T_I}$	n_{T_I}	s
Dev. Study							
1	-1.36	25	7.87	25	4.35	22	4.2593
2	0.98	40	9.32	38	—	—	2.8831
3	1.17	50	8.08	50	—	—	3.1764
4	0.45	30	7.44	30	5.34	30	2.9344

SOURCE: Authors' compilation.

Table 19.4 Estimated Effect Sizes for the Data in Table 19.3 (Computed Using Equation 19.17).

	Intensive Exercise	Light Exercise
Study		
1	2.1670	1.3406
2	2,8927	—
3	2.1754	—
4	2.3821	1.6664

SOURCE: Authors' compilation.

Table 19.5 Effect of Drill Coaching on Differences Between Post-Test and Pre-Test Achievement Scores

| | | Means | | | | | Pooled Standard Dev. | | |
| | Control | | | Treatment | | | | | |
	n	Math	Reading	n	Math	Reading	Math	Reading	Correlation $\hat{\rho}$
School									
1	22	2.3	2.5	24	10.3	6.6	8.2	7.3	0.55
2	21	2.4	1.3	21	9.7	3.1	8.3	8.9	0.43
3	26	2.5	2.4	23	8.7	3.7	8.5	8.3	0.57
4	18	3.3	1.7	18	7.5	8.5	7.7	9.8	0.66
5	38	1.1	2.0	36	2.2	2.1	9.1	10.4	0.51
6	42	2.8	2.1	42	3.8	1.4	9.6	7.9	0.59
7	39	1.7	0.6	38	1.8	3.9	9.2	10.2	0.49

SOURCE: Authors' compilation.

Table 19.6 Estimated Effect Sizes for Drill Coaching and Their Estimated Covariance Matrices

	Effect Sizes		Estimated Variance and Covariances of the Effect Size Estimates		
	d_{math}	$d_{reading}$	vâr(d_{math})	vâr($d_{reading}$)	côv(d_{math}, $d_{reading}$)
School					
1	0.976	0.562	0.0975	0.0906	0.0497
2	0.880	0.202	0.1045	0.0957	0.0413
3	0.729	0.157	0.0874	0.0822	0.0471
4	0.545	0.694	0.1152	0.1177	0.0756
5	0.121	0.010	0.0542	0.0541	0.0276
6	0.104	-0.089	0.0477	0.0477	0.0281
7	0.011	0.324	0.0520	0.0526	0.0255
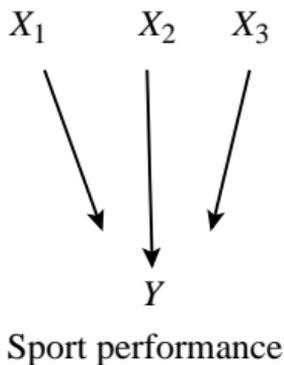
Figure 20.1 Prediction of Sport Performance
SOURCE: Author's compilation.
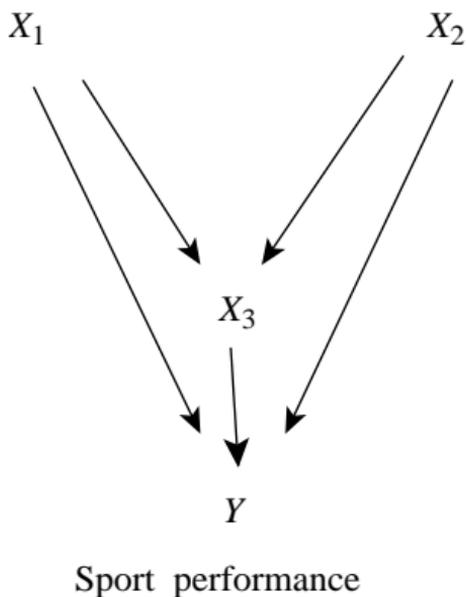
Sport performance

Figure 20.2 X_3 Plays a Mediating Role in Sport Performance
SOURCE: Author's compilation.
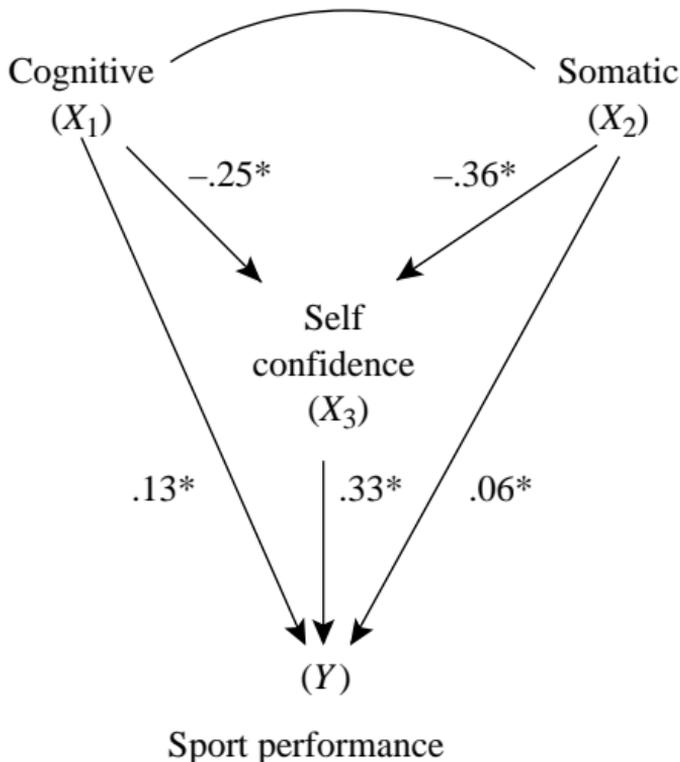
Figure 20.3 Prediction of Sport Performance from Components of Anxiety
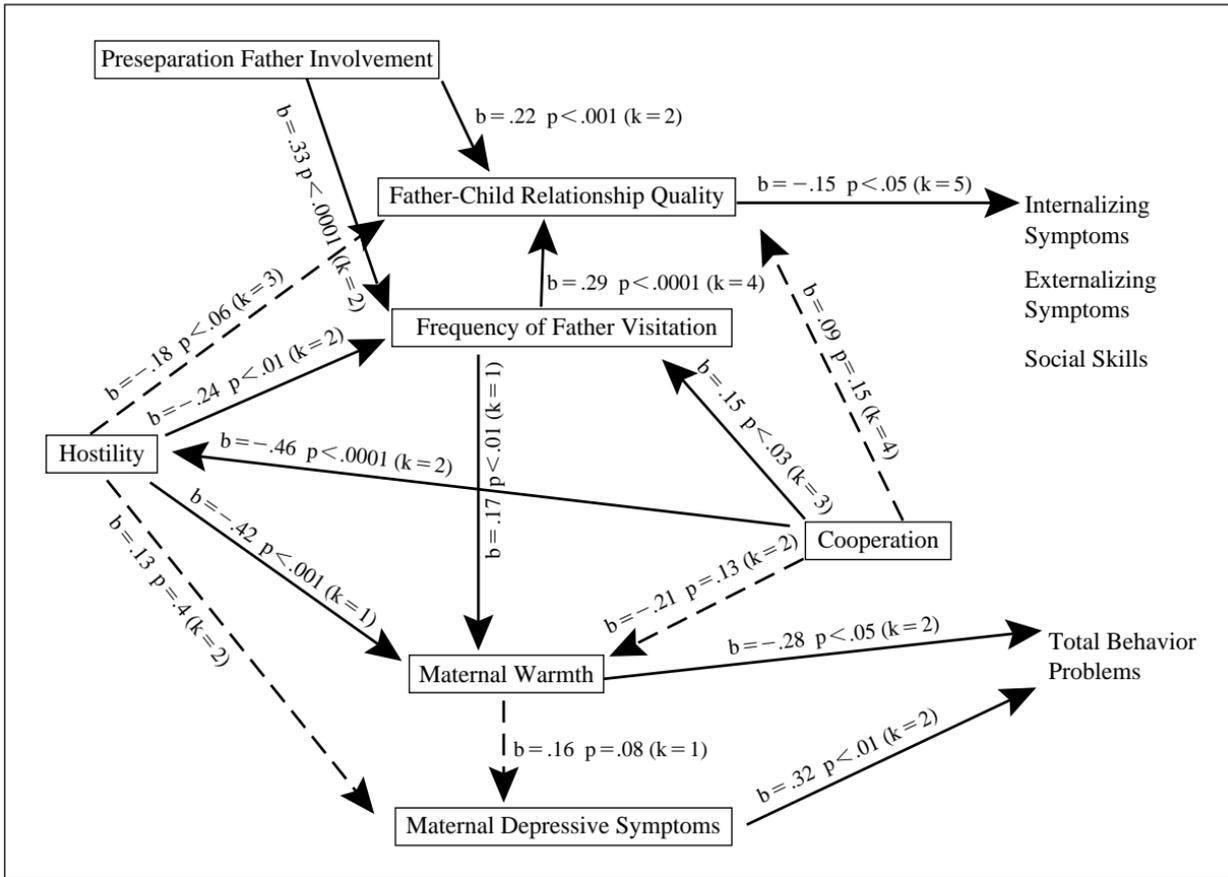
SOURCE: Author's compilation.

Figure 20.4 Model of Child Outcomes in Divorcing Families

source: Whiteside and Becker 2000.

	Performance (Y)	Cognitive anxiety	Somatic anxiety	Self confidence
Performance (Y)	1.0	.10	.31	−.17
Cognitive anxiety	C1	1.0	NR	NR
Somatic anxiety	C2	C4	1.0	NR
Self confidence	C3	C5	C6	1.0

Figure 20.5 Form for Recording Values of Correlations
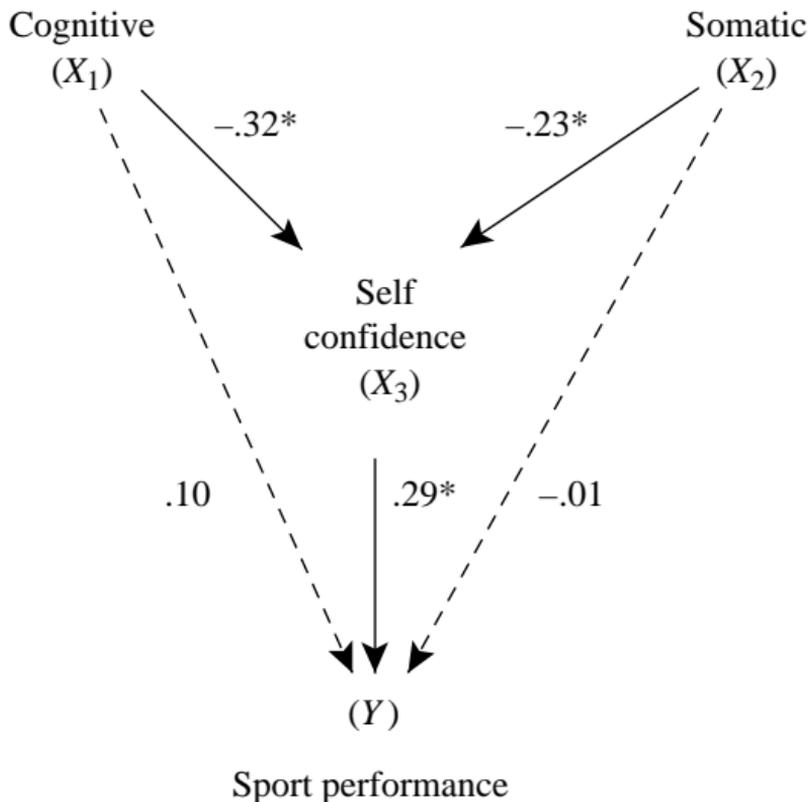
Figure 20.6 Random-Effects Path Coefficients for Prediction of Sport Performance
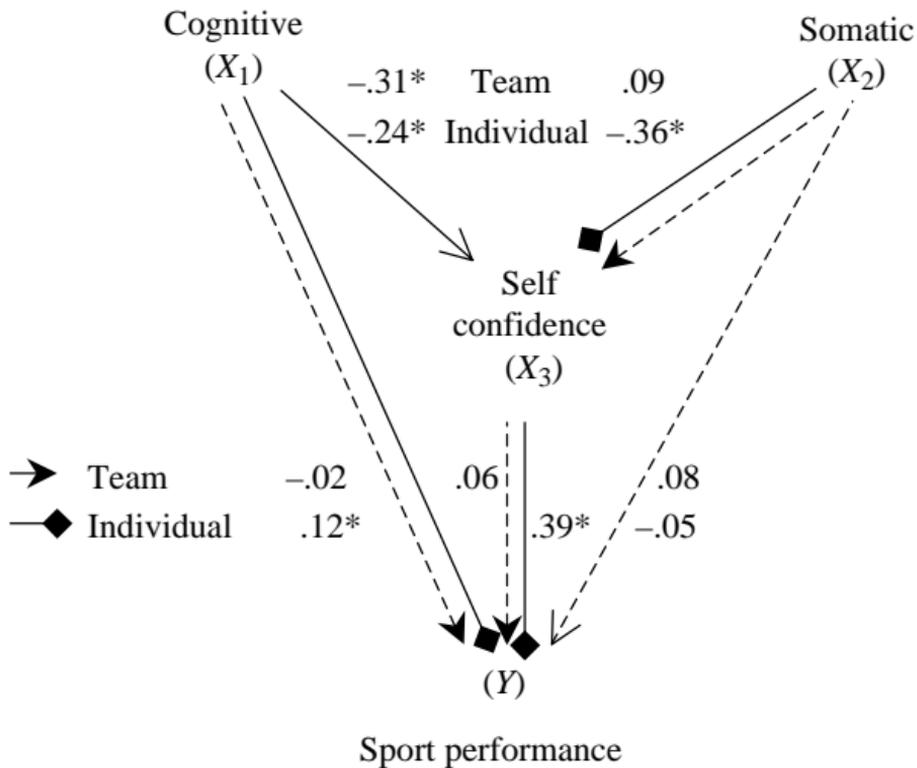
Figure 20.7 Random-Effects Path Coefficients by Type of Sport

Table 20.1 Relationships Between CSAI Subscales and Sport Behavior

			Variable Names and Corresponding Correlations					
			Cognitive/ Performance	Somatic/ Performance	Self Confidence/ Performance	Cognitive/ Somatic	Cognitive/ Self Confidence	Somatic/ Self Confidence
		Type	C1	C2	C3	C4	C5	C6
ID	n_i	of sport	r_{i1Y}	r_{i2Y}	r_{i3Y}	r_{i12}	r_{i13}	r_{i23}
1	142	2	−.55	−.48	.66	.47	−.38	−.46
3	37	2	.53	−.12	.03	.52	−.48	−.40
6	16	1	.44	.46	9.00	.67	9.00	9.00
10	14	2	−.39	−.17	.19	.21	−.54	−.43
17	45	2	.10	.31	−.17	9.00	9.00	9.00
22	100	2	.23	.08	.51	.45	−.29	−.44
26	51	1	−.52	−.43	.16	.57	−.18	−.26
28	128	1	.14	.02	.13	.56	−.53	−.27
36	70	1	−.01	−.16	.42	.62	−.46	−.54
38	30	2	−.27	−.13	.15	.63	−.68	−.71

Table 21.1 Oral Anticoagulant Therapy Data

ID	Odds Ratio	Log-Odds Ratio	Variance of Log-Odds Ratio	Intensity of Dose	Year of Publication	Study Age
1.00	20.49	3.02	2.21	High	1960	39.00[2]
2.00	0.16	−1.84	0.80	High	1960	39.00[2]
3.00	1.27	0.24	0.16	High	1961	38.00[1]
4.00	0.86	0.15	0.07	High	1961	38.00[2]
5.00	0.62	0.47	0.07	High	1964	35.00[2]
6.00	0.68	0.38	0.28	High	1964	35.00[1]
7.00	0.68	−0.38	0.18	High	1966	33.00[2]
8.00	0.62	−0.47	0.22	High	1967	32.00[1]
9.00	0.78	−0.25	0.07	High	1967	32.00[2]
10.00	1.25	0.22	0.10	High	1969	30.00[1,2]
11.00	0.43	0.84	0.08	High	1969	30.00[1,2]
12.00	0.71	0.35	0.04	High	1980	19.00[2]
13.00	0.72	0.33	0.02	High	1990	9.00
14.00	0.89	0.12	0.01	High	1994	5.00
15.00	0.16	−1.81	0.82	High	1969	30.00[1]
16.00	0.65	0.43	0.02	High	1974	25.00
17.00	1.20	0.18	0.06	High	1980	19.00
18.00	1.48	0.39	0.07	High	1980	19.00
19.00	0.41	0.90	0.41	High	1993	6.00
20.00	0.52	0.65	0.29	High	1996	3.00[2]
21.00	4.15	1.42	2.74	High	1990	9.00
22.00	0.87	0.14	4.06	High	1990	9.00[1]
23.00	1.04	0.04	1.36	Moderate	1982	17.00[1]
24.00	0.71	0.35	0.35	Moderate	1981	18.00[1,2]
25.00	0.92	0.08	0.03	Moderate	1982	17.00
26.00	0.94	0.06	0.03	Moderate	1969	30.00
27.00	0.65	0.43	0.07	Moderate	1964	35.00
28.00	0.31	−1.16	0.93	Moderate	1986	13.00
29.00	0.47	0.75	0.98	Moderate	1982	17.00[1]
30.00	0.45	0.81	0.60	Moderate	1998	1.00
31.00	1.04	0.04	0.82	Moderate	1994	5.00[1]
32.00	0.70	0.35	0.70	Low	1998	1.00
33.00	0.71	0.34	0.06	Low	1997	2.00[2]
34.00	1.17	0.15	0.02	Low	1997	2.00[1]

SOURCE: Author's compilation.
[1] Value deleted for MCAR data example
[2] Value deleted for MAR data example

Table 21.2 Descriptive Statistics, Complete Case Analysis

Variable	N	Mean	SD
Log-odds ratio			
Full data	34	−0.239	0.826
MCAR data	22	−0.185	0.938
MAR data	22	−0.262	0.634
Intensity of dose			
Full data	34	2.559	0.660
MCAR data	22	2.591	0.666
MAR data	22	2.454	0.671
Study age			
Full data	34	20.353	13.112
MCAR data	22	19.500	13.780
MAR data	22	17.000	12.107

SOURCE: Author's compilation.

Table 21.3 Correlations, Complete Case Analysis

Correlation	Intensity of Dose & Log-Odds Ratio	Study Age & Log-Odds Ratio	Study Age & Intensity of Dose
Full data	0.058	0.049	0.498
MCAR data	0.172	0.158	0.381
MAR data	0.052	−0.121	0.369

SOURCE: Author's compilation.

Table 21.4 Descriptive Statistics, Available Case Analysis

Variable	N	Mean	SD
Log-odds ratio			
Full data	34	−0.239	0.826
MCAR data	34	−0.239	0.826
MAR data	34	−0.239	0.826
Intensity of dose			
Full data	34	2.559	0.660
MCAR data	34	2.559	0.660
MAR data	34	2.559	0.660
Study age			
Full data	34	20.353	13.112
MCAR data	22	19.500	13.780
MAR data	22	17.000	12.107

SOURCE: Author's compilation.

Table 21.5 Correlations, Available Case Analysis

Correlation	Intensity of Dose & Log-Odds Ratio	Study Age & Log-Odds Ratio	Study Age & Intensity of Dose
Full data	0.058 (N = 34)	0.049 (N = 34)	0.498 (N = 34)
MCAR data	0.058 (N = 34)	0.158 (N = 22)	0.381 (N = 22)
MAR data	0.058 (N = 34)	−0.121 (N = 22)	0.369 (N = 22)

Table 21.6 Descriptive Statistics, Mean Imputation

Variable	N	Mean	SD
Log-odds ratio			
Full data	34	−0.239	0.826
MCAR data	34	−0.239	0.826
MAR data	34	−0.239	0.826
Intensity of dose			
Full data	34	2.559	0.660
MCAR data	34	2.559	0.660
MAR data	34	2.559	0.660
Study age			
Full data	34	20.353	13.112
MCAR data	34	19.500	10.992
MAR data	34	17.00	9.658

SOURCE: Author's compilation.

Table 21.7 Correlations, Mean Imputation

Correlation	Intensity of Dose and Log-Odds Ratio	Study Age and Log-Odds Ratio	Intensity of Dose and Study Age
Full data	0.058	0.049	0.498
MCAR data	0.058	0.144	0.307
MAR data	0.058	−0.074	0.299

SOURCE: Author's compilation.

Table 21.8 Descriptive Statistics, Regression Imputation

Variable	N	Mean	SD
Log-odds ratio			
Full data	34	−0.239	0.826
MCAR data	34	−0.239	0.826
MAR data	34	−0.239	0.826
Intensity of dose			
Full data	34	2.559	0.660
MCAR data	34	2.559	0.660
MAR data	34	2.559	0.660
Study age			
Full data	34	20.353	13.112
MCAR data	34	19.181	11.359
MAR data	34	17.648	10.129

Table 21.9 Correlations, Regression Imputation

Correlation	Intensity of Dose and Log-odds Ratio	Study Age and Log-odds Ratio	Intensity of Dose and Study Age
Full data	0.058	0.049	0.498
MCAR data	0.058	0.128	0.445
MAR data	0.058	−0.193	0.430

Table 21.10 Descriptive Statistics, Maximum Likelihood Methods

Variable	Mean	SD
Log-odds ratio		
Full data	−0.239	0.826
MAR data	−0.239	0.813
Intensity of dose		
Full data	2.559	0.660
MAR data	2.559	0.650
Study age		
Full data	20.353	13.112
MAR data	17.649	11.885

SOURCE: Author's compilation.

Table 21.11 Correlations, Maximum Likelihood Methods

Correlation	Intensity of Dose and Log-odds Ratio	Study Age and Log-odds Ratio	Intensity of Dose and Study Age
Full data	0.058	0.049	0.498
MAR data	0.058	−0.162	0.361

Table 21.12 Oral Anticoagulant Therapy Data

ID	Log-odds ratio	Intensity of dose	Study age	Imputations				
1.00	3.02	High	39.00[1]	21	17	2	21	6
2.00	−1.84	High	39.00[1]	10	20	25	44	24
3.00	0.24	High	38.00					
4.00	0.15	High	38.00[1]	3	48	20	37	19
5.00	0.47	High	35.00[1]	12	6	30	19	17
6.00	0.38	High	35.00					
7.00	−0.38	High	33.00[1]	25	56	16	12	1
8.00	−0.47	High	32.00					
9.00	−0.25	High	32.00[1]	25	34	34	26	20
10.00	0.22	High	30.00[1]	19	28	16	34	17
11.00	0.84	High	30.00[1]	16	17	9	4	3
12.00	0.35	High	19.00[1]	9	0	23	0	11
13.00	0.33	High	9.00					
14.00	0.12	High	5.00					
15.00	−1.81	High	30.00					
16.00	0.43	High	25.00					
17.00	0.18	High	19.00					
18.00	0.39	High	19.00					
19.00	0.90	High	6.00					
20.00	0.65	High	3.00[1]	26	42	14	35	29
21.00	1.42	High	9.00					
22.00	0.14	High	9.00					
23.00	0.04	Moderate	17.00					
24.00	0.35	Moderate	18.00[1]	18	9	20	24	12
25.00	0.08	Moderate	17.00					
26.00	0.06	Moderate	30.00					
27.00	0.43	Moderate	35.00					
28.00	−1.16	Moderate	13.00					
29.00	0.75	Moderate	17.00					
30.00	0.81	Moderate	1.00					
31.00	0.04	Moderate	5.00					
32.00	0.35	Low	1.00					
33.00	0.34	Low	2.00[1]	5	23	5	0	13
34.00	0.15	Low	2.00					

[1]Value deleted for MAR data example

Table 21.13 Correlations, Maximum Likelihood Methods

| | Study Age | | Correlations | |
	Mean	SE (Mean)	Study Age and Log-Odds Ratio	Study Age and Intensity of Dose
Imputation 1	16.56	1.84	0.01	0.34
Imputation 2	19.82	2.47	−0.07	0.32
Imputation 3	17.29	1.91	−0.26	0.36
Imputation 4	18.53	2.25	−0.10	0.40
Imputation 5	16.06	1.86	−0.20	0.26
Multiple Imputation	17.65	2.67	−0.12	0.34
Full data	20.35	2.25	0.05	0.50

SOURCE: Author's compilation.

```
−4   3 8
−3
−2   6
−1   6
−0   1 4 4 9
 0   1 4 5
 1   0 0 2 3 7
 2   9
 3   4
```
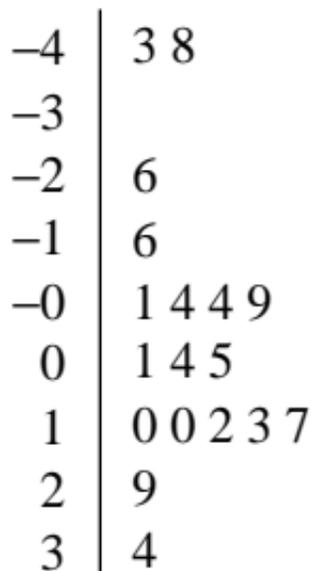
Figure 22.1 Stem-and-Leaf Plot of Standardized Mean Differences.

Figure 22.2 Box Plot of Standardized Mean Differences.

SOURCE: Authors' compilation.
NOTE: For studies reported in table 22.1
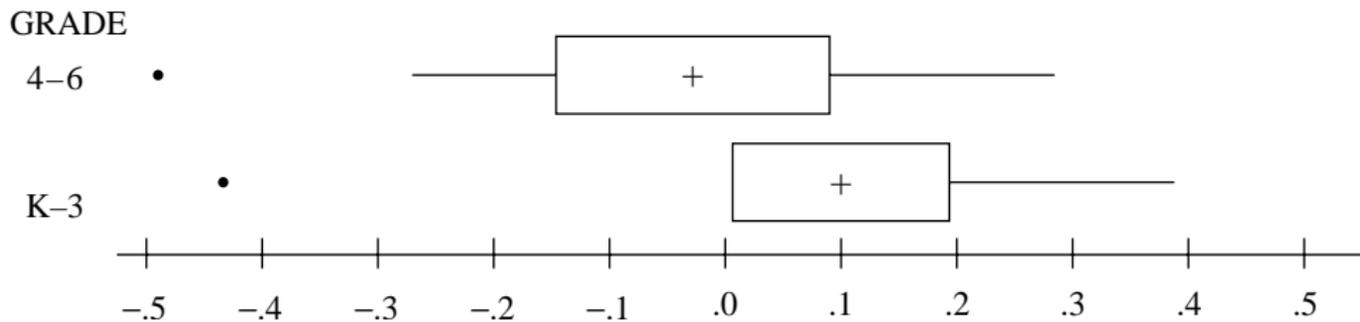
Figure 22.3 Comparative Box Plots of Distribution of Standardized Mean Differences.

SOURCE: Authors' compilation.
NOTE: For studies of grades K–3 versus grade 4–6
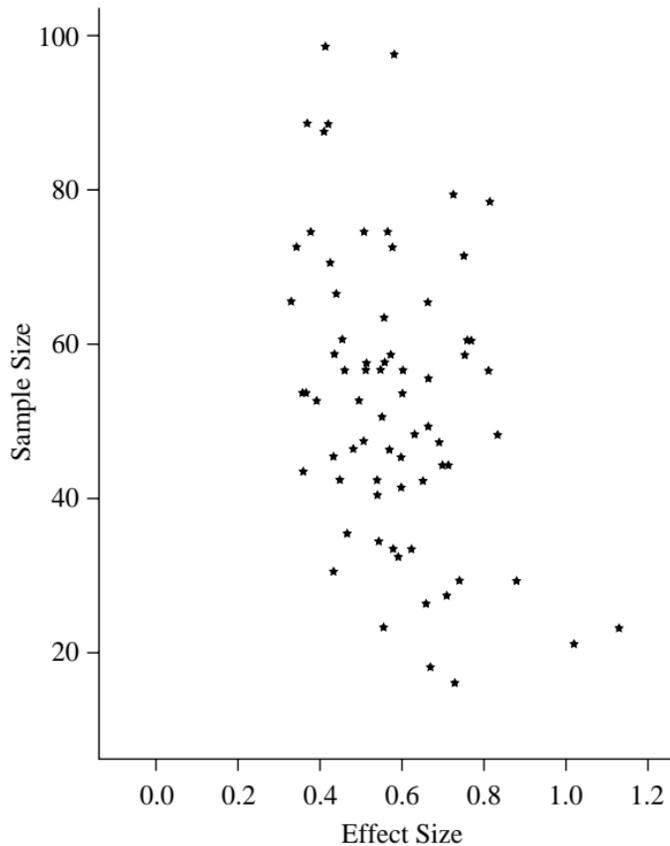
Figure 22.4 Funnel Plot, Only Studies Statistically Significant at the 0.05 Level Reported
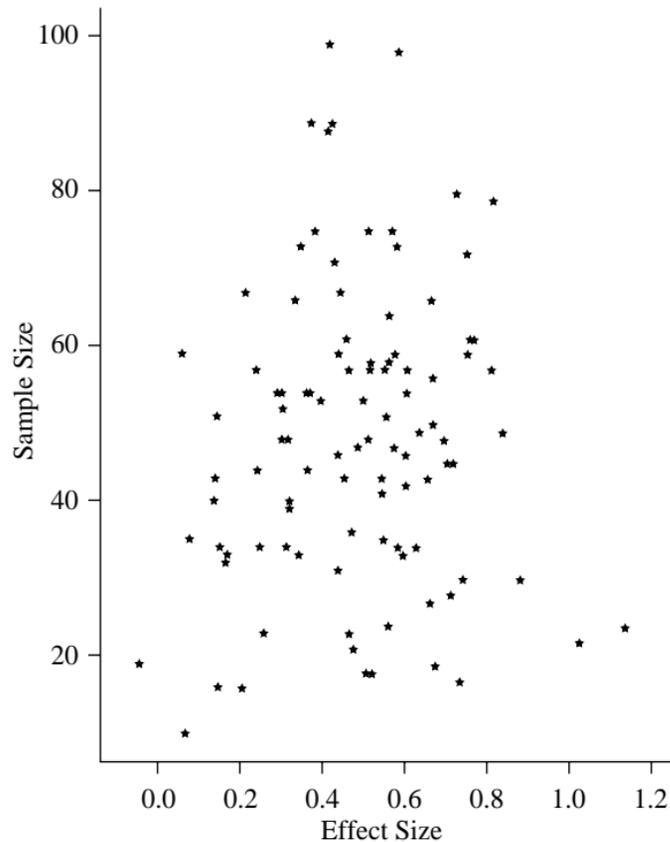
Figure 22.5 Funnel Plot for All Studies
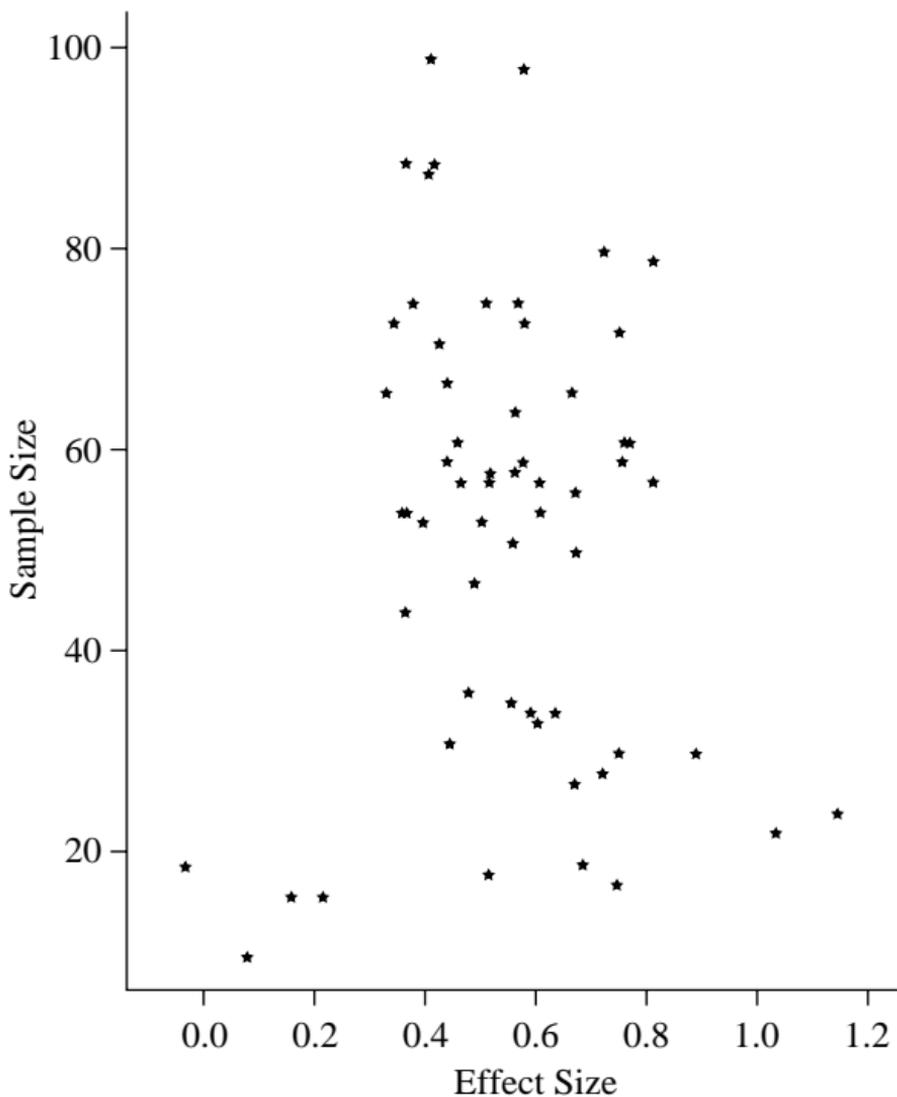
Figure 22.6 Funnel Plot for a Biased Reporting Mechanism

NOTE: See text for details.

Table 22.1 Effects of Open Education on Student Self-Concept

Study	Grade	Open Education n^T	Traditional School n^C	Weights w_i	Standardized Mean Difference T
1	4–6	100	180	0.115	0.100
2	4–6	131	138	0.120	−0.162
3	4–6	40	40	0.036	−0.090
4	4–6	40	40	0.036	−0.049
5	4–6	97	47	0.057	−0.046
6	K–3	28	61	0.034	−0.010
7	K–3	60	55	0.051	−0.431
8	4–6	72	102	0.076	−0.261
9	4–6	87	45	0.053	0.134
10	K–3	80	49	0.054	0.019
11	K–3	79	55	0.058	0.175
12	4–6	40	109	0.052	0.056
13	4–6	36	93	0.046	0.045
14	K–3	9	18	0.011	0.103
15	K–3	14	16	0.013	0.121
16	4–6	21	22	0.019	−0.482
17	4–6	133	124	0.115	0.290
18	K–3	83	45	0.052	0.342

Table 22.2 Effects of Open Education on Student Independence and Self-Reliance

Study	$n_E = n_C$	T
1	30	0.699
2	30	0.091
3	30	-0.058
4	30	-0.079
5	30	-0.235
6	30	-0.494
7	30	-0.587

SOURCE: Authors' compilation.

Table 22.3 Numerical Summary Measures for Distribution of T

	K–3	4–6	Total
n	7	11	18
median	0.103	−0.046	0.032
mean	0.046	−0.043	−0.008
Q_1	−0.010	−0.162	−0.109
Q_3	0.176	0.100	0.127
IQR	0.186	0.262	0.236

Table 22.4 The "Leave One Out" for the Studies in Table 22.1

Study Left Out i	T	Unweighted $\overline{T}(i)$	Weighted $\overline{T}_w(i)$
1	0.100	−0.015	−0.001
2	−0.162	0.001	0.030
3	−0.091	−0.003	0.013
4	−0.049	−0.006	0.012
5	−0.046	−0.006	0.013
6	−0.010	−0.008	0.011
7	−0.434	0.017	0.032
8	−0.262	0.008	0.030
9	0.135	−0.017	0.003
10	0.019	−0.010	0.009
11	0.176	−0.019	0.000
12	0.056	−0.012	0.007
13	0.045	−0.011	0.008
14	0.106	−0.015	0.009
15	0.124	−0.016	0.009
16	−0.491	0.020	0.020
17	0.291	−0.026	−0.023
18	0.344	−0.029	−0.008
median	0.032	−0.011	0.009

Table 22.5 Comparison of Fixed Effects Analysis to Random Effects Analysis

	Fixed effects				
Table	Study	k	$\hat{\delta}$	$SE(\hat{\delta})$	95% c.i. for δ
22.2	Independence	7	-0.095	0.099	$(-0.288, 0.099)$
22.1 K–3	Self-Concept	7	0.034	0.081	$(-0.125, 0.192)$
22.1 4–6	Self-Concept	11	0.001	0.050	$(-0.096, 0.099)$

	Random effects						
Table	Study	k	$\hat{\Delta}$	$SE(\hat{\Delta})$	95% c.i. for Δ	$\hat{\sigma}_{\Delta}^2$	χ^2 for $H_0{:}\hat{\sigma}_{\Delta}^2=0$
22.2	Independence	7	-0.095	0.161	$(-0.411, 0.220)$	0.113	$\chi_6^2 = 15.50$
22.1 K–3	Self-Concept	7	0.037	0.066	$(-0.093, 0.167)$	0.0*	$\chi_6^2 = 9.56$
22.1 4–6	Self-Concept	11	0.004	0.057	$(-0.116, 0.107)$	0.007	$\chi_{10}^2 = 13.96$

SOURCE: Authors' compilation.
*The unbiased estimate, -0.012, is inadmissible.
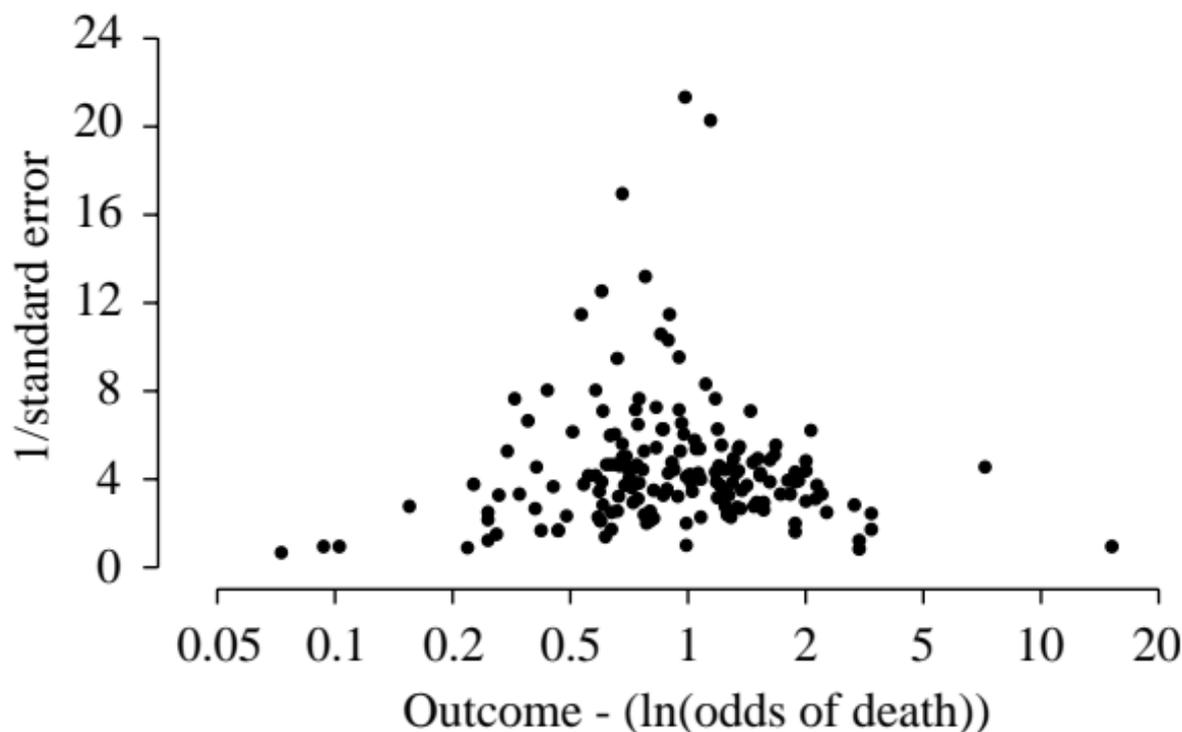
Figure 23.1 Symmetric Funnel Plot, Overall Mortality
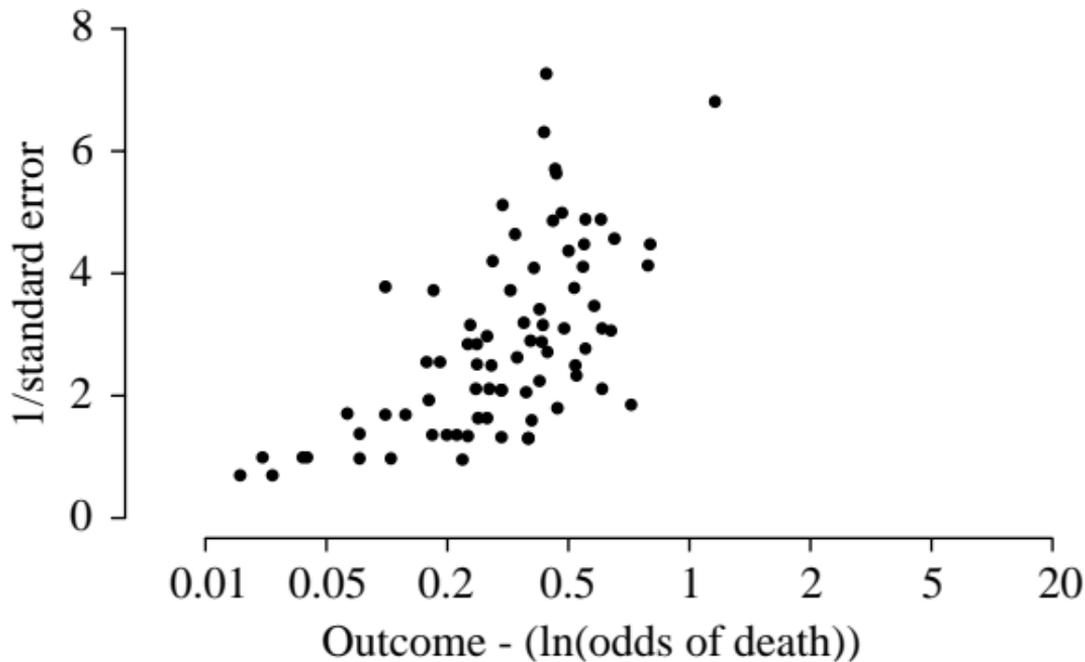SOURCE: Bown et al. 2002.

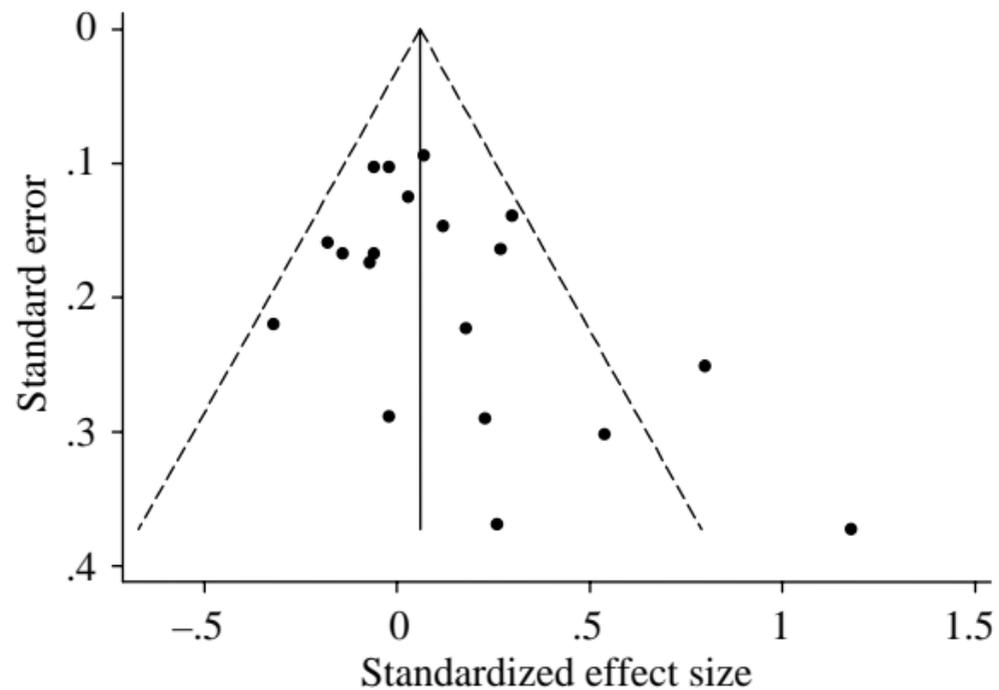**Figure 23.2** Asymmetric Funnel Plot, Mortality During Surgery

Figure 23.3 Funnel Plot, Teacher Expectancy on Pupil IQ, 95% Guidelines
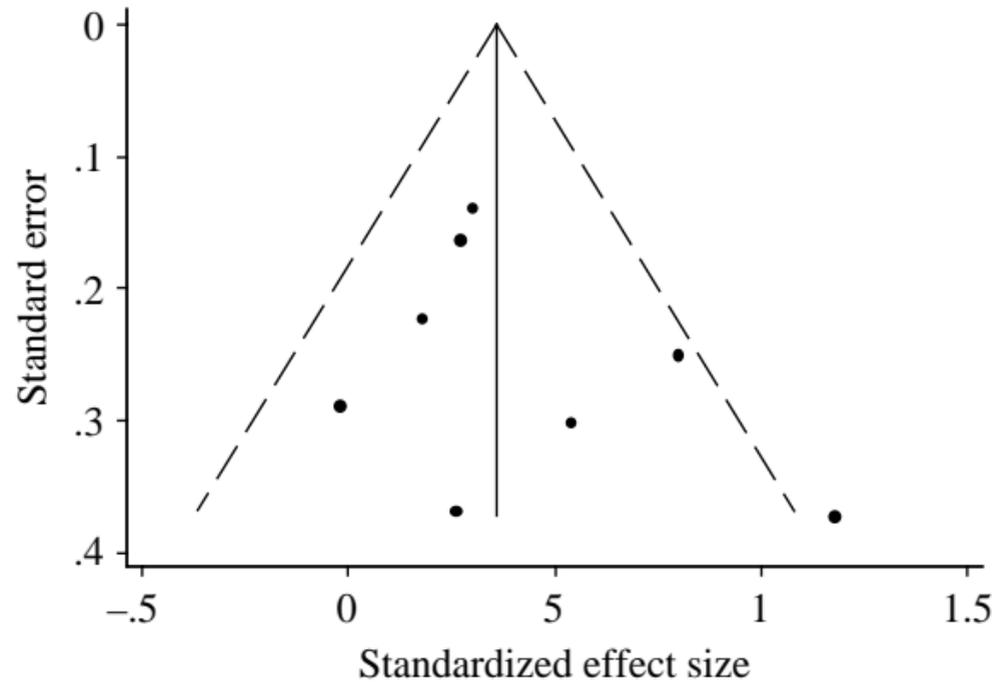
SOURCE: Author's compilation.

Figure 23.4 Funnel Plot, Teacher Expectancy on Pupil IQ, prior contact One Week or Less
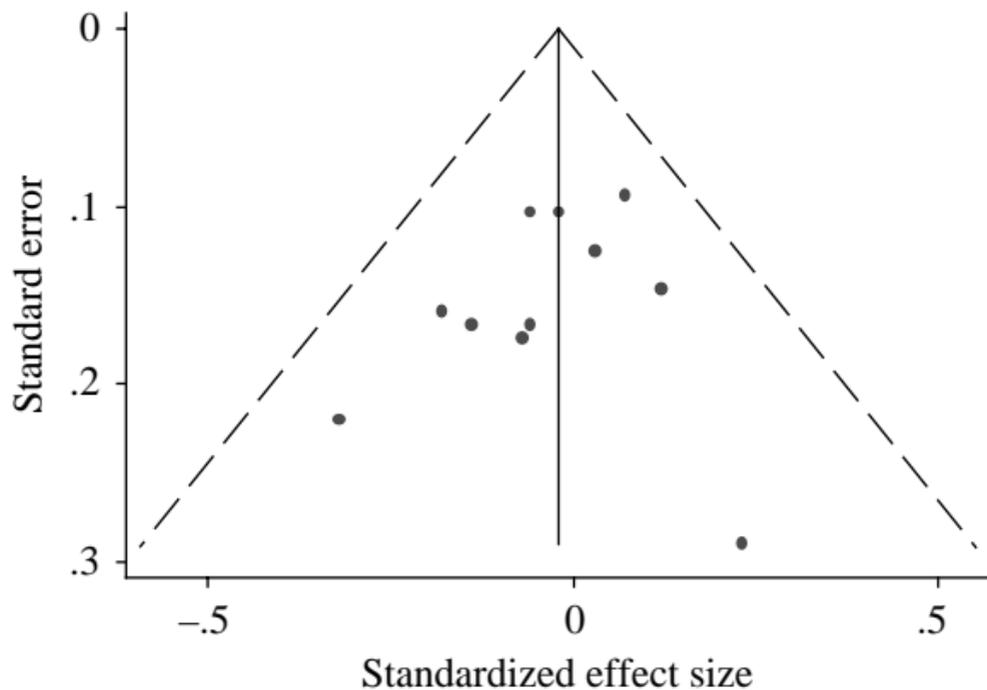
SOURCE: Author's compilation.

Figure 23.5 Funnel Plot, Teacher Expectancy on Pupil IQ, prior contact More Than One Week
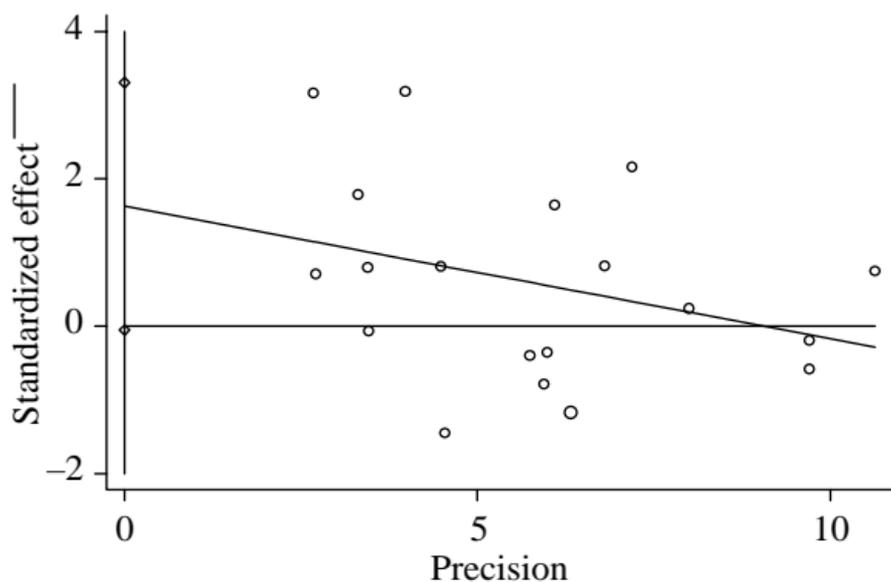
Figure 23.6 Egger's Regression Line on Galbraith Plot, Teacher Expectancy on Pupil IQ
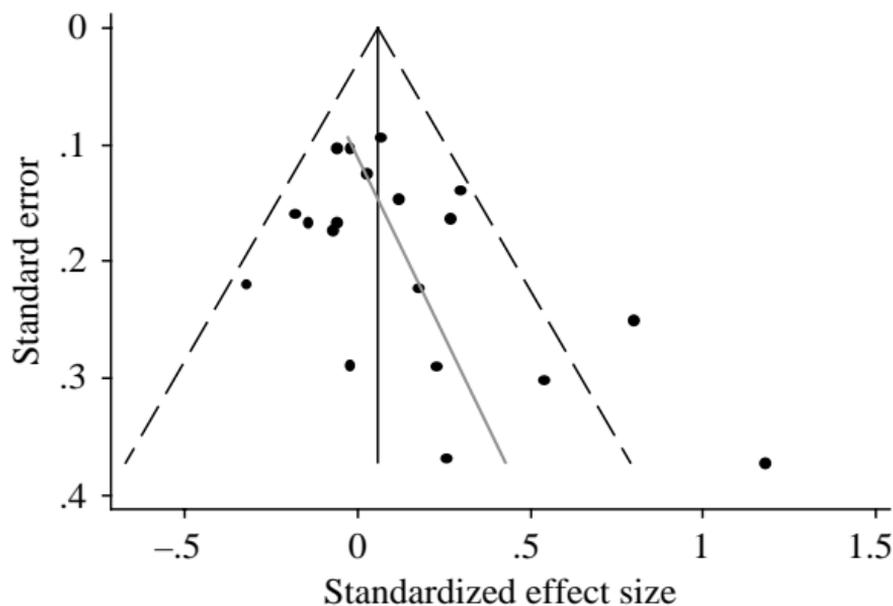
SOURCE: Author's compilation.

Figure 23.7 Egger's Regression Line on Funnel Plot, Teacher Expectancy on Pupil IQ
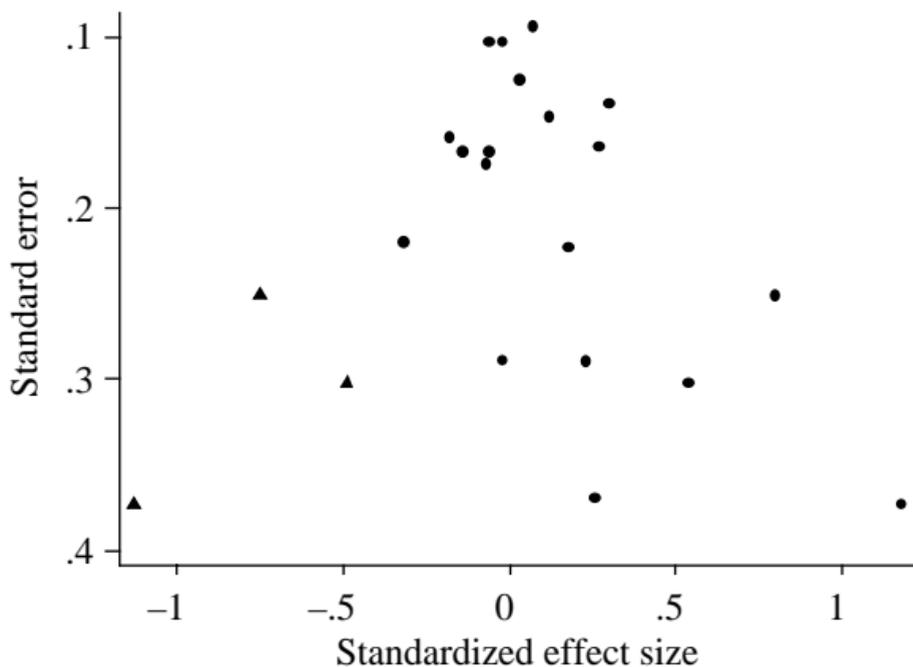
SOURCE: Author's compilation.

Figure 23.8 Trim and Fill Analysis, Teacher Expectancy on Pupil IQ

KEY: Circles are original studies, triangles are "filled" imputed studies
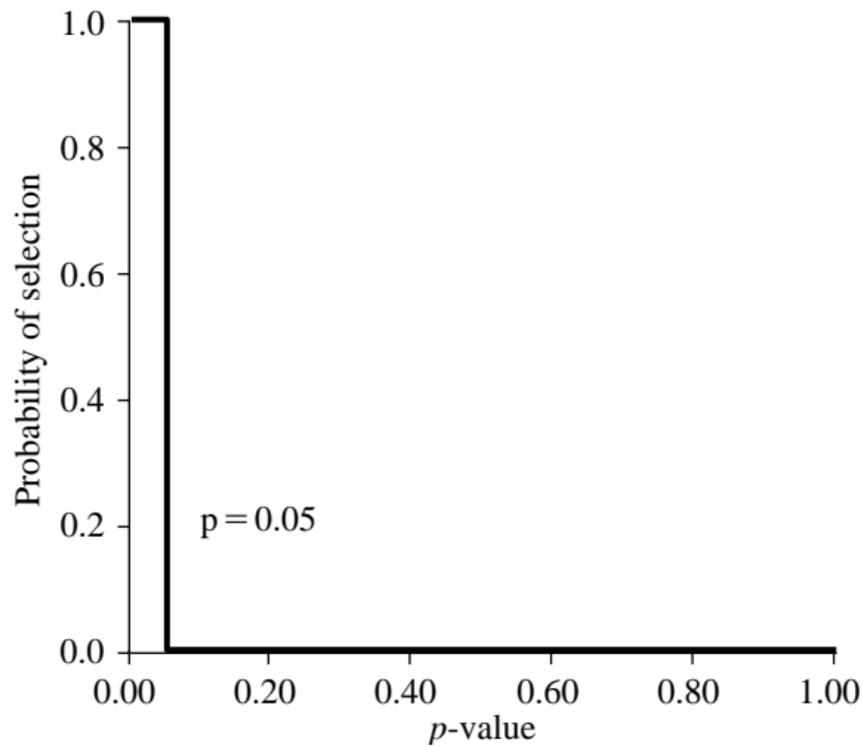
Figure 23.9 Simple Weight Function, Published if Significant
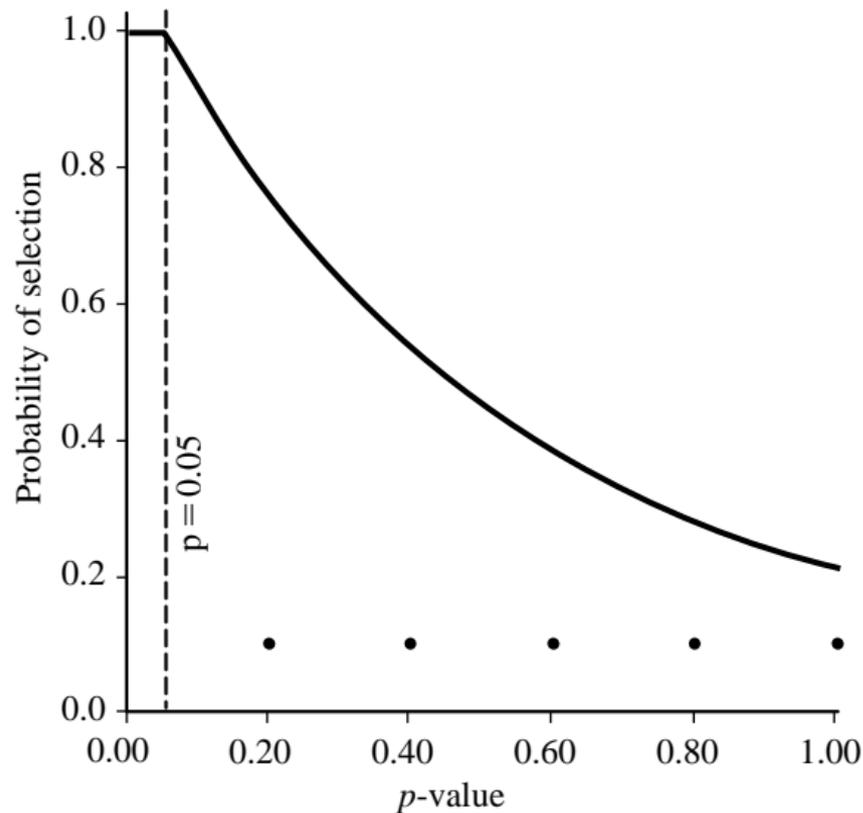
SOURCE: Author's compilation.

Figure 23.10 Example Weight Function, Probability of Publication Diminishes
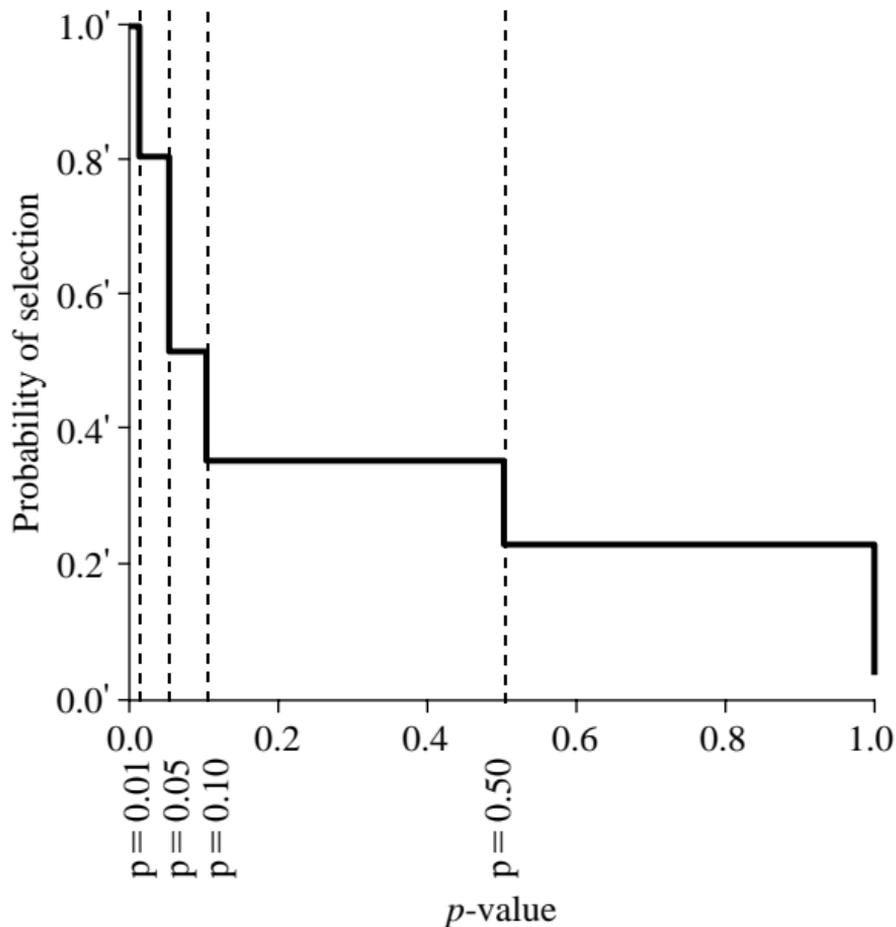
SOURCE: Author's compilation.

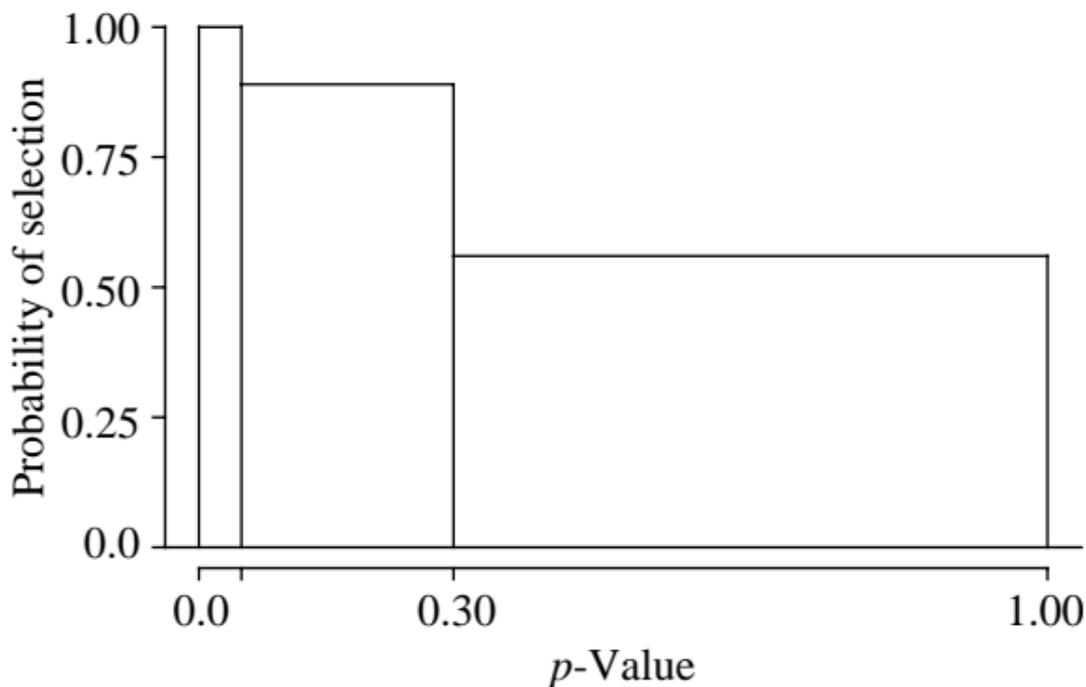**Figure 23.11** Example Psychological steps Weight Function

Figure 23.12 Estimate Weight Function, Teacher Expectancy Example

SOURCE: Hedges and Veva selection method approaches.

Table 23.1 Summary, Methods to Address Publication Bias

Method	Findings
Funnel plot of all the data	Funnel visibly asymmetric
Funnel plot subgrouped by prior contact	Little evidence of asymmetry for either funnel
Egger's regression test ignoring prior contact data	$p = 0.057$ (i.e. some evidence of bias)
Egger's regression test including prior contact covariate	$p = 0.70$ (i.e. little evidence of bias)
File drawer method ignoring prior contact data	13 studies would have to be missing (compared to 19) to overturn conclusions
Trim and Fill ignoring prior contact data	3 studies estimated missing. Effect size changes from 0.060 (s.e. 0.036) to 0.025 (s.e. 0.036)
Trim and Fill subgrouped by prior contact	For > 1 week prior contact, 0 studies estimated missing For ≤ 1 week prior contact 1, study estimated missing. Effect size changes from 0.357 (s.e. 0.079) to 0.319 (s.e. 0.077)
Selection model including prior contact covariate (fixed effect, 2 cut points ($p = 0.05$ and 0.30) estimated from data)	For > 1 week prior contact, effect size changes from -0.371 (s.e. 0.089) to -0.363 (0.109) For ≤ 1 week prior contact, effect size changes from 0.349 (s.e. 0.079) to 0.321 (s.e. 0.111)
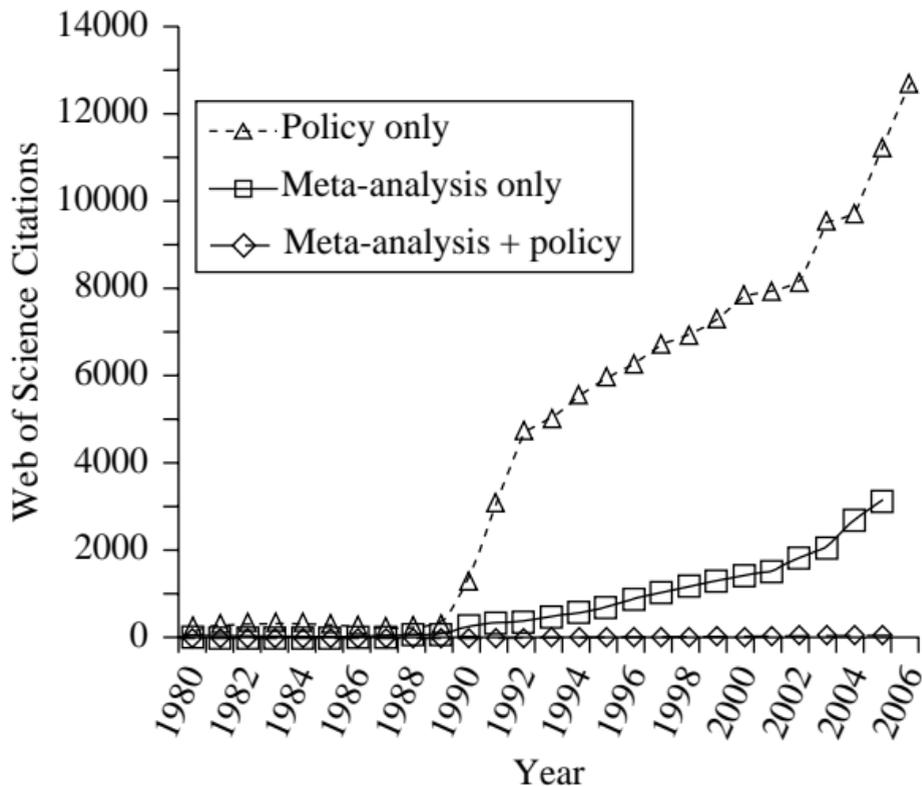
Figure 25.1 Comparison of Publications
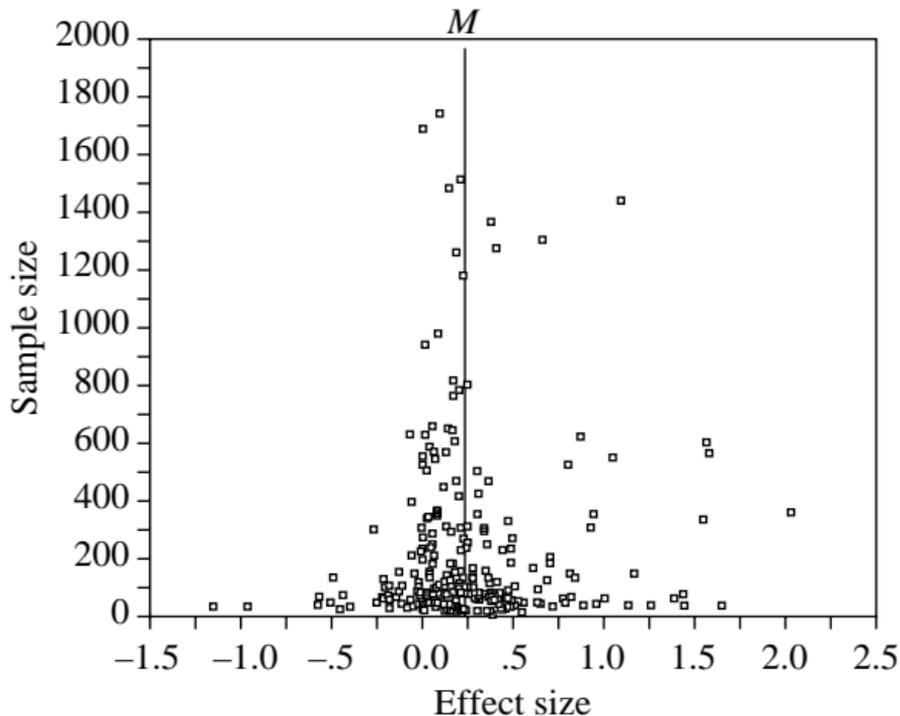
Figure 26.1 Funnel Plot of Effect Size Against Sample Size

SOURCE: Albarracín et al. 2005.

NOTE: Funnel plot. Two effects with extremely large sample sizes were excluded to make the shape of the plot more apparent. These large sample groups had average effect sizes.
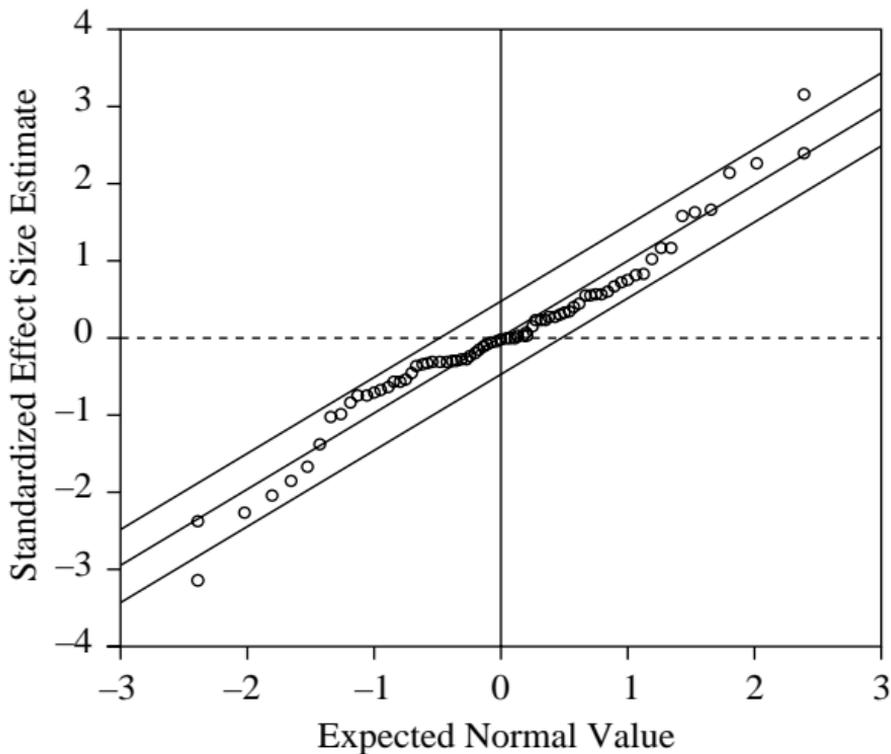
Figure 26.2 Normal Quantile Plot Used to Evaluate Publication Bias

NOTE: Normal quantile plot of the effect sizes representing the magnitude of change in persuasion in discounting-cue conditions from the immediate to the delayed posttest.

Stem	Leaf End of Instruction (1 yr)[a]	Leaf End of Instruction (>1 year)[b]	Leaf Followup[c]
3.7	1		
2.2	7		
2.1			
2.0			
1.9	9		
1.8			
1.7			
1.6			
1.5			
1.4	12		
1.3			
1.2			
1.1	9		
0.9	1		
0.8	4		
0.7	0236	5	6
0.6	001233	47	
0.5	00133	24	6
0.4	345789		
0.3	23367889	6	238
0.2	014457	48	8
0.1	23469	7	
+0.0	01344479	0	
−0.0	7		
−0.1	1		
−0.2	05		
−0.3	3		
−0.4	7		7

Figure 26.3 Stem-and-Leaf Plot of Effect Sizes of Systematic Phonics instruction on Reading by Timing of Posttest

NOTE: Stem-and-leaf plot showing the distribution of mean effect sizes of systematic phonics instruction on reading measured at the end of instruction and following a delay.

[a] End of instruction or end of Year 1 when instruction lasted longer.

[b] End of instruction which lasted between 2 and 4 years.

[c] Followup tests were administered 4 to 12 months after instruction ended.
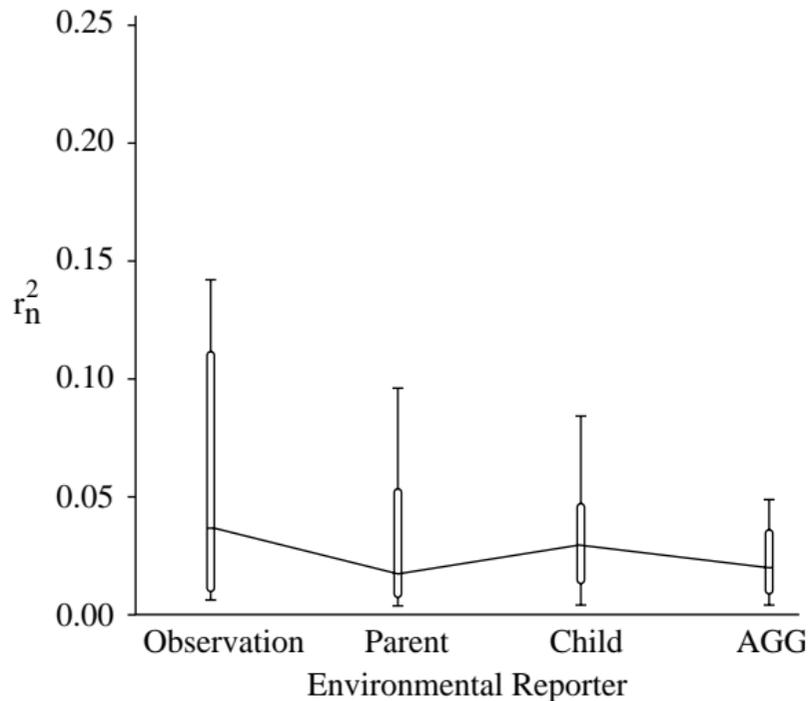
Figure 26.4 Parallel Schematic Plot of Median Effect Size by Environmental Reporter

SOURCE: Turkheimer and Waldron 2000.
NOTE: Median effect size by environmental reporter. AGG indicates aggregate of more than one reporter. (See figure 26.5 caption for explanation of box and whisker plots.)
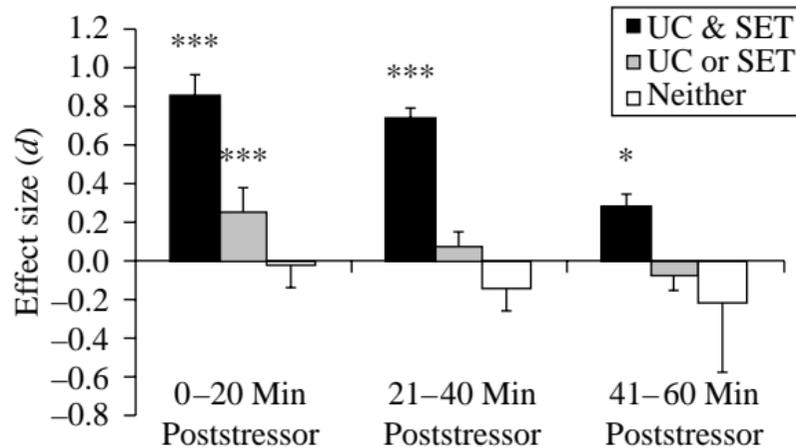
Figure 26.5 Mean Cortisol Effect Size for Performance Tasks with Both Social-Evaluative Threat (SET) and Uncontrollability (UC), Either SET or UC, and Neither by Timing of Poststressor Measurement

SOURCE: Dickerson and Kemeny 2004
Note the effective use of shading as well as the error bars and p-value indicators.
NOTE: Mean ($\pm$ *SEM*) cortisol effect size (*d*) for performance tasks with both social-evaluative threat (SET) and uncontrollability (UC), performance tasks with either SET or UC, and performance tasks without either component or passive tasks (Neither) during intervals 0–20, 21–40, and 41–60 min poststressor. *$p < .05$. ***$p < .001$.
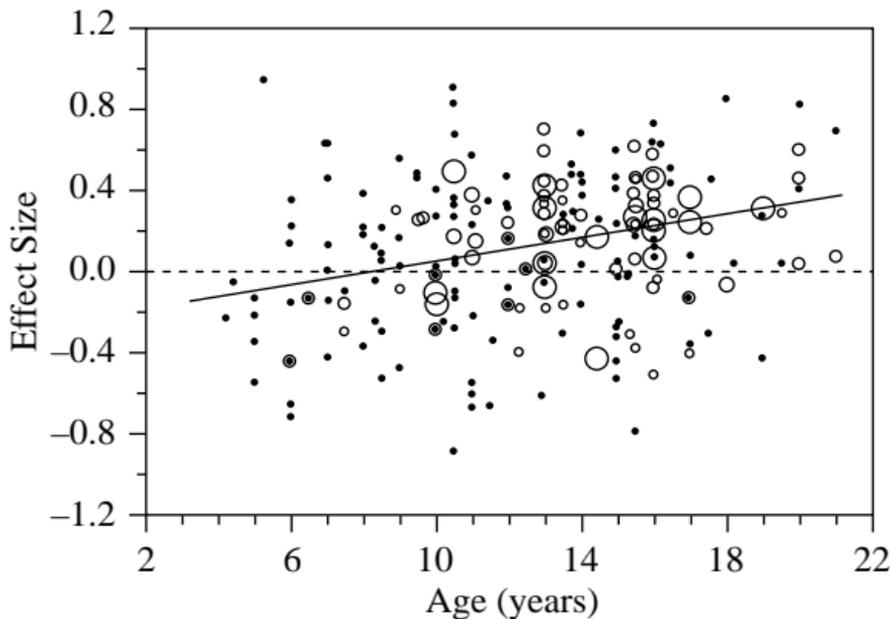
Figure 26.6 Scatterplot of Effect Size by Average Participant Age in Study
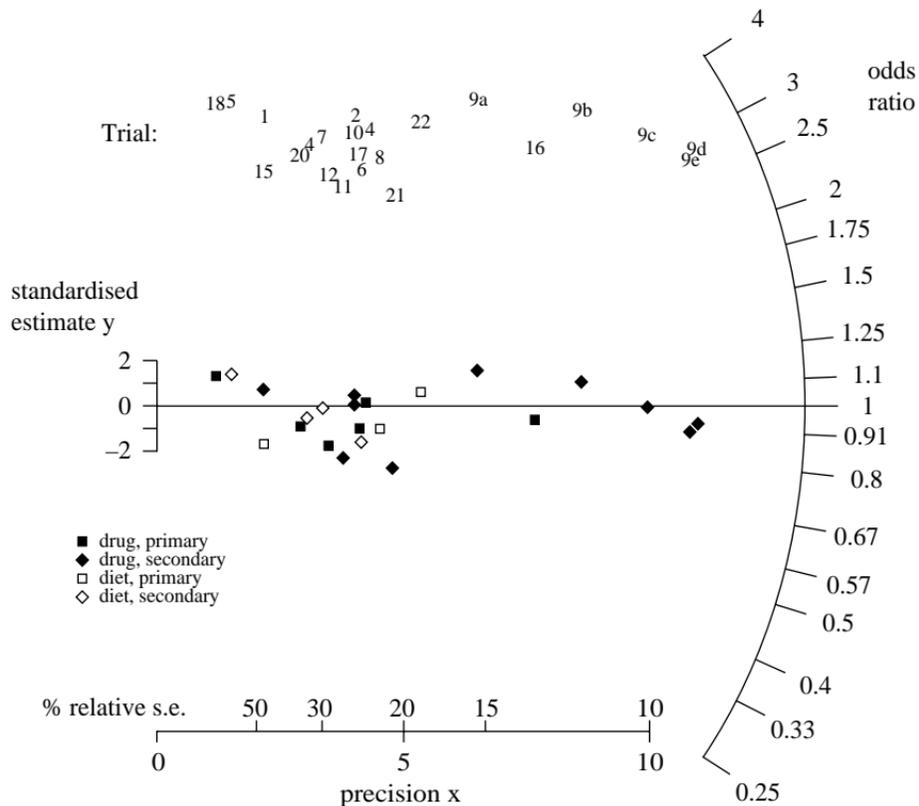
Figure 26.7 Radial Plot of Fatal Coronary Heart Disease Odds Ratios

NOTE: A Radial Plot of Fatal Coronary Heart Disease Odds Ratios (Treated/Control) for 22 Cholesterol Lowering Trials Using z_i and σ_i Given by (14). Data from Ravnskov (1992, table 1).

Figure 26.8 Forest Plot of Effect Sizes Derived from Eighteen Studies of Teacher Expectancy Effects on Pupil IQ

SOURCE: Author's compilation.

| Study name | Prior Weeks | Statistics for each study | | | Standardized difference in means and 95% CI |
		Standardized difference in means	Standard error	*p*	
Pellegrini & Hicks 1972 [1]	0	1.180	0.373	0.002	
Pellegrini & Hicks 1972 [2]	0	0.260	0.369	0.481	
Kester 1969	0	0.270	0.164	0.100	
Carter 1970	0	0.540	0.302	0.074	
Flowers 1966	0	0.180	0.223	0.420	
Maxwell 1970	1	0.800	0.251	0.001	
Keshock 1970	1	−0.020	0.280	0.945	
Rosenthal & Jacobson 1968	1	0.300	0.139	0.031	
Rosenthal et al. 1974	2	0.030	0.125	0.810	
Henrikson 1970	2	0.230	0.290	0.428	
Fleming & Anttonen 1971	2	0.070	0.094	0.456	
Evans & Rosenthal 1968	3	−0.060	0.103	0.560	
Greiger 1970	5	−0.060	0.167	0.719	
Ginsburg 1970	7	−0.070	0.174	0.687	
Fielder et al. 1971	17	−0.020	0.103	0.846	
Fine 1972	17	−0.180	0.159	0.258	
Jose & Cody 1971	19	−0.140	0.167	0.402	
Conn et al. 1968	21	0.120	0.147	0.414	
Claiborn 1969	24	−0.320	0.220	0.146	
Overall		0.060	0.036	0.698	

−2.00   −1.00   0.00   1.00   2.00
Favors Control   Favors Treatment

Figure 26.9 Forest Plot of Effect Sizes Derived from Eighteen Studies of Teacher Expectancy Effects on Pupil IQ Sorted by Weeks of Teacher-Student Contact Prior to Expectancy Induction

SOURCE: Authors' compilation using data from Raudenbush and Bryk 1985.
NOTE: "Prior Weeks" are estimated weeks of teacher-student contact prior to expectancy induction.

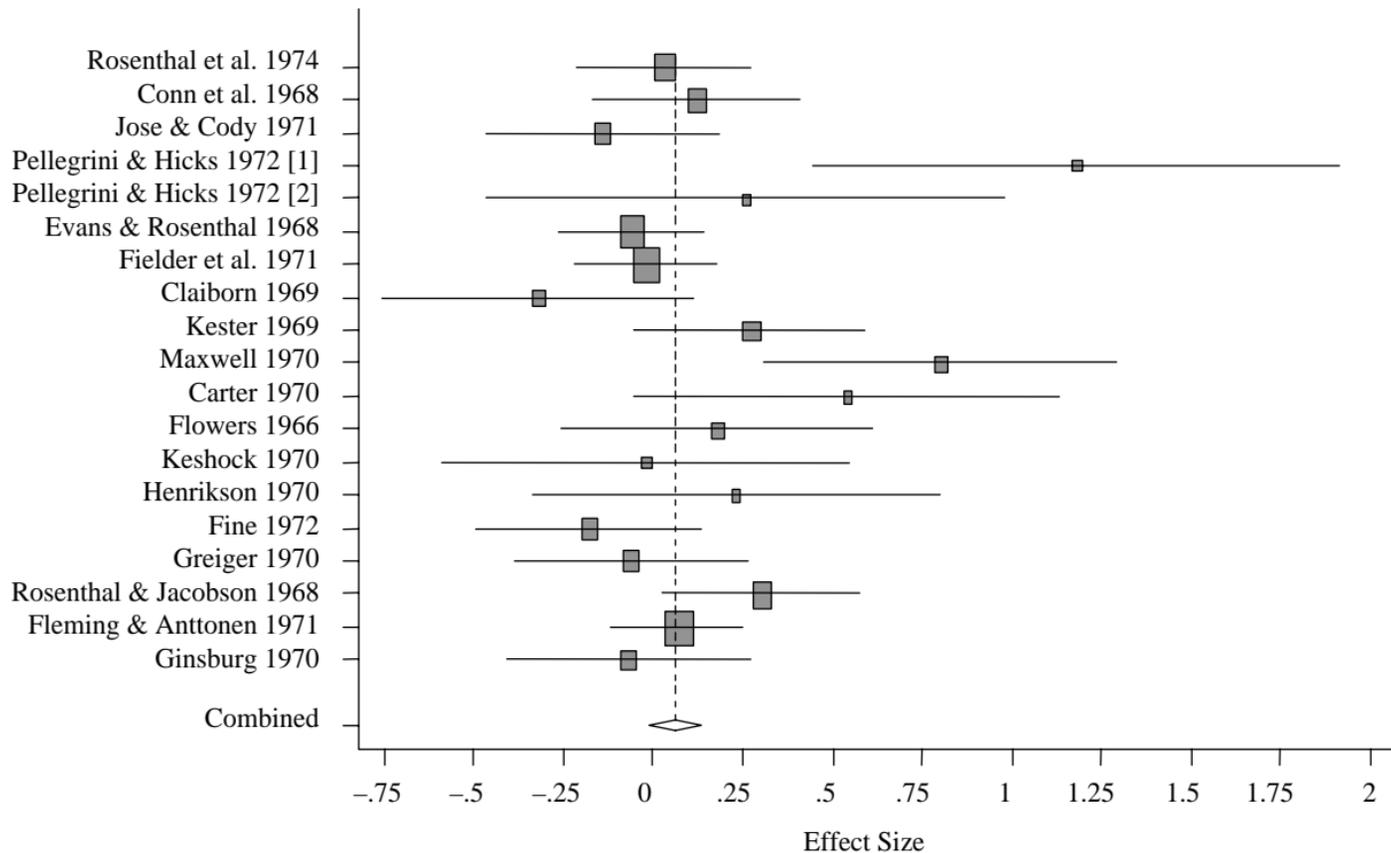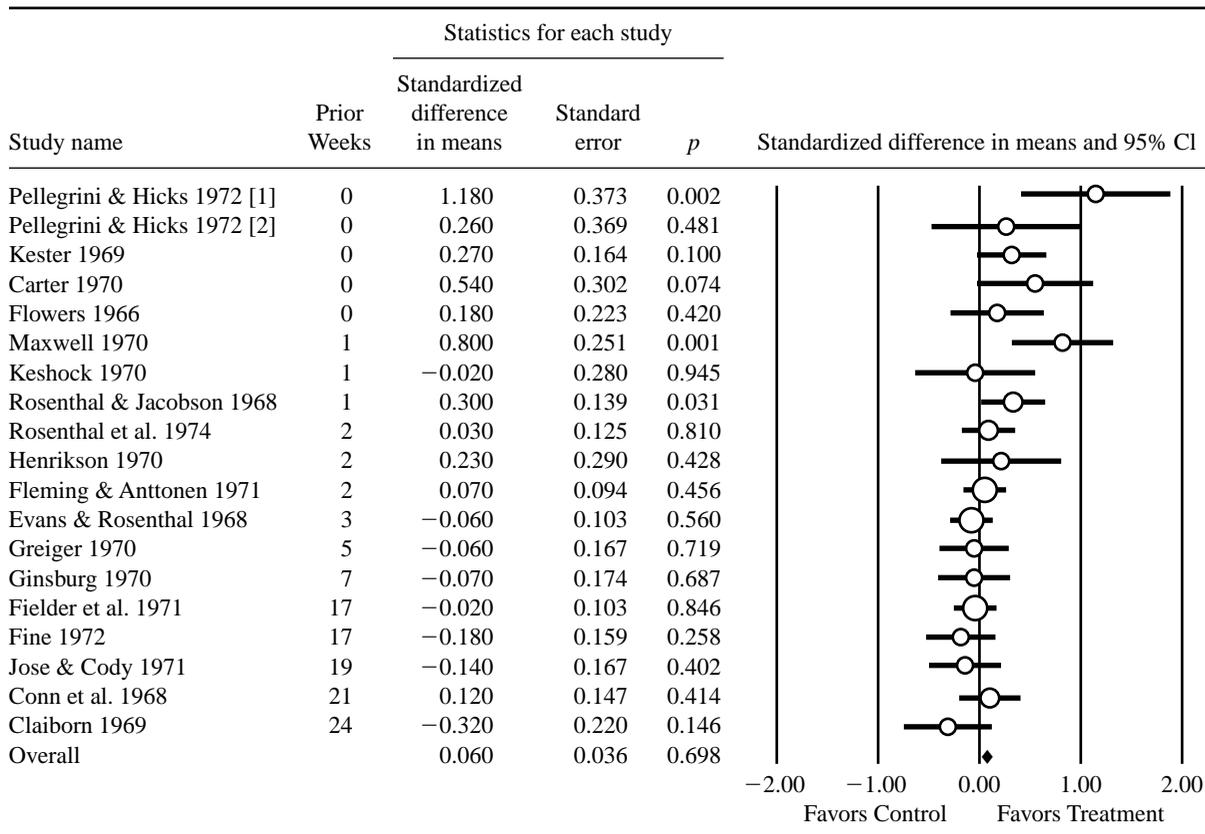| Group by Ability Control | Study name | Sections | Statistics for each study | | | | Correlation and 95% CI |
			Correlation	Lower limit	Upper limit	p	
Covariate Adjustment	Bryson 1974	20	0.560	0.156	0.803	0.009	
	Centra 1977 [1]	13	0.230	−0.368	0.693	0.459	
	Centra 1977 [2]	22	0.640	0.299	0.836	0.001	
	Crooks & Smock 1974	28	0.490	0.143	0.730	0.007	
	Doyle & Crichton 1978	12	−0.040	−0.600	0.546	0.904	
	Doyle & Whitely 1974	12	0.490	−0.117	0.830	0.108	
	Elliot 1950	36	0.330	0.002	0.594	0.049	
	Frey, Leonard & Beatty 1976	12	0.180	−0.439	0.683	0.585	
	Greenwood et al. 1976	36	−0.110	−0.423	0.227	0.526	
	Hoffman 1978	75	0.270	0.046	0.468	0.019	
	McKeachie et al. 1971	33	0.260	−0.091	0.554	0.145	
	Marsh et al. 1956	121	0.400	0.239	0.540	0.000	
	Remmer et al. 1949	37	0.490	0.197	0.702	0.002	
	Wherry 1952	20	0.160	−0.304	0.563	0.506	
Covariate Subtotal			*0.339*	*0.253*	*0.419*	*0.000*	
Random Assignment	Bolton et al. 1979	10	0.680	0.088	0.917	0.028	
	Ellis & Richard 1977	19	0.580	0.171	0.819	0.008	
	Sullivan & Skanes 1974 [1]	14	0.510	−0.028	0.819	0.062	
	Sullivan & Skanes 1974 [2]	40	0.400	0.101	0.633	0.010	
	Sullivan & Skanes 1974 [3]	16	0.340	−0.187	0.715	0.202	
	Sullivan & Skanes 1974 [4]	14	0.420	−0.142	0.777	0.138	
Random Subtotal			*0.465*	*0.293*	*0.607*	*0.000*	
Overall			0.363	0.287	0.434	0.000	

−2.00 −1.00 0.00 1.00 2.00
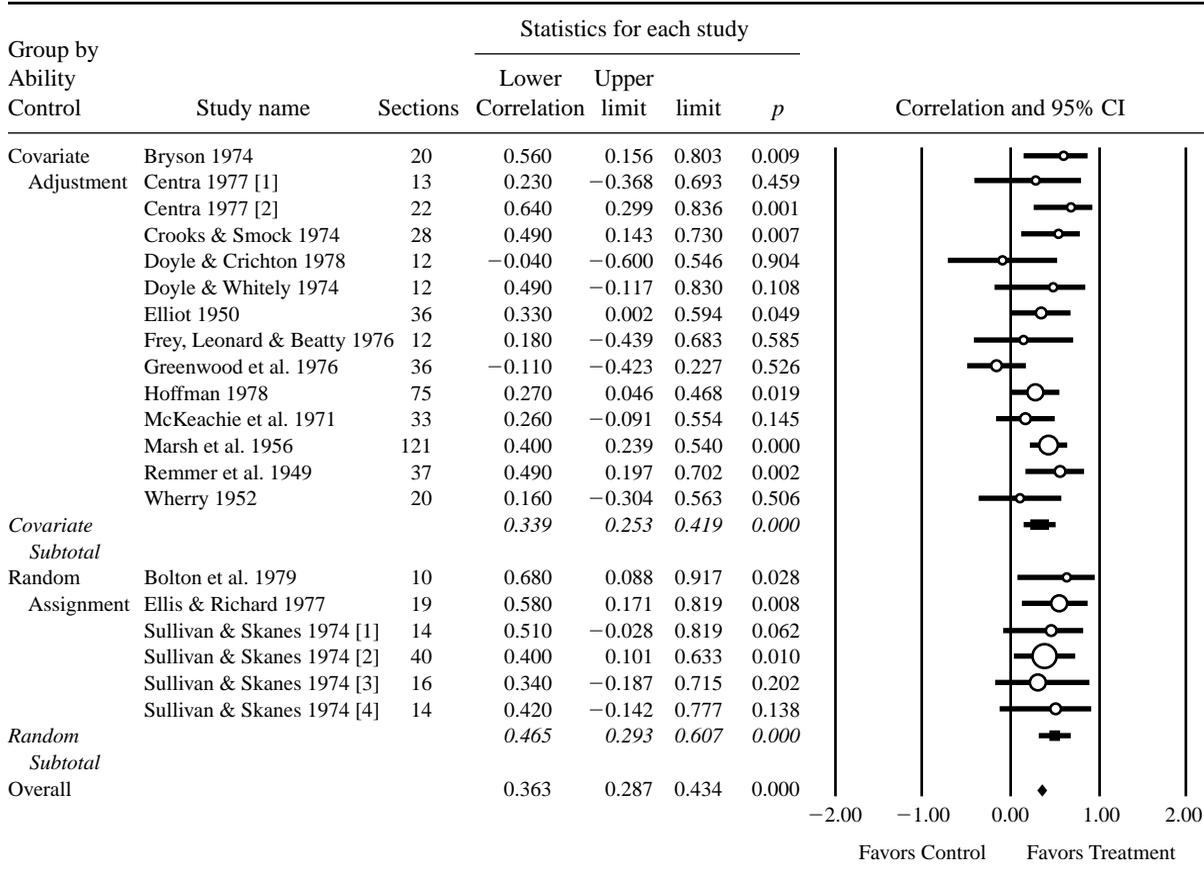
Favors Control   Favors Treatment

Figure 26.10 Forest Plot of Validity Studies Correlating Instructor Ratings and Student Achievement Grouped by Ability Control

SOURCE: Authors' compilation using data from Cohen 1983.

NOTE: Cohen (1983); studies with sample sizes less than ten were excluded.

Table 26.1 Types of Tabular and Graphic Summaries Used in All Meta-Analyses

Volume	Meta-Analyses (*n*)	Table		Figure					
		Raw Effect Size	Summary Effect Size	Any Graph	Effect Size Dist.	Funnel Plot	Other Graphs	Represents Uncertainty	Represents Summary Effect
Psychological Bulletin									
1985–1991	74	41	57	14	8	1	8	NA	NA
Percentage of Total		*55%*	*77%*	*19%*	*11%*	*1%*	*11%*		
Psychological Bulletin									
2000	11	7	10	6	2	1	5	2	1
2001	5	3	4						
2002	11	9	11	7	6		3	1	
2003	14	10	11	9	6	2	1	1	
2004	9	9	8	5	3	4	2	1	1
2005	10	5	9	4	2	1	4	2	1
2000–2005	60	43	53	31	19	8	15	7	3
Percentage of Total		*72%*	*88%*	*52%*	*32%*	*13%*	*25%*	*12%*	*5%*
Review of Educational Research									
2000	2	2	2	1					
2001	4	2	4	2	2		1		
2002	2	2	1	2	2		1		
2003	3	3	3	2	2				
2004	4	3	4	3	3	1	1		1
2005	5	4	4	3	1	1	1		
2000–2005	20	16	18	13	10	2	4	0	1
Percentage of Total		*80%*	*90%*	*65%*	*50%*	*10%*	*20%*	*0%*	*5%*

SOURCE: Authors' compilation (Light, Singer, and Willet 1994).

Table 27.1 Meta-Analysis Reporting Standards (MARS)

Paper Section and Topic	Description
Title	• Make it clear that the report describes a research synthesis and include meta-analysis, if applicable Footnote funding source(s)
Abstract	• The problem or relation(s) under investigation • Study eligibility criteria • Type(s) of participants included in primary studies • Meta-analysis methods (indicating whether a fixed or random model was used) • Main results (including the more important effect sizes and any important moderators of these effect sizes) • Conclusions (including limitations) • Implications for theory, policy and/or practice
Introduction	• Clear statement of the question or relation(s) under investigation ◦ Historical background ◦ Theoretical, policy and/or practical issues related to the question or relation(s) of interest ◦ Rationale for the selection and coding of potential moderators and mediators of results ◦ Types of study designs used in the primary research, their strengths and weaknesses ◦ Types of predictor and outcome measures used, their psychometric characteristics ◦ Populations to which the question or relation is relevant ◦ Hypotheses, if any
Method	• Operational characteristics of independent (predictor) and dependent (outcome) variable(s)
Inclusion and exclusion criteria	• Eligible participant populations • Eligible research design features (random assignment only, minimal sample size) • Time period in which studies needed to be conducted • Geographical and/or cultural restrictions
Moderator and mediator analyses	• Definition of all coding categories used to test moderators or mediators of the relation(s) of interest • Reference and citation databases searched • Registries (including prospective registries) searched ◦ Keywords used to enter databases and registries ◦ Search software used and version (Ovid) • Time period in which studies needed to be conducted, if applicable
Search strategies	• Other efforts to retrieve all available studies, ◦ Listservs queried ◦ Contacts made with authors (and how authors were chosen) ◦ Reference lists of reports examined • Method of addressing reports in languages other than English • Process for determining study eligibility ◦ Aspects of reports were examined (i.e., title, abstract, and/or full text) ◦ Number and qualifications of relevance judges ◦ Indication of agreement • How disagreements were resolved • Treatment of unpublished studies • Number and qualifications of coders (e.g., level of expertise in the area, training) • Intercoder reliability or agreement • Whether each report was coded by more than one coder and if so, how disagreements were resolved

(*Continued*)

Table 27.1 (*Continued*)

Paper Section and Topic	Description

Coding procedures	• Assessment of study quality
	  ◦ If a quality scale was employed, a description of criteria and the procedures for application
	  ◦ If study design features were coded, what these were
	• How missing data were handled
	• Effect size metric(s)
	  ◦ Effect sizes calculating formulas (means and SDs, use of univariate *F* to *r* transform, and so on)
	  ◦ Corrections made to effect sizes (small sample bias, correction for unequal *n*s, and so on)
	• Effect size averaging or weighting method(s)
	• How effect-size confidence intervals (or standard errors) were calculated
	• How effect-size credibility intervals were calculated, if used
	• How studies with more than one effect size were handled

Statistical methods	• Whether fixed or random effects models were used and the model choice justification • How heterogeneity in effect sizes was assessed or estimated • Means and SDs for measurement artifacts, if construct-level relationships were the focus • Tests and any adjustments for data censoring (publication bias, selective reporting) • Tests for statistical outliers • Statistical power of the meta-analysis • Statistical programs or software packages used to conduct statistical analyses

Results	• Number of citations examined for relevance
	• List of citations included in the synthesis
	• Number of citations relevant on many but not all inclusion criteria excluded from the meta-analysis
	  ◦ Number of exclusions for each exclusion criteria (effect size could not be calculated), with examples
	• Table giving descriptive information for each included study, including effect size and sample size
	• Assessment of study quality, if any
	• Tables and/or graphic summaries
	  ◦ Overall characteristics of the database (number of studies with different research designs)
	  ◦ Overall effect size estimates, including measures of uncertainty (confidence and/or credibility intervals)
	• Results of moderator and mediator analyses (analyses of subsets of studies)
	  ◦ Number of studies and total sample sizes for each moderator analysis
	  ◦ Assessment of interrelations among variables used for moderator and mediator analyses
	  ◦ Assessment of bias including possible data censoring

Discussion	• Statement of major findings
	• Consideration of alternative explanations for observed results
	  ◦ Impact of data censoring
	• Generalizability of conclusions,
	  ◦ Relevant populations
	  ◦ Treatment variations
	  ◦ Dependent (outcome) variables
	  ◦ Research designs, and so on
	• General limitations (including assessment of the quality of studies included)
	• Implications and interpretation for theory, policy, or practice
	• Guidelines for future research

Table 28.1   Threats to Inferences About Existence of Association Between Treatment and Outcome Classes

(1)   Unreliability in primary studies
(2)   Restriction of range in primary studies
(3)   Missing effect sizes in primary studies
(4)   Unreliability of codings in meta-analyses
(5)   Capitalizing on chance in meta-analyses
(6)   Biased effect size sampling
(7)   Publication bias
(8)   Bias in computing effect sizes
(9)   Lack of statistical independence among effect sizes
(10) Failure to weight effect sizes proportional to their precision
(11) Underjustified use of fixed or random effects models
(12) Lack of statistical power for detecting an association

Table 28.2 Threats to Inferences About Causal Nature of Relationship Between Treatment and Outcome Classes

(1) Absence of studies with successful random assignment
(2) Primary study attrition

Table 28.3 Threats to Generalized Inferences in Research Syntheses

Inferences to Target Constructs and Universes
- (1) Sampling biases associated with the persons, treatments, outcomes, settings, and times
- (2) Underrepresentation of prototypical attributes
- (3) Restricted heterogeneity of substantively irrelevant third variables
- (4) Mono-operation bias
- (5) Mono-method bias
- (6) Rater drift
- (7) Reactivity effects

Inferences about Robustness and Moderating Conditions
- (8) Restricted heterogeneity in universes of persons, treatments, outcomes, settings, and times
- (9) Moderator variable confounding
- (10) Failure to test for homogeneity of effect sizes
- (11) Lack of statistical power for homogeneity tests
- (12) Lack of statistical power for studying disaggregated groups
- (13) Misspecification of causal mediating relationships

Extrapolations to Novel Constructs and Universes
- (14) Misspecification of models for extrapolation

SOURCE: Authors' compilation.

Table 29.1 Scales and Checklists for Evaluating Research Syntheses Located by the Agency for Healthcare Research and Quality

Auperin, A., J. P. Pignon, and T. Poynard. 1997. "Review Article: Critical Review of Meta-Analyses of Randomized Clinical Trials in Hepatogastroenterology." *Alimentary Pharmacology and Therapeutics* 11(2): 215–25.

Beck, C. T. 1997. "Use of Meta-Analysis as a Teaching Strategy in Nursing Research Courses." *Journal of Nursing Education* 36(2): 87–90.

Clarke, Mike, and Andy D. Oxman, eds. 1999. *Cochrane Reviewer's Handbook 4.0*. Oxford: The Cochrane Collaboration.

Harbour, R., and J. Miller. 2001. "A New System for Grading Recommendations in Evidence-Based Guidelines." *British Medical Journal* 323(7308): 334–36.

Irwig, L., A.N.A. Tosteson, C. Gatsonis, J. Lau, G. Colditz, T. C. Chalmers, and F. Mosteller. 1994. "Guidelines for Meta-Analyses Evaluating Diagnostic Tests." *Annals of Internal Medicine* 120(8): 667–76.

Khan, K. S., G. Ter Riet, J. Glanville, A. J. Sowden, and J. Kleijnen. 2000. *Undertaking Systematic Reviews of Research on Effectiveness: CRD's Guidance for Carrying Out or Commissioning Reviews*. York: University of York, NHS Centre for Reviews and Dissemination.

Oxman, Andy D., and Gordon H. Guyatt. 1991. "Validation of an Index of the Quality of Review Articles." *Journal of Clinical Epidemiology* 44(11): 1271–78.

Sacks, H. S., J. Berrier, D. Reitnam, V. A. Ancona-Berk, and T. C. Chalmers. 1987. "Meta-Analyses of Randomized Controlled Trials." *New England Journal of Medicine* 316(8): 450–55.

Scottish Intercollegiate Guidelines Network. 2001. *Sign 50: A Guideline Developers' Handbook. Methodology Checklist 1: Systematic Reviews and Meta-Analyses*. Edinburgh: Scottish Intercollegiate Guidelines Network. http://www.sign.ac.uk/guidelines/fulltext/50/checklist1.html

Smith, Andrew. F. 1997. "An Analysis of Review Articles Published in Four Anaesthesia Journals." *Canadian Journal of Anaesthesia* 44(4): 405–9.

West Suzanne, Valerie King, Timothy S. Carey, Kathleen N. Lohr, Nikki McKoy, Sonya F. Sutton, and Linda Lux. 2002. *Systems to Rate the Strength of Scientific Evidence*. Evidence Report/Technology Assessment 47. *AHRQ* Publication 02-E016. Rockville, Md.: Agency for Healthcare Research and Quality.

Table 29.2 Checklist of Questions for Evaluating Research Syntheses

Defining the problem
1. Are the variables of interest given clear conceptual definitions?
2. Do the operations that empirically define the variables of interest correspond to the variables' conceptual definitions?
3. Is the problem stated so that the research designs and evidence needed to address it can be specified clearly?
4. Is the problem placed in a meaningful theoretical, historical, or practical context?

Collecting the research evidence
5. Were complementary searching strategies used to find relevant studies?
6. Were proper and exhaustive terms used in searches and queries of reference databases and research registries?
7. Were procedures employed to assure the unbiased and reliable application of criteria to determine the substantive relevance of studies, and retrieval of information from study reports?

Evaluating the correspondence between the methods and implementation of individual studies and the desired inferences of the synthesis
8. Were studies categorized so that important distinctions could be made among them regarding their research design and implementation?
9. If studies were excluded from the synthesis because of design and implementation considerations, where these considerations explicitly and operationally defined, and consistently applied to all studies?

Summarizing and integrating the evidence from individual studies
10. Was an appropriate method used to combine and compare results across studies?
11. If effect sizes were calculated, was an appropriate effect size metric used?
12. If a meta-analysis was performed were average effect sizes and confidence intervals reported, and was an appropriate model used to estimate the independent effects and the error in effect sizes?
13. If a meta-analysis was performed, was the homogeneity of effect sizes tested?
14. Were study design and implementation features (as suggested by question 8) along with other critical features of studies, including historical, theoretical and practical variables (as suggested by question 4) tested as potential moderators of study outcomes?

Interpreting the cumulative evidence
15. Were analyses carried out that tested whether results were sensitive to statistical assumptions and, if so, where these analyses used to help interpret the evidence?
16. Did the research synthesists discuss the extent of missing data in the evidence base and examine its potential impact on the synthesis' findings?
17. Did the research synthesists discuss the generality and limitations of the synthesis findings?
18. Did the synthesists make the appropriate distinction between study-generated and synthesis-generated evidence when interpreting the synthesis' results?
19. If a meta-analysis was performed, did the synthesists contrast the magnitude of effects with other related effect sizes and/or present a practical interpretation of the significance of the effects?

Presenting the research synthesis methods and results
20. Were the procedures and results of the research synthesis clearly and completely documented?

Table A.1 Data Set I: Studies of Gender Differences in Conformity

Study	Total Sample Size	Effect Size Estimate	Male Authors (%)	Items (n)
King 1959	254	.35	100	38
Wyer 1966	80	.37	100	5
Wyer 1967	125	−.06	100	5
Sampson and Hancock 1967	191	−.30	50	2
Sistrunk 1971	64	.69	100	30
Sistrunk and McDavid 1967 [1]	90	.40	100	45
Sistrunk and McDavid 1967 [4]	60	.47	100	45
Sistrunk 1972	20	.81	100	45
Feldman-Summers et al. 1977 [1]	141	−.33	25	2
Feldman-Summers et al. 1977 [2]	119	.07	25	2

NOTE: These data are from Eagly and Carli 1981 and Becker 1986.

Table A.2 Data Set II: Studies of the Effects of Teacher Expectancy on Pupil IQ

Study	Estimated Weeks of Teacher-Student Contact Prior to Expectancy Induction	d	Standard Error
Rosenthal et al. 1974	2	.03	.125
Conn et al. 1968	21	.12	.147
Jose and Cody 1971	19	−.14	.167
Pellegrini and Hicks 1972 [1]	0	1.18	.373
Pellegrini and Hicks 1972 [2]	0	.26	.369
Evans and Rosenthal 1968	3	−.06	.103
Fielder et al. 1971	17	−.02	.103
Claiborn 1969	24	−.32	.220
Kester 1969	0	.27	.164
Maxwell 1970	1	.80	.251
Carter 1970	0	.54	.302
Flowers 1966	0	.18	.223
Keshock 1970	1	−.02	.289
Henrikson 1970	2	.23	.290
Fine 1972	17	−.18	.159
Greiger 1970	5	−.06	.167
Rosenthal and Jacobson 1968	1	.30	.139
Fleming and Anttonen 1971	2	.07	.094
Ginsburg 1970	7	−.07	.174

NOTE: These data are from Raudenbush and Bryk 1985; see also Raudenbush 1984.

Table A.3 Data Set III: Validity Studies Correlating Student Ratings of the Instructor with Student Achievement

Study	Sample	Ability Control	n[a]	r
Bolton et al. 1979	General psychology	Random assignment	10	.68
Bryson 1974	College algebra	CIAT pretest	20	.56
Centra 1977 [1]	General biology	Final exam for prior	13	.23
Centra 1977 [2]	General psychology	semester of same course	22	.64
Crooks and Smock 1974	General physics	Math pretest	28	.49
Doyle and Crichton 1978	Introductory communications	PSAT verbal score	12	$-.04$
Doyle and Whitely 1974	Beginning French aptitude test	Minnesota Scholastic	12	.49
Elliot 1950	General chemistry	College entrance exam scores	36	.33
Ellis and Richard 1977	General psychology	Random assignment	19	.58
Frey, Leonard and Beatty 1975	Introductory calculus	SAT math scores	12	.18
Greenwood et al. 1976	Analytic geometry and calculus	Achievement pretest	36	$-.11$
Hoffman 1978	Introductory math	SAT math scores	75	.27
McKeachie et al. 1971	General psychology	Intelligence test scores	33	.26
Marsh et al. 1956	Aircraft mechanics	Hydraulics pretest	121	.40
Remmer et al. 1949	General chemistry	Orientation test scores	37	.49
Sullivan and Skanes 1974 [1]	First-year science	Random assignment	14	.51
Sullivan and Skanes 1974 [2]	Introductory psychology	Random assignment	40	.40
Sullivan and Skanes 1974 [3]	First-year math	Random assignment	16	.34
Sullivan and Skanes 1974 [4]	First-year biology	Random assignment	14	.42
Wherry 1952	Introductory psychology	Ability scores	20	.16

NOTE: These data are from Cohen 1983; studies with sample sizes less than ten were excluded.

[a] Number of sections.

Table B.1 Probability that a Standard Normal Deviate Exceeds Z

					Second Digit of Z					
Z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641
.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
2.9	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
3.2	.0007									
3.3	.0005									
3.4	.0003									
3.5	.00023									
3.6	.00016									
3.7	.00011									
3.8	.00007									
3.9	.00005									
4.0	.00003									

SOURCE: Reproduced from S. Siegel, *Nonparametric Statistics* (New York: McGraw-Hill, 1956), p. *247,* with the permission of the publisher.

Table B.2 Critical Values of the Chi-Square Distribution

Degrees of Freedom	Left Tail Area						
	0.50	0.75	0.90	0.95	0.975	0.99	0.995
1	0.4549	1.323	2.706	3.841	5.025	6.635	7.879
2	1.386	2.773	4.605	5.991	7.378	9.210	10.60
3	2.366	4.108	6.251	7.815	9.348	11.34	12.84
4	3.357	5.385	7.779	9.488	11.14	13.28	14.86
5	4.351	6.626	9.236	11.07	12.83	15.09	16.75
6	5.348	7.841	10.64	12.59	14.45	16.81	18.55
7	6.346	9.037	12.02	14.07	16.01	18.48	20.28
8	7.344	10.22	13.36	15.51	17.53	20.09	21.95
9	8.343	11.39	14.68	16.92	19.02	21.67	23.59
10	9.342	12.55	15.99	18.31	20.48	23.21	25.19
11	10.34	13.70	17.28	19.68	21.92	24.72	26.76
12	11.34	14.85	18.55	21.03	23.34	26.22	28.30
13	12.34	15.98	19.81	22.36	24.74	27.69	29.82
14	13.34	17.12	21.06	23.68	26.12	29.14	31.32
15	14.34	18.25	22.31	25.00	27.49	30.58	32.80
16	15.34	19.37	23.54	26.30	28.85	32.00	34.27
17	16.34	20.49	24.77	27.59	30.19	33.41	35.72
18	17.34	21.60	25.99	28.87	31.53	34.81	37.16
19	18.34	22.72	27.20	30.14	32.85	36.19	38.58
20	19.34	23.83	28.41	31.41	34.17	37.57	40.00
21	20.34	24.93	29.62	32.67	35.48	38.93	41.40
22	21.34	26.04	30.81	33.92	36.78	40.29	42.80
23	22.34	27.14	32.01	35.17	38.08	41.64	44.18
24	23.34	28.24	33.20	36.42	39.36	42.98	45.56
25	24.34	29.34	34.38	37.65	40.65	44.31	46.93
26	25.34	30.43	35.56	38.89	41.92	45.64	48.29
27	26.34	31.53	36.74	40.11	43.19	46.96	49.64
28	27.34	32.62	37.92	41.34	44.46	48.28	50.99
29	28.34	33.71	39.09	42.56	45.72	49.59	52.34
30	29.34	34.80	40.26	43.77	46.98	50.89	53.67
31	30.34	35.89	41.42	44.99	48.23	52.19	55.00
32	31.34	36.97	42.58	46.19	49.48	53.49	56.33
33	32.34	38.06	43.75	47.40	50.73	54.78	57.65
34	33.34	39.14	44.90	48.60	51.97	56.06	58.96
35	34.34	40.22	46.06	49.80	53.20	57.34	60.27
36	35.34	41.30	47.21	51.00	54.44	58.62	61.58
37	36.34	42.38	48.36	52.19	55.67	59.89	62.88
38	37.34	43.46	49.51	53.38	56.90	61.16	64.18
39	38.34	44.54	50.66	54.57	58.12	62.43	65.48
40	39.34	45.62	51.81	55.76	59.34	63.69	66.77
50	49.33	56.33	63.17	67.50	71.42	76.15	79.49
60	59.33	66.98	74.40	79.08	83.30	88.38	91.95
70	69.33	77.58	85.53	90.53	95.02	100.4	104.2
80	79.33	88.13	96.58	101.9	106.6	112.3	116.3
90	89.33	98.65	107.6	113.1	118.1	124.1	128.3
100	99.33	109.1	118.5	124.3	129.6	135.8	140.2

(*Continued*)

Table B.2 (*Continued*)

Degrees of Freedom	Left Tail Area						
	0.50	0.75	0.90	0.95	0.975	0.99	0.995
110	109.3	119.6	129.4	135.5	140.9	147.4	151.9
120	119.3	130.1	140.2	146.6	152.2	159.0	163.6
130	129.3	140.5	151.0	157.6	163.5	170.4	175.3
140	139.3	150.9	161.8	168.6	174.6	181.8	186.8
150	149.3	161.3	172.6	179.6	185.8	193.2	198.4
160	159.3	171.7	183.3	190.5	196.9	204.5	209.8
170	169.3	182.0	194.0	201.4	208.0	215.8	221.2
180	179.3	192.4	204.7	212.3	219.0	227.1	232.6
190	189.3	202.8	215.4	223.2	230.1	238.3	244.0
200	199.3	213.1	226.0	234.0	241.1	249.4	255.3

SOURCE: Reprinted from Hedges and Olkin with permission of the publisher.

Table B.3 Fisher's *z* Transformation of *r*

r	Second Digit of r									
	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.000	.010	.020	.030	.040	.050	.060	.070	.080	.090
.1	.100	.110	.121	.131	.141	.151	.161	.172	.182	.192
.2	.203	.213	.224	.234	.245	.255	.266	.277	.288	.299
.3	.310	.321	.332	.343	.354	.365	.377	.388	.400	.412
.4	.424	.436	.448	.460	.472	.485	.497	.510	.523	.536
.5	.549	.563	.576	.590	.604	.618	.633	.648	.662	.678
.6	.693	.709	.725	.741	.758	.775	.793	.811	.829	.848
.7	.867	.887	.908	.929	.950	.973	.996	1.020	1.045	1.071
.8	1.099	1.127	1.157	1.188	1.221	1.256	1.293	1.333	1.376	1.422

r	Third Digit of r									
	.000	.001	.002	.003	.004	.005	.006	.007	.008	.009
.90	1.472	1.478	1.483	1.488	1.494	1.499	1.505	1.510	1.516	1.522
.91	1.528	1.533	1.539	1.545	1.551	1.557	1.564	1.570	1.576	1.583
.92	1.589	1.596	1.602	1.609	1.616	1.623	1.630	1.637	1.644	1.651
.93	1.658	1.666	1.673	1.681	1.689	1.697	1.705	1.713	1.721	1.730
.94	1.738	1.747	1.756	1.764	1.774	1.783	1.792	1.802	1.812	1.822
.95	1.832	1.842	1.853	1.863	1.874	1.886	1.897	1.909	1.921	1.933
.96	1.946	1.959	1.972	1.986	2.000	2.014	2.029	2.044	2.060	2.076
.97	2.092	2.109	2.127	2.146	2.165	2.185	2.205	2.227	2.249	2.273
.98	2.298	2.323	2.351	2.380	2.410	2.443	2.477	2.515	2.555	2.599
.99	2.646	2.700	2.759	2.826	2.903	2.994	3.106	3.250	3.453	3.800

SOURCE: Reprinted from Snedecor and Cochran with permission of the publisher.

NOTE: z is obtained as $ In, $\frac{I+r}{I-r}$