A meta-presentation:
Tools for building trustworthy cumulative knowledge

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“First Friday” Research Presentation
I/O Psychology Department | Virginia Tech

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****These PowerPoint slides and other resources on meta-analysis can be found at:**
https://jamiefield.github.io/research/vt2020

WestVirginiaUniversity.

John Chambers College of
Business and Economics

Personal note

- I thank Frank Bosco, Mike McDaniel, Ernest O'Boyle, George Banks, Sven Kepes, Fred Oswald, and Iain Chalmers for the use of some of their slides and/or software.

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- I also also thank Charles for being Charles!

Agenda

- What is meta-analysis and why is it so important?
- How to conduct a meta-analysis.
- The current research environment and threats to our cumulative knowledge.
- Two *free* tools that will help you with your meta-analysis.
- Past and ongoing research efforts.
- Open discussion and Q&A.

What is a meta-analysis?

- Meta-analysis is a statistical technique by which information from independent studies is assimilated (Field, 2011)
  - Effectively, meta-analysis uses statistical procedures to determine the best estimate (i.e., a fancy weighted average) of the population effect size (McDaniel, 2014)
- Meta-analysis examines whether or not the effect is uniform, or varies
  - In the event that the effect varies across studies, meta-analytic procedures assist the researcher in determining the sources of variation

Why are meta-analyses so important?

- They are the primary way to summarize, integrate, and synthesize areas of research (Schmidt & Hunter, 2015)
  - Allows fields to build cumulative scientific knowledge (Kepes & McDaniel, 2015)
  - Meta-analytic results have been referred to as the “building blocks of theory” (Schmidt, 1992)

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- "There are research syntheses in such diverse topics as advertising, agriculture, archaeology, astronomy, biology, chemistry, criminology, ecology, education, entomology, law, manufacturing, parapsychology, psychology, public policy, zoology and *even of eyewitness accounts of the Indian rope trick*." (italics added for emphasis; Petticrew, BMJ 2001)

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  - Meta-analytic results have been referred to as the “building blocks of theory” (Schmidt, 1992)
- Meta-analytic results serve as input for other analytic techniques
  - Relative importance analysis (see Banks et al., 2015)
  - Meta-analytic structural equation modeling (see Bennett et al., 2018)

Why are meta-analyses so important?

- Meta-analytic results often are used to inform evidence-based practice decision (across most industries)
  - Utility analyses (see Hancock et al., 2012; Kepes & McDaniel, 2015)

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- Consequences of not taking research synthesis seriously…

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- The theory
  - Patients with arrhythmias are at increased risk of early death following a heart attack

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- Consequences of not taking research synthesis seriously…
- The theory
  - Patients with arrhythmias are at increased risk of early death following a heart attack
  - Anti-arrhythmic drugs reduce arrhythmias after heart attack
  - These drugs should reduce early death after heart attack

Why are meta-analyses so important?

- Consequences of not taking research synthesis seriously…
- The evidence
  - A 1983 systematic review of 14 RCTs of anti-arrhythmic drugs in heart attack revealed…

    "The theoretical potential for a preventive or prophylactic effect of antiarrhythmic drugs….. in the treatment of coronary patients with ventricular arrhythmias has not been realized." (Furberg, 1983)

Why are meta-analyses so important?

- Consequences of not taking research synthesis seriously…
- The evidence (even more!)
  - A 1993 systematic review of 51 RCTs of anti-arrhythmic drugs in heart attack revealed (Teo et al., 1993) revealed…
    - 660 deaths among 11,712 patients allocated drugs
    - 571 deaths among 11,517 patients allocated to control

Why are meta-analyses so important?

- Consequences of not taking research synthesis seriously…
- The consequence
  - At the peak of their use in the late 1980s, it has been estimated that, on an annual basis, anti-arrhythmic drugs were causing comparable numbers of deaths to the total number of Americans who died in the Vietnam war (Moore 1995)

Why are meta-analyses so important?

- Consequences of not taking research synthesis seriously…
- How could this have been avoided?
  - The discovery that these drugs are lethal could have been made a decade earlier if the Discussion sections in each report of a new trial had set the new results in the context of a systematic review of the results of all previous trials – in other words, *if scientists had cumulated evidence scientifically*.

Another personal note…

Another personal note…

- Lord Rayleigh, 1884
  - “The work which deserves, but I am afraid does not always receive, the most credit is that in which discovery and explanation go hand in hand, in which not only are new facts presented, *but their relation to old ones is pointed out*.”
- Luc de Clapiers Vauvenarques, 1715-1747
  - “It is easier to say something new than to reconcile things that have already been said.”

How to conduct a meta-analysis

- Does anyone in the room know how to conduct a meta-analysis?

How to conduct a meta-analysis

- Cooper's (2016) seven stages of a meta-analysis (book available here)
  - Step 1: Problem formulation
  - Step 2: Searching the literature
  - Step 3: Gathering information from studies
  - Step 4: Evaluating the quality of studies
  - Step 5: Analyzing and integrating the outcomes of studies
  - Step 6: Interpreting the evidence
  - Step 7: Presenting the results

How to conduct a meta-analysis

- Step 1: Problem formulation
  - A clearly defined, explicit question will help you to…
    - Collect studies
    - Check which studies should be included
    - Conduct the analysis
    - Interpret the results

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- Step 1: Problem formulation
  - A clearly defined, explicit question will help you to…
    - Collect studies
    - Check which studies should be included
    - Conduct the analysis
    - Interpret the results
  - Advice: Consider pre-registering your meta-analysis (see https://cos.io/prereg/)

How to conduct a meta-analysis

- Step 2: Searching the literature
  - Predefine inclusion and exclusion criteria based on problem formulation (i.e., Step 1)
  - Search comprehensively (all domains; related terms no language restrictions; published and unpublished literature; up-to-date)
  - Document the search!

How to conduct a meta-analysis

- Step 2: Searching the literature (Be transparent: Bad example)
  - "We conducted a search of the OCB literature by using a number of online databases (e.g., Web of Science, PsycINFO) as well as by examining the reference lists of previous reviews." (Hoffman et al. 2007)

How to conduct a meta-analysis

- Step 2: Searching the literature (Be transparent: Good example)
  - We began with an automated search of PsycINFO (Psychological Abstracts) and ABI/Inform using the key words compensation satisfaction, pay satisfaction, compensation equity, pay equity, compensation fairness, and pay fairness. We also searched manually 12 journals for the years 1960 through 2003: *Academy of Management Journal, Administrative Science Quarterly, Human Relations, Industrial and Labor Relations Review, Industrial Relations, Journal of Applied Psychology, Journal of Management, Journal of Organizational Behavior, Journal of Occupational and Organizational Psychology, Journal of Vocational Behavior, Organizational Behavior and Human Decision Processes,* and *Personnel Psychology*. (Williams et al., 2006)

How to conduct a meta-analysis

- Step 2: Searching the literature (Be transparent: Good example [cont.])
  - We chose the year 1960 to begin this search because the first formal attempts to measure pay satisfaction (e.g., the JDI; Smith et al., 1969) and the first theories of pay satisfaction (e.g., Lawler, 1971) were developed in the 1960s and early 1970s, and we were unaware of any empirical work on pay level satisfaction before that time. We also examined the empirical studies that included pay level satisfaction for references to other publications or articles that might have included pay level satisfaction (Williams et al., 2006)
  - Link to PRISMA flow diagram

How to conduct a meta-analysis

- Steps 3 & 4: Gathering information from studies and evaluating the quality of studies
  - Also referred to as the dreaded coding stage!

How to conduct a meta-analysis

Step 1 Step 2 Step 3 Step 4 Step 5 Step 6 Step 7

- A sample data coding form

Study ID	Sample ID	Time	DOI	Title	Pub year	X	Y	N	r	ryy	rxx
1	1	1	doi.org/xxx	Article title	2005	Job satisfaction	Turnover intention	356	.21	.89	.93
2	1	1	doi.org/xxx	Article title	2012	Job satisfaction	Intent to quit	415	.18	.85	.90
2	1	2	doi.org/xxx	Article title	2012	Job satisfaction	Intent to quit	415	.15	.87	.89
3	1	1	doi.org/xxx	Article title	1995	Job dissatisfaction	Withdrawal cognitions	264	-.19	.81	.89
3	2	1	doi.org/xxx	Article title	1995	Job dissatisfaction	Withdrawal cognitions	189	.24	.83	.79

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How to conduct a meta-analysis

Step 1 | Step 2 | Step 3 | Step 4 | Step 5 | Step 6 | Step 7

- A sample data coding form

It is good practice to have multiple coders so that inter-rater agreement can be checked!!

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How to conduct a meta-analysis

- Your data coding form should also include theoretically- and methodologically-relevant moderators
  - Sample type
  - Sample location
  - Gender
  - What are some other examples?

How to conduct a meta-analysis

Step 1 | Step 2 | Step 3 | Step 4 | Step 5 | Step 6 | Step 7

- Step 5: Analyzing and integrating the outcomes of studies

Approaches to meta-analysis
Hunter and Schmidt
Random effects
Common in organizational sciences
Can correct for sampling, measurement error, and range restriction

How to conduct a meta-analysis

- Step 5: Analyzing and integrating the outcomes of studies

Approaches to meta-analysis	
Hunter and Schmidt	Hedges and Olkin
Random effects	Random and fixed effects
Common in organizational sciences	Common in other social and medical sciences
Can correct for sampling, measurement error, and range restriction	Corrects for sampling error only

How to conduct a meta-analysis

- Step 5: Analyzing and integrating the outcomes of studies
  - What actually goes on under the hood? Let's take a quick look…

Hunter & Schmidt approach

Coding sheet			
N	*r*	ryy	rxx
356	.21	.89	.93
415	.18	.85	.90
415	.15	.87	.89
264	.19	.81	.89
189	.24	.83	.79

Hunter & Schmidt approach

Coding sheet				
N	*r*	ryy	rxx	*z*
356	.21	.89	.93	0.213171347
415	.18	.85	.90	0.181982689
415	.15	.87	.89	0.151140436
264	.19	.81	.89	0.192337169
189	.24	.83	.79	0.244774113

Hunter & Schmidt approach

Coding sheet					
N	*r*	ryy	rxx	*z*	(N * *z*)
356	.21	.89	.93	0.213171347	75.88899938
415	.18	.85	.90	0.181982689	75.52281577
415	.15	.87	.89	0.151140436	62.72328091
264	.19	.81	.89	0.192337169	50.77701267
189	.24	.83	.79	0.244774113	46.26230729

Hunter & Schmidt approach

Coding sheet					
N	*r*	ryy	rxx	*z*	(N * *z*)
356	.21	.89	.93	0.213171347	75.88899938
415	.18	.85	.90	0.181982689	75.52281577
415	.15	.87	.89	0.151140436	62.72328091
264	.19	.81	.89	0.192337169	50.77701267
189	.24	.83	.79	0.244774113	46.26230729
1639					311.174416

Hunter & Schmidt approach

Coding sheet					
N	*r*	ryy	rxx	*z*	(N * *z*)
356	.21	.89	.93	0.213171347	75.88899938
415	.18	.85	.90	0.181982689	75.52281577
415	.15	.87	.89	0.151140436	62.72328091
264	.19	.81	.89	0.192337169	50.77701267
189	.24	.83	.79	0.244774113	46.26230729
1639					311.174416

$$\bar{z} = {\sum(N*z)}/{\sum N}$$

$$\bar{z} = {311.174416}/{1{,}639}$$

$$\bar{z} = .189856264$$

Hunter & Schmidt approach

Coding sheet					
N	*r*	ryy	rxx	*z*	(N * *z*)
356	.21	.89	.93	0.213171347	75.88899938
415	.18	.85	.90	0.181982689	75.52281577
415	.15	.87	.89	0.151140436	62.72328091
264	.19	.81	.89	0.192337169	50.77701267
189	.24	.83	.79	0.244774113	46.26230729
1639					311.174416

$$\bar{z} = {\sum(N*z)}/{\sum N}$$

$$\bar{z} = {311.174416}/{1{,}639}$$

$$\bar{z} = .189856264$$

$$\bar{r} = .187607532$$

Hedges and Olkin approach

Coding sheet			
N	*r*	ryy	rxx
356	.21	.89	.93
415	.18	.85	.90
415	.15	.87	.89
264	.19	.81	.89
189	.24	.83	.79

Hedges and Olkin approach

Coding sheet				
N	*r*	ryy	rxx	*z*
356	.21	.89	.93	0.213171347
415	.18	.85	.90	0.181982689
415	.15	.87	.89	0.151140436
264	.19	.81	.89	0.192337169
189	.24	.83	.79	0.244774113

Hedges and Olkin approach

Coding sheet					(N - 3)
N	*r*	ryy	rxx	*z*	*w*
356	.21	.89	.93	0.213171347	353
415	.18	.85	.90	0.181982689	412
415	.15	.87	.89	0.151140436	412
264	.19	.81	.89	0.192337169	261
189	.24	.83	.79	0.244774113	186

Hedges and Olkin approach

Coding sheet					(N - 3)	(1/N – 3)
N	*r*	ryy	rxx	*z*	*w*	*vi*
356	.21	.89	.93	0.213171347	353	0.002833
415	.18	.85	.90	0.181982689	412	0.002427
415	.15	.87	.89	0.151140436	412	0.002427
264	.19	.81	.89	0.192337169	261	0.003831
189	.24	.83	.79	0.244774113	186	0.005376

Hedges and Olkin approach

Coding sheet					(N - 3)	(1/N – 3)	$\sqrt{vi}$
N	*r*	ryy	rxx	*z*	*w*	*vi*	sei
356	.21	.89	.93	0.213171347	353	0.002833	0.053225
415	.18	.85	.90	0.181982689	412	0.002427	0.049266
415	.15	.87	.89	0.151140436	412	0.002427	0.049266
264	.19	.81	.89	0.192337169	261	0.003831	0.061898
189	.24	.83	.79	0.244774113	186	0.005376	0.073324

Hedges and Olkin approach

Coding sheet					(N - 3)	(1/N – 3)	$\sqrt{vi}$	$1/\sqrt{vi}$
N	*r*	ryy	rxx	*z*	*w*	*vi*	sei	inv.sei
356	.21	.89	.93	0.213171347	353	0.002833	0.053225	18.78829
415	.18	.85	.90	0.181982689	412	0.002427	0.049266	20.29778
415	.15	.87	.89	0.151140436	412	0.002427	0.049266	20.29778
264	.19	.81	.89	0.192337169	261	0.003831	0.061898	16.15549
189	.24	.83	.79	0.244774113	186	0.005376	0.073324	13.63818

Hedges and Olkin approach

Coding sheet					(N - 3)	(1/N – 3)	$\sqrt{vi}$	$1/\sqrt{vi}$	
N	*r*	ryy	rxx	*z*	*w*	*vi*	sei	inv.sei	z * inv.sei
356	.21	.89	.93	0.213171347	353	0.002833	0.053225	18.78829	4.005126
415	.18	.85	.90	0.181982689	412	0.002427	0.049266	20.29778	3.693845
415	.15	.87	.89	0.151140436	412	0.002427	0.049266	20.29778	3.067816
264	.19	.81	.89	0.192337169	261	0.003831	0.061898	16.15549	3.107302
189	.24	.83	.79	0.244774113	186	0.005376	0.073324	13.63818	3.338274

Hedges and Olkin approach

Coding sheet					(N - 3)	(1/N – 3)	$\sqrt{vi}$	$1/\sqrt{vi}$	
N	*r*	ryy	rxx	*z*	*w*	*vi*	sei	inv.sei	z * inv.sei
356	.21	.89	.93	0.213171347	353	0.002833	0.053225	18.78829	4.005126
415	.18	.85	.90	0.181982689	412	0.002427	0.049266	20.29778	3.693845
415	.15	.87	.89	0.151140436	412	0.002427	0.049266	20.29778	3.067816
264	.19	.81	.89	0.192337169	261	0.003831	0.061898	16.15549	3.107302
189	.24	.83	.79	0.244774113	186	0.005376	0.073324	13.63818	3.338274
								89.17754	17.21236

Hedges and Olkin approach

Coding sheet					(N - 3)	(1/N – 3)	$\sqrt{vi}$	$1/\sqrt{vi}$	
N	*r*	ryy	rxx	*z*	*w*	*vi*	sei	inv.sei	z * inv.sei
356	.21	.89	.93	0.213171347	353	0.002833	0.053225	18.78829	4.005126
415	.18	.85	.90	0.181982689	412	0.002427	0.049266	20.29778	3.693845
415	.15	.87	.89	0.151140436	412	0.002427	0.049266	20.29778	3.067816
264	.19	.81	.89	0.192337169	261	0.003831	0.061898	16.15549	3.107302
189	.24	.83	.79	0.244774113	186	0.005376	0.073324	13.63818	3.338274
								89.17754	17.21236

$$\bar{z} = {\sum(inv.sei * z)}/{\sum inv.sei}$$

$$\bar{z} = {17.21236}/{89.17754}$$

$$\bar{z} = .193012$$

Hedges and Olkin approach

Coding sheet					(N - 3)	(1/N – 3)	$\sqrt{vi}$	$1/\sqrt{vi}$	
N	*r*	ryy	rxx	*z*	*w*	*vi*	sei	inv.sei	z * inv.sei
356	.21	.89	.93	0.213171347	353	0.002833	0.053225	18.78829	4.005126
415	.18	.85	.90	0.181982689	412	0.002427	0.049266	20.29778	3.693845
415	.15	.87	.89	0.151140436	412	0.002427	0.049266	20.29778	3.067816
264	.19	.81	.89	0.192337169	261	0.003831	0.061898	16.15549	3.107302
189	.24	.83	.79	0.244774113	186	0.005376	0.073324	13.63818	3.338274
								89.17754	17.21236

$$\bar{z} = {\sum(inv.sei * z)}/{\sum inv.sei}$$

$$\bar{z} = {17.21236}/{89.17754}$$

$$\bar{z} = .193012$$

$$\bar{r} = .190651$$

How to conduct a meta-analysis

- Comparing the H&S and H&O results
  - H&S $\bar{r}$ = .189
  - H&O $\bar{r}$ = .191

How to conduct a meta-analysis

- Step 6: Interpreting the evidence
  - Compare the observed meta-analytic mean effect size to existing effect size benchmarks (see Bosco et al., 2015)
  - Does the 95% confidence interval include zero?
  - Do the corresponding sensitivity analysis results suggest that the observed meta-analytic mean effect size estimate is robust?

How to conduct a meta-analysis

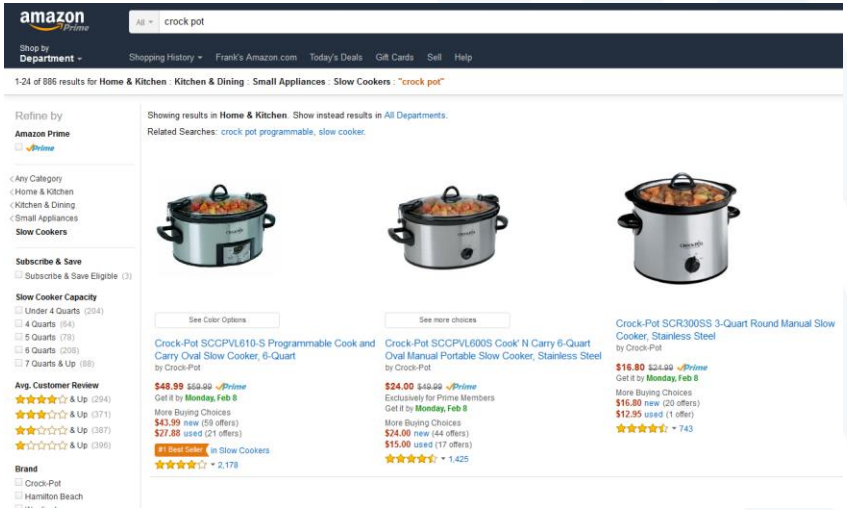
- Step 6: Presenting the evidence
  - Be transparent!

Open-source meta-analysis tools

- metaBUS
  - An instant meta-analysis tool
  - See http://metabus.org/
- Meta-Sen
  - A comprehensive sensitivity analysis tool
  - See https://metasen.shinyapps.io/gen1/

metaBUS

- How do we find crockpots?



Show results for

- Any Category
- Home & Kitchen
- Kitchen & Dining

Small Appliances

- Slow Cookers (503)
- Electric Pressure Cookers (1)
- Food Processors (1)
- Rice Cookers (7)
- Ovens & Toasters (3)
- Hot Pots (1)
- Steamers (2)

- See Less

metaBUS

- How do we find scientific findings?

metaBUS

- How do we find scientific findings?

Identification of Studies

In order to locate studies containing relationships between individual job satisfaction and job performance, we first searched the PsycINFO electronic database (1967–1999).[2] Our primary focus was on locating published studies, unpublished doctoral dissertations, and cited but unpublished manuscripts and research reports from government agencies. We also reviewed the bibliographies from previous qualitative and quantitative reviews. Finally, in order to locate studies that might not have been referenced in these sources, we manually searched the 21 journals in which most of the satisfaction–performance correlations appeared from 1983 to the present.

metaBUS

- How do we find scientific findings?

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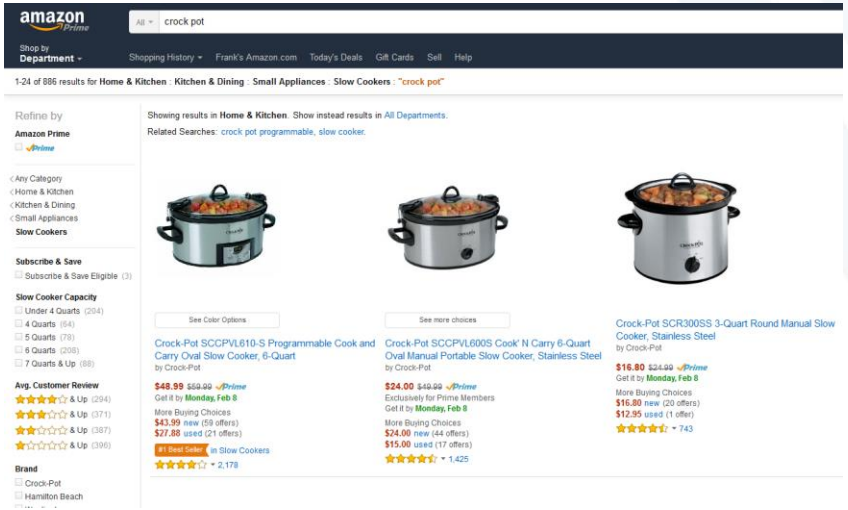
21 journals * 17 years = 357 volumes
357 volumes * 5 issues = 1,785 issues
1,785 issues * 6 articles = 10,710 articles

(Judge et al., 2001; Psychological Bulletin)

metaBUS

- Science lags behind crockpots!!



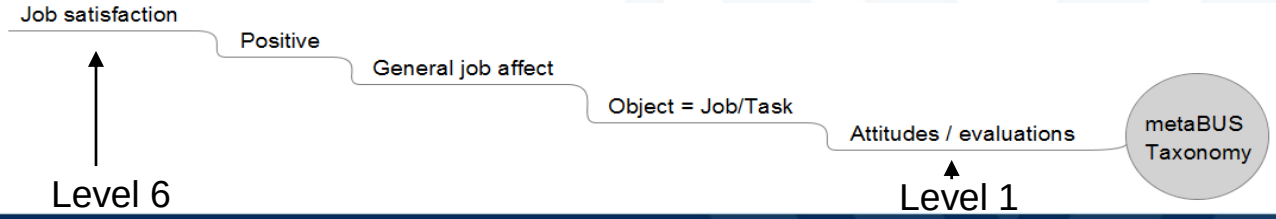
>

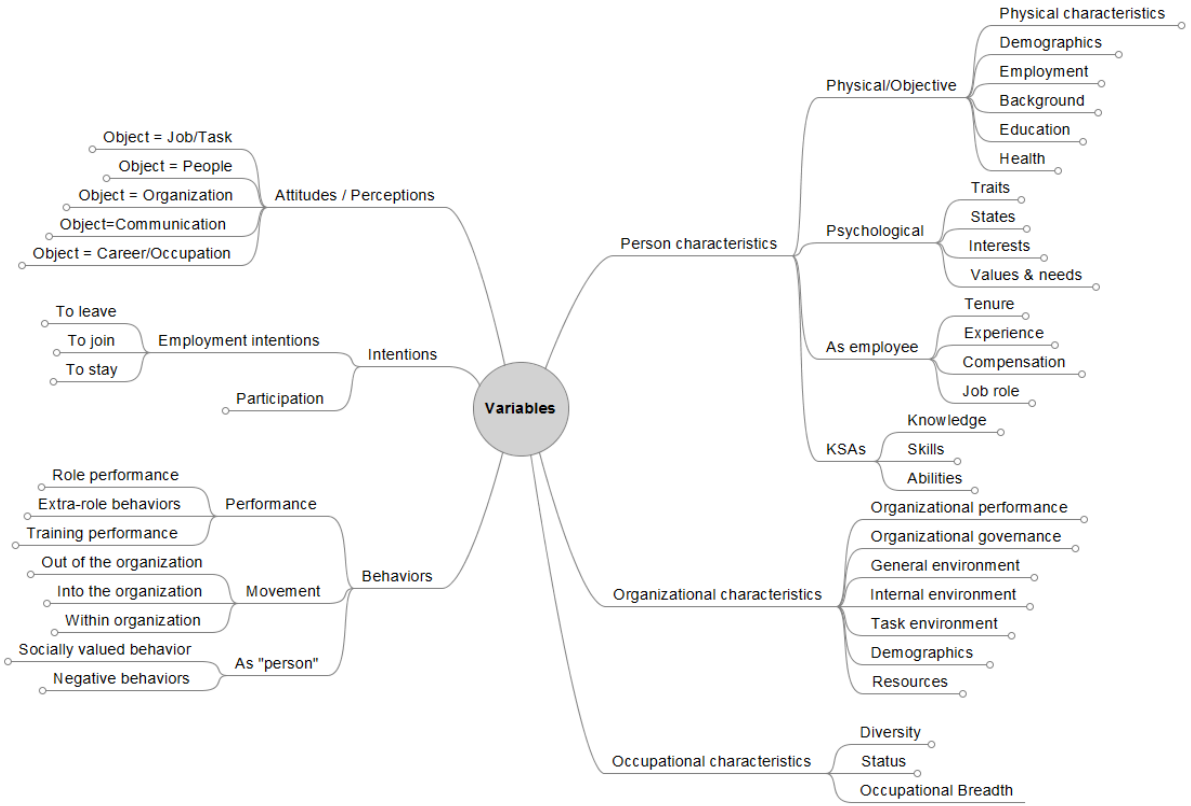
metaBUS

- Database
  - 1,100,000 effect sizes
  - ~30 OB/HR/IO journals
  - Published between 1980 and 2017
  - All effect sizes tagged to a hierarchical taxonomic map of the field

metaBUS

- Database
  - 1,100,000 effect sizes
  - ~30 OB/HR/IO journals
  - Published between 1980 and 2017
  - All effect sizes tagged to a hierarchical taxonomic map of the field
- Taxonomic map of the field




Variables
Person characteristics
Physical/Objective
Physical characteristics
Demographics
Employment
Background
Education
Health
Psychological
Traits
States
Interests
Values & needs
As employee
Tenure
Experience
Compensation
Job role
KSAs
Knowledge
Skills
Abilities
Organizational characteristics
Organizational performance
Organizational governance
General environment
Internal environment
Task environment
Demographics
Resources
Occupational characteristics
Diversity
Status
Occupational Breadth
Intentions
Attitudes / Perceptions
Object = Job/Task
Object = People
Object = Organization
Object=Communication
Object = Career/Occupation
Employment intentions
To leave
To join
To stay
Participation
Behaviors
Performance
Role performance
Extra-role behaviors
Training performance
Movement
Out of the organization
Into the organization
Within organization
As "person"
Socially valued behavior
Negative behaviors

Live demonstration

- metaBUS
  - An instant meta-analysis tool
  - See http://metabus.org/

metaBUS

- "I have begun to think that no one ought to publish biometric results, without lodging a well-arranged and well-bound copy of his data in some place where it should be accessible, under reasonable restrictions, to those who desire to verify his work." (Francis Galton, 1901)

OPEN ACCESS Freely available online

PLOS | MEDICINE

Policy Forum

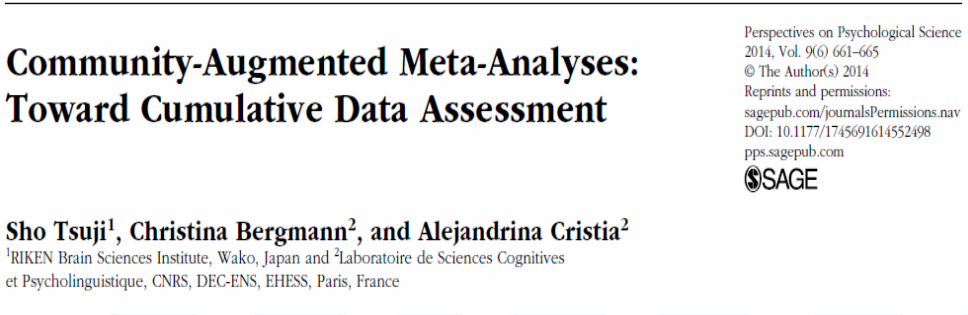
Living Systematic Reviews: An Emerging Opportunity to Narrow the Evidence-Practice Gap

Julian H. Elliott[1,2*], Tari Turner[2,3], Ornella Clavisi[4], James Thomas[5], Julian P. T. Higgins[6,7], Chris Mavergames[8], Russell L. Gruen[4,9]

1 Department of Infectious Diseases, Alfred Hospital and Monash University, Melbourne, Australia, 2 School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia, 3 World Vision Australia, Melbourne, Australia, 4 National Trauma Research Institute, Alfred Hospital, Melbourne, Australia, 5 EPPI-Centre, Institute of Education, University of London, London, England, 6 School of Social and Community Medicine, University of Bristol, Bristol, England, 7 Centre for Reviews and Dissemination, University of York, York, England, 8 Informatics and Knowledge Management Department, The Cochrane Collaboration, Freiburg, Germany, 9 Department of Surgery, Monash University, Melbourne, Australia

The Bridge from Evidence to Practice

Summary



Community-Augmented Meta-Analyses: Toward Cumulative Data Assessment

Sho Tsuji[1], Christina Bergmann[2], and Alejandrina Cristia[2]

[1]RIKEN Brain Sciences Institute, Wako, Japan and [2]Laboratoire de Sciences Cognitives et Psycholinguistique, CNRS, DEC-ENS, EHESS, Paris, France

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DOI: 10.1177/1745691614552498
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SAGE

Open-source meta-analysis tools

- metaBUS
  - An instant meta-analysis tool
  - See http://metabus.org
- Meta-Sen
  - A comprehensive sensitivity analysis tool
  - See https://metasen.shinyapps.io/gen1/

Current research environment?

Current research environment?

RESEARCH ARTICLE

Estimating the reproducibility of psychological science

Open Science Collaboration*,†
+ See all authors and affiliations

SCIENCE

Psychology's Replication Crisis Can't Be Wished Away

It has a real and heartbreaking cost.

Industrial and Organizational Psychology
PERSPECTIVES ON SCIENCE AND PRACTICE

Industrial and Organizational Psychology, **6** (2013), 252–268.
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FOCAL ARTICLE

How Trustworthy Is the Scientific Literature in Industrial and Organizational Psychology?

The Washington Post
Democracy Dies in Darkness

Monkey Cage

Does social science have a replication crisis?

Current (meta) research environment?

J Bus Psychol (2011) 26:105–121
DOI 10.1007/s10869-010-9185-2

Meta-analytic Decisions and Reliability: A Serendipitous Case of Three Independent Telecommuting Meta-analyses

Levi R. G. Nieminen · Jessica M. Nicklin · Tara K. McClure · Madhura Chakrabarti

Meta-analyses were supposed to end scientific debates. Often, they only cause more controversy

By Jop de Vrieze | Sep. 18, 2018 , 4:15 PM

Original Investigation

The Mass Production of Redundant, Misleading, and Conflicted Systematic Reviews and Meta-analyses

JOHN P.A. IOANNIDIS

Meta-Analytic Choices and Judgment Calls: Implications for Theory Building and Testing, Obtained Effect Sizes, and Scholarly Impact

Herman Aguinis
Dan R. Dalton
Indiana University
Frank A. Bosco
Charles A. Pierce
University of Memphis
Catherine M. Dalton
Indiana University

Current (meta) research environment?

- Meta-analysis is not immune from scrutiny
  - “All the old methods are in doubt. Even meta-analyses, which once were thought to yield a gold standard for evaluating bodies of research now seem somewhat worthless. “Meta-analyses are f**ked,” Inzlicht warned me. If you analyze 200 lousy studies, you’ll get a lousy answer in the end. It’s garbage in, garbage out.” (Engber, March 2016: Slate)

Meanwhile, I’m here…

Current (meta) research environment?

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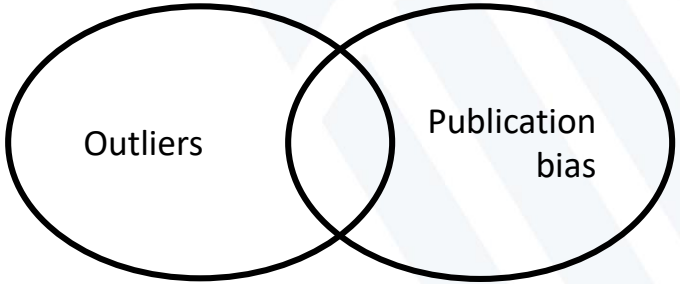
- What could be driving opinions like these?



Live demonstration

- Meta-Sen
  - A comprehensive sensitivity analysis tool
  - See https://metasen.shinyapps.io/gen1/

Thank you for attending today!

Remember…

You can find this presentation and some other meta-analysis resources (e.g., interesting papers) at:

jamiefield.github.io/research/vt2020

Questions?
Comments?
Complaints?

Feel free to follow up with me…

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@fieldjamie

jamiefield.github.io