PS4060: Review Essay

Dr. Eric M. Bowman
School of Psychology
University of St. Andrews
Semester I, 2014-2015
Session 1

Verity Brown
History of psychology at St. Andrews

Eric Bowman
PS4060 Module requirements
What are the potential purposes of a review of the scientific literature?
History of psychology at St. Andrews
PS4060 Module requirements

Selection of paper on which to base review
Published 5-10 years ago
No other student has selected
Of interest to you, and important to field
Submit choice in Moodle forum for approval
PS4060 Module requirements

Proposed title & structured outline
  Structured list of heading and subheadings
  No passages of text
  Document template in Moodle
  Due 19 December 2014 by 5PM in MMS
  Formative feedback
PS4060 Module requirements

Academic alert if late or failure to submit outline
Review structure

Historical antecedents
Theories
Methodologies
Problems

Important Paper
5-10 years old
Unique

Social Impact
Policy
Culture
Medicine, tech, etc...

Psychology impact
New theories
Citations
New research
New methods
PS4060 Module requirements

Review essay
  No more than 4000 words – word count required
  Document template in Moodle
  Due 9 March 2015 by 5PM in MMS
  Good academic practice
  Honours Handbook
Why write a review?

What are the potential purposes of a review of the scientific literature?
Session 2

Purposes of a review (from session 1)
Selecting an important key paper for the review
Selecting articles to include in a review
  - Defining focus & scope
  - Bibliographic search strategies
What makes a scientific report important?
Purposes of reviews

Assessing quality of the literature
Integrating & organizing findings across studies
Pooling/aggregating data across studies
  Meta-analysis
Guidance for future research
Predicting direction of future research
Historical update based on key paper
Methodological/theoretical tutorial
Selecting the key paper

- Historical antecedents
- Important key paper
  - 5-10 years old
  - Unique to you
- Social Impact
- Psychology impact
Selecting the important key paper

Let your own curiosity guide you.
Remember constraints (age of paper, unique).
Remember that it must be approved.
Avoid dead ends.
Be wary of overlap with research project.
You must argue that the paper was important.
‘Important’ might not mean good.
Selecting articles for the review

- Historical antecedents
- Important key paper 5-10 years old
  Unique to you
- Social Impact
- Psychology impact
Selecting articles for the review

Inclusion and exclusion criteria
  Publication date
  Language
  Key words for systematic bibliographic search
  Database(s) searched
  Type of paper (original article, review)
  Should be made explicit in the review
Selecting articles for the review

All of Psychology

Key paper – focus

Inclusion & exclusion criteria define scope
Search strategies – snowballing
Bibliographic search strategies

Snowballing – potentially biased; unsystematic

Computerized searches
- PubMed
- Google Scholar
- Web of Science
- PsycINFO, PsychARTICLES

Approaches
- By authors
- By key words
- By citation (articles citing; articles cited)
Searching by citation

Web of Science

Web of Science Core Collection includes the Science, Social Sciences and Arts & Humanities Citation Indexes, Conference Proceedings Citation Index for Science, Social Sciences & Humanities, Current Chemical Reactions and Index Chemicals.
Searching by citation

Web of Science

Latest news:
Thomson Reuters Collaborates with DataCite to Expand Discovery of Research Data.
Journal Citation Reports Data Release 2014 (JCR 2013 data) – now available
Thomson Reuters September Webinars - All products

Please check access - Web of Science - Free trial to Journal and Highly Cited Data (Thomson Reuters) until 30 September 2014 - UK Academic Jisc subscribers. Further information.

Web of Science Service for UK Education

The Web of Science Service for UK Education provides a single route to all the Thomson Reuters products subscribed to by your institution. Connect to the Web of Science Service, search using the 'All Database search' or select an individual product from the drop down list.

Check the Subscribers List to see if your institution has a subscription to Web of Science and any additional resources.

Problems with access? Try this Alternative Link. Institution name, username and password required. Please note you may need to try alternative options.

Service Information - Running as normal.
Searching by citation

Web of Science

![Search interface for Web of Science with a query example: Bowman AND Brown AND nucleus accumbens](image)
Searching by citation

Web of Science
Searching by citation

Web of Science
Searching by citation

Web of Science – citation map

Option for 1 generation link or 2 generations
Searching by citation

Web of Science – citation map

Appearance menu can colour article by year, author

Mousing over reveals article information
Searching by citation

Web of Science – citation map
Uses JAVA – can trigger security warning
Can set site to be on trusted “exception” list
What makes a psychological article important? How do we judge its impact?
Session 3

Importance of research article (from session 2)
Defining the structure of an argument
Word processing and structured argumentation
  Styles for headings and subheadings
  Outline view
Drawing connections among studies
Importance of research article

Scientific/academic
Quality of design, implementation, analysis*
Citations
Novelty
Practical applications for new research
Development of theory (falsification of theories)
Stimulation of new research
Importance of research article

Social

Practical
   People: e.g., psychiatric/medical advances
   Planet: e.g., sustainability awareness
   Profit: e.g., medical or educational device

Policy and law

Culture/art

Understanding human condition
   Understanding of psychiatric and neurological illness
   Understanding of aging, prejudice, etc.
Defining structure of argument

Every viewpoint is an answer to a question.
   Even a summary: ‘Are the data consistent with…?’
   Thus, task is to answer question implicit in viewpoint

Making the implicit question explicit
Structure of argument answers the question
Once structure is finished, writing is easy

Technical writing requires structured arguments
   Efficiency in communication
Defining structure of argument
Defining structure of argument

Introduction
Defining structure of argument
Defining structure of argument
Introduction

Explicit statement of question posed
Importance of question posed
Necessary background information
Road map of argument
  Argument stated explicitly
  Method of proof
Review body

Point by point evidence, logically linked
Each paragraph = a step toward conclusion
If you wander, reader will not reach conclusion
Easiest to write – road map in introduction
Review conclusion

Brief summary leading to answer to question
  Inescapable conclusion given evidence
Admitted weaknesses in argument
Further *specific* work required
Implications of conclusion beyond question
Word processing an outline

Styles
- Normal
- Heading 1
- Heading 2 etc. (subheadings)

Inheritance

Characteristics
- Font, size
- Indentation
- Numbering

Language
Word processing an outline

Styles

Modify Style

Properties

Name: Normal
Style type: Paragraph
Style based on: Normal
Style for following paragraph: Normal

Formatting

Font: Arial, 12 pt, Font color: Black, Left, Line spacing: 1.5 lines, Widow/Orphan control, Style: Quick Style

Add to template: Yes, Add to Quick Style list

Format: Font, Paragraph, Tabs, Border, Language, Frame, Numbering, Shortcut key, Text Effects...
Word processing an outline

Styles

Kern at 14 pt, Indent: Left: 1.27 cm, Keep with next, Keep lines together, Level 1, Style: Quick Style, Based on: Normal, Following style: Normal
Word processing an outline

Outline view

- Introduction: Are cats better pets than dogs?
  - History of domestication
  - Impact of pet choice
    - Abandoned pets
    - Environment
    - Financial
    - Time commitment
    - Disease
  - Cats are better
  - Evidence overview
    - Lifestyle
    - Financial costs
    - Psychological impact on owners
  - Lifestyle
    - Feline independence
    - Hygiene
    - Pet behaviour toward owner
  - Costs
    - Food
    - Vet bills
    - Environmental enrichment
    - Training costs
  - Impact on owners
    - Purring and parasympathetic activity
    - Life satisfaction
    - Rate of abandonment
  - Conclusion: cats are better
    - Importance in guiding pet ownership choices
    - Unknowns
      - Environment
      - Disease
  - Specific recommendation for future research
    - Environmental impact of predation
    - Risks of transmissible diseases
Word processing an outline

Print layout
Word processing an outline

Insert…Index and Tables…. Table of Contents
Introduction: Are cats better pets than dogs? .......................................................... 2
History of domestication ...................................................................................... 2
Impact of pet choice ............................................................................................ 2
Cats are better ..................................................................................................... 2
Evidence overview .............................................................................................. 2
Lifestyle .................................................................................................................. 2
Feline independence ............................................................................................ 2
Hygiene .................................................................................................................. 2
Pet behaviour toward owner .............................................................................. 2
Costs ....................................................................................................................... 2
Food ......................................................................................................................... 2
Vet bills ................................................................................................................... 2
Environmental enrichment .................................................................................. 2
Training costs ....................................................................................................... 2
Impact on owners .................................................................................................. 2
Purring and parasympathetic activity ................................................................. 2
Life satisfaction ................................................................................................... 2
Rate of abandonment ......................................................................................... 2
Conclusion cats are better ................................................................................... 2
Importance in guiding pet ownership choices ................................................... 2
Unknowns ............................................................................................................... 2
Specific recommendation for future research ................................................... 2
Making connections among studies
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Session 4

Exclusion & inclusion criteria
Meta-analysis
Access to data
Exclusion & inclusion criteria

Define scope of review

Key paper – focus

All of Psychology

Inclusion & exclusion criteria define scope
Exclusion & inclusion criteria

Key terms
Database searched
Date of publication
Language
Research design characteristics
  Independent variables
  Dependent variables
  Target population; sample properties
Research quality
Meta-analysis

Datum

Research report

Datum

Research report

Datum

Research report

Systematic review

Database

Summary measure(s) per study

Statistical analyses
Meta-analysis

Pooling or aggregating data across reports
  Raw data
  Summary measures of effect size

Advantages
  Enhanced statistical power
  Reduces equivocation in summarizing field
  Identification of historical trends
  Assessment of literature quality
  Identifying studies that are outliers
  Increased accuracy of parameter estimates
Meta-analysis

Disadvantages
- GIGO – ‘garbage in, garbage out’
- Archival research – selective deposit … retrieval
- Inadequate methods & results sections
- Heterogeneity of research designs
- Problem of assigning weight or importance
- Loss of raw information in measures of effect size
- Statistical controversies
Meta-analysis

Meta-analyses in SSCI
Meta-analysis

Statistics – measures of effect size

Cohen’s $d$

- # of pooled sd’s by which 2 means differ
- Variants: Hedge’s $g$; Glass’ $\Delta$

MMN amplitude
Cohen’s $d = -0.65$
Umbricht & Krljes (2005)

Normal
Schizophrenia
Meta-analysis

Statistics – measures of effect size

Odd's ratios – often used in treatment contexts

Odds ratio = \( \frac{ad}{bc} \)

<table>
<thead>
<tr>
<th>DV present?</th>
<th>IV present?</th>
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<tbody>
<tr>
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<td>a</td>
</tr>
<tr>
<td>No</td>
<td>c</td>
</tr>
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</table>
Meta-analysis

Odds ratio example – Koehler et al (2013)

Young offender treatment programmes in Europe
25 reports satisfying inclusion criteria
7940 young offenders
Behavioural/CBT odds ratio 1.73
Punitive deterrence + monitoring odds ratio 0.85
Meta-analysis

Odds ratio example – Koehler et al (2013)

<table>
<thead>
<tr>
<th>Model</th>
<th>Study name</th>
<th>Odds ratio</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>p-Value</th>
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</tbody>
</table>

Fig. 1: Effectiveness of young offender treatment programs
Meta-analysis

Funnel plot: example from Sterne et al (2001)

Large studies close to true effect

Small studies vary from true effect

Possible publication bias
Meta-analysis

Odds ratio example – Koehler et al (2013)
Should all psychology data be made available for public review and meta-analysis?
Should all psychology data be made available for public review and meta-analysis?

Who pays?
What about confidential information?
Informed consent for uses of data?
Loss of earnings from private research?
When should research be deposited?
What format should data be in?
How much help should be provided?
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Session 5

Meta-analysis follow-up
Psychology’s impact outside of academia
  Impacts
  Stakeholders
  Importance of psychology to society
Why is psychology funded?
Meta-analysis

The point of last session: familiarity not expertise

No requirement to perform meta-analysis
Inside the ivory tower...

Inside academia (ideally)
- Distributed effort by specialists
- Integrity of research
- Sharing of information
- Peer review, comment, and debate
- Competitive funding
- Self-correcting process of information evaluation
- Knowledge considered inherently valuable
  - Intellectual satisfaction of curiosity
  - Utility to society and individuals
Inside the ivory tower looking out…

Academics’ view of the ‘real world’
  Distortion of information
  Intellectual nuances ignored
  Boring
  Lack of tolerance
  Lack of agreement on evaluating information
  Different value system
  Language barrier
Outside the ivory tower looking in...

Non-academics’ view of academics
  Boring, esoteric, irrelevant ‘boffins’
  Self-interested
  Language barrier
  Disorganized, absent minded, chaotic
  Costly
  Dispassionate
  Politically biased
  Arrogant, patronizing, condescending
The ivory tower under siege...

Budget reductions
Restriction of expression
Restriction on research
Devaluation of degrees
Performance evaluations
Loss of professional status
Violence & direct action
  Animal research
  GM crops & organisms
  Stem cells
The ivory tower under siege…

Attempts to quantify ‘impact’ of basic research
Attempts to enhance ‘knowledge transfer’
Attempts to enhance ‘public engagement’
Enhanced training regarding ethical issues related to research

In general, making academia outward-looking
In general, inviting the public to look in
Who are our stakeholders?

Who funds psychological research?

No answers specific to psychology *per se*

Mixture of:

- National public funding
  - UK research councils
- International public funding
  - EU; Human Science Frontiers
- Industrial funding
- Charitable trusts
  - Wellcome Trust
  - Howard Hughes Medical Institute
Who are our stakeholders?

In the US, public funding of science is dwarfed by industrial funding.

Who are our stakeholders?

The same is true in the UK.

Source: Alok Jha, *The Guardian*, 7 October 2010
Who are our stakeholders?

The public
The government
Industry
Patient groups
Other scientists, researchers, academics
Students
The press

Who do we consider the most important? Is funding contribution sole criterion?
Who are our stakeholders?

‘Triple accounting’
  People
  Planet
  Profit

Can we apply this to Psychology?
People – benefits of psychology

Improving quality of life (well-being)
Improving approaches to social issues
Changing social attitudes
Informing public debate
Improving policy-making (evidence-based)
Enhancing the knowledge of the nation
Reducing social inequality
Improving health, safety and security
Enhancing arts and ‘culture’?
Planet – benefits of psychology

Reducing environmental damage from humans
  Encouraging recycling
  Enhancing pollution awareness
  Enhancing energy conservation
Conservation initiatives from understanding animal behaviour and evolutionary processes
Enhancing the value placed on biodiversity
Increasing support for sustainability
Environmentally friendly leisure behaviour
Profit – benefits of psychology

- Improving productivity
- Enhancing the skills base
- Increasing employment
- Economic growth / wealth creation
- Increasing innovation and creativity
- Economic returns from policy adjustments
- Improving interaction with new technology
All very well and fine…

How do we find impacts for the review?

News – What is newsworthy?
- Timing – little value if > 1 week old
- Significance – number of people affected
- Proximity – closer to home is more newsworthy
- Prominence – impact on cultural leaders
- Human interest – newsworthiness link to emotion

Does newsworthy = ‘good’?

Nightingale & Scott (2007)

Research that is highly cited or published in top journals may be good for the academic discipline but not for society. Research that gets widespread press coverage may be the result of ‘academic streaking’, not quality. Research that is loved by user communities, may be so because it is glib, sycophantic and unchallenging. Such research may be the antithesis of high-quality, independent research based on a deep understanding of problems and their potential solutions.
Does newsworthy = ‘good’?
All very well and fine…

How do we find impacts for the review?

Google
Press releases
Government / charity / business reports
Parliamentary debates
Visiting web page of author(s)
Writing the author(s)
Marketing documents
Why is psychology funded?