Literature reviews.....

We all produce them...

But how to do them?
What method are available?
How do the methods differ?
Why should I consider doing a......

Systematic Quantitative Literature Review?
What about the traditional non-systematic narrative review?

It involves...

• reading as much literature as possible,
• assessing its importance,
• constructing carefully argued narrative of you analysis of the current status of research
Maybe try a Meta-analysis?

• Statistical method for combining results from separate studies to assess effect size often using weighted average.
• Often need studies with similar methodology, similar subjects and similar response variables
• Common in health sciences and many other areas when enough suitable datasets.
• Need team of experts and lots of time!
Examples of systematic reviews using meta-analysis

Cochrane Databases of systematic reviews (mostly health care but also social)

Campbell Collaboration – public policy interventions (crime, education, social welfare etc)

So what about using a systematic quantitative literature review?

Mapping the discipline...

1. **Systematic** = methods to survey literature, and select papers to include, are explicit and reproducible
2. **Quantitative** = measure of the amount (number of papers) of research within different components of a chosen field
3. **Comprehensive** = assesses different combinations of locations, subjects, variables and responses
4. **Structured** = working out what is important about the literature (categories/subcategories) - collecting, analysing literature, and writing follows clear steps
Easier step by step process for collecting, analysing the data and the writing the review

**Step 1**
Define topic

**Step 2**
Formulate research questions

**Step 3**
Identify keywords

**Step 4**
Identify & search databases

**Step 5**
Read & assess publications

**Step 6**
Structure database

**Step 7**
Enter first 10% papers

**Step 8**
Test & revise categories

**Step 9**
Enter bulk of papers

**Step 10**
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**Step 11**
Evaluate key results & draft results section

**Step 12**
Draft methods

**Step 13**
Draft introduction

**Step 14**
Draft discussion & abstract

**Step 15**
Revise paper till ready for submission
<table>
<thead>
<tr>
<th></th>
<th>Traditional narrative</th>
<th>Systematic quantitative</th>
<th>Meta-Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who commonly does the reviews?</td>
<td>Experts &amp; new PhD students</td>
<td>PhD students &amp; others</td>
<td>Teams of experts</td>
</tr>
<tr>
<td>How can usually publish them</td>
<td>Experts</td>
<td>PhD students &amp; others</td>
<td>Teams of experts</td>
</tr>
<tr>
<td>How papers selected</td>
<td>Rarely systematic</td>
<td>Systematic</td>
<td>Systematic</td>
</tr>
<tr>
<td>Compiling data on papers</td>
<td>Rarely systematic</td>
<td>Systematic</td>
<td>Systematic</td>
</tr>
<tr>
<td>Comparing papers</td>
<td>Expert evaluation</td>
<td>Quantitative or expert evaluation</td>
<td>Expert evaluation</td>
</tr>
<tr>
<td>Statistical analysis</td>
<td>No</td>
<td>If want to</td>
<td>Yes</td>
</tr>
<tr>
<td>Gap analysis</td>
<td>Descriptive</td>
<td>Quantitative</td>
<td>Descriptive</td>
</tr>
<tr>
<td>Structure of the paper</td>
<td>Narrative</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td>Easy for updating during PhD</td>
<td>Limited</td>
<td>Easy</td>
<td>Re do statistics</td>
</tr>
</tbody>
</table>
Method with benefits...

1. Straight forward structure/process for undertaking and writing review
2. Maps the literature by – finding geographic, scalar, theoretical and methodological gaps
3. Useful for confirmation report
4. Can be rapidly turned into paper
5. Database can be easily updated
6. Database useful for intro/discussion of other PhD papers
7. Easier to use for final thesis without having to re-read the whole literature again!
Systematic quantitative literature views works for students

Review
A review of t...

Review
A systemat methods ac...

Review
Past results and future directions in urban community gardens research

Daniela Guitart¹, Catherine Pickering*, Jason Byrne²

¹ Environmental Futures Centre, School of Environment, Griffith University, Gold Coast Campus, Queensland 4222, Australia
So how do you do it...


Includes –
1. youtube videos on each stage,
2. paper outlining the approach,
3. papers published by students using the method,
4. youtube videos of students talking about the method
5. Youtube video on why publish during your PhD

Will summarise it now for you!
Being systematic

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Step 1. Define topic

Works well for

- emerging areas, and
- topics where methods so diverse cannot do meta-analysis
- trans-disciplinary fields

Some examples

- Impacts of nature based recreation on birds
- Urban tree benefits, costs, and evaluation methods
- Community gardens
- Shark tourism
Step 2. Formulate research questions

...e.g...

1. when and who has done research
2. geographical spread of the research
3. types of methods used
4. types of subjects examined
5. types of variables measured
6. different disciplines assessing the topic, and
7. patterns found in results
Step 3. Key words

• Need to identify relevant literature, but not lots and lots of irrelevant literature
• Trail and error
• May need synonyms
• Talk to university librarians

Example... (also use wildcards)
Step 4. Search databases

1. Web of Science
2. Google Scholar
3. Science Direct
4. Scopus,
5. ProQuest
6. Web of Knowledge
7. Sage
8. Bio Med
Step 5. Read and assess papers

For each publication:
• is it relevant?
• abstract for some, whole paper for others
Need criteria for inclusion – reproducibility
• original research papers only? (may want to limit to certain types of research)

Use reference lists and citations of the paper to cross-check you have all (most!) papers

How many relevant papers did you find?
• If <15 papers – narrative might be better, or broaden topic
• If ~>300 may need to narrow topic
Creating your own database

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Step 6: Structure database

Work out categories and subcategories...
This provides structure for the review
Include data on..
Who does research, where, using what methods, what response variables, what subjects, what statistics (if used), what found?

Excel works well but can use other programs
• Each paper is a row
• Categories/subcategories are columns
Categories about the paper

Full reference details: Authors names Year, Journal title, Journal discipline, Article research discipline

Categories about geographic location of research

City, State, Country, Continent, Climatic zone, General habitat types, others
**Categories for subjects of research**

For Birds

- Number and name of bird species assessed.
- Conservation status of the birds?
- Type of foraging guild?

**Categories for response variables**

For birds

- Individual response? (physiological or behavioural),
- Population level response? (density/abundance),
- Reproductive response? (number of nests, number eggs laid, number of chicks that hatched or fledged)?
Categories about the methods used

What you include depends on the discipline...... Some examples...

- Observational vs experimental?
- Did it compare disturbed and undisturbed areas, or had controls?
- Was it a BACI design or what.. What statistics were used....?
- Natural science, social science or mixed?
- Which qualitative approach(es)? (interviews, content and text analysis, case studies, observations, focus groups, archival research),
- Which quantitative approach(es)? (questionnaire surveys, field-surveys and samples, field experiments, GIS, remote sensing and satellite imagery)
- Which mixed approach? (including existing data base and records searches, or other literature analysis).
Weighting methods/studies.....

Weight studies by types of evidence?
1. Randomized control trails (number replicates, effect size etc)
2. Before, After, Control, Impact (BACI) experiments
3. Experiments with controls
4. Observational studies with ‘controls’, Quasi-experimental designs,
5. Observational studies without ‘controls’,
6. Cohort studies
7. Case studies

Can also use checklists to compare studies using similar methods – high, moderate and low quality....

Problem if interdisciplinary study in how to assess different types of evidence....
Categories for results

• Studied and discussed, or actually demonstrated?
• Outcomes positive, negative, neutral, mixed or other?
• More detailed results – Statistically significant, size effect/number of replicates, power of analysis
• Others?
Step 7. Enter around 10% of papers

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Step 8. How well do the categories work?

• Are they too narrow or broad?
• Do you need additional values, new subcategories?
• Do the criteria apply to categories work in reality?
• Reflection now saves lots of time later!

Step 9: Enter rest of papers

• Again cross check your categories and criteria
• Check your database is comprehensive (reference lists)
Step 10: Produce and review summary tables so you can....

1. Check your database is accurate (entry errors)
2. Start to work out the most important results

A few examples of tables from papers...
Geographical spread of studies

Table 1. The number of journal papers examining community gardens in different countries and the number of countries authors of papers are from (based on author affiliations).

<table>
<thead>
<tr>
<th>Country</th>
<th>Community Gardens</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>51</td>
<td>119</td>
</tr>
<tr>
<td>Australia</td>
<td>12</td>
<td>26</td>
</tr>
<tr>
<td>Canada</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>UK</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>South Africa</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Singapore</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Spain</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cuba</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Mexico</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Portugal</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sweden</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Israel</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Brazil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Other African countries</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>89</strong></td>
<td><strong>195</strong></td>
</tr>
</tbody>
</table>

Figure 1. Map of USA with locations of the community gardens that have been studied in the literature.
### Number of papers examining impacts of nature based tourism on birds

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Negative effect</th>
<th>No Effect/Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Method</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observation</td>
<td>41</td>
<td>37</td>
<td>4</td>
</tr>
<tr>
<td>Experimental</td>
<td>30</td>
<td>27</td>
<td>3</td>
</tr>
<tr>
<td>Disturbed/undisturbed or control site</td>
<td>35</td>
<td>29</td>
<td>6</td>
</tr>
<tr>
<td><strong>Human activity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standing/observing</td>
<td>15</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>Touring/walking/hiking</td>
<td>47</td>
<td>42</td>
<td>5</td>
</tr>
<tr>
<td>Running</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Cycling/mountain bike riding</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Canoeing</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Dog walking</td>
<td>9</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Horse riding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Individual level response in birds</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behaviour</td>
<td>47</td>
<td>43</td>
<td>4</td>
</tr>
<tr>
<td>Physiological</td>
<td>11</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td><strong>Population level response in birds</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numerical/density</td>
<td>31</td>
<td>26</td>
<td>5</td>
</tr>
</tbody>
</table>
3. Writing the review

- **Step 1** Define topic
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- **Step 7** Enter first 10% papers
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- **Step 12** Draft methods
- **Steps 13** Draft introduction
- **Step 14** Draft discussion & abstract
- **Step 15** Revise paper till ready for submission
Although its a literature review it has a standard paper structure

<table>
<thead>
<tr>
<th>Sections</th>
<th>Order written</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>7</td>
</tr>
<tr>
<td>Introduction</td>
<td>2 (aims) 5/6 rest</td>
</tr>
<tr>
<td>Methods</td>
<td>1</td>
</tr>
<tr>
<td>Results</td>
<td>3</td>
</tr>
<tr>
<td>Discussion</td>
<td>5/6</td>
</tr>
<tr>
<td>Conclusion</td>
<td>4</td>
</tr>
<tr>
<td>Reference</td>
<td>8</td>
</tr>
</tbody>
</table>

More time thinking about what to say = less time writing
Step 11: Methods

Need details about

- Key words
- Databases searched
- Criteria for using a paper
- Categories/subcategories – what, why and how values assigned
- Data analysis/issues examined
Step 12: Key results are....

So what was the
• Breadth?
• Depth?
• Methods?
• Main results?
• Critical gaps?

Of research on this topic currently....

Results need to match research questions – so update as required
Revising your Aims so match the results

Update your aims. They are the last paragraph of the introduction – often a list of aims

This paper assesses....

1.
2.
3.
4.

Mind map what you need to say in the rest of the paper before writing
12: Writing the Results

*Results should document – quantitative!*

1. How many papers?
2. Who publishes?
3. Where has research been done?
4. What disciplines do research on this topic?
5. What methods are used
6. What's been found/demonstrated?
7. What's missing – gaps?

Text to highlight key results from tables...

The golden thread
13. Introduction

• Carefully stepped out argument from the most general to the most detailed – e.g. your aims

• ~4-5 paragraphs

• Remember its a stepped argument, so everything needs to lead to the aims...

• Which need to be good and match what you actually did and found....
14a. Discussion

• Discuss the results in relation to the literature...
• For this literature review discuss the implications of what you found.

e.g. From Guitart et al. it was...

1. *Community gardens literature is geographically limited*
2. *Community gardens literature is diverse*
3. *Current research reflects USA social-political context*
4. *Future directions*
14b. Abstract

Word limit
Make every word count
Remember its not your aims its everything so need methods, results, discussion and conclusion in there...
Step 15: Revise the paper till ready for submission

More practice = fewer drafts – but few people get it right first go as different drafts have different functions.

- Early-drafts are about getting the information on paper
- Mid-drafts are about working out a better way to convey the information
- Later-drafts are about checking it’s all there and polishing.
So as you can see...

1. Straight forward structure/process for undertaking and writing review
2. Maps the literature by – finding geographic, scalar, theoretical and methodological gaps
3. Useful to demonstrate what you will do in your PhD
4. Can be rapidly turned into paper
5. Database can be easily updated
6. Database useful for intro/discussion of other PhD papers
7. Easier to use for final thesis without having to re-read the whole literature again!
Remember the supporting material


Includes –
1. youtube videos on each stage,
2. paper outlining the approach,
3. papers published by students using the method,
4. youtube videos of students talking about the method
5. Youtube video on why publish during your PhD

Pass on link to others who may find useful!
Hopefully soon this is you.....