"ASK THE LIBRARIAN" about … EVALUATING RESEARCH

Pātai: (Question)

How do I know the research I have found is reliable and scholarly? Are primary and secondary sources of information important?

Librarian Jennifer Hobson replies:

Developing a critical approach to evaluating the research you find is crucial not only for academic researchers, but for anyone wanting to ascertain the accuracy or reliability of published research. This process can be fraught with challenges at the best of times, but more so without a sound understanding of academic methods of research. In medicine and the natural and social sciences scholars learn how data is gathered, measured, analysed and reported. In the arts and humanities they learn critical or speculative methods of analysis.

Whether research is based on empirical science or conceptual ideas, evaluating research involves being able to judge its quality (or worth), against a standard in order to determine the validity of its claim based on the strength of the evidence presented. As part of this process all sources of information you collect will require close critical analysis along a number of dimensions such as writing style, theoretical underpinnings, methodology, evidence and purpose.

Being able to classify information by type and source also helps determine the independence and reliability of information. It is common to make distinctions between scholarly (academic) and popular (non-academic) sources, and between primary and secondary sources. Keep in mind the meaning or importance placed on these changes according to a specific discipline.

Scholarly and popular sources

Scholarly information disseminates the results of research and aims to generate new knowledge. Different research methodologies are employed which have their own methods. The results of scholarly research are usually written for an academic audience and reported in academic journals within a discipline, before filtering into the public domain (if they get that far).

Using inductive reasoning qualitative research starts with an idea, collects data, and based on the findings generates further ideas or hypotheses. Methods used may include case study, interviews, ethnography, phenomenology or grounded theory.

Quantitative research poses an idea or hypothesis and through measuring data draws conclusions based on deductive reasoning. Methods may include statistical analysis, meta-analysis, randomised controlled trials or observational studies.

Popular sources of information on the other hand often summarise current scientific developments and topical issues for the benefit of a general audience, in a brief easy to understand format without complex and detailed scientific information. This is characteristic of journalistic writing (in magazines and newspapers) which may use information selectively in order to entertain, tell a story, or reflect opinion rather than an objective analysis of research and current thinking in a field. Many authors do not supply credentials or references, which makes it difficult to establish credibility, or to verify the original research.

In contrast, scholarly information is usually written by trained experts in a field who declare their credentials and institutional affiliations, provide detailed descriptions of research methods and include an extensive list of references. In most scientific journals scholarly research is reviewed before publication for accuracy by independent peers or experts in the field. Peer review helps filter out poor research by identifying flaws in design or methodology and ensures that results are reported and interpreted correctly.

Despite the adherence of research to academic standards, a healthy dose of scepticism is still necessary when evaluating scholarly sources. It is easy for information to be misinterpreted and not all academic research published is accurate, reliable or even true. This may be unintentional due to bias or confounding results. Depending on the experience of a researcher journalistic writing may also characterise scholarly information.

Primary and secondary sources

Across disciplines, information can also be categorised as primary or secondary and can be further defined by source, format and type. Distinguishing between them is useful as it can help indicate whether an author is giving a first-hand or a second-hand account. Some disciplines prefer researchers to cite primary sources, whereas in medicine a systematic review and meta-analyses are the gold standard (secondary sources of information which critically analyse and appraise all primary studies that meet rigorous standards).

Primary sources include original documents, raw data or accounts and require interpretation e.g. novels, poems, plays, diaries, letters, speeches, manuscripts, photographs, artefacts, eyewitness accounts of recent events or census data. Also included is data from an original research study.

Secondary sources interpret, synthesise or summarise primary sources e.g. published summaries in journal articles or books, but may include government reports (and statistics), documentaries or conference proceedings. Secondary sources require careful evaluation as the information reported may not be used for the purpose for which it was originally collected.

Distinctions are not always clear cut. Articles published in a journal are also called a primary source if they include detailed methodology of original research. In reality much research draws on both primary and secondary sources. The process for evaluating primary or secondary sources of information can be similar, although the criteria may change depending on the discipline.

Evaluating quality

There are many ways to evaluate the quality of research which means no one generic checklist will cover all criteria (although attempts have been made in various disciplines, evidence-based medicine being the primary one). However, good quality research should be well written and

closely follow appropriate conventions and methods for carrying out research. Usually these include standard sections: introduction (the purpose of the study); methodology (how the research was carried out and analysed); results (what was found) and discussion (what it means). In the sciences the methodology section is most important.

Common questions to answer when evaluating quality are listed below, but the theoretical and methodological perspectives in your field will pose further considerations.

1. *Why was the information collected? What was the research question or purpose?*
   The intent of the study may produce bias and influence the findings (e.g. if it is for the purpose of advocating a position). Look for a clear statement of why the research was done and its significance.

2. *Who collected the information and what are their credentials?*
   Verify the author's qualifications, institutional affiliation and previous experience. Are they associated with an institution that has a reputation for high quality? Have they published previously? Check a citation database to see if they have been frequently cited. This may indicate they are respected by other authors.

3. *What was the research design and methodology?*
   Ensure the research design and methodologies were appropriate to the purpose of the study e.g. qualitative, quantitative or a mixture. Does the author state their perspectives e.g. identified limits, bias, assumptions, and theoretical underpinnings?

4. *What information was collected and how was it analysed?*
   Make sure this is described in adequate detail. Check there are clear definitions and that the information collected reflects what was actually measured.

5. *When was the information collected? What was the date of publication?*
   Does the discipline require current information to keep up with the latest developments? Check that the information is still current, given there may be a delay between the collection of information and the date of publication. This may not be as important in the humanities.

6. *What are the key findings?*
   Establish the strengths (and weaknesses) of the evidence. Are the findings justified by the results and are they consistent with the supporting evidence? Ensure other sources been taken into account and the existing body of knowledge has been appropriately acknowledged.

7. *Does the work add knowledge?*
   Decide on the extent to which the work has contributed new knowledge and the degree to which it indicates future areas of investigation that appear promising for furthering understanding.

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Write to Jenny at: jm.hobson@auckland.ac.nz
Mātauranga Tikanga Tāngata me Māori | Māori Liaison and Anthropology Subject Librarian, University of Auckland Library