Finding Out What's Known

Be skeptical! a skeptic’s questions

Sources of Information: religious tracts, anecdotes, popular media, magazines, websites, monographs and books, journals

Journal articles: original-research reports, reviews

How to read reports and reviews

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BE SKEPTICAL!
Ask the following questions about your source of information.

- What is the evidence?
- Who says?
- Who stands to gain?
- Who is trying to impress whom?
- Who is pushing their beliefs?
- What is the hidden agenda?
- Why would it be so?
- How could it be so?
- Is it reasonable, practical, sensible, LOGICAL?
- What’s a better alternative?
- Am I keeping an open mind? Should I?
- Can I be skeptical about being skeptical?

Worst Sources: Religious Texts/Oral Traditions

- Some regard their assertions as the word of God or gods.
- The assertions therefore cannot be questioned.
- Others regard them as an attempt to explain life in terms of what was known at the time.
- Still others see the darker political side: fundamentalism.
- They contain assertions about the origins of the universe and of life that are demonstrably false to most educated people.
- Even in the moral realm some assertions defy common sense.
- Why does a compassionate powerful ever-present god permit the suffering of children and their mothers?
- Good novels, short stories and travelers’ tales are a better source of wisdom about the human condition for young adults.
  - Alice Albinia, Empires of the Indus; William Dalrymple, Nine Lives

Bad Sources: Anecdotes

- "I tried it and it works!"
- Some great discoveries first develop this way, but be skeptical.
- What works for one person may not work for another.
- The person may use hype to impress you with his/her experience/knowledge/insight/helpfulness.
- Anything new or different sometimes works, either because of the novelty (Hawthorne) effect or the placebo effect (belief that it works).
- OK, so it still works, but it usually wears off.
- For health or performance of individuals, regression to the mean can make something work artifactually.
- When you feel bad you try something.
- But statistically you're likely to get better then anyway.
- So you will think that what you tried made you better.

Bad Sources: Popular Media

- TV, Radio, Newspapers
  - Often a mix of factoids and fairy tales deliberately hyped to attract an audience for advertisers.
  - The advertisements are misleading and exploitative.
  - Articles by journalists are often biased or oversimplified.
  - Editorial policy is biased by the media owner or target audience.
  - What they don't report is often more important.
  - Opinion polls published in these media are particularly bad.
    - A "good" public-relations firm can get whatever opinion its clients want by skillful wording and sequencing of questions.
    - The “margin of error” does not refer to a margin for bias!
    - Ignore polls not commissioned by a disinterested institution.
  - Engage with most popular media mainly for entertainment!
  - Trust only non-commercial non-religious public media.

Better Sources: Some Magazines

- Most magazines are vehicles for unsubstantiated opinion or third-hand information.
  - Their main aim is to sell advertising space, not inform readers.
  - Some even specialize in pseudoscience, publishing fiction as fact.
- But some are reasonably trustworthy and stimulating:
  - The information is often first-hand (reported by someone directly involved) or second-hand (by someone who read the study).
  - New Scientist is good but hyped by journalists for a racy image.
  - Scientific American is more restrained and usually outstanding.
  - Some magazines specializing originally in radio and TV programs now provide inspirational social, cultural and artistic commentary.
    - In NZ it's the Listener.
  - Find magazines like these to widen your horizons.
Better Sources: Some Monographs or Books
- Some are by one author; others have chapters by different authors.
- Often they are not properly peer reviewed.
- They usually contain information already in a scientific journal.
- If it's not already in a journal, why not?
- Sometimes they contain an author's pet theory that a journal wouldn't accept.
- They are there mostly to make money for the publisher, or to get the author academic recognition or promotion.
- But some do inform and entertain superbly.
- Read those recommended by trusted friends or colleagues.
- Check out reviews online, but beware of the reviewer's agenda.
- Websites are replacing them to some extent.

Better Sources: Some Websites
- Google and Google Scholar are miraculous!
- But recognize and be skeptical about the hype at sites ending in .com, .co.xx and even .gov.xx.
- These are usually no better than any other popular medium.
- Sites ending in .org, .edu(.au), and .ac.xx are generally non-profit and/or educational and are therefore more trustworthy.
- But beware; some .orgs are commercial sites.
- Very few sites are overtly peer-reviewed.
- Blogs aren't. Their content is often inflammatory and false.
  - But their uncensored comment can also be valuable.
- Wikipedia is, sort of, but anyone can edit most pages. Trust the information if it looks researched and a hidden agenda is unlikely.

Best Sources: Academic Journals
- Journals are where most researchers publish their work.
- Most journals are peer reviewed and therefore trustworthy.
  - Peer review: the editor sends an article to one or two experts for comment, then either accepts the article, rejects it, or invites the author to rewrite and resubmit it.
  - The process should be called expert review.
- Some people take notice of a journal's impact factor.
  - Impact factor = number of times per year the average recent article in the journal was cited (referred to) in other articles.
  - The range of the impact factor is <0.01 to ~40.
  - The range reflects mainly research activity in the field of the journal, rather than quality of its articles.
  - Journals specializing in reviews have higher impact factors.
  - With experience you don't need the impact factor.

More About Journals
- Most articles or papers are reports of original research.
- Most papers in journals are reports of academic (impractical) me-too research: stuff lacking true originality or utility, which researchers have to publish to avoid perishing.
  - It's hard for newbies to distinguish between good and ordinary.
- Some articles are reviews of original-research papers.
  - Some journals publish only reviews in one form or another.
  - Most reviews are worthwhile.
- Find articles by using Google Scholar, Pubmed, SportDiscus, PsychLit, and other searchable bibliographic databases.
  - Recent issues of most journals are on the Web via your library.
  - If a journal isn't on the Web or in the local library, use Interloan.
  - Get a hard copy of either the abstract or the full paper.

How to Read an Original-Research Article
- Title, Author(s), Institution
  - Get to know the big names and big places.
- Abstract or Summary
  - Skip to the last sentence or two, then read the whole abstract.
  - It often omits the most important bit: the magnitude of the effect.
  - Be wary of claims for no effect based on statistical non-significance ("P>0.05").
  - If the results look interesting, delve into the rest of the paper.
- Keywords at the end of the Abstract may omit words in the title.
- Introduction
  - Usually contains a useful mini-review of the field and a statement of why the study was done.
  - Use the Introduction in the most recent paper on a topic to access earlier papers.
- Methods
  - Read bits of this only for clarification of something in the Abstract, Results, or Discussion.
- Results
  - Should contain only an objective account of findings, without discussion or evaluation. Skip bits of it sometimes.
- Discussion
  - The author(s) should explain the magnitude and clinical or practical significance of the effect(s), any technical limitations, likely biases, and the direction of further research.
- Conclusions or practical applications are sometimes in a separate section.
- References
  - A list of papers cited in the article, in a specific sequence and format. Find and read some of them.
How to Read a Review Article

- Title, Authors, Institution, Abstract
  - See if the review is a meta-analysis: a quantitative synthesis of studies with an overall magnitude for an effect.
  - The conclusions in a meta-analytic review are likely to be more trustworthy than those in a more qualitative review.

- Topic-specific sections
  - See if your kind of subjects or situation are covered.

- Conclusions
  - Look for an assessment of magnitude of the effect.

- References
  - Find and read some of them, especially when you have to write your own review of literature for a thesis or for the Introduction in a paper.

In Conclusion...

- Be logical.
- Be skeptical.

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