

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?
- Best scholarly critique: *The God Delusion* by Richard Dawkins.
- 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 **artificially**.
 - 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 **fairly 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 on line, but beware of the **reviewer's agenda**.
- **Websites** are replacing them to some extent.

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.

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**.

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.

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.

- 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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