

HOW TO USE REFERENCES

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How many references do I need?

Lecturers usually hate this question – because it is the wrong question. The question you should be asking is: When do I need a reference? So, let's try again.

When do I need a reference?

Generally speaking, you need a reference whenever your argument or answer to your research question depends on some claim that is not obviously true – **something that might raise an eyebrow** as people wonder is whether this is indeed so. The purpose of the reference is, hence, **to bring that eyebrow back down**: By showing that other researchers have come to the same conclusion, you can try to convince your reader that what you say deserves to be believed. However, while references are always suitable to support your points, they are not the only way to do so.

To determine whether you need to back up your claim, ask yourself these questions:

- Is there any claim in this statement that, **if it were untrue**, would cast doubt on my argument?
- Can I assume that **anyone will accept that this claim is correct**?

If the first answer is Yes, and the second is No, some kind of evidence is in order. What kind of evidence is suitable and sufficient depends on the claim:

Examples can establish that something exists or is possible, but nothing else

Documents can establish that something has happened, but nothing else.

Reports can establish that someone said that something happened – and **if** that person was qualified to know and trustworthy, this may suffice to establish that this actually happened – but nothing else.

Arguments can establish that it is plausible to believe something, but not that it is certainly true. Arguments are only as strong as those claims they are based on, which may in turn require evidence.

Formal proofs can establish that something is necessarily correct **if** the stated assumptions hold.

References document that someone who checked something systematically, appraising existing knowledge and available evidence of all kinds, came to the same conclusion.

References are usually as close as we get to establishing that something is probably true. References are **always** needed when you make claims about theories and explanations, causal connections, and more generally anything that you cannot show by any of the other means.

In the following, I will address these points in more detail.

Evidence

To better understand this logic, let's start one step broader. **References are a form of evidence.** In academic papers, broadly speaking, evidence serves to corroborate that something can be considered to be true whenever that is not obviously so. Hence, **whenever you say something that is not obviously true, there may be a need for evidence.**

In academic writing, we require **adequate evidence** for **every claim that is necessary** to arrive at your conclusion: If your conclusion depends on a claim, and that claim turns out to be untrue, the conclusion falls with it, so you need to convince your readers (or audience) that every such claim deserves to be trusted. To determine whether a claim is such that your conclusion depends on it, presume, for a second, that the opposite was true – does your conclusion still hold? If yes, the claim is not critical, and you may consider removing it. If no, you found a claim that may require evidence.

To determine **whether a claim is not obviously true**, I propose that you put yourself into the role of an interested listener – say, your grandmother, your son – trying to follow your argument. For every claim, consider whether they might raise an eyebrow: Oh, is that so? Many claims don't raise eyebrows: If you claim, say, that North Korea is a dictatorship, that people enjoy jokes, or that the world is round, you don't need evidence for that (well, usually). But if you claim that social media breed hostility, or that information is hard to unlearn, it is quite perceptible that there is an eyebrow going up, wondering whether this is really so. Whenever that happens, you need evidence – and not just any evidence – to get that eyebrow back down, and see your son or grandmother nodding: Okay, I accept this as sufficient evidence that what you say is true.

What kind of evidence do I need?

To decide what kind of evidence you need, you need to understand what kind of evidence is capable of carrying the weight of your claim. In academic writing, references are among the strongest kind of evidence (superseded only by formal proof), so providing a reference is usually one possible solution. However, not for all claims, adequate references are always available, and there are several other forms of evidence, which are sometimes just as capable of carrying the required weight – most saliently, examples, documentation, reports, arguments and formal proofs. To determine whether you need a reference, or whether some other form of evidence will do as well, you need to examine the nature of your claim.

Examples

Examples corroborate a claim by showing that something exists. If all you need to show is that something is possible, examples thus can do the trick. However, examples are unable to establish that something is systematic or common, or that there is a specific pattern, causal relationship, or other kind of theoretical quality.

Documentation

Documentation is a form of evidence that proves that something specific existed or happened in a specific situation: A citation from a text documents that this text indeed said something; a receipt documents that some transaction happened; a digital record documents that some digital event has occurred; an official document documents that something has been certified by the appropriate authorities. If what you need to show is that something was the case in a specific setting, documentation is adequate evidence. In some cases, documentation can also serve to confirm the existence of specific patterns – notably, if that pattern itself has been the object of documentation (e.g., in official statistics). However, documentation never evidences anything that reaches beyond the specific setting, so it cannot support generalizations or theoretical claims.

Reports

Primary sources document that someone whose task it was to know what happened said that it happened or is the case. They can thus render credible that something happened or is the case to the extent that the reporter in question could observe and/or understand what happened, and can be trusted to report accurately. Sometimes, this is trivial: If a journalistic report states that there has been a flood, it is highly unlikely that the reporter has been mistaken about this or would report this if it wasn't true. However, there are two important limitations. First, not all reporters are equally trustworthy. If there is reason to believe that the report may distort the facts – think of biased media, partisan historical sources, official reports edited by the minister or think tank reports that pursue a specific political agenda – one report may not be sufficient to carry the weight of evidence. Only if different reports, for which we have no reason to suspect that they would all distort the facts, agree on something, we can consider this sufficient evidence. Second, some claims are difficult, if not impossible to observe for a reporter. Reports may provide compelling evidence that something observable happened – an event occurred, a statement was made – but are limited in reporting on unobservable facts – such as motivations, reasons or implications. Hence, it may be adequate to recruit additional evidence to bolster reports' suppositions that reach beyond what the reporter could have confidently known. For this reason, reports cannot serve as evidence to support inferential or theoretical claims.

Arguments

Arguments corroborate a claim by offering reasons why the claim could be considered to be valid. As such, arguments are very flexible and can be applied to just about any kind of claim. The trouble with arguments, however, is that arguments usually require evidence themselves: Arguments advance believed facts, regularities and tendencies, causes and reasons, all the way to theoretical claims to support a statement – raising in turn the question whether each of these facts, regularities etc. can be believed. Only where arguments are grounded in statements that are already established in your paper, or that are obviously true, can an argument stand by itself as adequate evidence.

Formal Proofs

Formal proofs corroborate a claim by demonstrating that it follows necessarily from a set of given or proposed premises. If the claim is logical or mathematical, formal proofs are usually conclusive: If you can show, for instance, that two conditions were identical save for one difference and the outcome, it follows logically that that difference caused the difference in the outcome. If proofs are used outside formal logic and mathematics, one often cannot rely on pre-established, given premises, but needs to propose them oneself. For instance, I can provide a formal proof that a specific game theoretical model explains a certain outcome – but then, I am still left to explain why that specific game theoretical model was appropriate to use – which means, I need more evidence.

References

Whenever the above kinds of evidence are unable to “bring down the raised eyebrow” and compellingly confirm that what you say deserves to be believed, you need a reference. References are generally needed whenever only scientific investigations are capable of sustaining a certain claim. Theoretical claims, causal links and claims about regularities almost always require a reference. It is easy to see why that is so: if you claim that A is usually followed by B, for some specified reason, any example, document, report or argument is evidently insufficient as evidence: neither examples nor documents can show that something is “usually” in some way, and none of these suffices to establish why. Only scientific evidence will do – and that means that a reference is in order. References are usually superior to most other forms of evidence because they refer to investigations that are systematic, transparent and guided by a wealth of existing scientific knowledge. However, also scientific work is not conclusive proof, as researchers also make mistakes, don’t know things or disagree. Sometimes, therefore, there may be a need for multiple references, or a reference in combination with other evidence. In the end, the guiding question is always whether the evidence that you provide is suitable to convince a possible reader or listener that what you just said deserves to be believed.

How many references do I need, again?

Based on the above discussion, you can see now that this question does not have a straightforward answer. Depending on the nature of your claims, you may end up needing relatively few references, or relatively many; and these references may point to a wide variety of sources, each cited few times, or to a smaller number of sources, cited repeatedly, or any mix of these. For instance, if you want to claim that there is scientific consensus on something, you may need multiple references to show that scientists across the board indeed agree – or you may find a book or review article that already made this point for you, so you can just cite that one text. You may find one source rich in that it provides suitable evidence for many of your claims, or you may find that you need different references for each point. There is no correct or minimum number of references: The key rule is that all relevant, non-obvious claims must be supported by adequate evidence, and whatever is needed to do that is the correct number of references.

So anything goes?

Obviously, no.

First, all research departs from what we already know. You cannot start building your paper without considering what others have already concluded. This presentation of the state of present knowledge inevitably requires some references – even if that is in part to cite others' conclusion that we know little and that more research is needed.

Second, all research needs to go beyond what we already know. If all that you say comes from the same source, I could just read that source, and would not need your contribution. Accordingly, it is usually inappropriate to build your entire argument, or even major stretches of it, exclusively on one source. If you find evidence for every relevant claim in one and the same source, this probably means that you are not going beyond what that source already knew.

Third, few things in science are entirely uncontroversial. As you build your argument, you will usually encounter claims to which there exist good counterclaims or objections. Whenever there exist good grounds for doubting that what you say is the only or certain correct answer, scientific transparency dictates that you should at least note these objections. Especially for key claims in your work, it is therefore rarely sufficient to cite only one study as evidence – both because one reference fails to establish that something is widely agreed, and because it fails to note the limits of scientific agreement.

Are all references the same?

Obviously, not all references weigh the same in supporting your arguments. Therefore, it usually makes sense to consider the quality of cited sources when using them to support your key claims. The following points are rules of thumb, to which there are many exceptions, but which can guide you in evaluating your sources.

Usually, **key works** are better than peripheral ones – because the fact that many have read these and found their conclusions valid strengthens their credibility.

Usually, **recent works** are better than old ones – because newer findings may have revised older knowledge.

Usually, **works that have undergone quality checks** (such as peer review) are better than those that have not – because such checks help identify weaknesses and weed out problematic arguments. In effect, this means that articles in major journals, where quality control is tough, are usually the strongest sources; generally, journal articles and also most conference full papers are peer reviewed, so these are good sources. Books and book chapters may have been rigorously checked or not, and there is usually no easy way to know. The standing of the publisher and the responsible editor sometimes can provide some clues. Conference talks without full papers are usually evaluated based on the abstracts only, which is better than nothing, but no rigorous quality check. Working papers and unpublished manuscripts are usually not quality checked and thus often are inferior sources.

Usually, **accessible sources** are better than inaccessible ones – because then your readers can follow up and read what you read. For this reason, citing talks without published papers, or works that are hard to get should be a fallback option only if no better sources exist.

Generally, sources whose **scientific quality and independence** is in doubt need handling with care. Lacking independence is a larger problem in some areas of science than in others – notably, when strong ideological viewpoints or economic incentives may interfere with scientific objectivity (e.g., propaganda research). Such sources may still be informative – especially if no other sources are available – but you need to consider whether (and possibly explain why) they can still be trusted regarding those claims that you wish to support.

Generally, **scientific sources** are structurally different from non-scientific sources, such as journalistic analyses, think tank reports or Wikipedia pages – because unlike the latter, scientific sources must always explicate the origins of their ideas and arguments, document the treatment of their data, and submit themselves to an ongoing debate that reviews their strengths and weaknesses based on transparent and independent argument and evidence.

This does not mean that there are not also many brilliant analyses found in old, unpublished manuscripts which have been rarely cited, or even in journalistic news or (but very rarely) on Wikipedia. However, if these analyses are strong, we have no simple way to know this or distinguish them from other, weak and problematic contributions. It is exactly because of their use of references and other forms of evidence that the specific quality of scientific writing can always be evaluated.