Evaluating arguments

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1 Structure of the lecture

This lecture contained four sections, each aimed at improving your ability to evaluate arguments — both your own, and other people's. In the first two sections of the lecture, I considered two common biases in argumentation. These are biases that people often do not realise they have, but which reliably occur unless they deliberately takes steps to avoid them. In each case, I give advice on how to avoid these biases in your own thinking. In the third part of the lecture, I considered weak arguments — how to identify them and hence avoid being taken in by them. In the final part, I demonstrated a systematic method for evaluating arguments.

2 My-side bias

The first four slides demonstrate a study by Stanovich and West (2006). The study shows that peoples' assessment of the strength of claims is affected by the relation of those claims to their personal circumstances. Thus, for example, non-drinkers are more likely than drinkers to think that drinking at university leads to alcoholism later in life. This is called *my-side bias*.

The next slide summarizes another study of my-side bias, this time in the interpretation of news reports concerning the Lebanon War in 1982. Pro-Israeli students considered the reports to be anti-Israel, but pro-Arab students considered the reports to be pro-Israel. So, in this case, both sides considered the reports to be biased towards the opposing side in the conflict. This is another example of my-side bias — the assessment of evidence is affected by what you already believe.

The next two slides summarize a study by Perkins et al. (1991). The study illustrates that my-side bias is not reduced by age, experience, or education. However, it is reduced if participants receive a prompt to look for arguments on both sides ("scaffolding").

The final slide of this section summarizes what you can do to avoid my-side bias. Basically, scaffold yourself!

3 Illusory correlation

Illusory correlation is the phenomenon, originally due to Hamilton and Gifford (1976), that people will tend to perceive a correlation between two variables when in fact one does not exist.

In Hamilton and Gifford's study, participants were presented with a series of statements about the members of two gangs. The statements described either desirable or undesirable

behaviour. For example, "a member of group A visits a friend in hospital" (desirable), or "a member of group B kicks a puppy" (undesirable). Participants get 39 statements and then are asked questions such as "How likely is it that a member of Group A engages in desirable behaviours?". Group A is larger than Group B, so participants see more statements about Group A than about Group B. The first slide shows the number of statements they see.

The result of the study is that Group B is rated as more likely to engage in undesirable behaviours than Group A. This is not because of the labels "A" and "B", because these are counter-balanced (i.e. for half the participants Group A is the minority group).

The result is striking, because there is no correlation here — the ratio of desirable to undesirable behaviour is the same in both groups. The result is reliably found where (a) Group B statements are less frequent than Group A statements, (b) desirable behaviour is more common than undesirable behaviour, and (c) the number of observations of Group B is quite low.

There are clear links here to the prejudice against minorities we see in the real world, and it is interesting and important to note that this illusion is not specific to such real world content — both the groups and the behaviours can be arbitrary and abstract, and you still get this effect. It's a fundamental limitation in the human ability to assess correlation from small samples, and a classic example of why it is important to sit down and work out the ratios, rather than making a judgement "on instinct".

4 Weak arguments

Weak arguments are those that do not support the arguer's conclusion (or do so only very weakly). Weak arguments are prevalent in general society, and even in science, because they have the *appearance* of being good arguments. I'm telling you about weak arguments so you can detect and reject them. Do not be tempted by the *dark side* of weak arguments! They are very powerful, as they can often be used to win arguments without having to go to the bother of considering the evidence.

Across six slides, I summarize some of the more common weak arguments. The examples on the slides are intended to be light-hearted and clear, but the point is serious. Listen to media reports, read scientific papers, and try to identify these kinds of weak arguments. Here are some further examples

- "Many migrants are from Syria, and some Syrians are terrorists, so some migrants are terrorists". This is a non-seqitur.
- "Global warming is a good thing — it's always so bloody cold around here!". This is equivocation - it makes use of the everyday meaning of the word "warming", which is different to scientific meaning of the term global warming, which relates to a range of effects consequent to a rise in overall global temperature (including, potentially, a reduction in UK temperatures due to movement of the gulf stream).
- "Dr. Smith, a leading expert in sleep research, confirms that alarm clocks are bad for your health". Unless one goes on to discuss the evidence, this is an appeal to force — we are meant to be convinced by the description of this person as an expert.
- A GP says "I'm going to prescribe Prozac. It's an anti-depressant, so it should improve your mood". By definition, an anti-depressant improves mood, so this statement is circular, it provides no evidence for the conclusion. It is begging the question.

As an exercise, see if you can come up with your own examples of the weak arguments discussed in the lectures.

5 How to evaluate an argument

In the final section of this lecture, I talked you through a step-by-step method for evaluating other peoples' arguments. Evaluating arguments is at the heart of all good scientific writing and is central to doing well in all essays and reports throughout your course.

5.1 Infallible Flowchart

I call the method the Infalliable Flowchart because it always works. When reading a paper (or textbook) have this flowchart beside you and go through its steps for each key claim.

You start by identifying the conclusion of the argument. If you don't know what it is that is being claimed, you cannot evaluate that claim. So, start with the conclusion and work backwards.

Next, you identify the premise or premises. In other words, identify the statements that are used to support the conclusion. These are called premises.

Next, you work out the relationship between the premise(s) and conclusion. For example, if there are two premises, are they independent? In other words do they each provide separate arguments for the conclusion? Or perhaps they are conjoint? In other words, the argument assumes that both premises have to be correct for the conclusion to follow. Or perhaps they are casually linked? In other words, the second premise is a conclusion drawn from the first premise, and then the stated conclusion is drawn from the second premise?

Next, you ask whether the premises support the conclusion. In other words, does the conclusion follow from the reasons given. Is it a logical deduction? A logical deduction is where the conclusion necessarily follows, given the truth of the premise(s). Logical deduction is quite rare. Often, an inference is being made. An inference is a conclusion that is likely to be true given the truth of the premises, but not inevtiably so.

Finally, you ask whether the premises are true. Even if the conclusion logically follows from the premises, it is not a valid conclusion unless the premises are true. In science, previous or current research is generally used to evaluate whether the premises are true.

5.2 AIDS example

We worked through an example of argument evaluation using an argument about AIDS. We identified the conclusion and premises, and then decided that the relationship between them was independent. The two premises provide two different reasons why the authors wants us to believe his conclusion. If one reason fails, the other may still support the conclusion.

We then came to the less formulaic part — do the premises support the conclusion? This is quite difficult to say, and one of the reasons it's difficult is because the conclusion is somewhat vague. What does the phrase "not necessarily a death sentence" mean? Life is a death sentence — we all die — and in the legally-related sense of the phrase, there is often a delay of years or even decades between the announcement of a death sentence and it being carried out. This makes it hard to see the first premise as supporting the conclusion — the author would need to make a more specific conclusion in order to use this premise appropriately.

The relationship of the second premise to the conclusion is somewhat clearer. AIDS is a cause of death, being HIV+ is a symptom. If being HIV+ does not necessarily lead to

AIDS, it therefore does not necessarily lead to death. This is fairly close to what the author seems to wish to conclude, although again the conclusion could be clearer.

Finally, and crucially, we asked whether the premises were true. This is the legwork of science, and its interconnectedness. Evaluation of the truth of these premises depends on other arguments, in papers, and on the soundness of those arguments.

The first premise is relatively straight forward and testable. One well-cited study estimates mean incubation time of HIV to be 10 years in young adults (Bacchetti & Moss, 1989) so, on first glance, the premise seems not unreasonable.

In the second premise - "suggesting", "may" and "significant" are hedges. They reduce the clarity of the premise without changing its essential character. If the second premise is to support the conclusion, we have to consider it as the statement, "some people who test positive for HIV never develop AIDS". Put this way, the premise is hard to evaluate. There is one sense in which it is true — no test is perfect, so some people who test positive for HIV are not, in fact, HIV+. But this is unlikely to be what the author intended. If so, the statement is "some people who are HIV+ never develop AIDS". Again, there is a fairly trivial sense in which this is true. For example, someone who commits suicide on the news they are HIV+ is never going to develop AIDS. As a matter of principle, then, it is going to be very difficult to discount the possibility that AIDS would have developed if the patient had not died of some other cause first.

What the author may be referring to is the presence of what the field describes as "long-term non-progressors" - people who are still asymptomatic after 12 years. Such cases do exist, and their prevalence is hard to estimate, but they are certainly very rare (one estimate is 1 in 500 cases of HIV+). `http://www.niaid.nih.gov/volunteer/hivlongterm/Pages/default.aspx`

In summary, the first premise seems to be supported by scientific evidence, but the author's conclusion is too vague to be supported by the first premise. The second premise supports the conclusion, but it is too vague to be clearly evaluated. If the author refers to long-term non-progressors, then these do exist, but it seems too much of a leap from an approximately 1 in 500 chance of not developing symptoms for more than 12 years to "a significant number of people who test positive never developing AIDS".

5.3 Fox hunting example

We also considered an argument about fox hunting. Steps 1 to 4 of argument evaluation are covered in the slides. But are the premises true? The first premise is not really a scientific claim because it is prescriptive rather than descriptive, as covered in the last lecture. The second premise is too vague to investigate, because of the term "unnecessary". What defines whether an event is unnecessary? However, the related claim "fox hunting causes suffering" is a claim for which the evidence can potentially examined be scientifically — if one were satisfied that animal suffering is something that can be measured (which it probably is).

5.4 Ethymemes

This refers to a situation, undesirable but quite common even in scientific writing, where one or more of the premises are missing and have to be inferred by the reader.

5.5 Using the flowchart in your writing

In the end, it all comes back to the flowchart. You should also see this as the receipe for constructing good arguments. One of the most common problems in student essays and

reports is that one or more of these steps are missing in the arguments presented. Most commonly, the conclusion is given, but the premises are not. Or, if they are, the relationship between premise and conclusion is not clarified. Or the truth of the premises is not examined.