

Explanation; inference to the best explanation

EXPLANATION

The notion of *explanation* is an ordinary one; you know it well. But it is worth examining it more carefully.

Often, when one thing explains another, it is because the first thing *causes* the second thing. For example, consider the claim that the fire alarm sounded because Randy was cooking. This claim involves a causal relationship between Randy's cooking and the sounding of the fire alarm. But later in this seminar we will encounter non-causal explanations.

We can diagram explanatory relationships using the same methods that we used to represent evidential relationships. For example:

1. Randy was cooking.
2. The fire alarm sounded.

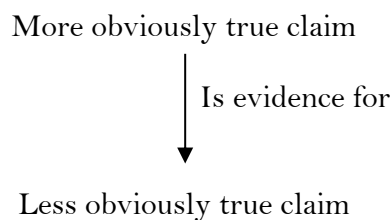


Be warned that the same words – words like “because,” “since,” “thus,” and “so” – can be used to indicate *either* evidential *or* explanatory relationships (or both). This can be confusing, since evidential relationships and explanatory relationships are not the same thing! For example, suppose that you see smoke pouring out behind a hill and conclude that there is a fire (which you cannot see). Consider these claims:

3. There is smoke.
4. There is fire.

In this case, 3 is evidence for 4, but 3 does not explain 4. On the contrary, it is 4 that (causally) explains 3.

Suppose you know that there is an evidential relationship between two claims. How can you tell which claim is evidence for the other? One good heuristic is this: **typically, the claim that is *more obviously true* is evidence for the claim that is *less obviously true*.** In a picture:



Note well: which claim is more obviously true is a context-sensitive matter! To return to our example above, suppose that someone starts a fire behind a hill. If you see the smoke but do not

see the fire (because you are on the other side of the hill), then, in your context, 3 will be evidence for 4. But suppose that you instead see the fire being started, but you turn around before any smoke is produced. In this context, 4 will give you evidence for 3.

Now suppose you know that there is an explanatory relationship between two claims. How can you tell which claim explains the other? Here it is harder to give general advice, but I can offer this heuristic for cases of *causal* explanation: **an earlier event will almost always causally explain a later event.**¹

As you read texts for this seminar, begin to pay closer attention to the words that indicate evidential and/or explanatory relationships, and carefully consider which direction the relationship runs in. You should expect to find this difficult! There is no need to worry; we will practice this skill repeatedly in seminar.

PRODUCTIVITY

Most people find it natural to start their days with the tasks that they find easiest and build to the ones that are hardest. But it has been scientifically demonstrated that, generally, the *opposite* strategy is much more effective:

You should start your day with your hardest task and work your way down.

This technique works for several reasons. First, if you go from easy tasks to harder ones, you will always feel like you are climbing uphill. But if you start with the hardest task and go to easier ones, your day will get easier and easier. You start with one hard climb and then get to amble downhill the rest of the time.

Second, psychologists have demonstrated that our willpower only decreases as the day continues. So you should use the earliest part of your day, when you have the most mental fortitude, to do what is most challenging.

I therefore offer you a challenge: for the next week, reserve your first 20-minute block of free time every day for whatever task you find the most intimidating. **You do not have to take this challenge. It is entirely your choice.** But if you do, I predict that you will accomplish great things!

INFERENCE TO THE BEST EXPLANATION

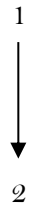
In its simplest form, *inference to the best explanation* is a form of argument in which one infers from a body of evidence to the best explanation of that evidence. Scientific reasoning often takes the form of an inference to the best explanation. Schematically, a simple inference to the best explanation might be represented as follows:

1. [Evidence.]
2. [Evidence.]
3. [Evidence.]
4. [The best explanation for all of the above evidence.]

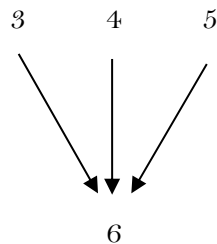
Here are some simple examples of inferences to the best explanation:

¹ Cases of time travel are a rare exception to this rule.

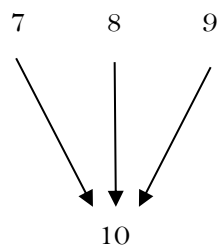
1. Whenever Quentin is around Alice, his cheeks become flushed, his heart rate quickens, and he loses his train of thought.
2. Quentin has a crush on Alice.



3. There are many small paw-prints on the ground.
4. The lettuce in the garden has been chewed up.
5. This morning, my dog was barking in the direction of the garden.
6. This morning, there was a rabbit in the garden.



7. In societies without laws, people behave chaotically.
8. Children are greedy and selfish.
9. As our technological capacities have developed, human beings have killed one another in larger and larger numbers.
10. Human nature is bad.



Note well: in an inference to the best explanation, the evidential and explanatory arrows run in opposite directions. The premises are *evidence* for the conclusion because the conclusion *explains* why each premise is true. Students often get confused about this: they think that *any* argument in which there is some explanatory relationship between the conclusion and the premises is an inference to the best explanation. This is false! For example, consider this argument:

11. Dara drank three cups of espresso at midnight.

12. Dara will not fall asleep before 2 AM.

11



12

Yes, this is a perfectly reasonable argument, but it is *not* an inference to the best explanation. Why not? Because the premise explains why the conclusion is true, not the other way around – Dara’s drinking three cups of espresso at midnight is what causes her not to fall asleep before 2 AM. So remember:

- If the conclusion explains why each premise, taken individually, is true, then the argument is an inference to the best explanation.
- Otherwise – for example, if the premises explain why the conclusion is true – the argument is *not* an inference to the best explanation.

Some final notes. Unlike a number of argument forms that we will study later, inference to the best explanation is *not deductively valid*: that is, the conclusion of an inference to the best explanation may be false *even if the premises are true*. Nevertheless, inference to the best explanation is often a *good* form of argument. (An argument form can be good without being deductively valid.) And an inference to the best explanation becomes more persuasive as the body of starting evidence grows larger.