

Unit 5

Logic

Introduction

Now that you have the basic vocabulary and concepts for interpreting and evaluating arguments, you are ready to get into deeper matters. This section takes up the topic of logic.

Learning objectives

When you have completed this unit you should be able to:

- demonstrate the various uses of the term “logic”;
- define “entailment” and be able to use that definition;
- identify arguments intended to prove their conclusions; and
- distinguish between the two sorts of definitions and evaluate arguments containing either sort.

Assigned reading

Oxford English Dictionary. “chair”

American Psychiatric Association. ““Asperger’s Disorder”

How to proceed

1. Read the study notes for unit 5.
2. Do the assigned readings.
3. Answer the following questions.
 - What sort of definition does the Oxford English Dictionary give of the word “chair”?
 - What is wrong with this definition? (Hint: there is definitely something wrong.)
 - What sort of definition does the American Psychiatric Association give of the term “Asperger’s Disorder”?
 - What is wrong with this definition? (Hint: there is definitely something wrong.)
4. Once you have thought about these questions, submit your answers by clicking on **course discussion** on the course web site and compose your message. Fellow students will give feedback, and perhaps ask questions. In addition, your instructor will respond to comments from students, and may ask for clarification on student views stated in the discussion.

Study notes

Uses of the word “logic”

The word “logic” is used in a number of ways. Below are the most common uses of “logic” and its cognates.

1. For a person to *think logically* is when that person’s thoughts lead to epistemically rational beliefs.
2. For a person to *be logical* is for that person to tend to think logically.
3. A person *uses logic* or *makes a logical argument* by making good arguments.
4. *Formal logic* is a field of study in which people try to give mathematical precision to the idea that some statements are inconsistent with other statements, or the idea that some statements can be proven if you accept other statements.
5. The *logic of an argument* is its structure—the reasons that are given for the conclusion and how they are related to each other.

When philosophers think about logic, they think mainly about formal logic—that is, about consistency, proof, and disproof. Advanced formal logic looks, to the untrained eye, exactly like advanced mathematics, and it is equally incomprehensible to non-experts. More basic courses in logic show how one can develop formal-logical models of statements to determine whether premises guarantee their conclusions or not (more on this below), just as basic courses in mathematics show how one can develop mathematical models of the world in order to answer various questions about whether Billy or Bobbie has more apples.

As an aside, it is important to point out that logic has nothing to do with emotion. All four possible combinations of emotionality and logic are possible, and indeed are exemplified by people every day. A person can be very emotional and very logical, such as a person who passionately gives good arguments for environmentalism, and a person can be very emotional and very illogical, like a singer/songwriter who is so depressed over a lost love that he loses confidence in his ability to write good songs. Similarly, a person can be very unemotional and very logical, like Star Trek’s Mr. Spock, and a person can be very unemotional and very illogical, like a person who is so cold-hearted she doesn’t realize that her behaviour is actually harmful to her. Of course, no one who is very emotional is likely to sit down and start using formal logic (though that happens!), but that doesn’t mean such a person fails to think logically.

Entailment

Another way of characterizing formal logic is that it studies entailment. Though I am not about to launch into a discussion of formal logic, entailment is still a very important topic, and a lot can be said at an informal, non-technical level. That is what this section will attempt to do.

There is a simple way of describing what entailment is, and it is so important that it deserves to be set off from the surrounding text just to make it stand out:

For a statement or set of statements to entail another statement is for there to be no way for the former to be true and yet the latter be false.

As this analysis shows, entailment is a relation between possible statements, in which one statement (or set of statements) would guarantee the truth of the other. To say that the statement “X” entails the statement “Y” is to say there is a strong relation between the two states of affairs X and Y: X guarantees Y; there is no way of having X which avoids Y.

It is important to study entailment in a course on Critical Thinking because arguments relying on entailments are common, as are bare claims of entailment. Furthermore, there are some general features of entailments that can be studied in the abstract, unlike, for example, features of faithfulness or hockey. We will come to discuss entailment in statements in a moment. First, though, it may help to have some examples of arguments in which the premise(s) entail(s) the conclusion. Here are five:

1. There are people in this room. Therefore, there are mammals in this room.
2. There are three possibilities: Ms Red, Mr. Black, or Ms Blue committed the murder. Ms Red had no chance to commit the murder, and Mr. Black did not have the strength. So Ms Blue committed the murder.
3. Bill Clinton is worse than Hitler. Thus, Bill Clinton is a bad man.
4. If I kiss Roland the duck he will explode, because all ducks explode if you kiss them.
5. My dog has fleas, so $1 + 1 = 2$.

In each of these cases, it is impossible for the premise or premises to be true while the conclusion is false. In the first two cases, there is a sensible relation between premise and conclusion. To infer from the premise that there are people in the room to the conclusion that there are mammals in the room is a sure thing: there is no way the premise can be true and the conclusion false, because humans are a kind of mammal. Likewise, there is no way that the premises of (2) can be true while the conclusion is false, because the premises tell us there are three possibilities while ruling out two; if this is right, then the conclusion, that the remaining possibility must be correct, is certain to be so.

Arguments (3) and (4) show us how the definition of “entailment” can be stretched. In arguments (3) and (4), the premise is false, but if it were true, the conclusion would have to be true. So the premise entails the conclusion in each case. Argument (5) stretches the definition of “entailment” to its limit. Although the premise is irrelevant to the conclusion (and in fact, I do not even have a dog), still, technically, the conclusion is entailed by the premise, because there is no way for the premise to be true and the conclusion false—there is just no way for “ $1 + 1 = 2$ ” to be false.

Entailments do not only occur in arguments. Often, someone will simply make a claim about entailment, rather than argue that one thing entails another. It will help discussion to introduce a simple symbol. For “A entails B”, write “ $A \rightarrow B$ ” (“A” and “B” are assumed to stand for complete sentences). In this notation, A is the *antecedent* and B is the *consequent*.

Given this notation, the following sentences can be symbolized straight forwardly:

1. a. The fact that Kiyoshi hates all animals *entails* that Kiyoshi hates cats.
b. Kiyoshi hates all animals → Kiyoshi hates cats.
2. a. The lack of microfractures guarantees that the propeller has never been used.
b. The propeller lacks microfractures → The propeller has never been used.

Less obviously, other sentences can also be symbolized in this fashion.

3. a. *If* his heart stops beating *then* the bomb he is carrying will explode.
b. His heart stops beating → The bomb he is carrying will explode.
4. a. *When* Saturn is visible from the Earth, the sun has long been below the horizon.
b. Saturn is visible from the Earth → The sun has long been below the horizon.
5. a. Political unrest in Tibet *means* that U.S./Chinese relations will get worse.
b. There is political unrest in Tibet → U.S./Chinese relations will get worse.

In each of these examples, a statement is made (note: *not* an argument). That statement holds that one thing guarantees another; that it is impossible for the one thing to obtain but not the other. Sometimes this is said in so many words, other times constructions like *if...then...* or *...means...* are used. They are all different ways of talking about the same relation, however.

Once we see that entailment claims are fairly common, we can also note some more complex cases.

6. a. John will come back to Liz *only if* she sends her cat away.
b. John will come back to Liz → Liz sends her cat away.
7. a. A person is a bachelor if and only if that person is an unmarried man.
b. A person is a bachelor ↔ That person is an unmarried man.
8. a. The fact that Carl is coming to the party does not mean that you can't go.
b. It is not the case that [Carl is coming to the party → You can't go].
9. a. Earthquakes will destroy California if the planets align.
b. The planets align → Earthquakes will destroy California.

How does one go about evaluating entailment claims? Recall that claims of entailment are true when and only when it is not possible for the first part, the antecedent, to be true while the second part, the consequent, is false. To evaluate a claim of entailment, then, you need to try to imagine scenarios in which the antecedent is true but the consequent is false. If it is possible to imagine such a scenario, then the claim of entailment is false; if it is not possible to imagine such a scenario, though, then the claim of entailment is true.

Example of a false claim of entailment

The fact that the Liberal Party forms the provincial government guarantees that the province will run a large deficit.

It is possible for the Liberal Party to govern a province without running any deficit at all, so it is possible for the antecedent to be true while the conclusion is false. Even

if no Liberal provincial government has recently gone without a deficit, the possibility still exists, and so the claim of entailment is false.

Example of a true claim of entailment

From the fact that makers of brand-name pharmaceuticals flourish, even while there are cheaper versions of the same product, it follows that the market will bear the higher prices.

The antecedent is true and so is the conclusion. Brand-name drugs cost more than generic versions containing the same active ingredients, but brand-name drugs remain profitable for their makers. And certainly, the market does bear the higher prices. But what is more, the antecedent guarantees the conclusion. There is no way that brand-name drug makers would flourish if the market did not bear their higher prices for a company to flourish; it is necessary that people in the market actually pay what the company charges. Thus, the claim of entailment is true.

One of the things brought out by some of the earlier examples is that entailments come in stronger and weaker forms. For instance, the claim made in (1) (the fact that Kiyoshi hates all animals *entails* that Kiyoshi hates cats) is an entailment in the sense that there is no way imaginable that A could be true and B false, while it is certainly *imaginable* that, in (5), there be political unrest in Tibet and yet U.S./Chinese relations not get worse. In (5), A entails B in the sense that there is no way, *practically speaking*, that A could be true and not B. This is a fairly weak sense of entailment. Example (4) shows an intermediate case: the entailment between Saturn's visibility and the sun's location is not just a practical matter, but it is imaginable that it be otherwise (perhaps Saturn could be twice as bright as Venus, or as bright as the moon). Example (4) is an example of a case where it is not possible, given the laws of nature, that A be true and B be false. The sort of entailment found in it is weaker than the sort in (1), but stronger than the sort found in (5).

Normally, when philosophers are interested in entailments, they are interested in entailment in a very strong sense. But people make claims about entailments in weaker senses all the time, so you should watch for all three. A word of caution, though: you have to be sensitive to the sort of entailment an author/speaker has in mind. A person who makes the claim in (5) will not be interested in the fact that it is *conceivable* that bad political relations not follow from unrest in Tibet; that person is making a claim about the practical possibilities. To argue that a claim about practical possibilities is false, you need to provide a practical counter-example, not a merely conceivable one. An example may help to make this clear.

False claim of entailment

If you are sent to a mental hospital, you must have some sort of brain disease.

Silly response

That is not true, because aliens could beam you into a mental hospital with a teleportation device just in order to bug you.

Sensible response

That is not true. Some people are sent to mental hospitals because their behaviour is very disruptive to their families and schoolmates and then, when

they are taken to see a psychiatrist, the psychiatrist does a bad job of diagnosis. They are sent to a mental hospital, although they do not literally have any brain disease at all, just conflicts at home and school.

The examples just given are all of statements about entailments: they are examples of entailment claims that could be premises. Now it is time to further investigate how arguments can be made in ways involving entailment.

Argument construction and entailments: Modus ponens and modus tollens

The simplest way in which an argument might involve an entailment is that one premise in the argument might be a claim of entailment. There are two famous types of arguments that involve entailment claims in this way. In the first sort, one premise holds that $A \rightarrow B$, and a second holds that A , from which it is concluded that B . (This is a form of inference known to philosophers by its Latin name, *modus ponens*.)

E.g.: If there is no water pressure left in the radiator, that means the head gasket is blown. And I see that there is no pressure left in the radiator. So clearly the head gasket is blown.

Premise 1 There is no water pressure left in the radiator $\rightarrow$ The head gasket is blown.

Premise 2 There is no water pressure left in the radiator.

Conclusion The head gasket is blown.

The second sort of argument is one that begins with the premise that $A \rightarrow B$, but it goes on to say that it is *not* the case that B , and concludes that it must not be the case that A . (This is a form of inference known to philosophers as *modus tollens*.)

E.g.: The mind and the body can only causally interact if they both have spatial locations. But the mind does not have a location in space, and so it cannot interact causally with the body.

Premise 1 The mind and body can causally interact $\rightarrow$ The mind and body both have spatial locations.

Premise 2 The mind does not have a location in space.

Conclusion The mind cannot interact causally with the body.

These two styles of argument—*modus ponens* and *modus tollens*—are examples of good uses of entailment claims. If there is good reason to believe the premises firmly, it will probably be rational to believe firmly in the conclusion.

Entailments as guises

Entailments can appear in arguments wearing either of two guises: as *part* of a premise, or as the *link* between premises and conclusion. Consider the following example.

Causal interaction between mind and body is only possible if both have spatial locations. But clearly they do interact—what I want from the fridge determines what I take from it. This means that minds do have locations in space.

Premise 1 What I want from the fridge determines what I take from it.

Subconclusion: The mind and body do causally interact.

Premise 2 The mind and body can causally interact → they both have spatial locations.

Conclusion Minds do have locations in space.

In this example, entailment appears twice. The first instance is found in the first sentence, in the words "...only possible if..." The second is found connecting the conclusion to the rest of the argument: "This means..." The first instance is an entailment claim—the premise claims that one thing entails another, and whether the premise is true or false depends on whether the entailment between causal connections and spatial relatedness exists or not. The second appearance of entailment is in the logic of the argument—it indicates how the speaker sees the premises as being related to the conclusion. In this particular case, the speaker thinks that the premises, if true, guarantee the truth of the conclusion. If the speaker is right, then anyone who rationally accepted the premises as known would be rationally required to also accept the conclusion as certain.

Now that you know a little about entailment, it is time for two special applications of the concept. The first application to be made of the concept of entailment will be to the analysis of proof, and the second will be to the analysis of definitions.

Proof

Claims of entailment are made in various contexts. One such context is that of *proof*. When a person claims to have proven something claims to have premises, known to be true, which entail the conclusion. Thus, if you are interested in whether or not some claim has been proven, you are interested in whether or not that claim follows with certainty from the premises provided (along with whether the claims are known to be true or not). Do the premises really guarantee the truth of the conclusion, or do they only make it likely, or do they not even do that?

To test whether or not certain premises entail a conclusion, think about all the possible situations in which the premises might be true, and try to imagine one such situation in which the conclusion is also false. If you succeed, then you know that the truth of the premises cannot *guarantee* the truth of the conclusion, and so you know that the conclusion is not entailed by the premises. If you fail, then you have good reason to think that the truth of the premises would guarantee the truth of the conclusion.

Examples

First example: an example of an attempted proof that fails.

Fred: I can prove to you that China is planning to invade Japan. Just consider the evidence: they go around launching long-range missiles, building up their nuclear capabilities, and sailing their warships around the ocean, and they have very aggressive policies regarding Taiwan. Also, they have fought Japan earlier in the century.

Frieda: Well, Fred, I'm not sure how convinced I should be by your evidence, but it definitely isn't a proof. China might be doing all those things to intimidate

Taiwan, for instance, and be completely uninterested in invading Japan. As for having fought a war with Japan before, do I have to remind you that Canada and Germany fought a war not so long ago, and neither is thinking of invading the other?

Second: an example of an attempted proof that succeeds, assuming the premises are known to be true.

Akeel 2 is the only even prime number.

Apurna Can you prove that, or is it just something you were taught?

Akeel No, I still remember the proof. 2 is a prime number, because the only natural numbers that divide evenly into it are 1 and itself, and that's what it takes to be a prime number. For any other even number, that number will be divisible by 2 (because all even numbers are divisible by two), and so it will be divisible by 1 and itself, and also by 2 and some other number (whatever is left after dividing by two). So no other even number is a prime number. Thus, 2 is the only even prime number.

A word of warning

A word of warning about proofs. When a friendly discussion turns into a heated argument, and the argument itself gets nasty, it is usually not long until someone says **"Oh yeah? Prove it!"** The other party to the argument usually falls into this trap and tries to prove the point under contention, whereupon the first party shows that nothing has been proven. With a bit of luck, the argument somehow ends without violence.

There is something very natural about the demand "prove it!" Someone tells us something hard to believe—that angels saved him from drowning, that aliens abducted her, that the Prime Minister has never done anything of a morally questionable nature—and we want proof. Or so we say. Really what we want is a chance to show the other person how stupid her or his claim is, by showing that it cannot be proven true. What proof can be offered for angelic intervention, or alien abduction, or Prime Ministerial propriety? A sworn affidavit from a first-person witness? But witnesses may be untrustworthy, gullible, or confused. A home-made video tape? But tapes may be doctored, scenes may be staged for the camera. An encyclopedia entry? But who wrote the entry, and why should she be trusted? Proof of hard-to-believe matters is hard to come by. It is very hard to provide evidence *known* to be true that *entails* the truth of a conclusion.

The problem with demanding proof is that proof of obvious truths is also hard to come by. Try proving that the side of the moon facing the Earth does not contain a base for UFO's. What evidence is there? A few NASA photos, none of them so detailed that they would detect clever camouflage, and our knowledge of alien motivation, which seems rather unreliable. Try proving that U.S. forces once fought in Grenada. It was in all the papers, true, but how many non-military witnesses were there, and of them how many do you know? Is it not easy to fake footage of such things? Might not any soldiers in Grenada have been mercenaries in U.S. uniforms? Where is the *proof*?

Are we heading for disaster here? If nothing can be proven, is it reasonable to believe anything? To accept this conclusion would be premature. To demand proof is to demand much more evidence than usual. No one insists on having proof that there is breakfast cereal in the box before eating breakfast, and no one insists on having proof that her car will not blow up before starting it (except for those at risk for terrorism). To demand proof is to demand something that we do not usually demand, and which we cannot usually give. Because of that, demanding proof in most contexts is an unfair epistemic thing to do.

Instead of proof, what most people want (and what most people can reasonably demand) in argument is good evidence. It may be hard to prove that there were U.S. troops in Grenada, but it is easy to provide good evidence—evidence that will support rational belief. That is all one normally wants, and all one normally should want. Of course, what constitutes good evidence is a problem in itself, and one that cannot be ignored. But let us keep things clear: most of the time, when one is arguing one just wants good evidence one way or the other, not proof. Proofs are very interesting when they *can* be provided, but when they cannot, that is often not of deep significance.

Definitions

Another context in which an understanding of entailment is especially useful is that of testing definitions. To see this, it will help to say a little about what definitions are.

Definitions come in two kinds: descriptive and stipulative. A descriptive definition is one that tells you what a word in some language means. For instance, a definition can tell you that “water” means “a collection of H₂O molecules in liquid phase,” or something of that sort. Stipulative definitions, on the other hand, do not say what a word already means, but invent a specific new meaning for a word, regardless of what the word means in the language. A logician might say something like “by “atomic WFF” I simply mean any individual propositional letter (P₁, P₂, P₃, etc.),” and thus tell you what will be meant by the strange phrase “atomic WFF” (at least, assuming you have also been given a stipulative definition of “propositional letter”).

Descriptive definitions are useful if you want to use your language correctly. If you want to know what “obsequious” means, you want a descriptive definition. Stipulative definitions, on the other hand, are useful when there is no one word that means just what you want to say. This is often the case in the law, where you can stipulate that, say, by the word “serious” you will mean “resulting in more than \$5000 damage”, and then talk about serious property crime in those terms.

Given the difference between descriptive and stipulative definitions, it is important not to let someone use a stipulative definition for a word when you are relying on using that word in its ordinary meaning.

Consider the following dialog:

Janet	The government is murdering hundreds of its own citizens every year.
Juan	No it isn't.
Janet	It is! It's just leaving them to die of AIDS or gang violence, or letting them freeze to death because they're homeless.

Juan Well, maybe, but that isn't murder.

Janet It's what I mean by murder.

In the dialog, Janet changes the point for which she is arguing. She starts off by saying that the government murders hundreds of its own citizens every year. That is a pretty serious claim! Juan doubts it, and Janet ends up changing her conclusion to an implicit conclusion that is something like "the government is responsible (in part) for the deaths of hundreds of its own citizens every year." That is still a serious claim, but it is not the same one. It is fair for Juan to complain that Janet should not change what she means when arguing. If Janet wants to stipulate that she will mean something special by "murder", she should announce that at the beginning, since otherwise Juan can only assume Janet means by "murder" what everyone else means.

Is the moral of the story that we should always define our terms? No! If we refused to speak before defining our terms, we would never get around to saying what we wanted to say. Just imagine what it would take to say "Clyde is waiting for us at the corner store." You would have to start by saying "By "Clyde", I mean the person who ..." but before you could even say that, you would have to say, "By "by", I mean ..." and so you could never really get started.

Furthermore, if two people disagree about a subject, the disagreement will probably not go away if people just define their terms. Suppose we disagree about whether capital punishment is immoral. If I say "well, when I say "immoral" I mean "causes harm to someone", so I'm right" then I am changing the subject. We have stopped arguing about whether capital punishment is immoral, and started arguing about whether it causes harm to someone. And that is a pretty boring topic! The real question is whether causing harm is always immoral. Defining our terms (that is, stipulating definitions for them) will not answer *that* question. We need to work out a descriptive definition of "morality", or something of the sort, and that is hard work.

On the other hand, there certainly are occasions when it is helpful to introduce a stipulative definition, just to clear things up—there is nothing wrong with defining one's terms when one can, and when it is helpful. One often sees useful stipulative definitions in mathematics and logic, the law relies heavily upon them, and they appear in the behavioural sciences under the name of "operational definitions." But you should be warned that it is not always so simple to resolve a debate.

Definition vs. essence: the use/mention error

One further point of clarification: only words have definitions. The word "tree" can be defined, but trees cannot be defined, they can only be understood (planted, climbed...). If you understand what it is for something to be a tree, then you can descriptively define the English word "tree" by saying that "tree" means "...X...", where instead of X you write a sentence expressing your understanding of what it is to be a tree. But this is not the same as defining a tree. Because there is a close relationship between defining words and understanding the essence of the things denoted by the words, people sometimes get confused or lazy, and write about defining love, trees, the environment, and so on, but this is a mistake. Really, one either defines the words "love", "tree", "the environment", etc., or one says what the essence of love (etc.) is. The close relationship between definitions and essences makes clear why defining is not a pointless task: if you know the definition of a

word, then you know the essence of the thing denoted by the word. If you know the definition of “water”, for instance, then you know what water is.

This point about the difference between definitions of words and the essences of things is a familiar one in philosophy, and is often discussed under the heading of “the use/mention error.” Consider the following sentence:

“Our concept of practical rationality is doing whatever seems most likely to get you everything you want.”

This is the sort of thing that philosophers call a use/mention error. Look at the sentence abstractly. It says that our concept of A is B, where A = practical rationality and B = doing whatever seems most likely to get you everything you want. This is where the problem should begin to be evident. Our *concept* of A is, according to this sentence, doing whatever seems most likely to get you everything you want. But what you *do* isn’t a *concept*. It might be true that practical rationality is doing whatever seems most likely to get you everything you want, but practical rationality is different from the concept of practical rationality.

Confused? Consider love. The concept of love is different from love—after all, toddlers love without having the concept, and misanthropes have the concept without loving. In just this way, the concept of rationality is different from rationality. I might have the concept of rationality without being rational, or vice versa. What is true of a concept is not generally true of the thing it is a concept of. My *concept* of tables is a thing in my head, but *tables* are not things in my head. My concept of rationality is one of my concepts, but my rationality is a property I have (if I act rationally) which involves a very complex co-ordination amongst my thoughts and my actions.

What does this all have to do with using and mentioning? Well, a standard example of the difference between using and mentioning is found with words. Think of the sentence “John sat on the chair.” In this sentence, the word “chair” is used to mean chairs. Compare this with “The word “chair” has five letters.” This latter sentence isn’t about chairs, it’s about the *word* “chair”. Chairs don’t have five letters, but “chair”’s do. When “chair” is used, it means chairs; when it is mentioned, a certain word in the English language is under discussion. Quotation of a word is one way to mention, rather than use that word, but one can also talk about the concept of X instead of talking about X, or talk about the way we think of Y rather than Y. The pattern is the same in each case, even if the details are different.

Now go back to the sentence we began with:

“Our concept of practical rationality is doing whatever seems most likely to get you everything you want.”

The concept of X stands in the same relation to X that the name of a thing stands to a thing—in the same relation that the mentioning of a word stands to its use. The above sentence begins by mentioning rationality, but then turns around and starts using the concept. This switch—from talking about the name/concept of the thing to the thing itself—is a use/mention error.

How should the sentence be re-worded to avoid the problem? Its author has two choices. She can stay at the level of mentioning, and talk about concepts, or she

can stay at the level of using, and talk about rationality directly. So either of the two below would be an improvement:

1. Our concept of practical rationality is a concept of doing whatever seems most likely to get you everything you want.
2. Being practically rational is doing whatever seems most likely to get you everything you want.

In 1, rationality gets mentioned, in (2) one finds a use of the concept. Of course, neither (1) nor (2) is a very good definition or especially well-written, but at least neither embeds a use-mention error.

Evaluating definitions

To evaluate definitions, you need to know what sort of definition you are evaluating, and then you need to know what the definition entails.

For a descriptive definition to be good, it should tell you exactly what a word means, and to do that, it should not be possible for anything to fit the definition unless that thing is denoted by the word being defined. In other words, the definition should not entail that X is denoted by a word unless X really is denoted by that word.

Here is an example.

Proposal “A is in love with B” means “A feels good when thinking about B.”

Objection If “A is in love with B” means “A feels good when thinking about B”, then if I feel good whenever I think about something, I am in love with that thing. I feel good when I think about placing second in a certain competition I was once in. Given this definition, it follows that I am in love with that second-place finish. However, that’s clearly not true—I’m just fond of thinking about it. Thus, the definition is bad.

For a stipulative definition to be good, it should stipulate just what the person making it wanted to stipulate. Again, you can check it by seeing what the definition entails.

An example of a bad stipulative definition:

Suppose I want to talk about a certain behaviour only found in one- to three-year-olds, and I stipulate that by “blathering” I mean “producing sounds that approximate meaningful words but are not actually meaningful.” That definition doesn’t distinguish what young children do from what adults do when they get tongue-tied. So my stipulative definition doesn’t stipulate what I want it to. It needs fixing.