

CHAPTER 9

Consistency and Inconsistency

Your goal is to maintain the consistency of your beliefs as you add new beliefs. This chapter is devoted to exploring how to achieve this goal. All of us want to remove any inconsistent beliefs we have, because if we don't then we are accepting something impossible. We aren't like the red queen in *Alice in Wonderland* who said she could believe six impossible things before breakfast.



by Ice Vision

Recognizing Inconsistency and Contradiction

The topic of inconsistency is at the heart of logic. If you say, "Everyone left the room," and I say, "She is someone who is still in the room," then I've said something inconsistent with what you've said. Noticing an inconsistency is a wake-up call to resolve the conflict. One or both of the conflicting claims must fail to be true.

Because the study of inconsistency requires you to know what the words "true" and "truth" mean, it might help you to have a definition. Here it is: The truth is a lie that hasn't been found out. I got that definition from my favorite intelligence service (spy organization).

Just kidding. A truth is a statement of fact, but it is too basic to define.

A group of statements is **inconsistent** if it's not *possible* for them all be true. What does the word *possible* mean here? It means something like conceivable or imaginable, assuming words mean what they normally mean.²⁰¹ A group of sentences (even a group the size of one) that is not inconsistent is **consistent**. There is no middle ground between consistent and inconsistent.

Even two false statements can be consistent with each other. These are consistent:

Abraham Lincoln is my mother.
Abraham Lincoln is your mother.

The two are consistent with each other, but not with the facts, such as the fact that Lincoln isn't the mother of either of us.

Resolving an inconsistency can be at the heart of deep issues. Theologians recognize that they have a burden of resolving the apparent inconsistency between divine foreknowledge and human free will. Some philosophers of religion argue that the two are inconsistent because God knows what you are going to do, so you are not free to do otherwise than the way God has foreseen. Yet presumably the ability to do otherwise than you do is the essence of your free will. If there's an inconsistency, then you can't have it both ways. Other philosophers of religion say there is no inconsistency, but we won't go further into this thicket of dispute.

²⁰¹ When we say it's not imaginable, we mean we cannot imagine it unless we allow words to change their meanings in mid-sentence or mid-passage — which we do not allow for purposes of assessing possibility. If we were to permit language to go on holiday this way with no restrictions on equivocation, there would never be any inconsistency.

Inconsistency between what we expect and what we get is at the heart of many jokes. Here are some examples:

"I didn't attend the funeral, but I sent a nice letter saying I approved of it." -- Mark Twain

"I feel so miserable without you, it's almost like having you here." -- Stephen Bishop

Let me tell you a story. It is about the second time Candace lost her virginity. While she was on a bridge crossing the stream, walking up the lane toward her was a tall man with a dog.... By now you are suspicious of what I am saying because you were alert to the fact that this remark is inconsistent with our common sense knowledge that people can lose their virginity only once.

We have now discussed some different kinds of inconsistencies. They can be put into categories (intellectual boxes). There are **logical inconsistencies** in which the very meaning of the words requires one of the claims to be false. Example: {Everyone left the room. She is someone who is still in the room.}

There are **inconsistencies with our expectations** as in Mark Twain's joke about approving of the funeral.

There are **inconsistencies with facts** as when we say she lost her virginity twice. Any false statement is logically inconsistent with the facts.

A factual inconsistency is a logical inconsistency with the facts.

Are these two sentences (or statements) logically inconsistent?

Almost everyone in the room is an Arab.

He's in the room, but he's no Arab.

No, they are consistent. If you were to change "Almost everyone" to "Everyone," then they'd be inconsistent.

The notion of logical inconsistency can get more complicated. These two statements can be said to both logically consistent and logically inconsistent:

Everybody left the room.

John is still in the room.

They are inconsistent with the assumption that John is a person, but they aren't consistent as presented, because John could be a teddy bear in the room. However, if you made these two statements to people without them knowing John was a teddy bear, then you'd be tricking them and violating the normal rules of conversation which say that ordinary names of people refer to people and not to other objects unless you say otherwise.

So, the moral about the complication is that consistency questions can depend crucially on what else you are assuming. To explore this complication a bit more, consider the relationship between these two statements.

Abraham Lincoln is currently the president of the United States.

Abraham Lincoln is a Sumo wrestler.

Would you say the two are

- a. consistent
- b. inconsistent
- c. none of the above



You can't tell whether the answer is a or b. Neither of the two sentences are true. Each one alone is factually inconsistent or inconsistent with the facts, but they are not logically inconsistent with each other and so are logically consistent. If "b" means "factually inconsistent," then the

answer is b. If "b" means "logically inconsistent," then the answer is not b. People are notoriously ambiguous when they ask about inconsistency.

Another way to describe inconsistency is to say that two or more statements are inconsistent with each other if they couldn't all be true. Now the ambiguity is embedded in what the word "could" means. Does it mean "could" as far as the meaning of the words are concerned, or "could" where it is assumed that we are comparing them to all the facts and are not allowed to change any of the current facts of the world? Here's a way to make the point.

Could eggs grow naturally on trees? They couldn't if they have to obey the laws of biology, but they could so far as what those words mean. That is, the sentence "Eggs could grow naturally on trees" violates biology but not grammar. So, we say the sentence is factually inconsistent but not logically inconsistent.

The statement that Abraham Lincoln is your mother could be true but in fact is false. Here we are using "could" in the sense of possible so far as grammar and meaning are concerned.

More on that word "could." Most false statements (sentences) could be true, as far as grammar or meaning is concerned. Similarly, most true statements could be false. But there are exceptions. Here's one. The statement "If it's raining and cold, then it's cold" is true, but it could *not* be false. Statements like this that can't be false without violating what words mean are said to be **analytically true**. The statement that it's cold at the North Pole is true but not analytically true.

As you deal with problems of consistency in real life, you want to be alert to what people mean rather than just to what they say. For example, suppose Jack says, "Nobody got an A on that test, but she did. Wow, is she smart." What Jack said literally was self-contradictory. If you called him on it, Jack would probably say not to take him so literally because what he really meant was "Nobody (other than her) got an A on that test." What he meant is not self-contradictory. So, to get what Jack intends, you need to overlook his inconsistency.

Are these three sentences consistent?

Lincoln is taller than Jones.

Jones is taller than Shorty.

Shorty is taller than Lincoln

The three are logically inconsistent with each other. Understanding this inconsistency is all part of understanding the term "taller than." If a person couldn't see that the three sentences were inconsistent, we'd have to wonder whether they really understood what "taller than" meant.

Very often, people will use the terms "inconsistency" and "contradiction" as synonyms, but technically they aren't synonyms. A contradiction between two statements is a stronger kind of inconsistency between them. If two sentences are contradictory, then one must be true and one must be false, but if they are inconsistent, then both could be false. Do the following two statements contradict each other?

The house is all green.

The house is not all green.

Yes, these two contradict each other; one of the two must be true and the other must be false. This is so for any house. Do the following two statements contradict each other?

The house is all green.

The house is all blue.

No, both could be false; the house might be white. So, the two statements do not contradict each other, although they are logically inconsistent with each other. This inconsistency is the weaker kind of inconsistency that we call being **contrary**.

When you leave the logic classroom and go out onto the street, you'll find that people use our technical terms "contradiction," "inconsistent," and "contrary" in a sloppy manner; sometimes the three terms are meant to be synonyms. Few people are careful to distinguish factual inconsistency from logical inconsistency. So, you have to be alert to this and try to get at what they mean rather than just what they say.

—CONCEPT CHECK—

Are these two sentences consistent or inconsistent with each other?

Serena is not taller than Carlos.

Carlos is not taller than Serena.

—202

Here is a more difficult question to answer. Are the following two statements inconsistent?

202 This pair is consistent because it is possible that they are both true. They are true in a situation where Samantha and Carlos are the same height. Even if you know that Carlos really is four inches taller we still call the pair *logically* consistent because it is possible, as far as the meanings of the words are concerned, that there is a situation in which they are the same height.

Venice was running in the Boston Marathon at 8 a.m. today.
 Venice was having breakfast at Bob's Restaurant at 8 a.m. today.

Not quite. Maybe she stopped for breakfast during the marathon.

————CONCEPT CHECK————

Consider this consistent list of statements:



- i. The president admires the first lady.
- ii. The first lady also admires the president.
- iii. Everybody else admires the president, too.

These statements are logically consistent. Label the following sentences as being consistent or inconsistent with the above list:

- a. Everybody but the admiral admires the first lady.
- b. The admiral admires the first lady but not the president.
- c. The president admires other people besides the first lady.
- d. The vice-president does not admire the first lady.
- e. The first lady does not admire the vice-president.

 203

Statements can even be made with body language. A man could say, "Sure, sure, I believe you" as he lifts his eyebrows and rolls his eyes. In doing so, his actions contradict what he says.

CONCEPT CHECK

Are these two sentences inconsistent?

All real televisions are appliances.

Some real televisions are appliances.

 204

Identifying Self-Contradictions and Oxymorons

Self-contradiction is logical inconsistency within a single statement; one part of the statement is inconsistent with another part. An example would be "This replica of a coin manufactured by the Continental Congress in 1776 is authentic in every respect." Here is a slightly more complicated example: "Sharks were on Earth millions of years before any of the dinosaurs, but a few of the early, small dinosaurs lived before the first sharks." You can just look at that statement and see that the author is confused about sharks; you need not be an expert on sharks.

203 (b) is inconsistent with the original three on the list. Each of the others, separately, is consistent with the original three.

204 There might or might not be an inconsistency here because "some" is ambiguous in English. If "some" is meant in the sense of "at least one but definitely not all," there is a logical inconsistency. But if "some" means "at least one and possibly more," then there is no inconsistency. Because "some" could be meant either way here, you cannot tell whether an inconsistency exists. Speakers who intend to imply with their word "some" that some are and some aren't should stick in the word "only" and say "Only some of the real televisions are appliances." From now on in this book we will make the assumption that "some" means simply "at least one but possibly more."

Self-contradictory statements are false, but false statements need not self-contradictory.

"False" is another way of saying
"inconsistent with the facts."

When George Bush was campaigning for the U.S. presidency, he said the following about the resignation of eight campaign aides accused of anti-Semitism: "I hope I stand for anti-bigotry, anti-Semitism, anti-racism. This is what drives me . . ." A slip-up. If you are for anti-Semitism, then you must be for bigotry, so Bush contradicted himself. Anti-Bush folks got a big laugh out of this one; many pro-Bush folks believed the press shouldn't have bothered to make such a fuss about it.

—CONCEPT CHECK—

Explain the self-contradiction that occurs in this dialogue. Notice that if you take the colonel literally, his hormones are staging a *coup d'etat* on his brain.

Colonel: (angry at the soldier he is speaking to): Are you on our side or theirs, soldier?

Private: On our side, sir.

Colonel: Soldier, I don't demand very much from my men . . . just that they obey me like they would the word of God.

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I wish I could show you a round square; I cannot because *round square* is a contradiction in terms. The very meanings of the terms *round* and *square* conflict with each other, so there can be no round squares. "Jumbo shrimp" is not a contradiction in terms; it doesn't mean "large and not large"; it means "large for a shrimp." A contradiction in terms is called an **oxymoron**. Debates are often started by asking whether a term is an oxymoron. For example, is *artificial intelligence* an oxymoron? Jokes are often based in oxymorons, as when someone asks whether *military intelligence* an oxymoron. Military officers do not believe this is a joke.

205 In demanding that the private obey his word like the word of God, he is demanding very much—too much. This is inconsistent with his saying that he isn't demanding very much. What the colonel says is amusing because he is so obvious about being inconsistent. We in the audience are charitable and do not take him literally; instead we note the irony and reinterpret him to mean simply that he is very demanding. The dialogue is from the film *Full Metal Jacket*.

When a communicator unintentionally uses an oxymoron, the mistake doesn't usually destroy the main point being made. It does, however, cause the audience to lose respect for the communicator. The mistake is a sign of carelessness or lack of sophistication.

A theologian once said that capital punishment is inconsistent with forgiveness. The theologian meant that if the government kills a criminal, then it cannot later forgive the criminal for the crimes.

—CONCEPT CHECK—

The Health-o-Meter personal scale says "100 percent electronic spring-free strain gauge technology. Consistent accuracy... up to 300 pounds or 136 kilograms." This ad

- a. contains an oxymoron.
- b. does not use *consistent* in the sense of logically consistent.
- c. makes a mathematical error.
- a. says the personal scale is logically consistent with its description.

—206

Inconsistency with Presuppositions

You may have seen cars bearing this threatening bumper sticker: "If you don't like the way I drive, then stay off the sidewalk." The statement taken literally presupposes that the driver drives on the sidewalk.

Definition The *presuppositions* of a statement are other, unsaid, relevant statements that would normally be taken for granted if you believed the statement.

Referring to U.S. arms shipments to Iran being made in exchange for the release of U.S. hostages, comedian Mark Russell, impersonating the president, said, "We sold no weapons to Iran, and we won't do it anymore." The joke here turns on inconsistency. A speaker probably

206 Answer (b). It means "unchanging," not "logically inconsistent" or "factually inconsistent."

wouldn't say "We won't do it anymore" unless the speaker was presupposing that we did it once. But the first part of this joke explicitly says we didn't do it, even once.

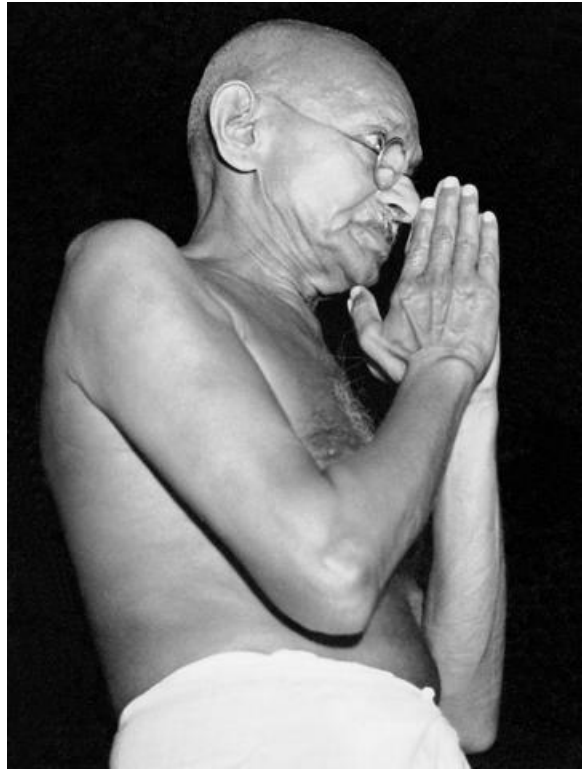
CONCEPT CHECK

Gandhi led India to independence from Britain in 1947, a few years after World War II. British soldiers killed, injured, or jailed many Indians in an attempt to suppress this revolution. When asked by a reporter what he thought of Western civilization, Gandhi said, "I think it would be a good idea." Gandhi's joke turns on a presupposition. Identify the presupposition.

- a. The British are still there in spirit and were never expelled.
- b. The Western world is not civilized.
- c. Western civilization is a good idea.
- d. He had a good idea.
- e. It would be a good idea for the British to be expelled.

207

207 Answer (b). He assumed that the Western world is not civilized and was remarking that it would be a good idea for it to become civilized. Because his assumption is not the questioner's assumption, the comment is humorous.



CONCEPT CHECK

The United States and Iran were the two parties involved in a 1980s scandal about trading U.S. weapons in return for the U.S. hostages who had been seized by Muslim fundamentalists. Impersonating the president, a comedian referred to the trade and said, "There was no third party involved, and we want to thank Israel for all their help." What is the presupposition that is being contradicted?

208

Well, we've been talking a lot about jokes. Now it's time to get serious. Let's examine astrology – the ancient study of how the stars and planets affect earthly events. My reason for not believing in astrology is that I'm a Scorpio.

That completes our examination of astrology. It also demonstrates something about how jokes turn on self-contradiction.

208 If you thank Israel for their help, you presuppose that Israel did help and thus that there was a third party involved after all.

You may enjoy trying to detect the inconsistency that makes you doubt Harpy's excuse in the following story.

Harpy lived with his grandmother next to the freeway in Cleveland, Ohio. He and his grandmother, Mrs. Harker, were on welfare because his father had disappeared and his mother drank so much every day that she was in no condition to raise her children. Harpy didn't like going to middle school, but he did like model airplane glue. Fortunately, he wasn't old enough to buy it himself. In Ohio you have to be eighteen or have a note from your parents. One morning he asked his welfare worker to buy him some glue. A friend had promised to give him a kit for a small airplane, he said. He wanted to start with fifteen tubes.

Although he never got the glue from her, Harpy did enjoy talking to the welfare worker whenever she came for a visit. A few months after the glue incident, between Christmas and New Year's, she arrived for one of her scheduled morning visits. She was surprised to find Harpy's grandmother alone and crying about the Christmas they had just had. Mrs. Harker was crying because her grandson had given her such wonderful presents for Christmas. She wasn't crying for joy. She was crying for another reason.

The next time the welfare worker had a chance, she asked Harpy about those presents. He responded very seriously, "I talked to God in my dream just before Christmas. God said my grandmother loved me very much, and I hadn't done nothin' for her. She worked real hard all her life, and she deserved somethin' real good. We didn't have no money, so God said to me, 'Harpy, you go to Sears' I went to Sears."

Harpy's claim that God told him to shoplift is inconsistent with most people's beliefs about what God would really sav.²⁰⁹

Refuting General Statements by Finding Counterexamples

Here is a universal generalization about cows: "All cows are brown." You can refute it by pointing out a cow that isn't brown.

²⁰⁹ Unfortunately this is a true story in the author's experience, although all the names of the people and the city have been changed.

When you say, "Most of the cows are brown," you are also making a generalization, but not a universal generalization, and you cannot refute it by pointing out a cow that isn't brown.

When you say, "My cow is all brown," you are not generalizing but are making a more specific statement. A **generalization** about a group is a statement about the group that says some, all, or a percentage of them have some property. The property we have been talking about is brown color.

Here is a list of different kinds of generalizations:

All A are B

No A are B

Most A are B

Many A are B

44% of A are B

Two-thirds of A are B

Some A are B

The letters "A" and "B" stand for groups or things, not whole statements. Only the first item on the list is a universal generalization, but when most people use the term "generalization," they mean a universal generalization, and they don't realize that other items on the list are also generalizations. You'll have to be alert to this.

Generalizations saying that some percent or fraction of A are B are called "**statistical generalizations.**"

One version of the straw man fallacy is called **quibbling about a generalization**. The mother tells her little girl, "Drinking poison will kill you; put that down!" Our quibbler responds, "Wait! It might not kill her. I once heard that someone drank a half teaspoon of some poison and lived to tell about it because the emergency crew arrived in time, and the person was fed intravenously for a week." OK, the quibbler is correct that there is a counterexample to the mother's generalization IF you take her generalization too literally. However, the mother really meant to tell her little girl that drinking poison will *very probably* kill her. The quibbler didn't pay attention to the spirit of the remark and took it too literally. Critical thinkers are charitable and don't quibble. When quibblers confront us and our generalizations, we recognize their mistake and we point out that we didn't mean for them to take us so literally.

Your opponent's statement has been **refuted** when you have made a totally convincing case that the statement is false. A refutation is a successful disproof. If you make a statement that is inconsistent with your opponent's statement, you don't have to be correct, but if you refute them, you do. Presenting a **counterexample** is one way to refute a universal generalization. The counterexample will be an exception to the claim.

A true statement cannot be refuted, so a true generalization will have no counterexamples.

—CONCEPT CHECK—

Fill in the blank. Suppose Chandra Morrison says every U.S. president has been a man, and Stephanie says the third president was female. Stephanie has _____ Chandra.

- a. refuted
- b. given a counterexample to
- c. done both a and b to
- d. done none of the above to

_____210

If someone makes the general claim that all As are Bs, one good way to test the claim is to sample some of the As and check to see whether they are also Bs. If you find even one exception, the generalization is refuted.

Refutation is the engine driving science forward. Science progresses by trying to refute statements that are precise enough to be tested. Scientists attempt to refute predictions, conjectures, claims, hypotheses, laws, and theories, provided they are formulated precisely enough that a scientist can figure out how to run a test or experiment which, if failed, would refute them. Statements that fail the tests because they are inconsistent with the observations are

210 Answer (d). Stephanie has said something inconsistent with what Chandra said, but not refuted her, so (a) is incorrect. If you refute someone, you must be correct, but Stephanie was not correct, was she? Now about (b). Stephanie has not given a counterexample to Chandra's statement, because a counterexample must be correct, yet what Stephanie says is incorrect. So (b) is also the wrong answer.

declared to have been refuted. The scientific community holds on only to that which it has not yet refuted. The truth is what can stand up to this procedure of attempted refutation.

For an everyday example of this procedure, suppose you flip the switch to turn on the light in your bedroom and nothing happens. Then you try to figure out why nothing happened. Can you think of any explanations? How about “The laws of electricity were just repealed”? No, that is not a likely explanation. Here are four better ones:

- The bulb is burned out.
- A fuse is blown.
- The switch is broken.
- A wire in the circuit is broken.

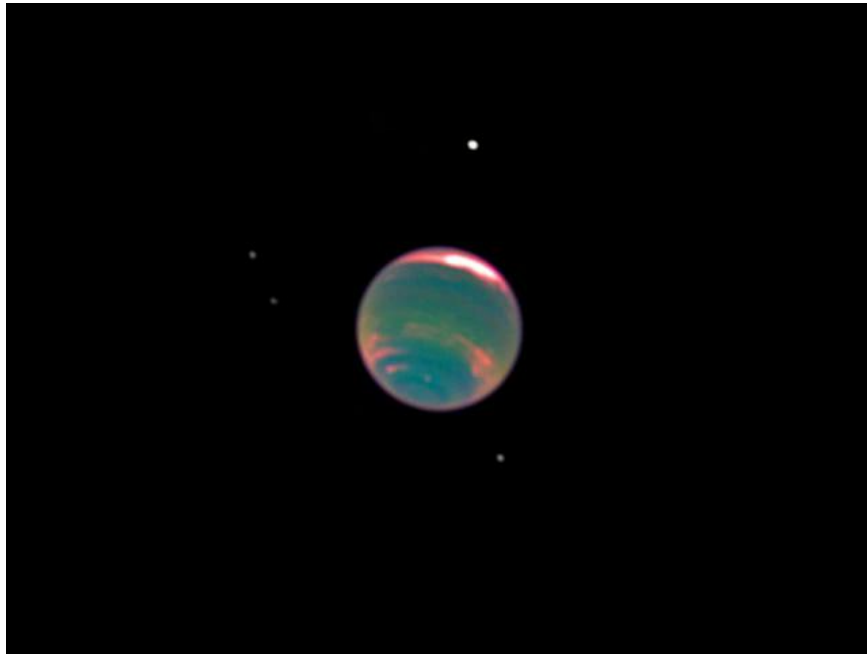
Which one of these hypotheses is correct? Any of the four could be correct. Well, suppose you screw in a new light bulb and it lights up. That settles it. Your scientific experiment has supported the first hypothesis and refuted the other three.

—CONCEPT CHECK—

The following passage describes a scientific test designed to confirm or refute some hypothesis, (i) State the hypothesis to be tested. Hint: It had to do with both Uranus and something beyond Uranus. (ii) Describe the test – that is, state how the hypothesis was tested. (iii) What possible test result would have been consistent with the hypothesis? (iv) What possible test result would have been inconsistent with the hypothesis? (v) Did the test results refute the hypothesis? That’s a lot of questions. OK, here’s the passage.

The success of the English astronomer Edmund Halley in using Newton's laws of mechanics and gravitation to predict the orbits of recurring comets and the success of other astronomers in predicting the positions of the planets convinced almost all astronomers in the Western world that the heavenly bodies are not supernatural beings but are in fact physical objects obeying Newton's laws. In the early 1800s, the outermost planet known to exist in our solar system was Uranus. Unfortunately the positions of Uranus that were predicted from using Newton's laws did not quite agree with the observed positions, and the deviation was too much to attribute to errors made with the astronomical instruments. Astronomers at the time offered two suggestions for the fact that the predicted positions did not agree with the observations. One hypothesis was that Newton had made some mistake with his laws of mechanics and that the laws should be revised. The other conjecture was that Uranus wasn't the outermost planet after all – that some other unknown planet was attracting Uranus. To check this latter conjecture, the English astronomer J. C. Adams, in 1843, and the French astronomer Leverrier, in 1845, calculated that the positions of Uranus could be explained by

Newton's laws if there were another planet nearby of a specific size and orbit. They suggested that astronomers begin looking in a certain place in the night sky for this planet, a place where the planet must be in order to account for Uranus's orbit. The planet was in fact observed there in 1846 by astronomers from several different observatories. That planet is now called Neptune.

 211


Resolving Inconsistencies

In a Peanuts comic strip, Charlie Brown says, "I tell you, Lucy, birds do fly south during the winter." Lucy responds with what she takes to be a counterexample: "Chickens are birds, aren't they? You never see a chicken flying south for the winter, do you?"

211 (i) Another planet beyond Uranus was attracting it sufficiently to account for the actually observed positions of Uranus in the sky according to an accounting using Newton's laws. (The hypothesis is not simply that there is another planet.) (ii) It was tested by using Newton's laws to predict where the new planet should be located. (iii) Test results that would consistent with the hypothesis: finding a new planet in the predicted location after a careful search. (iv) Test results that would be inconsistent with the hypothesis: not finding a new planet in the predicted location after a careful search. (v) No, the actual test results were consistent with the hypothesis.

"Good grief," says Charlie Brown. This exchange contains a good example of misinterpretation resulting from ambiguity. Lucy takes Charlie Brown's claim one way, but he means it another way. In the way Lucy takes it (all birds fly south) there is a counterexample involving chickens; in the way Charlie Brown means it (many birds fly south), there is no counterexample. To avoid the misunderstanding, Charlie should revise his statement by saying what he means. The moral is that clearing up ambiguity can resolve an inconsistency.

Clearing up ambiguity can resolve an inconsistency.

When you are given inconsistent information, you should reject some of the information to resolve the problem and achieve consistency among the remaining pieces of information. Because you also want to find the truth, you should always reject the information that is the least well supported or the most likely to be false. However, in cases where it isn't clear what to revise, you need to search for more information (and hope that in the meantime you will not have to act on the information you have).

Sometimes a person has inconsistent moral principles that don't appear to be inconsistent. For example, suppose you, like most people, believe the moral principle that

(1) People ought to keep their promises to their family,

and also the moral principle that

(2) You shouldn't do anything that is likely to hurt innocent persons.

Now suppose that your father insists you keep your promise to help him with his summer project. His project is, you later learn, to stop the burglaries on your family farm by booby-trapping the windows and doors of the barn. An infrared beam of light will pass by the inside of each window. If anyone forces open the window and sticks his head through, he will get a blast of birdshot in the side of the head.



Think of the innocent but curious eight-year-old girl next door who finds the window unlocked on a day when the alarm is activated. She could be hurt. This would violate principle (2) above. This story, even if it never happens, shows that moral principle (1) is inconsistent with (2). Moral principles are supposed to cover possible situations as well as actual ones. Therefore, you are caught in an ethical dilemma. Which moral principle should be revised? One reasonable change would be to revise principle (1) in favor of (1')

(1') People ought to keep their promises to their family unless doing so is likely to hurt innocent people.

Principles (1') and (2) are consistent. This process of resolving moral dilemmas by thinking in advance about potential situations is an important way to make moral progress, and it is the kind of thing that gets talked about in ethics classes. Attention to logical inconsistency can promote moral growth.

The notion of resolving contradictions also plays a central role in adding new information into your store of knowledge. Your goal in adopting new beliefs is always to add more while maintaining consistency. We all try to do this, but there are good ways and not so good ways to do so. Suppose, for example, that your problem is to decide whether George can swim well. If you knew that he was a lifeguard, that would be significant supporting evidence. Almost every lifeguard in the world is a good swimmer – let's say 99 out of 100 lifeguards are good swimmers. Here is a fine argument using this evidence:

George is a lifeguard.
99 out of 100 of the world's lifeguards can swim well.
So, George can swim well.

You cannot be absolutely sure of the conclusion on the basis of those two pieces of information, but you can be about 99 percent sure. It would be illogical to conclude that he *cannot* swim well. Now, compare that argument with this one:

Fred is a Frisian.
Frisians are poor swimmers; in fact, 8 out of 10 Frisians cannot swim well.
So, Fred cannot swim well.

You could be about 80 percent sure that Fred cannot swim well, given these two pieces of information. Both arguments are good arguments because they provide good reasons to believe their respective conclusions. You should add both conclusions into your store of information if you happen to know that the premises are true.

Now for the surprise. Suppose you acquire some new information: Fred is George. If you hold onto the conclusions from the two previous arguments, you will conclude that Fred can swim well and also can't. You can't have that. It is time to go back and revise your store of information. How are you going to resolve your contradiction?

You should retract your belief that Fred cannot swim well. Fred is an exceptional Frisian. The best conclusion on the total evidence is that he *can* swim well, but now you can no longer be 99 percent sure. You need to reduce your estimate of the probability. We won't try to figure out the new probability number.

An important moral can be drawn from our swimming story is: Do not cover up counterevidence. The more evidence you pay attention to, the better position you are in to draw the best conclusions. A second moral is that belief is a matter of degree; it is not an all or nothing affair.

We hold beliefs more or less strongly. It's not simply that you believe something or you don't.

Review of Major Points

In this chapter we examined the notion of inconsistency, which plays such an important role in judgments of improbability. We considered how one sentence can be inconsistent with another, as well as how a sentence can be self-contradictory and can be inconsistent with its presuppositions. A verbal statement can even be inconsistent with the speaker's body language or tone of voice. Finding an example that is inconsistent with a general claim of the form "All As are Bs" will serve as a counterexample that refutes this general claim. Finding a counterexample is not, however, the only way to refute a claim.

When you are given inconsistent information, you should reject some of the information to resolve the problem and achieve consistency among the remaining pieces of information. Because you also want to find the truth, you should always reject the information that is the least well supported or the most likely to be false. However, in cases where it isn't clear what to revise, you need to search for more information (and hope that in the meantime you will not have to act on the information you have). One important lesson from this discussion is that, when trying to assess a belief, you should not cover up counterevidence, and you should pay attention to the strength, or degree of certainty, with which you should hold a belief.

Glossary

contradiction in terms Applying two or more terms to give a logically inconsistent description. Calling a farmer's field a *round square* would be to use a contradiction in terms. Contradictions in terms are also called *oxymorons*.

contrary A pair of statements are contrary if they are inconsistent but both might be false. "It is less than 10" and "It is greater than 77" are contrary statements.

counterexample to a statement A true statement that is inconsistent with a previous statement and that is about some specific item in a category mentioned in the previous statement. "Spud Webb is a short basketball player" is a counterexample to "All basketball players are tall." We also can say Spud Webb is a counterexample.

generalization A generalization about a group is a statement about the group that says some, all, or a percentage of them have some property.

hypothesis An hypothesis is a claim that is proposed. If someone were to offer a possible explanation of some phenomenon, then that explanation would be an hypothesis.

logically inconsistent statements A group of statements that could not all be true together, in virtue of their meaning. Normally we drop the word "logically" during discussions of inconsistency.

oxymoron A contradiction in terms. Inconsistent phrases such as *the living dead* and *exceptionally ordinary* are oxymorons.

presuppositions A statement's presuppositions are unsaid, relevant statements that would normally be taken for granted in making the statement. Saying, "I like your car" presupposes you do have a car. It doesn't presuppose that $1 + 1$ is 2.

refutation A successful disproof. Refuting a statement requires more than merely contradicting it.

self-contradiction Logical inconsistency within a single statement. Example: "Ahmed is taller than Steve, and Steve is taller than Ahmed."

Exercises

Inconsistency

- 1. Which of these signs, if any, gets its humor from an appeal to inconsistency?
 - a. On a California freeway: "Fine for Littering."
 - b. On the wall of a Canadian cleaning service: "Able to Do the Worst Possible Job."

- c. In a Boston fast-food parking lot: "Parking for Drive-Through Customers Only."
- d. At a Florida bookstore: "Rare, out-of-print, and nonexistent books."
- e. Posted at a New Hampshire library honoring the poet Robert Frost: "Frost Free Library."²¹²

- 2. If somebody says to you that it is raining and it is not, then by applying the principle of charity you can reasonably assume that the person intends to say something logically inconsistent – something that is really so and not so in the same sense at the same time.

- a. true b. false²¹³

3. The principle of charity for inconsistency

- a. is a technique of thought for revealing or uncovering a contradiction in one's own thinking.
- b. says to be charitable to your principles regardless of the inconsistency in other people's principles.
- c. is applied to consistent sets of statements to turn them into inconsistent sets.
- d. says to try to find a consistent interpretation.

- 4. If Sarah says, "Andre Agassi from Las Vegas once won the French Open Tennis Tournament," and if you reply with, "No, he didn't," then you've contradicted Sarah

- a. true b. false²¹⁴

5. Read the following newspaper editorial.

Tfiineo Sakai won't be attending classes at the University of Rochester's William E. Simon School of Business this fall. He was admitted all right, but that was before the Eastman Kodak Company found out he worked for Fuji Photo Film in Japan and would actually be associating right there in the same classroom with some of its own employees in a two-year master's degree program for middle-level businessmen. Kodak

212 All of them. For example in the first sign, there is an inconsistency between one interpretation of the ambiguous sign and your expectation. The one interpretation is that the littering is fine in the sense of OK, but that's inconsistent with your expectation that the littering is not OK and thus deserving of a financial fine.

213 Answer (b). Perhaps the person means that it is raining in some place but not raining in some other place. That could be true. Using the principle of charity, you would assume that the person intends to say something true; logically inconsistent statements cannot all be true.

214 Answer (a). Your remark contradicts her statement, but doesn't refute it until you go on to show you are correct and she is not.

doesn't approve of that kind of fraternization with its business rivals, and Sakai has been sent packing.

When Kodak barks, Rochester jumps. The film and camera company isn't just the city's leading industry; it's also the reason why the university has one of the ten largest endowments in the country. Other American universities have run into criticism for undertaking research under proprietary contracts with private companies or for accepting funds from foreign countries or other sources of beneficence with strings attached specifying what's going to be taught with that money. But only in Rochester, so far as anyone knows, can a corporate benefactor actually reach right down into the admissions process to determine who's fit to be educated.

Japanese companies like to send their employees to study here so that they can learn more about American business principles and practices. Sakai certainly obtained a terrific object lesson at the Simon school, which has heretofore loudly proclaimed its commitment to free markets and an absence of regulatory oversight. Kodak, for its part, says it was only concerned that some of its people might have felt constrained from talking in school while Sakai was around for fear that they might give away some company trade secrets. Meanwhile, Kodak has announced that it's giving the Simon school another \$36,000 a year to train business executives in how to take creative risks. Obviously, there's no connection between the two events.²¹⁵

In the above passage, is the following remark true? The writer reports that Kodak's contributions to the university are the real reason why the university has one of the ten largest endowments in the country, yet the article itself contradicts this claim by suggesting between the lines that this is not the real reason why the university has one of the ten largest endowments in the country.

- a. true b. false

6. The writer of the editorial in the previous question explicitly says there's no connection between the two events (requesting the student rejection and donating \$36,000) but implies between the lines that there really is a connection, so the writer accuses Kodak of committing a contradiction between what they say is so and what is really so.

- a. true b. false

7. Given your common knowledge, and paying attention to the source of the information in the above editorial, it is reasonable to be skeptical and say it is fairly improbable that Kodak really intends to give \$36,000 more a year to the University of Rochester.

- a. true b. false

²¹⁵ From *The Sacramento Bee*, September 9, 1987, p. B6.

8. The writer of the editorial about Kodak says the Simon business school at the University of Rochester has publicly proclaimed a commitment to free markets and an absence of regulatory oversight, yet the writer suggests that the school's actions show they don't actually have that commitment, so the editor indirectly accuses the Simon school of an inconsistency between what they say and what they do.
- a. true b. false
9. Notice in the following dialogue how Emilio slowly uncovers Washington's inconsistent set of moral beliefs.

Emilio: Listen to what it says here in the paper. "David Jones was especially bitter after the experience. After commenting on the incident, he said I don't see why having sex with your mother is wrong. If it feels good, then it's OK. Of course, I would never do it; I wouldn't want to go to jail. Besides, in my own case I never really liked my mother, God rest her soul, but I don't believe it's unethical." Damn. Can you believe Jones really said that? I think he ought to get what he deserves.

Washington: What's that?

Emilio: About twenty years making license plates in the prison factory.

Washington: Who's to judge?

Emilio: What do you mean by that? I'm to judge, that's who!

Washington: I doubt it. It's not your place. Are you planning on playing God here? It's for God to decide these things.

Emilio: Are you saying that no ordinary person is supposed ever to make any moral judgments of right and wrong about anybody else's behavior?

Washington: You got it.

Emilio: You don't really believe that. I know what you've done.

Washington: What are you talking about? Done what, when?

Emilio: Remember the little boy you found in the psychology building when we were on our way to class?

Washington: Yes.

Emilio: Well, you made a moral decision right there. You could tell he was lost, and you helped him find his way back to his family. He had gotten off the elevator on the wrong floor. You were fifteen minutes late to your psych class.

Washington: Just because I helped him doesn't mean I made any moral judgment of him.

Emilio: Right, you didn't judge him, but you did judge your own action. You acted to help, but you could have acted by doing nothing. A decision not to get involved is a moral decision, too. You chose. You weren't playing God. You just judged between the two ways for you to act.

Washington: OK, but I judged my *own* actions, I didn't judge anyone else's.

Emilio: Suppose I'd been alone and had found the same boy.

Washington: Then it would have been your problem.

Emilio: Wouldn't you have expected me to do the same thing you did?

Washington: Yeah, I'd have predicted that. I know you're apt to do that kind of thing just because you're you. It comes natural.

Emilio: But wouldn't you have thought badly of me if I'd *not* done what you expected? You do believe I have the free will to do something you don't expect, right?

Washington: Uh, yes. OK, I'd approve if you did help the kid. Which reminds me, you never paid back the money I gave you when we both had turkey sandwiches at lunch the day before Thanksgiving.

Emilio: Oh. Well, your memory is as good as any elephant in your herd.

Washington: Why is it easier to remember who owes you money than who you owe money to?

Emilio: Maybe because it's easier to judge than to be judged.

Identify the inconsistent set of Washington's moral beliefs that Emilio uncovered with his questioning.

10. If a set of statements is inconsistent, then any addition to the set that doesn't revise the original statements will preserve inconsistency.
 - a. true
 - b. false
11. Create a sentence that contains an oxymoron that was not used or mentioned in this chapter.
- 12. Is this group of three statements logically inconsistent? (In this problem, interpret the word *some* to mean "at least one and possibly all.")

Every dog chases some cat.
 Some cats chase no dogs.
 Some dogs chase all the cats.²¹⁶

- 13. The following statement is false:

A rose is not a rose.

- a. true b. false²¹⁷

- 14. The following statement is self-contradictory:

A rose is not a rose.

- a. true b. false²¹⁸

- 15. If a person is being inconsistent, as we have been using this term, then the person has irregular patterns of behavior or frequently changes his or her beliefs.

- a. true b. false²¹⁹

16. Are these four statements logically consistent?

- Only bears sleep in this house.
- Goldilocks is not a bear.
- Smokey is a bear.
- Goldilocks and Smokey both sleep in this house although Smokey sleeps downstairs and Goldilocks sleeps upstairs.

17. Consider this list of three statements:

i. $x + 1 = 10$

ii. x is unequal to 7

iii. $x < 3$

²¹⁶ The three could all be true, so they are consistent.

²¹⁷ Answer (a).

²¹⁸ Answer (a).

²¹⁹ Answer (b).

If the following statement is added to the above three, will the resultant set of four statements be consistent?

$$x = 9$$

18. Consider this list of three statements:

- i. Modern works of art are not romantic.
- ii. But they are occasionally erotic.
- iii. However, an erotic work of art could be romantic.

Which statement(s) below, if added separately to the above list, would cause the list to be inconsistent?

- a. More than one romantic work of art is erotic.
- b. Only one romantic work of art is erotic.
- c. Two romantic works of art are modern works.
- d. Romantic works of art are not modern.
- e. All of the above.

■ 19. Is this set of statements inconsistent, provided there is no equivocation?

The human body is totally a material thing.
The human mind is totally a spiritual thing.
Mind and body can interact.
Spirit and matter cannot interact.²²⁰

20. Which of the following statements, if added to the four statements in the previous question, would make the new list of five statements be consistent?

- a. Spirit and matter do interact.
- b. The human body is both a material and a spiritual thing.
- c. Sometimes the human body is a material thing and sometimes it is not.
- d. None of the above.

■ 21. What logical inconsistency, if any, occurs in this hypothetical news story?

²²⁰ Yes, because the statement that spirit and matter cannot interact implies that no spiritual thing can interact with any material thing.

The Russian Military says that it sold 150 bear missiles for \$3 million to Central American freedom fighters last month. It says the USSR received full payment. The guerrillas say they paid \$3 million to a representative of Soviet intelligence last month; they say they were promised they would receive 150 bear missiles, but only 50 missiles were ever delivered.²²¹

22. Defend your evaluation of the quality of the following explanation:

Approximately two-thirds of the doctor's patients caught Barre's disease. This fact can be explained by pointing out that the doctor breathed directly on all his patients, that the doctor had Barre's disease, too, and that whenever a person with Barre's disease breathes directly on another person the other person will catch it, too.

23. Is the following sentence self-contradictory?

Voters must be club members, but some club members are nonvoters.

24. Is the following sentence self-contradictory?

Voters must be club members, but no club members are nonvoters.

■ 25. Are these two statements inconsistent? (Assume the term the *senator* refers to the same person in both statements so there is no equivocation.)

- a. The wife of the senator is an interesting person.
- b. The senator has no wife.²²²

■ 26. If two statements are consistent, then they've got to be true.

- a. true
- b. false²²³

27. If a group of two statements is consistent, then at least one of them must be true.

- a. true
- b. false

■ 28. It is impossible for contradictory statements to accurately characterize the physical world, although people could hold contradictory beliefs about the world.

221 No inconsistency. However, it is likely that either the guerrillas were lying or they were cheated by the representative.

222 Yes; (a) presupposes what (b) denies.

223 Answer (b). All that is required is that they could be true as far as their meanings are concerned. These two sentences are consistent even though both are false: George Washington was assassinated by Benedict Arnold. It has never snowed in the United Kingdom.

- a. true b. false²²⁴

■ 29. My friend Stan told me that yesterday he had met my wife's friend Kate at a political meeting. He said they were going out to dinner this Saturday. My wife told me that she talked to Kate earlier today and Kate said she had met Stan at a political meeting; Kate told her that she and Stan were going to play tennis together on Saturday. What inconsistency, if any, is there here?²²⁵

■ 30. The statement that Barack Obama was the first president of the United States of America is false. It is also

- a. self-contradictory
- b. an oxymoron
- c. inconsistent with our background knowledge
- d. contrary to the claim that Abraham Lincoln was not the first president of the United States of America.²²⁶

31. Why is inconsistency at the heart of logical reasoning?

■ 32. Are these two statements logically inconsistent?

Hell doesn't exist. Yet in a different sense it really does.²²⁷

■ 33. Suppose Alex says, "Any oxide will melt if heated to at least 2000 degrees," and Linda says "Yttrium barium oxide melts only above 2300 degrees." Has Linda made a claim inconsistent with Alex's?

- a. can't tell (briefly say why)
- b. yes
- c. no²²⁸

224 Answer (a).

225 No inconsistency.

226 Answer (c).

227 No, because of that phrase "in a different sense." If *exist* can have different senses, then hell might not exist literally as a place you can go to after you die, but it might exist here on Earth in people's minds. However, if *exist* cannot have this latter sense, then the second statement is simply false, but still not inconsistent with the first.

34. Referring to the previous question, explain why you cannot tell whether Linda has refuted Alex.

35. If three statements are inconsistent (with each other), then at least one of them must be false.

- a. true b. false

36. If John says something that contradicts what Sandra says, does it follow that either John or Sandra is lying?²²⁹

37. Is the following sentence, which contains three sub-statements, self-contradictory?

An asterique is an emulator; all emulators can transverse-bilateralize, and an asterique cannot transverse-bilateralize.

■ 38. Which of the following statement pairs are logically inconsistent?

1. That cereal is at least 20 percent sugar.
2. That cereal is at most 20 percent sugar.

3. That soft drink is at least 10 percent sugar.
4. That soft drink is at least 15 percent sugar.

5. Some of them are.
6. Some of them aren't.

- a. 1 and 2.
- b. 3 and 4.
- c. 5 and 6.
- d. None of the above.²³⁰

39. You are asked to find out if the following statement is true. What should a good critical thinker do? "A few dinosaurs lived on Earth before the first sharks, and some sharks were on Earth millions of years before any of the dinosaurs, but there are still many other kinds of sharks in today's oceans, although no dinosaurs that we've so far detected." Yes, the instructions are imprecise.

228 Answer (b).

229 It follows that one of them said something false. It doesn't follow that anyone was *intending* to say something false — that is, lying.

230 Answer (d).

40. If I've contradicted what the manager of the New York Giants says, then I've thereby refuted what the manager says.

a. true b. false

■ 41. Are these four statements inconsistent?



- Either the U.S. or Russia will start a global thermonuclear war; nobody else can.
- If Russia starts it, then we will all die.
- Yet if the U.S. starts it, then we will all die, too.

- However, God has given us the knowledge that we won't all die, no matter what happens.²³¹

42. Create two graphs — one, a bar graph; the other, a pie chart. Make the two graphs be inconsistent with each other but contain as much of the same information as possible.
43. Write a short essay discussing whether the following two quotations are really inconsistent. Mention why somebody might say they are and why somebody else might say they aren't. Then try to resolve the issue of consistency. Stick to the issue; do not discuss the issue of whether slavery is morally wrong.

"Slavery is morally wrong." (Abraham Lincoln for the Union)

"Slavery is not morally wrong." (Jefferson Davis for the Confederacy)

44. Are these three statements logically consistent with each other?

Only bears sleep in these woods.
 Squirrels sleep at night, but not in these woods.
 If a thing sleeps in these woods, then it's a bear.
 All bears and only bears sleep in these woods.

Counterexamples

1. If statement A is a counterexample to B, then B is a counterexample to A

a. true b. false

- 2. (a) Create an original generalization about AIDS or about being HIV positive. (b) Give an example that is consistent with it and supports it. (c) Create a successful counterexample that is inconsistent with it and that refutes it.²³²

231 Yes, they are inconsistent. From the first three statements, it follows that we will all die. From the fourth, it follows that we won't. This is an inconsistency. If you know something, then it is true; that idea is applied to the fourth statement.

232 (a) All past basketball players were HIV positive, (b) Magic Johnson (a basketball player who played for the Los Angeles Lakers) was HIV positive, (c) Johnny Dawkins (a basketball player who played for the Philadelphia 76ers) was not HIV positive.

- 3. If it is possible, create an original statement that is easily recognized to be a universal generalization with no counterexamples.²³³
- 4. If it is possible, create an original statement that is easily recognized to be a universal generalization but that has a counterexample.
- 5. Create a statement that would be a counterexample to the claim that all things in the universe are cooler than a candle flame.
- 6. Give a counterexample to the claim that all promises should be kept.²³⁴
- 7. Identify the claim below that is a generalization but that has no counterexamples.
 - a. There is no there there. (Said by Gertrude Stein when she was talking about her home in Oakland, California.)
 - b. All professional basketball players in the U.S. like to eat Cheerios.
 - c. Every planet around the sun is held in orbit primarily by the force of gravity.
 - d. In general, General Abrams has more clout than General Franklin.
- 8. Here is a refutation of the astrologers' claim that the stars determine every person's destiny. It is from the Confessions of St. Augustine, a Roman, who was a Catholic father born in North Africa and who wrote in about 400 A. D. First, briefly explain why his challenge is a successful refutation. Then revise and weaken the claim by making it less precise so that St. Augustine's remarks won't refute the revised claim.

Firminus had heard from his father that when his mother had been pregnant with him a slave belonging to a friend of his father's was also about to bear. It happened that since the two women had their babies at the same instant, the men were forced to cast exactly the same horoscope for each newborn child down to the last detail, one for his [father's] son, the other for the little slave. Yet Firminus, born to wealth in his parents' house, had one of the more illustrious careers in life whereas the slave had no alleviation of his life's burden.

233 All even numbers are integers.

234 Consider the example of a promise you made to your friend to return the knife you borrowed. In the situation in which he rushes up to you raving mad and saying he wants his knife back so he can kill his mother, you should break your promise. Saying "You should not keep promises that might hurt someone" is a relevant answer. It is in the ballpark, but it is inadequate because it provides no specific example of a promise. A counterexample is always a specific example from the category that the generalization is about.