

Identifying Faulty Reasoning

A reasonable conclusion is based on data or evidence. Faulty reasoning occurs when the conclusion is not supported by the data. Three common types of faulty reasoning are:

- **Overgeneralization**, or drawing a conclusion based on too little data. In overgeneralization, information about a limited number of situations or things is applied to a broad class. If a conclusion about a whole class of things is based on very few samples, be alert for overgeneralization. One way to test for overgeneralization is to obtain more data. Do additional samples still fit the conclusion?

An example of an overgeneralization is, “American Beauty rosebushes cannot survive long harsh winters, because in my garden two American Beauty rosesbushes died over a long harsh winter.” This is an overgeneralization based on two rosebushes.

- **Illogical conclusion**, or making an inference that is not supported by data. Illogical conclusions often indicate a cause-and-effect relationship that does not exist, based on coincidental events. To test for an illogical conclusion, ask how the initial information is linked to the final conclusion. Are there any facts that support the link?

For example, suppose you break a mirror and then fall on your way to school, losing your homework. You conclude that “Breaking mirrors causes bad luck.” This is an illogical conclusion based on two unrelated incidents.

- **Personal bias**, or basing conclusions on opinion rather than information. Personal bias can lead to conclusions that are actually contradicted by the data. To test for personal bias, determine whether the author or speaker is trying to argue for a particular point of view. Is the point of view supported by facts or only by opinions? If no facts support the argument, then bias is likely.

For example, the speaker says, “The candidate is so stupid that he didn’t know the capital of China.” The speaker gives no evidence and shows personal bias against the candidate.

When you detect faulty reasoning, you need to obtain additional information to determine whether the conclusion is valid or not

PRACTICE IDENTIFYING FAULTY REASONING

In each of the examples below, determine whether the reasoning is sound. If the conclusions are not supported by facts, determine what type of faulty reasoning led to the conclusion. Then correct the conclusion or state how you would obtain facts to determine whether the conclusion is valid.

You walk through a heavily overgrown field on your way to a wooded area. The weeds and grasses are about a foot high. The next day you develop an itchy skin rash on your face. You conclude that the rash developed because you cut through the heavily overgrown area. You will not go into the woods again.

1. Is this concern based on sound reasoning? If not, what type of faulty reasoning is used? Explain your answer.

2. What more do you need to know before forming a conclusion? List three questions you would need to answer.

An experiment is conducted to determine what physical properties identify a metal. One part of the experiment tested the melting point of a substance. An iron nail, a copper penny, and a piece of lead pipe were heated in an oven at 250°C. None of the metals showed any change. The conclusion, based on the experimental data, is that all metals have a melting point above 250°C .

3. Is this conclusion based on sound reasoning? If not, what type of faulty reasoning is used? Explain your answer.

4. How could you obtain more information to determine whether all metals have a melting point above 250°C ?

Sending people into space is a waste of money. The space program is an expensive project that allows a few people to look at the earth from a vantage point that most people will never get to see. We are spending way too much money to let these astronauts play in space. Nothing useful has ever come from human space flight. If the government spent as much money on medical research as it spends on space flight, it would help a lot of sick people.

- 5.** Is this argument sound? If not, what type of faulty reasoning is used?

- 6.** How could you decide whether human space flight costs too much compared to its benefits?

Three friends ate at Spacey's Restaurant last night, and all are sick today. It's obvious that the restaurant served them food with salmonella poisoning.

- 7.** Is this a logical conclusion? If not, what type of faulty reasoning was used?

- 8.** Name three other facts you would need to know to make this a valid conclusion.
