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Formal Fallacies

Often, arguments are flawed because of what the statements in the argument *say.* That is, a bad argument is often one which *assumes* something controversial, or the conclusion *claims* something that isn't supported by what the premises say.

But weirdly, sometimes an argument is fallacious just because of the *form* or *shape* of the argument. In such cases, logicians say that the argument commits a *formal* fallacy.

As with informal fallacies, formal fallacies normally render the argument deductively invalid (except Dubious Dilemma; see below). But like the informal fallacies, if an argument commits a formal fallacy, this does not mean that its conclusion is *false*. (Again, I can give a bad argument for a conclusion that happens to be true.) So here too, if you say that an argument contains a formal fallacy, you are saying *only* that the argument does not effectively *prove* its conclusion.

Affirming the Consequent

All and only arguments of the following form are cases of affirming the consequent:

(1) P ⊃ Q
(2) Q
(3) So, P

Example:

(1) If I ever hear someone call Bieber a "bad boy" again, I'm going to scream.
(2) I am going to scream.
(3) Therefore, I again heard someone call Bieber a "bad boy."

Even though (1)-(3) may all be true, the argument is not deductive. After all, it is *possible* that the conclusion is false, even if (1) is true and I am going to scream anyway (just because it is an enjoyable pastime).

What's especially notable is that the argument is invalid even if we were talking about, say, Ashton Kutcher. Ditto if I was threatening to pee my pants instead of scream. More broadly, the argument fails to be deductive mainly because of its **form** or **shape** rather than its *content.* For the most part, it does not matter what sentences you put in for '**P**' and '**Q**'. The result is inevitably a *formal fallacy*.

The name of the fallacy reflects this: The problem is that premise (2) affirms the "form" that occurs as the consequent of (1).

However, life is not often simple. There are a few arguments of this form which *are* deductively valid. That's because the meanings of the predicates sometimes "take up the slack," and render valid what is (strictly speaking) a formal fallacy. Example:

(1) If Snoopy is a dog, then he is a canine.
(2) Snoopy is a canine.
(3) Therefore, Snoopy is a dog.

So just like with informal fallacies, there are exception cases where a formal "fallacy" is actually legitimate piece of deduction. Still, these cases are relatively uncommon. Normally, an instance of affirming the consequent will be deductively invalid.

By the way, people often affirm the consequent because it looks very similar to a case of **modus ponens** (see the handout on Famous Forms). The difference is that modus ponens affirms the *antecedent* of the conditional rather than the consequent. (Also, modus ponens concludes the consequent, rather than the antecedent.)

Denying the Antecedent

All and only arguments of the following form are cases of denying the antecedent:

(1) P ⊃ Q
(2) ~P
(3) So, ~Q

Example:
(1) If Ann Coulter is a conservative Christian, she is a Republican.
(2) Ann Coulter is not a conservative Christian.
(3) She is not a Republican.

P = Ann Coulter is a conservative Christian
Q = Ann Coulter is a Republican

As before, this fallacy gets its name from what's happening in premise (2). Here, the antecedent of premise (1) is being denied. (And from that, the consequent is then denied.)

Again, normally such arguments are deductively invalid. But—surprise, surprise—there are few instances of this argument-form which are deductively valid. E.g.:

(1) If 5 is even, then 7 is even.
(2) 5 is not even.
(3) Therefore, 7 is not even.

But such cases are the exception.

As with affirming the consequent, people sometimes deny the antecedent since it looks *very similar* to a formally valid argument type. In this case, the valid argument schema is called **modus tollens**. (See handout on Famous Forms). The difference is that, with modus tollens, the *consequent* is denied in the minor premise. (Subsequently, the denial of the antecedent is inferred.)

Hasty Dismissal

All and only arguments of the following form are hasty dismissals (unless Q is the same as ~P):

(1) P or Q
(2) P
(3) Therefore, ~Q

Example:
(1) Either the generator or the distributor is defective.
(2) The generator is defective.
(3) Therefore, the distributor is not defective.

In this case, you're hastily dismissing the possibility of a defective distributor. After all, it could be that *both* the generator and distributor are defective, where both are a cause of the breakdown. (Despite what some philosophers imply, *this* kind of "causal over-determination" *is* possible.)

As with the previous fallacies, people commit a hasty dismissal since the reasoning looks *very similar* to a formally valid argument type. In this case, the valid form in question is called **disjunctive syllogism**. (See handout on Famous Forms). But unlike with hasty dismissal, disjunctive syllogism *denies* a disjunct rather than affirms one (plus, disjunctive syllogism concludes in favor of the other disjunct rather than against it.)

The Not-Both Fallacy

Hasty dismissal has a close cousin, where the conclusion is not hasty in *dismissing* but rather in *endorsing* some claim:

(1) ~(P & Q)
(2) ~P
(3) Therefore, Q

Example:
(1) Not both the Giants and the Patriots will win the Super Bowl.
(2) The Giants will not win.
(3) So, the Patriots will.

It is quite true that both teams cannot win the Super Bowl. But if the Giants do not win, that does not mean that the Patriots will. There's always the possibility of a third team winning.

If an actual person were to give this argument, perhaps they would be tacitly assuming that no other team will win. Still, the argument *as written* would commit a formal fallacy. (Moreover, as you saw earlier in the course, it is easy to get confused with "not both." The point here is that if one part of the "not both" claim is false, the other part could be false as well.)

Fun Fact! Any argument that has the form of a hasty denial or the not-both fallacy is equivalent to an argument that affirms the consequent or denies the antecedent. (However, the converse is not true.) I leave it as an exercise to figure out why.

Dubious Dilemma

All and only arguments that rest on a premise of the following form are dubious dilemmas (unless Q is the same as ~P):

(*n*) P or Q

Example:

(1) Bill Gates is registered either as a Democrat or a Republican.
(2) Bill Gates is not a registered Republican.
(3) Therefore, Bill Gates is registered as a Democrat.

The fallacy is to assume that (1) presents *exhaustive* options for one's political views. But clearly, (1) is not exhaustive: It is possible that Bill Gates is registered with some third party, or perhaps isn't registered to vote at all.

Regardless, note that the example is deductively valid! (It is a case of "disjunctive syllogism;" see the handout on Famous Forms). BUT: The problem is that the disjunctive premise will usually be controversial if the conclusion is at all in dispute. So in that case, the argument won't succeed in convincing any one. That is the sense in which a dubious dilemma is a flaw or fallacy.

In contrast, the following argument presents no dubious dilemma:

(1) Bill Gates is either a registered Republican or not.
(2) Bill Gates is either a registered Democrat or not.
(3) So, if Bill Gates is a registered Republican, then he is a registered Republican.

Here, (1) and (2) each express a dilemma that is exhaustive of their respective possibilities.

Guess what? Sometimes an argument with a "dubious dilemma" isn't really fallacious. That occurs when the disjunctive premise is not vulnerable to any real doubt. For example, suppose a judge sentences a criminal to 30 days in prison with a $5000 bail. Then you might reason:

(1) The convict will either pay $5000 or go to prison for 30 days.
(2) He is unable to pay $5000.
(3) So, he will go to prison.

Other things equal, there won't be any serious doubt about whether (1) is true. So it won't be fallacious, even though it has the form of a dubious dilemma.

Aside: Logicians typically call "dubious dilemma" the fallacy of "false dilemma" or "false dichotomy." However that may be misleading. For the problem is not necessarily that the "either-or" claim is *false.* Sometimes, the flaw is merely that the premise is *dubious*. So for instance, in the first example, it may be *true* that Gates is registered as a Democrat or a Republican, even though that is unknown. It thus seems clearer to say just that the dilemma is "dubious."