# CRITICAL THINKING Lecture #7



Deductive Arguments

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## Deduction

Deductive argument: An argument whose p (i.e., with 100% certainty) for its conclusion.

The claim is that it is *absolutely impossible* for the conclusion to be false when the premises are true.

## Deductive argument: An argument whose premises are supposed to provide *conclusive* support



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Deduction: Validity

Deductively valid argument: An argument where the truth of all its premises *logically* entails the truth of its conclusion.

This means that for a valid argument, *if* all the premises are true, then the conclusion *must* logically be true as well.

Notice that this says nothing whatsoever about whether the premises are actually true or not! Validity has us assume (for the sake of argument) that the premises are true, and then see whether the conclusion must actually follow or not. So validity is an assessment of the *inferences* of an argument, not its premises.





Deduction: Invalidity

Deductively invalid argument: An argumen be false while the premises are all true.

The easiest way to show that an argument is invalid is to *construct a counter-example*. That is, make up an example or case where the premises are true and the conclusion is false. If you can create an example like this that makes sense without contradiction, then the argument is invalid.

## Deductively invalid argument: An argument where it is logically possible for the conclusion to



Deduction: Soundness

Deductively sound argument: An argument that (I) is valid with (2) premises that are all actually true.

The tools of logic are used to assess part (1) of soundness. Other realms of knowledge are usually necessary to assess part (2).



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# Deduction: An Informal Approach

I postpone discussing the "logically" aspect of validity and invalidity until next week. That is when you will start to learn how to use formal tools of logic to assess deductive validity.

This week, we proceed more informally by focusing on the "impossible" and "possible" aspects of validity and invalidity, and how they are different from the concepts of truth and falsity.



# Argumentative Form: Instructions

This is done as follows:

- Make a numbered list of the premises, I.
- 2. Draw a line below the last premise, and
- 3. means "therefore") in front of it.

## Putting an argument into its "argumentative form" can make it easier to understand and assess.

Below the line put the main conclusion, but with a . . (called "triple dot", whose symbol



## Argumentative Form: Illustration

So given the argument:

Qatar is a millionaire and Professor Gray lives in Qatar.

It has the following argumentative form:

- Everyone living in Qatar is a millionaire.
- 2. Professor Gray lives in Qatar.
- ... Professor Gray is a millionaire.

# Professor Gray must be a millionaire. After all, everyone living in



Argument #1

Assess the following argument:

Everyone living in Qatar is a millionaire. |. 2. Professor Gray lives in Qatar.

. Professor Gray is a millionaire.

Are the premises true? Is it deductively valid? Is it deductively sound?



Argument #2

## Assess the following argument:

# Professor Gray is a philosophy professor because the Earth has one moon and Doha is the capital of Qatar.

The same argument in its argumentative form:

- 1. The Earth has one moon.
- 2. Doha is the capital of Qatar.
- . Professor Gray a philosophy professor.

Are the premises true? Is it deductively valid? Is it deductively sound?



Argument #3

Assess the following argument:

The same argument in its argumentative form:

- 1. If I get an A in critical thinking, then I am burning my notes.
- 2. I am getting an A in critical thinking.
- . I am burning my notes.

Are the premises true? Is it deductively valid? Is it deductively sound?

## If I get an A in critical thinking, then I am burning my notes. I am getting an A in critical thinking. Therefore, I am burning my notes!



Next Class...

# truth and falsity, on the other.

We will discuss in more detail the difference between *validity and invalidity*, on the one hand, and





## References

# [Blank t-shirt template]. (n.d.). [Digital image]. Retrieved March 3, 2017 from http://www. clipartbest.com/cliparts/pi5/GxA/pi5GxA5iB.jpeg.