Reasoning and Formal Modelling for Forensic Science Lecture 8

Prof. Dr. Benedikt Löwe

2nd Semester 2010/11

Argumentation Schemes.

Premiss 1. ...

Premiss 2. ...

Conclusion. ...

Critical Questions: ...

Argument from Position to Know.

Premise 1. Source a is in a position to know about things in a certain subject domain S containing proposition A.

Premise 2. a asserts that A is true.

Conclusion. A is true.

CQ1 Is a in a position to know whether A is true?

CQ2 Is a an honest, trustworthy, reliable source?

CQ3 Did a assert that A is true?

Example: Argument from Position to Know

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Oak Lawn Police Report, 9 Feb 2011. A witness told police that while at 9424 S. Pulaski Road, she observed a brown wallet on the ground in the main walkway. The witness said that as she went to pick up the wallet, Williams walked up and took possession of it. Police said that the wallet belonged to a friend of the witness. Williams refused to give the witness the wallet. When the witness told Williams that she was going to call the police, he fled through the parking lot, according to reports. Evergreen Park police said that they found Williams at a bus stop in possession of the wallet. The wallet contained a drivers license belonging to the victim, according to police.

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Premise 2. *a* asserts that *A* is true.

Conclusion. *A* is true.

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- The witness was present, so she is in a position to know things about the events.
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- Therefore, Williams stole the wallet.
- CQ1. Is the witness in a position to know whether this is true?
- CQ2. Is the witness a trustworthy source?
- CQ3. Did the witness assert that Williams stole the wallet?

Argument from Expert Opinion.

Premise 1. Source E is an expert in subject domain S containing proposition A.

Premise 2. E asserts that A is true.

Conclusion. A is true.

CQ1 How credible is E as an expert source?

CQ2 Is E an expert in the field that A is in?

CQ3 What did E assert that implies A?

CQ4 Is E personally reliable as a source?

CQ5 Is A consistent with what other experts say?

CQ6 Is E's assertion based on evidence?

Example: Argument from Expert Opinion (1).

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The victim of a George Town murder (27 Oct 2009) died from a "combination of multiple severe injuries" according to the state's forensic pathologist, Dr Donald Ritchie. The two accused are alleged to have killed the victim after a day spent drinking bourbon. Dr Ritchie took the jury through a series of graphic post-mortem photographs and told the court that the victim's body showed (among other injuries) a large tear in his skin overlaying a severe fracture to his jaw, which the expert witness said was extremely hard to break and therefore the injury inflicted must have involved a significant degree of force. Dr Ritchie said the injuries were so numerous and severe that it was likely the "constellation of injuries caused his death".

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- Dr Ritchie is an expert in pathology, an area involving determining the cause of injuries.
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- Therefore, the attack involved a significant degree of force.

CQ1 How credible is Dr Ritchie as an expert source?

CQ2 Is Dr Ritchie an expert in the field of determining whether an attack used a significant degree of force?

CQ3 What did Dr Ritchie assert that implies that the attack involved a significant degree of force?

CQ4 Is Dr Ritchie personally reliable as a source?

CQ5 Is Dr Ritchie's statement consistent with what other experts say?

CQ6 Is Dr Ritchie's assertion based on evidence?

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The interesting case is Case 2. in which we need to go back to our formal representation of the situation.

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Chapter 6 of the Walton/Reed/Macagno book:

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From Sherlock Holmes, *The Adventure of Silver Blaze*: "A dog was kept in the stable, and yet, though someone had been in and fetched out a horse, he had not barked enough to rouse the two lads in the loft. Obviously, the midnight visitor was someone whom the dog knew well."

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Missing premise: "Dogs generally bark when a person enters an area unless the dog knows the person well."

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- (Dogs generally bark when a person enters an area unless the dog knows the person well.)
- Someone entered the stable and there was a dog.
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Note that it was **our** decision to represent the missing assumption. It could have been "Dogs generally bark when a person enters an area unless the dog knows the person well or the dog is drugged; and furthermore I have evidence that the dog wasn't drugged."

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Use the list of argumentation schemes with their critical questions as a guideline:

1. Identify all possible argumentation schemes.
2. Use linguistic data (and possibly extra-linguistic data) as indicators which critical questions were considered relevant.
3. Determine which scheme was most likely the one that the original arguer intended.

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R. Artstein, M. Poesio. Inter-coder agreement for computational linguistics. *Computational Linguistics* 34(4): 555–596, 2008.

Annotations & Formalizations (2).

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C. Lynch, K. Ashley, N. Pinkwart, V. Aleven, Toward Assessing Law Students Argument Diagrams, In: Proceedings of the Twelfth International Conference on Artificial Intelligence and Law. pp. 222-3. Barcelona, 2009.

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- Study of *Argument Diagrams* in a formal language called LARGO.
- 198 students.
- Three Supreme Court cases.
- Development of systems how to assess the three possibilities of disagreement.

Argument from Popular Opinion.

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Premise 1. A is generally accepted as true.

Premise 2. If A is generally accepted as true, this gives a reason in favour of A.

Conclusion. There is a reason in favour of A.

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(Walton / Reed / Macagno list a number of subschemes: various *ad populum* arguments; deliberation, snob appeal, appeal to vanity, rhetoric of belonging.)

Argument from Popular Practice.

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Premise 1. A is popular practice among those who are familiar with what is acceptable or not in regard to A.

Premise 2. If A is popular practice, that gives reason to think that A is acceptable.

Conclusion. Therefore, A is acceptable.

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CQ1 What actions or other indications show that a large majority accepts A?

CQ2 Even if a large majority accepts A what ground might here be there for thinking that they are justified in accepting A?

Argument from Example.

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CQ2 Does the example cited support the generalization it is supposed to be an instance of?

CQ3 Is the example typical of the kinds of cases the generalization covers?

Argument from Example.

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Conclusion. Therefore, generally, if x has property F, then it has property G.

This argument scheme is different from the others we have seen so far. The others sounded plausible, even if defeasible. This one sounds positively dangerous. In general, this argument will be invalid.

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Premise 1. I can make bad things happen to you.

Premise 2. If you don't do A, I will make bad things happen to you.

Conclusion. You better do A.

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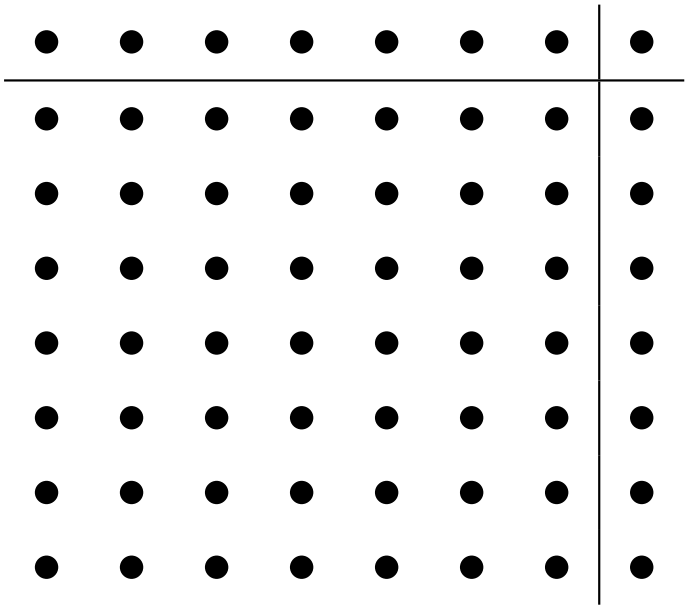

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- Abductive reasoning. Reasoning from observations to causes.

The problem of induction.

Prof. Dr. Benedikt Löwe

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When they propose to establish the universal from the particulars by means of induction, they will effect this by a review of either all or some of the particulars. But if they review some, the induction will be insecure, since some of the particulars omitted in the induction may contravene the universal; while if they are to review all, they will be toiling at the impossible, since the particulars are infinite and indefinite. (Sextus Empiricus)

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Argument from Cause to Effect.

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Premise 1. Generally, if A occurs, then B will occur.

Premise 2. A occurred.

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Premise 1. D is a set of facts.

Premise 2. There are some accounts that are successful in explaining D, and A is the most successful of them.

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CQ4 Could further evidence change our assessment of what the possible explanations are or of which of them is the most successful explanation?