Testing your own intuitions on inferences
Assignment 1/6, Introduction to Semantics, UniGe Fall 2011

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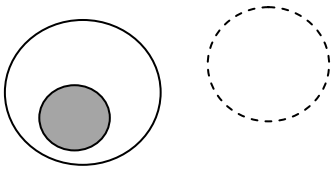
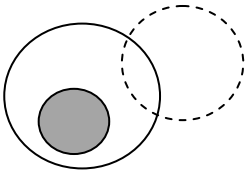
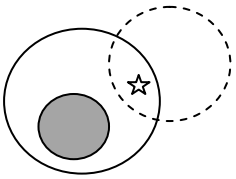
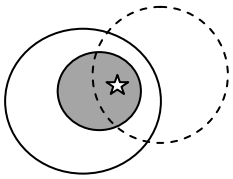
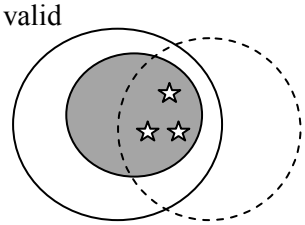
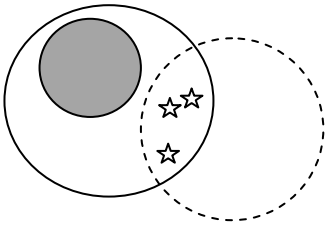
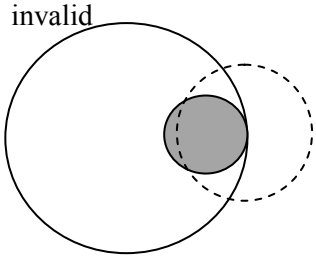
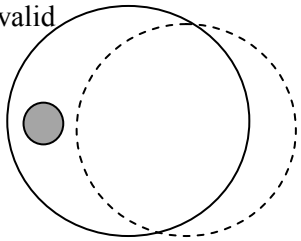
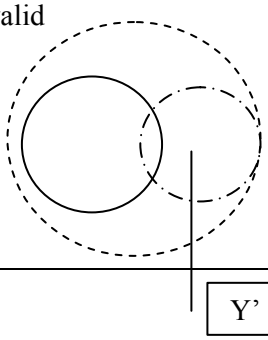
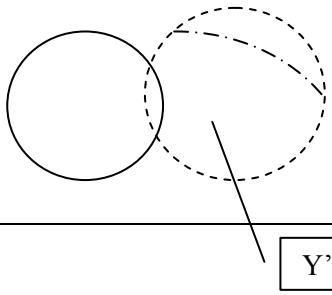
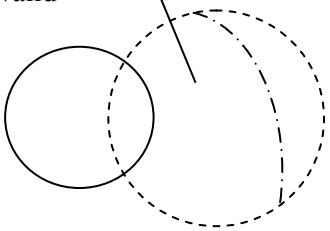
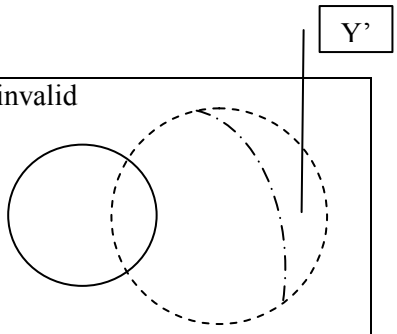
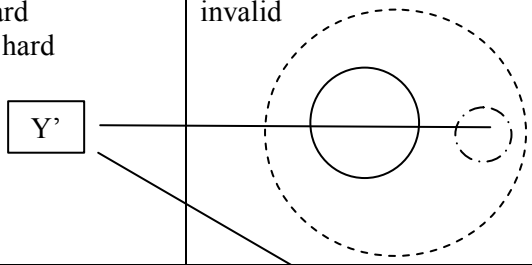
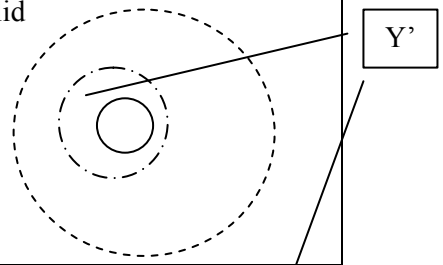
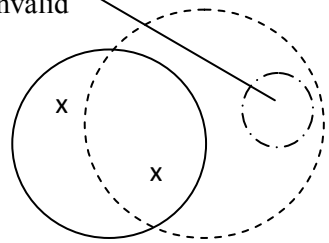
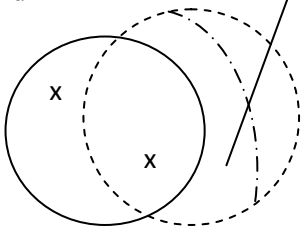
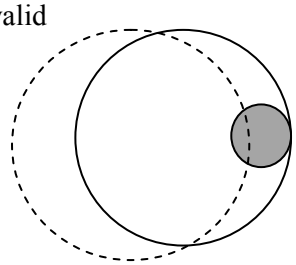
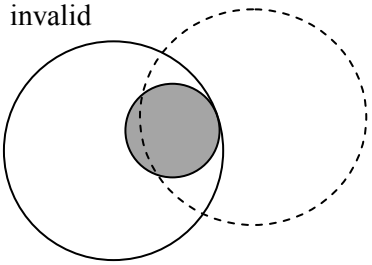
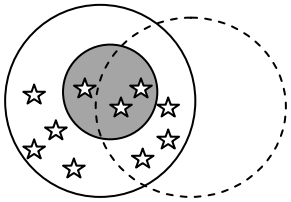
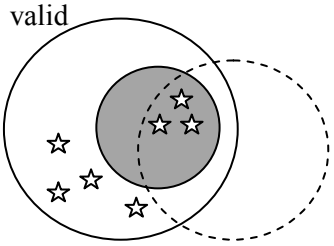
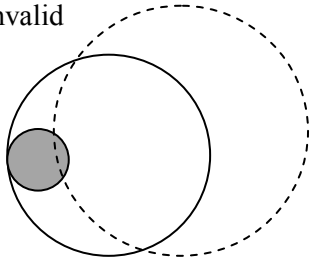
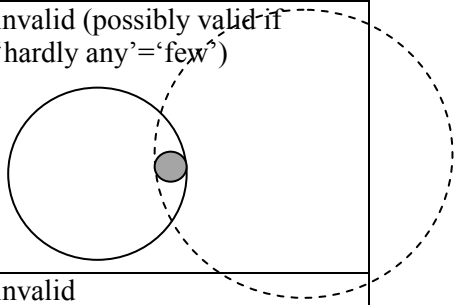
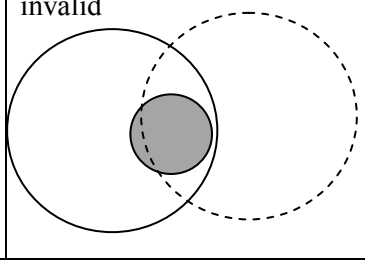
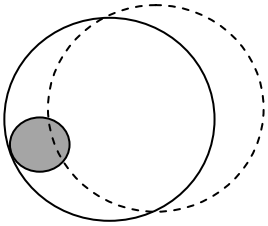
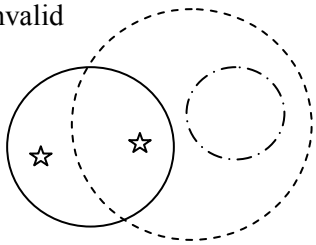
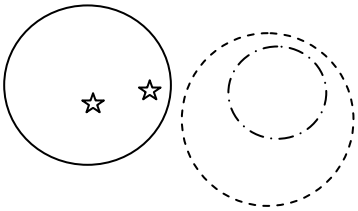
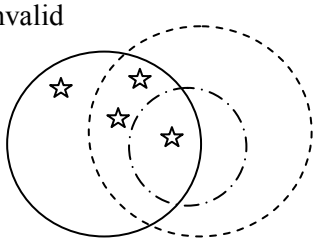
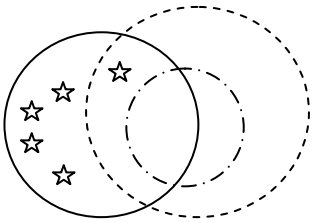
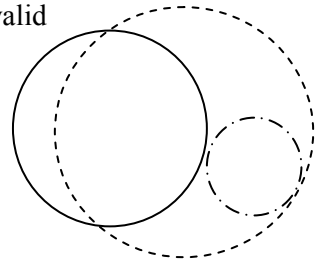
- in a valid inference: whenever the premise is true, the conclusion is necessarily true (so the question is not 'can it be true?', but 'must it be true?')
- if you can imagine a model where the premise is true, but the conclusion false, the inference is not valid => proceed by falsification attempts
- when drawing Venn diagrams: if the inference is not valid, represent the model such that it constitutes a counterexample to the inference (premise true, conclusion false)
- if the inference is valid, the model must make it obvious that the conclusion cannot be false (usually on account of some subset-to-set relation)

	→ if A then B:	→ if B then A:
1) A: No student works hard B: No smart student works hard white background for students gray background for smart students dotted line for hard workers Y' for very hard workers	valid 	invalid 
2) A: A student works hard B: A smart student works hard	invalid 	valid 
3) A: Three smart students work hard B: Three students work hard	valid 	invalid 
4) A: Most smart students work hard B: Most students work hard (here you must imagine the students evenly distributed in the diagrams)	invalid 	invalid 
5) A: Few students work very hard B: Few students work hard (even if all students who work hard work *very* hard, they cannot be but few) (here you must imagine the students evenly distributed in the diagrams)	invalid 	valid 

6) A: Several students work very hard B: Several students work hard	valid 	invalid 
7) A: Each student works hard B: Each student works very hard	invalid 	valid 
8) A: Every other student works hard B: Every other student works very hard (total number of students: 2x)	invalid 	valid 
9) A: Almost all students work hard B: Almost all smart students work hard (here you must imagine the students evenly distributed in the diagrams)	invalid 	invalid 
10) A: More 2 two students work hard B: More than 2 smart students work hard	invalid 	valid 
11) A: Hardly any smart st. works hard B: Hardly any student works hard (imagine the students evenly distributed in the diagrams)	invalid 	invalid (possibly valid if 'hardly any'='few') 
12) A: A lot of smart students work hard B: A lot of students work hard (imagine the students evenly distributed in the diagrams)	invalid 	invalid 

13) A: Neither student works very hard B: Neither student works hard	invalid 	valid 
14) A: Only one student works very hard B: Only one student works hard (imagine no more students in the model than there are stars)	invalid 	invalid 
15) A: Students work hard B: Students work very hard	invalid 	valid