

## Conditionals, Syllogisms and Counterexamples Remarks from a Linguist's Point of View

Despite considerable progress in formal logic and semantics conditional constructions continue to be a hotly debated topic: On March 20, first day of Spring 2013, *Google Scholar* lists 619 pertinent new publications in this year, which amounts to almost eight fresh papers per day, a clear indicator that the issues concerned are far from being settled. One reason for this difficulty of achieving a consensus could be that the problem is simply too difficult to be solvable at the current state of the art, so McGee might still be right with his 1985 conjecture: „It may be that it is not possible to give a satisfactory logic of conditionals. This is not to say that it is not possible to give a linguistic account of how we use conditionals, but only to say that such an account would not give rise to a tractable theory of logical consequence.“ (McGee 1985:471)

Another reason could be lack of cross-disciplinary communication: This paper looks at logicians' discussions of counterexamples to classical syllogistic schemata such as *modus tollens* and *modus ponens* from the point of view of a linguist and endeavors to show at least that some of them are fallacious and at most that a considerable amount of problems in this domain is due to insufficient care in formalization, i.e. in semantic analysis.

Assume that the miniature archipelago Twin Islands, consisting of Westland and Eastland, is rarely visited, so at present Jeff and Jane are the only visitors. Assume further that Jane is on Westland. Then the following propositions seem to be true:

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|---|-------------|
| (P1) Jeff is not the only visitor.                          | non q       |
| (P2) If Jeff is on Eastland, then Jeff is the only visitor. | if p then q |

Application of *modus tollens* should lead us to the truth of:

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|-------------------------------|-------|
| (C1) Jeff is not on Eastland. | non p |
|-------------------------------|-------|

However, intuitively, this does not seem to follow. So this appears to be a counterexample to *modus tollens*. But it isn't. It's easy to see why: Visitor is a relational noun. *Jeff is a visitor* can only be the case if there is a location Jeff is a visitor of. Uncovering the hidden parameter makes the counterexample disappear:

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|---|-------------|
| (P1) Jeff is not the only visitor (of Twin Islands).                      | non q       |
| (P2) If Jeff is on Eastland, then Jeff is the only visitor (of Eastland). | if p then r |

Since q and r are different, there is no way of applying *modus tollens*. This seems to be an easy exercise from Semantics 101, but I will argue that Yalcin's recent „Counterexample to Modus Tollens“ (2012) is subject to analogous criticism. It is about a marble selected at random from 100 marbles of which 40 are big (10 blue, 30 red) and 60 are small (50 blue, 10 red). This justifies plausibly that both (P3) and (P4) are licensed:

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|--|
| (P3) If the marble is big, then it's likely red. |
| (P4) The marble is not likely red.               |

However, from these, the following conclusion does not intuitively follow:

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|-----------------------------|
| (C2) The marble is not big. |
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Moving on to *modus ponens* let us imagine following McGee (1985:463) „... that some time in the future linguists will determine the truth conditions for the English conditional and prove that *modus ponens* is truth-preserving“ and that these then future linguists are currently at work.

Whereas McGee’s own counterexamples to *modus ponens* all involve iterated conditionalization Kolodny and MacFarlane recently proposed an instance with single conditionals (2010). Since their example involves also a modal (*ought*) it may be preferable to cook up an analogous case without a modal.

Orpheus famously wants to get back Eurydice from Hades as soon as possible. His singing softens Persephone’s heart and so she tells him that Eurydice is either behind door A or behind door B and if he opens the right door he can take her home immediately. If he opens the wrong door he has to wait two weeks and else he has to wait one week before Eurydice comes out and he can take her home after that delay. Arguably, this situation justifies (P5) and (P6):

(P5) Eurydice is either behind door A or behind door B.

(P6) Orpheus’s best choice is to wait.

But given his impatience (P7) and (P8) are also justified:

(P7) If Eurydice is behind door A, then Orpheus’s best choice is to open door A.

(P8) If Eurydice is behind door B, then Orpheus’s best choice is to open door B.

Applying *modus ponens* in each branch of a disjunction elimination and disjunction introduction process yields (C3), which is not compatible with (P6):

(C3) Orpheus’s best choice is to open door A or Orpheus’s best choice is to open door B.

So Kolodny and MacFarlane take this to be a counterexample to *modus ponens*, whereas at least one contemporary linguist disagrees, along the lines outlined above.

If there is time I will also comment on the consequences of these considerations for the restrictor – operator view debate (Gillies 2010).

All in all, the direction of impact of these comments is to argue, pace McGee, that it is not only possible to give a linguistic account of how we use conditionals, but also that such an account can give rise to a tractable theory of logical consequence.

## References

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