DIALETHEISM AND MODUS TOLLENS

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According to dialetheists, some contradictions are true. In other words, according to dialetheists there is a sentence A such that it and its negation $\neg A$ are both true. Dialetheists have argued for many examples of true contradictions. But for the sake of illustration, we will employ a purported example of a true contradiction arising from motion, given by Graham Priest (2006: *In Contradiction*, Oxford University Press, 161), who writes: "I am in a room. As I walk through the door, am I in the room or out of (not in) it?" Priest argues that the answer to this question is a true contradiction – as I walk through the door, I'm in the room, but also not in the room.

Modus tollendo tollens, or modus tollens for short, is the argument form $A \to B, \neg B \therefore \neg A$, in which the major premise is a conditional, the minor premise the negation of its consequent, and the conclusion the negation of its antecedent. For example, the argument 'if it's raining, then it's cloudy; it's not cloudy; therefore, it's not raining' is an instance of modus tollens where the major premise is the conditional 'if it's raining, then it's cloudy', the minor premise is 'it's not cloudy', the negation of the consequent, and the conclusion is 'it's not raining', the negation of the antecedent.

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We argue that if dialetheism is true, then modus tollens is invalid. To see why, suppose that both ‘I’m in the room’ and its negation ‘I’m not in the room’ are true, but that ‘I’m walking through the door’ is true while ‘I’m not walking through the door’ is not. Then consider the following instance of modus tollens:

(1) If I’m walking through the door, I am in the room.

(2) I am not in the room.

(3) $\therefore$ I’m not walking through the door.

By hypothesis, the second premise is true while the conclusion is not. In the scenario described, the first premise is intuitively true as well. But if so, we have an instance of modus tollens with true premises and a false conclusion, so modus tollens is invalid.

Whereas we think the instance of modus tollens described above has true premises and a false conclusion, we don’t have similar intuitions about any corresponding instance of modus ponens (the argument form $A \rightarrow B, A \therefore B$). Consider, for example, the following instance of modus ponens:

(1) If I am in the room, I’m in bed.

(2) I am in the room.

(3) $\therefore$ I’m in bed.

If ‘I’m in the room’ is both true and false, but ‘I’m in bed’ is just false, then ‘if I am in the room, I’m in bed’ is just false. Unlike the corresponding instance of modus tollens, this instance of modus ponens is intuitively valid.

The issue is notable for at least two reasons. First, many putatively invalid instances of modus tollens have been given even in the classical context. Most of these putative counterexamples involve an embedded conditional or modal in the consequent of the major premise, which is putatively negated in the minor premise (for an overview, see Theresa Helke (2018: On Conditionals, PhD Thesis, National University of Singapore)). But the logical complexity of the embedded conditional or modal makes it arguable whether these examples are truly instances of modus tollens. In contrast, the example we gave above is a perfectly straightforward instance of modus tollens.

Secondly, it's often observed that "one person's modus ponens is another's modus tollens". In the context of classical logic, the validity of modus ponens and modus tollens stand and fall together (as recently emphasised in this journal by Lina Lissia (2020: 'On some analogies between the counterexamples to modus ponens (and modus tollens)', *The Reasoner*, 35-7)). But we have just seen that in the context of dialetheism, the validity of modus ponens and modus tollens can come apart – some instances of modus tollens, but not of modus ponens, are intuitively invalid.[1]

[1]We thank Jay Garfield for discussion of this paper.