# The Surprise Examination Paradox in Dynamic Epistemic Logic

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## Abstract

The surprise examination paradox has been the topic of many philosophical papers. However, despite its long history, no long-lasting solution emerged. The debates related to the surprise examination paradox go deeper than what the correct solution is. One highly debated issue that I directly address in this thesis is the following: is there a solution to be given or should we embrace the surprise examination paradox as a true paradox and look for an inconsistency in our conceptions on knowledge, belief, etc. Kaplan and Montague 1960 (3) argue that the surprise examination paradox is indeed a paradox, while Gerbrandy 2007 (2) and Baltag and Smets 2010 (1) believe that a solution could be given but not if the teacher's announcement is meant to be fulfilled (Gerbrandy), or if the students are to trust the teacher (Baltag and Smets). Of course, such approaches have a lot of merit and all authors manage to use their (negative) conclusions to argue for deep philosophical conceptions regarding knowledge and the way in which agents revise their beliefs in face of new information. However, these approaches fail to meet widely accepted criteria that philosophers expect a solution to the surprise examination paradox to meet. They have been explicitly set up by Wright and Sudbury 1977 (5) and contain the idea that the students should be surprised even after the teacher's announcement (which neither Kaplan and Montague, nor Gerbrandy can accommodate) and that a surprise examination is indeed possible (which Baltag and Smets cannot accept).

In this thesis I show that dynamic epistemic logic (DEL) can guide us towards a philosophically informed solution to the surprise examination paradox. The question that drives the analysis is: is there a way of coming up with an intuitive solution to the surprise examination paradox that meets the criteria of Wright and Sudbury? I argue that there is indeed such a solution. I show that DEL can provide a way of distinguishing between various possible definitions of surprise, considerably more than have been addressed in the literature so far. I investigate how (some of) these definitions influence the outcome of the teacher's announcement on the students. The result is that one of the new ways of defining surprise, which is both intuitive and in line with a recent, empirically-informed, logic of surprise developed in Lorini and Castelfranchi 2007 (4), allows us to model the scenario of the surprise examination paradox in such a way that all the conditions of Wright and Sudbury are respected and the students end up as being surprised even after the teacher's announcement.

# References

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