A Value-Based Solution to the Surprise Exam Paradox
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I identify an assumption that the students should not rely on: if the teacher believes that the exam would not be a surprise on a certain day, the teacher will not give the exam on that day. The reason I present for not making this assumption does not involve doubting the moral goodness of the teacher. But it does involve making a value judgment.

Here is a statement of the surprise exam paradox. A teacher makes an announcement to their students that there will be a surprise exam in the next school week. Let us suppose that the school week lasts from Monday to Friday. The students reason that the exam will not happen on Friday because it will not be a surprise on that day. The night before, they would be able to predict that the exam will happen on Friday. But given that it will not happen on Friday, the students rule out the previous day as well. On the night before, they would be able to predict that the exam will happen on this day, since it will not happen on Friday. By extending this way of reasoning, they rule out all of the other days in the next school week. The students' conclusion is that a surprise exam cannot happen. A surprise exam can happen, so to solve the paradox we have to identify where the students' reasoning has gone wrong.

Before presenting a solution, I shall introduce a clarification. Let us suppose that a surprise exam, on the students' understanding, is an exam that occurs on a day that one cannot deduce beforehand, working only from the officially available information. Officially available information includes which day of the week it is, the length of the week, what the teacher said in their announcement that there will be a surprise exam[1] and whether the exam has been given yet or not. I do not think there is anything else that needs to be added to this list here.

It is acceptable for the students to assume that the teacher was speaking sincerely at the time of the announcement. But when arguing against the possibility of a surprise exam, the students also make the following assumption: *if the teacher believes that the exam would not be a surprise on a certain day, the teacher will not give the exam on that day.* The students should not also assume this, and my solution below targets this assumption.

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[1] This may sound circular because the term 'surprise exam' appears in the teacher's announcement. To avoid circularity, the teacher can be interpreted as saying, "There will be an exam on one of the school days next week. Before the exam occurs, it will not be possible for you to deduce the day of the exam by working from the officially available information. The officially available information covers: this announcement of mine, anything else I say to you, the length of the school week, which day of the week it is and whether the exam has been given yet or not."

What if the teacher does not decide on a specific day for the exam at the time of the announcement; then, on Thursday night of the next school week, they realize that they must give the exam on Friday if they are to give it within that week; then they realize the lack of surprise on this final day? They have two options: either give the exam on Friday or not give the exam on this day. Either way, they are not fulfilling their announcement. Taking the first option means that an exam has been given in the designated school week, but not a surprise exam; while taking the second option means that no exam has been given in the designated school week, hence no surprise exam has been given in that week. Let us suppose that in this situation the teacher should take whichever option is more faithful to the original announcement.[2] But there is no reason to regard not giving the exam as the option that is more faithful to the announcement. So it is acceptable for the teacher to still give the exam in this situation, even if it lacks the surprise element. No student should overlook taking this option, but that is what the students' assumption does. Without this assumption, there is no way for the students to justify their claim that the exam will not happen on the final day of the next school week.

It is worth noting that much the same point applies if the teacher comes to share the students' belief that it is impossible to give a surprise exam on any of the days in the designated school week, soon after making the announcement for example. The teacher is still faced with a choice between not giving an exam at all and giving an exam that (he or she believes) is not a surprise, and students should not assume that the teacher will choose the former option.

I call the solution offered in this paper a value-based solution, because it involves imagining the teacher to be in a position where they cannot fulfil their announcement and then making a value judgment: that they should come as close to fulfilling it as possible (see Raz 2003: 348-349). This does not mean not giving the exam.

Reference

Raz, J. 2003. Numbers, With and Without Contractualism. *Ratio* 16: 346-367

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[2] And if there is no reason to regard one option as more faithful, then it is acceptable for them to take either option.