_____

A SOLUTION TO THE SURPRISE EXAM PARADOX

TERENCE RAJIVAN EDWARD, University of Manchester, England

The students' argument against the possibility of a surprise exam assumes that the following combination would not occur: the teacher decides to give the exam on a certain day; the teacher believes that the exam would be a surprise on that day; but, actually, the exam would not be a surprise on that day. I give a reason to reject this assumption, and I point out that an attempt to reformulate the surprise exam paradox in order to allow for the assumption does not result in an acceptable argument.

Keywords: Surprise exam – Paradox – Students' assumption – Mistaken belief – R. A. Sharpe

This paper offers a solution to the surprise exam paradox. An article by R.A. Sharpe suggests this solution (Sharpe 1965, 255). However, the solution is only suggested there and I have not seen it openly stated in previous literature. I will first present the paradox for any readers unfamiliar with it, before presenting this solution to it.

A teacher makes an announcement to their students that there will be a surprise exam in the next school week. The students reason that the exam will not happen on the final day of that school week, 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 the final day. But given that it will not happen on the final day, 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 that day, since it will not happen on the final day. 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. For the solution that I shall propose, it is useful to define what the students regard as a surprise exam. Let us say that a surprise exam, on the students' understanding, is an exam which occurs on a day that cannot be deduced 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 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. Officially available information does not, of course, include anything that the teacher has written in their private diary.

Here is an example of how the students reason in order to rule out one of the days, namely Wednesday: "The exam will not happen on Wednesday, because it will not be a

surprise on Wednesday. It will not be a surprise because by the end of the Tuesday school day we would be able to predict that it will happen on Wednesday, if the exam has not been given yet, since we are able to rule out the days after Wednesday as days in which the exam might happen." A variation on this reasoning is used for any other day of the next school week. Now when the students rule out the days of this week, they make an assumption. Put simply, the assumption is that the teacher would not make the mistake of believing that the exam is a surprise on a certain day when actually it is not. More fully, the students assume that the following combination would not occur: the teacher decides to give the exam on a certain day; the teacher believes that the exam would be a surprise on that day; but, actually, the exam would not be a surprise on that day. My solution targets this assumption.

There is no good reason for the students to make the assumption. To justify this claim, let us suppose that the school week lasts from Monday to Friday and that the teacher has decided that the exam will happen on Wednesday. The students have argued against Wednesday as a day on which the exam would be a surprise, but that does not mean that their argument has occurred to the teacher as well. Even if we grant that an exam on this day would not be a surprise, because of what the students say, they should not be confident that the teacher will realize this. This is just not the sort of argument one should expect others to figure out by themselves. It may well not occur to others. Consequently, the students should not believe that the exam will not happen on Wednesday. The reason why they should not believe this applies to other days as well, apart from perhaps the final day of the next school week. It is more reasonable to expect the teacher to realize the argument for the exam not being a surprise on the final day.

It may be objected that the surprise exam paradox can be posed in an adapted form, in which the students are allowed to rely on the premise that the teacher is perfectly good at detecting when the exam would not be a surprise. A first response to this objection is that it concedes that the surprise exam paradox in its original form has been solved.

A second response is that the students are left with inconsistent commitments, at least given the following as part of what it is for the teacher to be perfectly good at detecting when the exam would not be a surprise: if the exam cannot be a surprise within a certain period of time, the teacher will not believe that the exam can be a surprise within that period. One of the premises that the students must rely on is that the teacher is sincere when giving the announcement. Otherwise they cannot rule out any day, because the teacher might give the exam on any day without caring whether it is a surprise or not. Another premise that the students rely on is that the teacher is perfectly good at detecting when the exam would not be a surprise – in the adapted version, they are allowed this premise too. But their conclusion is that the teacher's announcement is false. Let us list these three commitments to see the problem with this combination:

(i) The teacher spoke sincerely when making the announcement of a surprise exam.

(ii) The teacher is perfectly good at detecting when the exam would not be a surprise.

(iii) There cannot be a surprise exam within the period of time specified in the teacher's announcement.

These three commitments are inconsistent. Owing to the first commitment, the students have to say that when making the announcement the teacher believed that a surprise exam is possible within the period specified. Owing to the second commitment, the students have to say that the teacher would not have believed this if a surprise exam were impossible within that period of time. But owing to the third commitment, the students have to say that a surprise exam is impossible within that period of time.

Reference

SHARPE, R. A. (1965): The Unexpected Examination. *Mind*, 74 (294), 255.

_____
Terence Rajivan Edward
School of Social Sciences
Arthur Lewis Building
The University of Manchester
Manchester
M13 9PL
England
e-mail: t.r.edward@manchester.ac.uk