Knowledge-to-Fact Reasoning:
Towards a Unified Solution to the Prediction Paradox

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I have two goals in this paper. The first is to plug a conspicuous hole in my 'bootstrapping' diagnosis of, and attendant solution to, the surprise examination paradox [1]. The second goal is to show that the resulting solution extends to Sorensen's [2] 'recalcitrant' variants of the so-called *predicition paradox*—our exemplar will be the *designated student* variation—as well as, more significantly, his [3] *strengthened* prediction paradox and Olin's [4] *justified-prediction* paradox. The bootstrapping approach is the first to promise such a wide-ranging unified solution to the prediction paradox.

Here is sketch of the central moves.

The paradox arises from the following announcements from a trustworthy and trusted teacher:

(E) There will be an examination one morning at 10am next week.
(S!) But, you won't know which day you'll get it until you get it!

Paradoxically, it looks as if the students can legitimately argue, on the basis of these announcements, that they cannot be set any such exam, Here are the first, crucial steps of the reasoning to the absurd conclusion:

SURPRISE
1. ***Premise*:** (KE) *I know that there will be an exam one morning next week.*
2. ***Premise*:** (S!) *I won't know which morning I will get it before I get it.*
3. If I don't get the exam by Thursday, I will know on Thursday afternoon (and so, before Friday) that it is going to be on Friday. (from (1))
4. I won't know before Friday that I will get the exam on Friday. (from (2)
5. So, I will get the exam by Thursday, i.e.
   (¬F) *the exam will not be on Friday* (from (3) and (4))
6. ***Premise*:** I know (KE) and I know (S!).
7. ***Conclusion*:** Since (5) follows from (1) and (2), propositions I know according to (6), **I *know* (¬F)**. (from (1)-(6) and epistemic closure)

The resolution I favour takes the reasoning leading to (¬F) at step (5) to involve the same kind of *bootstrapping* evident in arguments which proceed from one's knowledge of a proposition P to the reliability of the source of one's belief in P, such as the following:

Premise 1: I know that it is around 4pm.
Premise 2: (I know that it is around 4pm) only if (my watch is reliable).
Conclusion: Hence, my watch is reliable.

The view that such arguments involve bootstrapping, and, thus, are incapable of *producing knowledge* is familiar (see e.g. Vogel [5]). In [1] I presented a case for extending the view to *all Knowledge-to-Fact* (*KF*-) arguments as I called them, i.e. valid arguments of the form:

$$S \text{ knows } P, P_1, \ldots, P_n \models Q$$

where Q is a non-epistemic proposition (i.e. a proposition which does not invoke knowledge). Consequently, S herself cannot acquire knowledge of Q by way of such reasoning. My earlier solution to the surprise exam rests on the fact that SURPRISE is a KF-argument for the reasoning student.

However, this solution is flawed in that it does not, as it stands, block a route to the paradox by way of *third-person* KF-reasoning—e.g. it does not preclude someone other than S using that same argument to attain knowledge of Q. I illustrate the point by way of considering Sorensen's designated student paradox.

The bootstrapping approach can be salvaged if it can be shown that the third-person KF-reasoning here involves the same sort of bootstrapping that first-person KF-reasoning does. But an immediate problem is the existence of perfectly sound and knowledge-producing third-person KF-arguments (I give an example in the talk). What I do in response is specify a context in which the very same argument would be deemed bootstrapping; I extract the following principle:

> SUFFICIENT CONDITION FOR BOOTSTRAPPING (SCB)
> For any KF-argument α:
>
> (α) S knows P, P_1, …, P_n |= Q
>
> α will be a bootstrapping argument for an individual X – so X cannot come to know Q by virtue of knowing, or by way of inferring it from, α's premises – if X's only grounds for accepting those premises are also the only grounds available to S.

SCB offers an explanation of the bootstrapping nature of certain instances of *third-person* KF-reasoning: namely, the reasoner's (X's) grounds for the premises are no different from that available to the knower the KF-reasoning invokes. And the latter, it has been argued, cannot attain knowledge of the conclusion by way of such reasoning. Hence, X cannot either. This resolves the surprise exam and designated student paradoxes.

Finally, Sorensen's strengthened prediction paradox and Olin's justified-prediction paradox are shown to rest on straightforward KF-reasoning and, so, to raise no special difficulty for the bootstrapping approach.

References

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