

Time Travel and Free Will

1 The Grandfather Paradox

Bruno travels back in time to kill Grandfather, who is yet to have any children. He has a loaded gun at point-blank range.

- If Bruno succeeds, Grandfather will never have any children. So Bruno will never be born, which contradicts the setup of the story.
- If Bruno doesn't succeed, what stops him?

2 What Does the Paradox Show?

Some possible answers:

1. It shows that the concept of time travel is incoherent.
2. It raises questions about whether the laws of physics could rule out paradoxical time travel in a principled way, without banning it altogether.
3. It shows that time travel is incompatible with free will.

I think these answers are all mistaken!

3 What is Free Will

The following hypothesis is meant to capture the idea that someone who acts freely has *control* over the action she performs:

Control Hypothesis An agent acts freely in doing X if and only if: (1) she does X by making a certain decision, and (2) she is in a position to do something other than X by making a different decision.

- The Control Hypothesis is actually incorrect. But it is a good starting point for elucidating the connection between time travel and free will, so we'll treat it as our working hypothesis for now.

- We'll assume the Control Hypothesis, and consider a couple of arguments purporting to show that Bruno fails to act freely because he was not in a position to make a different decision about how to take his shot.

4 First Argument

Argument: We know that, on pain of contradiction, Bruno's assassination attempt will fail. So Bruno isn't free to pull the trigger.

Reply: It is important to make the following distinction—

- Whether we—who live in the present day—have information about Grandfather's future that entails Bruno's assassination attempt will fail.
- Whether Bruno was in a position to kill Grandfather, regardless of whether we—who live in the present day—happen to know that things won't actually turn out that way.

5 Second Argument

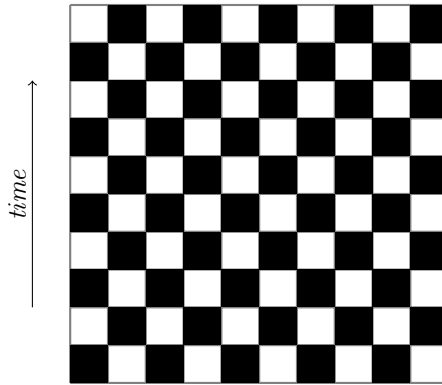
Argument: If Bruno were ever on track to kill Grandfather, the laws of physics would intervene to derail him.

5.1 Determinism

For a system of laws to be **deterministic** is for it to entail, on the basis of a full specification of the state of the world at any given time, a full specification of the state of the world at any later time.

- *Note:* Possessing free will is not simply a matter of having a decision-making process that is not subject to deterministic laws.

- *Note:* There are two different conceptions of physical law,
 1. The laws tell us what *will* happen, on the basis of what has happened.
 2. The laws tell us what *must* happen, on the basis of what has happened.



5.2 Back to the Argument

- On the second conception of physical law—a law tells us what *must* happen, on the basis of what has happened—it is indeed the case that the laws make it impossible for Bruno to act otherwise.
- On the first conception of physical law—a law tells us what *will* happen, on the basis of what has happened—the laws are silent on whether Bruno could have acted otherwise.

(They are simply descriptions of the patterns that, as a matter of fact, characterize our world's mosaic.)

But, what *would* have happened if Bruno acted differently?

- Don't say that some additional defeater would have appeared and saved Grandfather.

(That assumes that aiming just right would have *caused* the additional defeater to come about and we have been given no reason to think that such a causal structure is in place.)

- If Bruno had managed to aim just right, we would have ended up in a situation that cannot be accounted for while keeping the rest of the story fixed.

6 Why the Control Hypothesis is Incorrect

- Suppose Susan freely decides to stay in New York. But had she attempted to leave she would have been prevented from doing so. (Perhaps she would have even been prevented from *deciding* to leave.)
- Then Susan acts freely. But the Control Hypothesis entails (incorrectly) that she does not.

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