

## **A New Role for Rollbacks: Showing How Objective Probabilities Undermine the Ability to Act Otherwise**

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Rollback arguments focus on long sequences of actions with identical initial conditions in order to explicate the luck problem that indeterminism poses for libertarian free will theories (i.e. the problem that indeterministic actions appear arbitrary in a free-will undermining way). In this paper, I propose a rollback argument for probability incompatibilism, i.e. for the thesis that free will is incompatible with all world-states being governed by objective probabilities. Other than the most prominently discussed rollback arguments, this argument explicitly focusses on the ability to act otherwise. It argues that the negligible probability of the relative frequencies in overall rollback patterns being relevantly different indicates that even the ability to act otherwise with regard to individual actions is not free-will enabling. My proposed argument provides probability incompatibilists with a tool to argue against a classical event-causal response to the luck problem, while it can still motivate an agent-causal response to it.

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### **1. Introduction**

This paper considers rollback versions of the luck problem for libertarianism. Libertarianism in the free will debate is the position that free will is incompatible with determinism but that free will still exists, which is possible because the world is indeterministic. The luck problem threatens this libertarian position by questioning the possibility of free will even in indeterministic worlds.

Libertarians usually claim that free will is incompatible with determinism because determinism precludes that an agent can act differently than he actually does. If this is right (as I will presuppose in this paper), free will requires indeterminism: at least for some states of the world, different concurring later states have to be nomologically possible. Here the luck problem arises: If these later states are all possible, isn't it merely a matter of chance or luck which of them turns out to become actualized? If this is the case, arbitrariness threatens to undermine free will although the relevant actions are not determined. Accordingly, free will appears to be precluded not only by determinism, but also by indeterminism. In order to defend libertarianism, one must resist this dilemma and explain how free will can be possible in an indeterministic world.

In this paper, I argue for probability incompatibilism: In order to convincingly overcome the luck problem, libertarians must commit to the absence of all-encompassing probabilistic natural laws. My argumentative strategy is to show this by developing a version of the luck argument which essentially relies on the presupposition that everything is governed by

objective probabilities. Should I be successful in arguing that these objective probabilities undermine free will, this demonstrates that overcoming the luck problem requires a commitment to the absence of all-encompassing objective probabilities.

Before developing my specific luck argument, the basic threat of luck objections in general has to be clarified. Why exactly are undetermined actions supposed to be arbitrary in a sense that undermines free will? I will approach this question by considering existing luck arguments, the discussion of which will help me to develop my own position. The arguments on which I focus are so-called “rollback arguments”, which try to demonstrate the threat of indeterminism by considering long sequences of undetermined actions with identical initial conditions.

I present and discuss three such rollback arguments, namely by Peter van Inwagen (2000), Derk Pereboom (2005), and Lászlo Bernáth and János Tózsér (2020). After identifying problems with these arguments, I develop an own rollback argument which is intended to overcome these problems. It aims to show that thoroughly probabilistic indeterminism precludes free will by undermining the ability to act otherwise. After defending this argument against possible objections, I argue that it is able to avoid the earlier identified problems of other rollback arguments, as well as of intuition-based luck objections. Finally, I criticise Robert Kane’s event-causal response to the luck problem and sketch my own argument’s prospects for motivating a more satisfactory agent-causal response.

## 2. Peter van Inwagen’s Rollback Argument

The most prominent “rollback argument” against the compatibility of free will and indeterminism has been developed by Peter van Inwagen (2000: 13-16). His argument starts with the case of an indeterministic action that, from a libertarian perspective, is supposed to be (directly<sup>1</sup>) free due to its indeterminacy: Alice considers whether or not to lie, and how she turns out to decide is undetermined at  $t_I$ . Now it is imagined that as soon as the indeterminacy gets settled and Alice either lies or tells the truth, God rolls back the flow of time to  $t_I$ . As soon as the indeterminacy gets settled a second time and Alice performs her respective action, God rolls back the flow of time to  $t_I$  again, and this procedure gets repeated until there have been a thousand rollbacks.

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<sup>1</sup> What I mean with a *directly* free action is an action that establishes or increases freedom, rather than merely being free due to the freedom of its causal antecedents. For illustration, assume that an agent freely shapes his empathetic and helpful character, which later determines that he rescues a wounded animal. In this example, the shaping of character is directly free, whereas the animal rescue (determined by the freely-chosen character) is only indirectly free. If I discuss requirements for free actions, I always mean requirements for directly free actions (unless explicitly stated otherwise).

Since Alice's decision is undetermined, it is not to be expected that she will make the same choice in each replay. What composition of lying and truth decisions should be expected to occur instead? Van Inwagen (2000: 14) claims that "[a]s the number of 'replays' increases, we observers shall—almost certainly—observe the ratio of the outcome 'truth' to the outcome 'lie' settling down to, converging on, some value." The relative frequency of 'truth' cases, it is claimed, should be interpreted as indicating an objective probability of Alice's telling the truth in each individual instance. This way, the rollback scenario is intended to reveal that an undetermined action is governed by an objective probability (van Inwagen 2000: 14-15). I will call this the *probability-establishing* step of van Inwagen's rollback argument.

So, according to van Inwagen, if Alice makes the undetermined decision to tell the truth, this is a matter of objective probability. From this result, van Inwagen (2000: 15-16) straightforwardly infers that whether Alice in fact lies or tells the truth is "a mere matter of chance" (van Inwagen 2000: 15), rather than an exercise of free will. I will call this second part of the rollback argument its *freedom-undermining* step. Jointly, the probability-establishing step, which says that undetermined actions are a matter of objective probability, and the freedom-undermining step, which says that probability-governed actions aren't free, establish the rollback argument's conclusion that undetermined actions are not a matter of free will.

Van Inwagen's rollback argument is faced with two main problems. The first problem is that the argument itself doesn't tell us why exactly an action's being a matter of objective probability undermines that action's freedom.<sup>2</sup> Although the freedom-undermining inference might seem intuitively plausible, Robert Kane (1999) has argued that just because undetermined actions are a matter of "chance" in the technical sense of indeterminism, the freedom-undermining associations of "chance" in common language (implicating an action's being *merely* a matter of chance) need not apply to them. Of course, one might disagree with Kane's claim that "chance" in the purely technical sense of indeterminism is not responsibility-undermining. But even if so, one needs an argument against Kane's response that van Inwagen's rollback argument itself doesn't provide (cf. Ginet 2007: 248-249).

The second criticism has been raised by Lara Buchak (2013), who argues that van Inwagen's rollback arguments involves circularity. To understand her point, let's again consider

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<sup>2</sup> Admittedly, the same paper that features van Inwagen's (2000) rollback argument also contains his independent "Promising Argument", which is intended to support exactly this conclusion. However, since van Inwagen (2011) himself concedes severe problems with this latter argument, I am not going to discuss it here. I will also ignore van Inwagen's (2000) "mysterianism", according to which free will in an indeterministic world is only mysterious rather than straightforwardly impossible. Since the rollback argument itself is intended to show the impossibility of indeterministic free will, we can easily abstract from whether there is a mysterious undetected flaw in this argument. For the sake of simplicity, I choose my formulations as if van Inwagen fully endorsed his own argument's conclusion.

van Inwagen's (2000: 14) assumption in the probability-establishing step of his argument that, "[a]s the number of 'replays' increases, we observers shall—almost certainly—observe the ratio of the outcome 'truth' to the outcome 'lie' settling down to, converging on, some value." This claim is less innocuous than it might seem at first. Trivially, after any number of replays *there is* some ratio of truth-decisions to lying-decisions. But the quoted passage tries to establish more than this, namely that the ratio *converges* to an ultimate value, which means that, as the number of rollbacks increases, the ratio tends to get *ever closer and closer* to a final ratio. Why should we assume this?

As Buchak (2013: 23-24) points out, the underlying assumption seems to be the statistic law of large numbers. Roughly, this law says that if there is a long sequence of independent indeterminacy-settlings with the same initial conditions in each instance, then the relative frequency of times in which a certain event occurs converges almost certainly to that event's *prior probability* for each case, as the number of instances approaches to infinity. However, for this law to be applicable and thus to yield the expected convergence in a rollback scenario, one has to assume that the relevant action is governed by objective prior probabilities. This is a problem since what van Inwagen wants to eventually show with the convergence result is just the presupposed existence of objective probabilities. The probability-establishing step of the rollback argument, that is, involves circularity because it relies on a statistical law that can only be applied if one initially assumes the truth of this step's conclusion anyway.

Jointly, the two criticisms raised here suffice to cast severe doubt on the usefulness of van Inwagen's rollback argument. The first criticism suggests that the argument's freedom-undermining step requires a justification that the rollback argument itself does not provide. In principle, this criticism could be overcome if one found a supplementary argument that justifies the inference of the freedom-undermining step. But now the second criticism claims that the probability-establishing step involves circularity and is thus not warranted either. If the probability-establishing step is circular and the freedom-undermining step is unjustified, what is the rollback argument good for at all?

We can certainly avoid Buchak's circularity charge if we explicitly restrict our consideration to cases that involve exceptionless objective probabilities. However, if we thus circumvent the probability-establishing step, all that remains from van Inwagen's argument is the freedom-undermining step, which lacks justification. Since reference to the rollback sequence can only be found in the probability-establishing step, but not in the freedom-undermining step, what remains after eliminating the probability-establishing step cannot even be appropriately called a "rollback argument" anymore. However, if we found a way to employ

the rollback scenario not in the eliminated probability-establishing step, but rather in the freedom-undermining step, both of van Inwagen's problems would be avoided.

Before discussing rollback arguments that can be interpreted along these lines, it will be helpful to outline the difference between an undetermined action and an undetermined action with an objective probability. According to van Inwagen, there is no (extensional) difference. The probability-establishing part of his rollback argument was just intended to show that if an action is undetermined, it has to be a matter of objective probability. In contrast to this, Buchak (2013: 24-25) suggests that libertarians can escape van Inwagen's rollback argument if they require (directly) free actions not only to be undetermined, but also to be independent of objective probabilities. In such a case, some complete state of the world, conjoined with the natural laws, would not only be compatible with different possible states at some later time (which is just indeterminism) but, moreover, some states would not even nomologically yield a definite probability distribution over the different possibilities for some later time. In this case there would be an undetermined action without a definite probability (in respect to the earlier time), which illustrates the failure of van Inwagen's probability-establishing inference (cf. Ginet 2007: 244, 249-250).

Let's use these thoughts as basis for the following terminology: *Indeterminism*, as explained earlier, holds iff there is some pair of times, such that the complete state of the world at the earlier time is nomologically compatible with different possible states at the later time. *Thoroughly probabilistic indeterminism* holds iff, for all these pairs of times, the complete state at the earlier time is nomologically sufficient for an exact probability distribution over the possibilities for the later time. Iff, for some pair of times, this doesn't hold, I will speak of (*partly*) *lawless indeterminism*, because there is some state or event whose probability of occurrence remains ungoverned by the laws and the earlier state.<sup>3</sup>

The restricted rollback argument that I will develop in this paper doesn't argue for the incompatibility of free will with any indeterminism, but only for the incompatibility of free will with thoroughly probabilistic indeterminism. Moreover, it employs the rollback scenario not in

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<sup>3</sup> The argument of this paper presupposes a (rather commonsensical) propensity interpretation of probabilities, according to which probabilities contribute to the *grounding* of their respective events. For if one adopts a concurring frequency interpretation, according to which probabilities merely *describe* independently existing frequencies, free will seems not threatened by probabilities anymore because events can be regarded as "prior" to the frequency-probabilities they ground (Ginet 2007: 250). This is similar to the way in which deterministic laws don't seem to threaten free will anymore as soon as a Humean conception of laws is adopted, according to which laws do not ground events, but merely describe independently existing regularities (Beebe/Mele 2002; Keil 2007: 939-942; Tognazzini 2015: 134). I am indebted to Lena Burandt for making me aware of my argument's commitment to a propensity interpretation of probabilities.

establishing probabilities, but in arguing for this incompatibility. If the argument is successful, it establishes that free will requires (partly) lawless indeterminism.

### 3. Derk Pereboom's Rollback Argument

One of the investigations of Derk Pereboom (2005), who argues for the non-existence of free will more generally, becomes relevant here. Against the assumption of a thoroughly probabilistic structure of the world, he tries to show why it is "incredible" (Pereboom 2005: 247) that the control which is required for free will should exist. Since he thereby strongly relies on the consideration of a long sequence of undetermined actions with identical initial conditions, we can interpret him as presenting a rollback argument for the freedom-undermining inference.

Before this argument can be presented, a few introductory remarks and explanations are in order. Firstly, whereas van Inwagen intends his rollback argument to illustrate the luck problem for libertarianism, Pereboom (2005: 243-247) has a narrower goal. He accepts the luck problem on independent grounds and uses the rollback scenario only to point out a problem that the so-called agent-causal response to it faces. Secondly, Pereboom doesn't want to show that thoroughly probabilistic indeterminism is *incompatible* with the commitments of this agent-causal approach, but only that these commitments are very *unlikely* to be warranted given the assumption of thoroughly probabilistic indeterminism.

Let's start with defining and motivating the position of agent-causal libertarianism that Pereboom wants to argue against. Per definition, libertarianism requires indeterminism. But indeterminism is clearly not sufficient for free will. Just because there are some indeterminacies in a lifeless system or even in a human brain, there need be no freedom. So, what further conditions are required for an undetermined action to be free? Arguably, all plausible free-will accounts require that free actions must be caused by their agent in a free-will establishing manner (or must at least involve the agent's appropriately causing certain events).<sup>4</sup> The difference between event- and agent-causal libertarianism is about whether this required causation can be *reduced* to causation by states and events. Whereas event-causal libertarians assume such reducibility, agent-causal libertarians believe that when an agent causes a free action (or some other free-will relevant event), the cause is the *substance* of the agent and the causing by the agent-substance is *irreducible* to causings by the agent's individual states and events.

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<sup>4</sup> I am neglecting so-called non-causal accounts of free will here (see Clarke/Capes/Swenson 2021: Ch.1; Ginet 2007).

Why should one claim this irreducibility? Let's consider the luck problem again (in its intuition-based non-rollback form). If an allegedly free action is undetermined by its (directly) preceding state, then this earlier state and the natural laws are compatible with alternatives to the action in question. The earlier state and the laws do not definitively settle whether the action occurs or not. Now, if there is nothing over and above natural laws and states, then there is nothing that definitively settles whether the action occurs. This is what suggests that the action is arbitrary in a free-will undermining sense (Pereboom 2005: 243).

The agent-causal libertarian can jump in here and deny that there is nothing over and above natural laws and states. According to her, there is an agent whose causal influence cannot be reduced to that of states and events. Particularly, she can claim that the agent (as opposed to states and events) is not datable, i.e. that he and his decisions are not fixed to specific moments in time. So, while earlier states and events leave it in fact open whether the action occurs, the agent can be capable of settling this, because there is something about him that is not captured by his datable states and events. This allows the irreducible agent to purposively decide something that his states and events leave undetermined, such that a free-will enabling form of control can be ascribed to him. The event-causal libertarian cannot account for the same kind of control because, in the event-causal framework, the causal influence of the agent is reducible to that of states and events. States and events, however, are both datable such that they, by the definition of indeterminism, have to leave it open whether the undetermined action occurs. So, the agent-causal libertarian can claim she can account for the agent's control in a way that the event-causal libertarian cannot.<sup>5</sup>

Pereboom (2005: 244-245), however, argues that this agent-causal approach is unconvincing. In order to do so, he considers an undetermined action that is caused by an irreducible agent and is allegedly free due to this agent-causation. For illustration, let's use the example of Alice again. Which ratio of 'truth' cases to total cases should we expect to occur in a rollback scenario if Alice agent-causes her action? If objective probabilities are present, the law of large numbers should let us expect that the relative frequency of 'truth' cases will be

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<sup>5</sup> This is only a rough simplification. In fact, there is a possible escape even for the event-causal libertarian if he understands indeterminism as the statement that for some pair of times, the laws and an earlier *natural* state are compatible with different possibilities for the later time's state. If the event-causal libertarian postulates the existence of *non-natural* states, e.g. the states of a Cartesian soul, he can claim that these non-natural states decide in a free-will enabling way what the *natural* states leave undetermined. However, this approach is arguably less attractive than the agent-causal approach because it involves the metaphysically extremely demanding commitment that non-natural entities exist and are causally effective. The agent-causal libertarian, on the other hand, is not committed to this. The irreducible agent-substance, on her view, might well be completely natural. So, strictly speaking, the advantage of agent-causal libertarianism over event-causal libertarianism is not that the former can solve a problem that the latter cannot solve, but that it can solve the luck problem in a way that seems less metaphysically demanding. In what follows, when I speak of "event-causal libertarianism" I always mean those debate-dominating naturalist accounts which don't rely on the existence of non-natural states.

very close to the objective probability  $p$  of Alice's telling the truth (at  $t_1$ ). However, if Alice is free to either agent-cause her lying or her telling the truth in each instance, there seems to be no reason to expect that the relative frequency will be close to the objective probability, since Alice is free in any instance to decide however she wants. From the agent-causal perspective, there is no reason to assign a higher probability to the relative frequency being close to  $p$  than to the relative frequency being close to some other, arbitrary number. Accordingly, if one indeed finds the convergence of objective probability and relative frequency (as is to be expected from the probability-perspective), this has a very low likelihood on the hypothesis that Alice agent-causes her action. Therefore, Pereboom claims, the existence of agent-causation is extremely unlikely if there are objective probabilities, and thus one should not believe in it.

Importantly, Pereboom does not claim the *incompatibility* of agent-causation with thoroughly probabilistic indeterminism. Even under the assumption that there is agent-causation, it is not *impossible* to get a ratio very close to  $p$ . It is merely that “[t]he proposal that agent-caused free choices do not diverge from what the statistical laws predict for the physical components of our actions would run so sharply counter to what we would expect as to make it *incredible*” (Pereboom 2005: 245, my emphasis). One might criticise such a mere incredibility as not strong enough to demand the rejection of agent-causation from someone who is initially completely convinced of its existence. If a piece of evidence (the relative frequency of ‘truth’ cases being very close to  $p$ ) is not incompatible with a hypothesis (that Alice agent-causes her actions), but it only has a very low likelihood on this hypothesis, it is still logically consistent to accept both the hypothesis and the evidence. In contrast, if one found evidence that is logically incompatible with the agent-causal theory, or a deductive argument for the conclusion that agent-causation is not given (with premises acceptable to the completely convinced defender of agent-causation), even a completely convinced defender of agent-causation would be rationally required to make at least some changes in his belief system. Such an argument would seem superior to Pereboom's (Bernáth/Tőzsér 2020: 55).

There is also a second criticism, which concerns the justification of Pereboom's assumption that it is unlikely from the agent-causal perspective to get a ratio (of ‘truth’ to total cases) close to  $p$ . This assumption presupposes that for which action Alice agent-causally decides is not itself governed by the objective probability  $p$ . Because if this decision *was* governed by  $p$ , we would expect a ratio close to  $p$  even from the agent-causal perspective (due to the law of large numbers), such that finding indeed a ratio close to  $p$  could not work as an argument against agent-causation anymore (O'Connor 2003: 309; Bernáth/Tőzsér 2020: 52).



Accordingly, justifying the independence assumption in question is crucial for the success of Pereboom's argument. How can it be justified?

Pereboom's (2005: 244-247) own response to the question why agent-causal decisions should be regarded as independent from objective probabilities is the following: Since agent-causation is introduced in order to overcome the luck problem, "the causal power that the agent exercises in making a decision must be *of a different sort* from the causal powers of the antecedent events" (Pereboom 2005: 244, original italics). If the exercise of agent-causation was governed by the same probabilities that govern the event-causal proceedings, agent-causation and event-causation would not be sufficiently distinct, and reference to agent-causation could not be used in order to overcome the luck problem.

But one might still wonder why. Why exactly does the distinctiveness of agent- and event-causation, which seems definitely necessary for a successful agent-causal approach to overcome the luck problem, require the absence of a common probabilistic structure? Couldn't agent- and event-causation still be sufficiently distinct even if they were governed by the same probabilistic structure? As Randolph Clarke (2010: 396) notes, a free-will establishing "agent-causal power might differ from an event-causal power in some respects while resembling it in others". Couldn't a common probabilistic structure belong to those respects in which agent- and event-causation are similar, while there are other differences that suffice to give a satisfactory agent-causal response to the luck problem (for example the aforementioned lack of "datability" of the irreducible agent)? It is not yet clear why, on Pereboom's account, there must be the additional difference that the agent-cause is not subjected to the probabilistic structure of the event-causes.

#### **4. Bernáth and Tózsér's Rollback Argument**

A third rollback argument, which has recently been proposed by Lászlo Bernáth and János Tózsér (2020: 48-55), is intended to fill this argumentative gap. The main idea is that, since rollback patterns can be completely explained with reference to free agent-causal decisions for each individual action, there is no explanatory role left that could be filled by postulating objective probabilities. Even if the agent-causal decisions themselves were governed by objective probabilities, the decision's free and "non-chancy" (ibid.: 53) character itself would explain the overall pattern, such that the probabilities are not needed for the explanation of the pattern. Due to this explanatory dispensability, one should refrain from postulating the existence of objective probabilities for free actions in the first place.

One could say much more about why exactly there would be no explanatory role for the probabilities left, but for the development of my own argument these details are not important. This is because, although we argue for similar conclusions, Bernáth and Tózsér's rollback argument takes a very different approach to my own. Accordingly, I will only explain some general characteristics of Bernáth and Tózsér's argument, and motivate my own argument's divergence from them.

Firstly, Bernáth and Tózsér (2020: 55-56) claim superiority over Pereboom's account because they aim to show that a co-occurrence of free will and exceptionless objective probabilities is "impossible" rather than merely "highly unlikely" (ibid.: 55). However, their argument relies on the premise that "[i]f ground floor probabilities of free action do not have explanatory role, one should reject the existence of these probabilities with regard to free action" (ibid.: 52, 54). Now it may indeed be good methodological advice not to *assume* the existence of something that doesn't explain anything. However, this is not the same as claiming that something *cannot* exist just because its existence wouldn't explain anything. Couldn't it still be possible that the objective probabilities exist as harmless co-governors of free actions, without having their own explanatory relevance?

What Bernáth and Tózsér (2020: 53) aim to show is that the "introduction [of objective probabilities] to the metaphysical landscape of actions is empty". In the terminology of Section 2, this undermines the probability-establishing step of the rollback argument, which aims to *justify* the assignment of objective probabilities to free actions. But Bernáth and Tózsér don't establish that if there *were* objective probabilities, this *would* preclude free will, i.e. they don't justify the freedom-undermining step of van Inwagen's argument. But if one wants to argue for the *incompatibility* of free will and thoroughly probabilistic indeterminism, this freedom-undermining inference is exactly what needs to be justified.

Secondly, Bernáth and Tózsér's (2020: 58) investigation is restricted to free-will theories that regard "a complete lack of chanciness [as] a necessary condition of free action". Only for those theories, it is argued that one should not postulate the exceptionless presence of objective probabilities. This way, Kane's (1999) earlier sketched response to the luck problem, insisting that "chance" in a technical sense is not freedom-undermining in itself, becomes explicitly excluded from consideration (Bernáth/Tózsér 2020: 47-48). Although this restriction of focus is perfectly legitimate, it doesn't fit well with my own aim of showing that *any* successful response to the luck problem must require the absence of objective probabilities. Supporting this position requires a rejection of Kane's response to the luck problem which is outside the scope of Bernáth and Tózsér's argument. Besides that, it is not perfectly clear what

exactly Bernáth and Tózsér mean when they speak of “chance”. In order to avoid such problem, it would be desirable to have an argument that either doesn’t explicitly rely on the concept of “chance” at all or that gives it an unequivocal technical meaning. In my own argument, I equivocate “chance” with “thoroughly probabilistic indeterminism”, and it is intended to show how chance in this purely technical sense undermines free will.

The main difference between Bernáth and Tózsér’s and my own argument concerns the centrality of alternative possibilities. Bernáth and Tózsér’s argument relies on the requirement of “dual control”, which presupposes alternative possibilities (Shabo 2011: 107), but the role of these alternative possibilities isn’t directly investigated. In my own argument, the relationship between thoroughly probabilistic indeterminism and the ability to act otherwise constitutes the focal point of interest. In Section 7, I will explain how this approach helps to avoid the discussed problems of van Inwagen’s, Pereboom’s and Bernáth and Tózsér’s arguments. First, however, the proposed argument shall be presented.

## **5. Rollbacks and the Ability to Act Otherwise**

The main idea behind my argument is that thoroughly probabilistic indeterminism undermines the kind of ability to act otherwise that is required for the exercise of free will, and that rollback scenarios are apt to illustrate this because they reveal the agent’s lacking control over the overarching composition of actions.

Before explaining this argument, let me first recapitulate the main argument for regarding free will as incompatible with *determinism*. Abstracting from all technical details, the main idea of this “Consequence Argument” is that if determinism holds, one cannot do otherwise because everything one does is strictly implied by natural laws and states of the world before one’s own birth. Since one cannot do otherwise with respect to any of these, the lacking ability to act otherwise with respect to laws and earlier states transfers to all of the agent’s later actions. If determinism holds, one cannot act otherwise with respect to any of one’s actions. Now the “Principle of Alternative Possibilities” is deployed, which says that being able to act otherwise is a necessary condition for free will. Acceptance of this principle and the Consequence Argument leads one to incompatibilism about free will and determinism (van Inwagen 1983: Ch.3; Speck 2011).

Let’s shift from determinism to thoroughly probabilistic indeterminism. Does this change anything about whether the involved agents can act otherwise? In some sense, alternative possibilities appear to be compatible with thoroughly probabilistic indeterminism. For if there is a nonzero probability that Alice tells the truth and a nonzero probability that she

lies instead, whatever she finally does, it was possible that she did otherwise. However, it is unclear whether alternative possibilities in this basic sense are really the sort of alternative possibilities that the Principle of Alternative Possibilities requires for free will. Thus, the relevant question is not whether thoroughly probabilistic indeterminism is compatible with alternative possibilities *in some sense* (as it undeniably is), but whether it is compatible with *the right kind* of alternative possibilities. I will call the required right kind of having alternative possibilities, i.e. the strongest form of being able to act otherwise that is still a necessary condition for exercising free will, a *free-will enabling* ability to act otherwise.

There are intuition-based considerations to think that the probability-compatible ability to act otherwise is *not* free-will enabling. If there are objective probabilities for whether Alice lies or tells the truth, what seems possible is that *it turns out* differently how Alice decides and acts, but not that *she herself controls* which of these possibilities becomes actualized. One might even say that what is given is a mere *possibility that* Alice acts otherwise, but not her *ability to* do so in a controlled manner (Shabo 2014: 161-162). What seems required for free will, however, is the latter control rather than only the former possibility. This concern expresses the luck problem for (thoroughly probabilistic) indeterminism, since what one worries is that if Alice had acted otherwise, she wouldn't have had control over the alternative action, but that she would have acted otherwise as a (mere) matter of luck (Kane 1999: 219-220).

Robert Kane (1999: 236-239) tries to counter this luck objection by differentiating between two different kinds of control. While he admits that “*antecedent determining control*—the ability to determine or guarantee which of a set of options will occur *before* it occurs” is not available on the event-causal libertarian account he favours, he still insists that another kind of control is possible even in a thoroughly probabilistic world.<sup>6</sup> This available kind of control is “plural voluntary control over a set of options [which] means being able to bring about *whichever* of the options you will or most want, *when* you will to do so, for the reasons you will to do so, without being coerced or compelled in doing so” (Kane 1999: 237-238, italics in original). There is no reason for why this plural voluntary control should not be possible in a world of thoroughly probabilistic indeterminism. After all, *as soon as* a decision-concerning

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<sup>6</sup> Kane (1999) does not explicitly differentiate between thoroughly probabilistic and (partly) lawless indeterminism. Nonetheless, there are good reasons for interpreting him as claiming a compatibility between his own free will account and thoroughly probabilistic indeterminism. Firstly, he uses “quantum jumps” as paradigm examples of undetermined actions that can ground free will (Kane 1999: 219-220; 2011: 386), and quantum jumps are traditionally regarded as governed by objective probabilities. Secondly, he explicitly rejects the introduction of “extra factors” like Cartesian souls or irreducible agent causes (Kane 1999: 223; 2011: 386), arguably in order to *avoid unscientific* metaphysical commitments. Against this background, it would seem surprising if Kane committed himself to *exceptions* in the probabilistic *scientific* structure of the world. (Moreover, a commitment to partly lawless indeterminism seems to be of no use if there is no “extra factor” that utilizes that lack of structure to which partly lawless indeterminism gives rise. I will return to this point in the Conclusion.)

indeterminacy is settled, what the agent wants is also settled. In each case, she might very well be able to successfully act on that will, without coercion or other obstacles being in place. Now, if this probability-compatible plural voluntary control is all that is required for free will, it doesn't matter anymore whether the luck objection shows the more demanding antecedent determining control to be undermined in thoroughly probabilistic contexts.

How should we evaluate the control-concerning luck problem in light of this response by Kane? Of course, one might argue about whether antecedent determining control is really dispensable for free will. But the problem is that the above sketched form of the luck objection seems incapable of directly addressing this question. Once more, an intuitively plausible luck objection turns out to be too primitive to deal with Kane's (1999) sophisticated distinctions.

My rollback argument is intended to circumvent this shortcoming. Since the argument finally rejects the idea that free actions could be governed by all-encompassing objective probabilities, it implicates, just like the sketched luck objections, that undetermined actions in a world of thoroughly probabilistic indeterminism are merely a matter of luck. The crucial difference, however, is that my proposed rollback argument does not regard this implicated luck proposition as independently plausible, but rather derives it from further considerations. Crucially, in doing so the argument does not rely on those intuitions which make the earlier presented luck objections vulnerable to Kane's distinctions. In Section 8, I will return to how exactly my rollback argument deals with these distinctions. First, however, a detailed presentation of the argument is in order.

As noted, if there is an objective non-extreme probability at  $t_1$  for whether Alice tells the truth or lies, she is able to act otherwise, in the basic sense of it being possible that she acts otherwise. We do not know yet whether this ability to act otherwise is the free-will enabling ability to act otherwise that we are searching for, but we know that it is given for each individual rollback instance. What happens with this ability if we consider the whole sequence of Alice's decisions? Because of the law of large numbers, we can reliably predict that the relative frequency of 'truth' to total cases will converge to the objective probability of her telling the truth, as the number of rollbacks increases. In rough analogy to the Consequence Argument, it appears that Alice cannot (directly<sup>7</sup>) act otherwise with respect to this relative frequency,

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<sup>7</sup> What is the meaning and argumentative role of this "directly"? Without it, one might object here and point to a relevant disanalogy to the Consequence Argument. After all, the state at  $t_1$  is temporally located directly before Alice's decision and not before her own birth (as the determining state on which one focusses in the Consequence Argument). So, couldn't Alice still have had an *indirect* alternative to her rollback composition, by means of having had an alternative to the state at  $t_1$ ? Let's grant, for the sake of the objection, that this is true. However, what we are interested in is whether Alice's deciding to tell the truth or to lie is a *directly* free action, i.e. an action that *establishes* her free will rather than merely *transferring* it from earlier freedom (see footnote 1). For direct freedom to be possible, according to the main idea of the Principle of Alternative Possibilities, there has to be an

because the frequency is reliably predicted (with a precision that approaches to perfection as the number of rollbacks increases) by the laws and the state at  $t_1$ , both of which are already given. Whereas she appears able to act otherwise (in a certain sense) with respect to each individual decision, this ability (in the very same sense) seems to diminish if we shift our perspective from the individual action to the whole rollback sequence of actions (cf. Frederick 2013: 70).

This might seem intuitively freedom-threatening, but without further elaboration it doesn't show much yet. There can be properties which are given for each individual part of a system but not for the system as a whole. Consider for example the radioactive decay of an element. For each individual atom, it's undetermined (with a probability of 0.5) whether it will decay in the next half-value period. However, on the macroscopic level of the substance, it is not (relevantly) undetermined what happens: After one half-value period, there will be, pretty much exactly, half of the original amount left. The indeterminacies "wash out" if one switches perspective from the particle- to the macroscopic level. Each individual atom has a 0.5 probability of decaying, but it would be wrong to say the same about the whole substance. (The element is almost certain to decay to 50 per cent of its former *amount*, but this property is clearly not the same as the property of having a 0.5 *probability* of completely decaying.) Still, the fact that the whole doesn't have the property that each of its parts has, doesn't change anything about the parts having this property. Similarly, the fact that there is no ability to act otherwise in respect of the whole rollback composition need not change anything about this ability (in the sense under consideration) being given for the individual actions. What is the problem then?

Some properties transfer from parts to whole, others don't. The ability to act otherwise that is under consideration here apparently doesn't. Why is that supposed to be a problem? Remember that, in light of the luck problem, we were not sure whether the ability to act

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ability to act otherwise in the direct context of the respective action (Frederick 2013: 67-68). If this requirement for a directly free action is satisfied, i.e. if at the time of (or directly before) one's action one still has an alternative to it, I will speak of a *direct* ability to act otherwise. This direct ability to act otherwise seems not given for the overall rollback composition, because the already given state at  $t_1$  and the fixed laws predict this rollback composition with a reliability that approaches to certainty.

In what follows, when discussing the ability to act otherwise, I always mean a *direct* ability to act otherwise. One might object that requiring *direct* abilities to act otherwise for free will (as I will do in the third premise of my main argument) is more demanding than merely requiring a *direct or indirect* ability to act otherwise, and that my use of language thus hides a significant commitment of my argument. But explicitly stating the direct character of the required ability to act otherwise wouldn't make the respective premise (or anything else in my argument) any less convincing. For if an indirect ability to act otherwise is given, this still requires a direct ability to act otherwise at some other place. If I succeed in showing that thoroughly probabilistic indeterminism undermines the direct ability to act otherwise, it also undermines the indirect ability to act otherwise, and thus free will. So, if the *direct or indirect* ability to act otherwise is necessary for free will, then so is a *direct* ability to act otherwise. (Admittedly, demanding a direct ability to act otherwise *regarding a particular action* for the freedom *of this particular action* would be too strong. But I don't demand this, neither explicitly nor implicitly.)

otherwise under consideration is really the free-will enabling ability that we are searching for. I suggest that we found a reason for this scepticism, a reason to regard the probability-compatible ability to act otherwise as inferior to some further ability to act otherwise that is also necessary for free will. Let me try to elaborate this. I suggest that if one accepts the Principle of Alternative Possibilities, one should also accept the following principle (cf. Bernáth/Tózsér 2020: 49):

**Principle of Alternatives-Transfer** (unrevised): If one has the strongest ability to act otherwise that still constitutes a necessary condition for exercising free will, then this ability transfers (and would transfer) from individual actions to any overall composition of actions, if all of the composition-constituting actions have that ability (by the same person).

Why is this principle plausible? For an example, suppose you are designing a picture-file. The file consists of many pixels, the colour of each of which you can decide for in a free manner. You freely decide for a certain colour and you could have chosen any other colour as well. This holds not just for the first, but for every pixel. What about the resulting picture? The picture is nothing but the result of many of your free choices. Since you were able to decide for a different colour in respect of every individual pixel, you were also able to create a radically different colour composition as well, for example a composition that involves way less of the colour that dominates the picture. Your abilities to act otherwise with respect to every individual pixel transfer to the whole composition, since the composition is just the result of many of your colour-choices, each of which you could have made differently.

Now suppose someone claims that your decision regarding each individual pixel was free because you could have decided otherwise for each of them, but that you could still *not* have arranged a strongly diverging overall composition of pixels. Can you make sense of this claim? Remember that the overall composition is merely the result of all your free pixel-choices that you could have made differently. If you should finally come to accept that you could not have chosen otherwise with respect to the overall composition, how can you still believe that you were able to act otherwise regarding each of the individual pixels *in a free-will enabling manner*?

Now we can finally formulate our rollback argument concerning the ability to act otherwise. We can argue that the ability to act otherwise that is possible in a world of thoroughly probabilistic indeterminism is not the free-will enabling ability to act otherwise that we are searching for. For if this adequate ability to act otherwise was given, one would need to have an ability to act otherwise even regarding the overall composition in the rollback scenario. But thoroughly probabilistic indeterminism undermines the ability to act otherwise regarding this overall composition, because the relevant relative frequency is reliably fixed by the laws and

the probability  $p$ . Accordingly, thoroughly probabilistic indeterminism also undermines the free-will enabling ability to act otherwise in each individual instance. This ability, which is necessary for free will, is incompatible with thoroughly probabilistic indeterminism, and so is free will itself.

Before further expounding upon this argument, it will be helpful to give a more explicit version of it:

- (P1) If thoroughly probabilistic indeterminism holds, then there is an objective probability for every performed action.
- (P2) If there is an objective probability for an action, then the following counterfactual holds: If there was a long-run rollback scenario, then there would be no ability to act otherwise regarding the overall composition of actions.
- (P3) Free will requires the ability to act otherwise (in a free-will enabling sense).
- (P4) If a free-will enabling ability to act otherwise is given for an individual action, then the counterfactual holds that it would also be given for the overall composition of actions if there was a long-run rollback scenario.
- (C) If thoroughly probabilistic indeterminism holds, there is no free will.

(P1) follows from the definition of thoroughly probabilistic indeterminism. (P2) follows from the law of large numbers and the assumption that one lacks the ability to act otherwise regarding an overall composition of actions if the composition's basic ratio is highly reliably predicted by laws and earlier fixed states. (P3) states the Principle of Alternative Possibilities, with the parenthesised reminder that certain weak abilities to act otherwise *might* not be enough. What is required is an ability to act otherwise in the strongest sense that still constitutes a necessary condition for free will. But since the content of this sense is not specified yet, (P3) states nothing more substantial than that *some* ability to act otherwise is required (namely the appropriate free-will enabling one). (P4) is just the application of the Principle of Alternatives-Transfer to the rollback scenario in question. The conclusion (C) is what we are searching for: If the world is governed by thoroughly probabilistic indeterminism, there is no free will.<sup>8</sup> In the next sections, I will discuss possible objections to this argument.

## 6. Discussion of Possible Objections

Many objections against rollback arguments in general state that rollbacks are not actually existent (Clarke 2010: 391, 393) or not even metaphysically possible (Franklin 2012: 406-407). Note, however, that arguments regarding the actual non-existence of rollbacks are not

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<sup>8</sup> Supplementing a necessity operator on every premise and on the conclusion would deliver an argument for incompatibilism (in the classical modal sense) about free will and thoroughly probabilistic indeterminism. As far as I can see, there is no obstacle to adapting the argument in this way because the argument doesn't rely on any contingent features of the world.



applicable to my argument because both (P2) and (P4) involve *counterfactuals*, stating what *would* happen if there *was* a rollback situation. Saying something substantial with those counterfactuals clearly doesn't require the actual reality of rollbacks, but only their metaphysical possibility. As Bernáth and Tózsér (2020: 55) explain in more detail, arguments which deny the metaphysical possibility of rollbacks can usually be escaped by innocent changes in the illustration of the scenario (at least as long as one doesn't regard the concept of a long instance of actions with identical initial conditions itself as metaphysically suspicious). In this discussion section, I focus on two possible objections that specifically concern my proposed version of the rollback argument regarding the ability to act otherwise.

### 6.1 Lacking Alternative Possibilities Regarding the Rollback Composition

Concerning (P2), one might critically ask whether the ability to act otherwise regarding the overall rollback ratio of 'truth' to total cases would really be lacking. After all, given a fixed probability  $p$  at  $t_1$ , it is not strictly impossible that the overall ratio significantly departs from  $p$ , but it is merely extremely unlikely. Thus, if we rely on an undemanding sense of being able to act otherwise, according to which being able to act otherwise basically involves the *possibility that* the agent acts otherwise, shouldn't we grant this ability also in respect of the overall composition?

The answer depends once more on how exactly we understand "ability". I admit that there might be an extremely liberal interpretation of "being able to act otherwise" for which *any* given possibility is considered. But I contend that such an "ability" is no serious contender for the free-will enabling ability to act otherwise, even if one regards *noteworthy* possibilities that one acts otherwise as sufficient for a free-will enabling ability to act otherwise. This is because it is unavoidable to disregard tiniest probabilities, even in areas apart from free will.

Consider again the case of the radioactive element's decay, where every single atom has a 0.5 chance of decaying in the next half-value period. After this period, there will be half of the element's original amount on the macroscopic level left. Although this is highly reasonable to expect and to rely on, it is not *completely* certain. There is a nonzero probability that no atom will decay or that every atom will decay, even if the probabilities for these unexpected events are extremely low. Maybe even more illustrating, there are extremely small nonzero probabilities for even stranger events of a quantum-physical kind, like macroscopic objects spontaneously disappearing and reappearing somewhere distant. Despite their nonzero probabilities, it seems unreasonable to take those possibilities serious (Almeida/Bernstein 2011: 487-488). If the probability of one's acting otherwise is as small as the probabilities for such

bizarre quantum-physical events, it would be absurd to regard the respective possibility as free-will enabling, even if one believes that *larger* probabilities that one acts otherwise *can* be free-will enabling.

So, what is needed is a nonzero threshold-probability, such that probabilities of acting otherwise which fall below this threshold can be neglected. Similarly, we need a measure that tells us which overall ratios (e.g. of ‘truth’ to total cases) should be regarded as relevantly different from the predicted one. If the objective probability point-predicts an overall ratio of 0.32, and it turns out to be possible that it is 0.31999 instead, this would arguably not suffice to constitute a relevant alternative possibility. We should define a tolerance interval around the point-predicted ratio, such that only ratios outside of it are regarded as relevantly different. And now the law of large numbers tells us that *however* low we set the (nonzero) threshold probability and *however* small we set the (extended) tolerance interval, finding a ratio outside the tolerance interval will have a probability below the threshold probability, if the rollback sequence only gets long enough. Therefore, there is no relevant ability to act otherwise regarding the overall ratio in long-run rollback scenarios.

But, one might insist, even if there is no ability to act otherwise regarding the relevant *ratios*, couldn’t one still have an ability to act otherwise regarding the overall *composition*, in the sense of the relevant *pattern*? Let’s get back to the example of designing a picture file. Even if you have no choice about the ratio of, say, black to blue pixels, aren’t there still several possibilities concerning the *pattern* which these pixels compose? Even if the possibility of such a relevantly different pattern is admitted, I do not think that this seriously threatens my argument. For if there is a free-will enabling ability to act otherwise regarding each individual action, the Principle of Alternatives-Transfer should let us expect not only an ability to act otherwise regarding the resulting pattern, but also regarding the relevant relative frequencies. We can therefore stipulate that “composition” only refers to the relevant ratios, without the Principle of Alternatives-Transfer thereby losing plausibility. Thus, (P2) seems capable of withstanding the objections discussed in this section. If thoroughly probabilistic indeterminism holds, there would be no noteworthy ability to act otherwise regarding the overall composition of actions in a long-run rollback scenario.

## 6.2 Questioning the Principle of Alternatives-Transfer

However, the last objection leads to a more serious problem. If one can hold the ratio of ‘truth’ to total cases fixed, and could still have different patterns of actions, this implies that the pattern-relevant individual actions could be different, while the overall ratio is held fixed. Doesn’t this

give rise to counterexamples to the Principle of Alternatives-Transfer? Randolph Clarke (2010: 390-391) sketches a situation in which one can choose one hundred times between pushing a red button and pushing a blue button, while one complies to the requirement of having a final composition of 60 red-button pushes to 40 blue-button pushes. In this case, one cannot act otherwise with respect to the overall relative frequencies, but apparently this doesn't undermine one's ability to choose and act otherwise in each individual case. Accordingly, there is an ability to act otherwise regarding the individual actions, but not regarding the overall pattern. For another example, consider again the artist who designs a picture-file by deciding about the colour of each individual pixel. Let's assume that he has a compulsive disorder that forces him to only paint pictures that consist of 90% black pixels and 10% red pixels, such that he cannot act otherwise regarding this overall ratio. Still, he might be able to construct very different motifs, depending on where exactly the red pixels are. This compulsively disordered artist is able to act otherwise regarding any individual pixel, but not regarding the overall relative frequency. Thus, the Principle of Alternatives-Transfer, despite its initial plausibility, seems wrong.

I admit that these cases do indeed constitute counterexamples to the unrevised version of the Principle of Alternatives-Transfer. However, a slight amendment of the principle will suffice in order to deal with them. This is because the counterexamples differ from the rollback scenario in one important respect: In both Clarke's button-pressing example and in the case of the compulsively disordered artist, there is a constraint on the overall pattern that does not originate in the characteristics of the individual actions. The externality of the constraining influence makes it possible that the restrictions on the ability to act otherwise only concern (some aspects of) the overall pattern, but not (or only to a limited extent) the constituting individual actions. The rollback case, however, is not externally constrained in any relevant way. All features of the overall composition in rollback scenarios can be entirely traced back to the characteristics of the individual actions. It is this absence of external constraints (and thus the exclusive influence of internal characteristics) which allows us to trace back the lack of an ability to act otherwise regarding the overall composition to a free-will deficiency in the individual actions (cf. Bernáth/Tózsér 2020: 45-46). This is not possible in the counterexamples because as soon as there are external constraints, we do not know whether to trace back the lacking composition-concerning ability to act otherwise to the external constraint or whether to trace it back to features of the individual actions. The Principle of Alternatives-Transfer has thus to be revised, such that the absence of external influences on the overall pattern is explicitly required:

**Principle of Alternatives-Transfer** (revised): If one has the strongest ability to act otherwise that still constitutes a necessary condition for exercising free will, then this ability transfers (and would transfer) from individual actions to any overall composition of actions, if all of the composition-constituting actions have that ability (by the same person) *and given that all relevant characteristics of the overall composition have their origin entirely in characteristics of the individual actions.*

The added presupposition makes the principle immune to the discussed counterexamples, while still leaving it applicable the rollback scenarios under consideration. Thus, given that (P4) is just the result of applying the principle to such a rollback scenario, no amendment of (P4) is required.

## 7. Earlier Criticisms Avoided

The proposed rollback argument was supposed to overcome the earlier identified problems in van Inwagen's, Pereboom's and Bernáth and Tőzsér's rollback arguments. It shall now be investigated whether it succeeds in doing so. Regarding van Inwagen's argument, it was criticised, firstly, that the inference from an action's being governed by objective probability to that action's being a matter of chance in a freedom-undermining sense lacks motivation. Secondly, Buchak (2013) criticised that the probability-establishing step involves circularity. The proposed argument avoids both of these criticisms, because the problematic probability-establishing step is eliminated altogether, and the freedom-undermining step is supported by showing how objective probabilities undermine the free-will enabling ability to act otherwise.

Pereboom's argument faces two different criticisms. Firstly, the most it can show is that the existence of agent-causation is *unlikely* in a thoroughly probabilistic world, but it cannot show that thoroughly probabilistic indeterminism and agent-causation *exclude* each other. Secondly, it claims that agent-causation must be independent from the event-causal probabilistic structure, but it doesn't deliver a satisfactory argument for this claim. Moreover, it doesn't *explicate* the luck problem, but merely intends to show that *agent-causation* as a possible solution to it is not likely to be present. (This last point is not really an objection against Pereboom's argument, but rather a restriction of it.)

My proposed argument avoids these criticisms and restrictions. It aims to show that *every* account of free will that claims compatibility with thoroughly probabilistic indeterminism cannot give a free-will enabling account of the agent's ability to act otherwise. It also provides a reason for why agent- and event-causation cannot be governed by a common probabilistic structure, though its answer differs from Pereboom's. (While Pereboom claims that agent- and event-causation would not be sufficiently distinct anymore if they were governed by the same probabilistic laws, the present argument explains why the agent's free decisions must not be

governed by any all-encompassing probabilistic laws at all, be they dependent or independent from the event-causal level.) Moreover, the argument's logical character, as recognisable in the formalization at the end of Section 5, is deductive. It shows not only that free will and objective probabilities are highly unlikely to cooccur, but that they are incompatible.

My argument also exceeds Bernáth and Tózsér's argument in the respects motivated in Section 4. It doesn't only argue for the lacking explanatory motivation to posit objective probabilities for free actions, but it shows that if an action is governed by objective probabilities, it must lack a free-will enabling ability to act otherwise. The concept of "chance" that threatens free will is technically defined as an action's being governed by objective probabilities, such that no hidden responsibility-undermining or otherwise unclear associations are involved. If one only discusses thoroughly probabilistic indeterminism directly, one can even eliminate the concept of "chance" from the argument altogether. This is also what gives the argument its potential to deal with Robert Kane's event-causal responses to the luck problem.

## 8. Strengthening the Luck Objection

The first mentioned response of Kane (1999) is to differentiate between the meaning of "chance" or "luck" in the technical sense of indeterminism, and these terms' responsibility-undermining associations in common language, corresponding to something's being *merely* a matter of "chance" or "luck". Kane claims that even free-will establishing actions can be a matter of "chance" or "luck" in the technical sense, as long as they satisfy further conditions, such that they are not *merely* a matter of chance. The proposed rollback argument, however, can deal with this reply. This is because it shows that what undermines free will are not (only) the associations of "chance" or "luck" in common language, but rather the technical concept of indeterminism itself (at least as long as the indeterminism in question is a thoroughly probabilistic indeterminism, as it is under consideration here). In arguing that thoroughly probabilistic indeterminism undermines the free-will enabling ability to act otherwise, it was not necessary to rely on the freedom-undermining associations of something being *merely* a matter of chance. Instead, the purely technical concept of thoroughly probabilistic indeterminism sufficed to show that the composition-concerning ability to act otherwise is lacking.

Kane's (1999) second response, addressing the claim that undetermined actions were not under their respective agent's control, involves his differentiation between "antecedent determining control" and "plural voluntary control". He insists that plural voluntary control is all that is required in terms of free-will relevant control, whereas antecedent determining control

is dispensable. The problem of intuition-based luck objections is that they lack the resources to adequately answer this response. But I suggest that my rollback argument can be deployed for a promising approach to reject Kane's response.

Consider again the definition of plural voluntary control as "being able to bring about whichever of the options you will or most want, when you will to do so, for the reasons you will to do so, without being coerced or compelled in doing so" (Kane 1999: 237-238, without italics). Now remember that Kane is a libertarian and as such he believes that there is no free will in deterministic worlds, although there can be free will in indeterministic worlds. Accordingly, whatever specific account of free will Kane endorses, he should be able to explain this account's superiority to those kinds of alleged compatibilist freedom that can also be given in deterministic worlds.

Kane's account of plural voluntary control, however, bears remarkable resemblance to compatibilist accounts of free will. Its central elements—being able to do what one most wants to do, acting on the basis of reasons, the absence of coercion and compulsion—can all be satisfied in deterministic worlds and feature in fact in many compatibilist free-will accounts. The apparently only control-relevant feature that distinguishes Kane's account from a compatibilist account that also requires these elements is that on Kane's account the conditions must be fulfilled for a whole set of concurring possible actions, rather than for only one predetermined action. In other words, what is crucial for his account are the alternative possibilities, the plurality of the plural voluntary control that indeterminism allows for. Without these alternative possibilities, it would not be clear in which way Kane's account is supposed to be superior to a merely compatibilist account of free will. Therefore, the acceptability of Kane's account of control (at least for incompatibilists) seems to hinge on the freedom-relevance of the alternative possibilities that his account allows for.

The rollback argument presented here, however, is supposed to show that those alternative possibilities which can be given in a world of thoroughly probabilistic indeterminism are not free-will enabling. As far as I can see, it does so without presupposing the requirement for antecedent determining control that Kane challenges. Accordingly, if there is no free-will enabling ability to act otherwise in a world of thoroughly probabilistic indeterminism, then there seems to be also no free-will enabling difference between Kane's account of plural voluntary control and compatibilist accounts of control.<sup>9</sup> Although this might

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<sup>9</sup> Kane (2011) might try to escape this argument by claiming that his account differs from compatibilist accounts by allowing for agents' *ultimate sourcehood*. I do not deny this difference, but I deny its relevance for the investigation under consideration. For what is at stake here is the status of plural voluntary *control*. Control over one's actions, however, seems to depend on ultimate sourcehood only insofar as ultimate sourcehood allows for control over the open *alternative possibilities*. But the above considerations show that alternative possibilities in a

only be a rough sketch of an argument against Kane's response to the luck problem, it still illustrates that the proposed rollback argument offers resources to argue against Kane's responses which more intuition-based versions of the luck objection lack.

## 9. Concluding Remarks

In the preceding sections, I developed and defended an argument for the incompatibility of free will and thoroughly probabilistic indeterminism which focusses on the undermining of the free-will enabling ability to act otherwise by objective probabilities, and on how this undermining can be recognised by considering counterfactual rollback scenarios. In this concluding section, I want to focus on the consequences that this result yields for the general tenability of libertarianism.

As mentioned in the Introduction, libertarians have to explain how free will can be existent in an indeterministic world. The main thesis of this paper is that, in order to be successful with that task, they have to reject thoroughly probabilistic indeterminism. Until now, I supported this claim by arguing that if one commits to thoroughly probabilistic indeterminism, one *cannot* give a satisfactory account of free will. What has not been investigated, however, is how libertarians *can* account for the existence of free will if they rely on (partly) lawless indeterminism instead.

In Section 7, I sketched an argument for the insufficiency of Robert Kane's event-causal response to the luck problem in a context of thoroughly probabilistic indeterminism. Will such an event-causal response fare better if it is brought about in a context of (partly) lawless indeterminism? What has to be admitted is that my objections against this response do not work anymore as soon as all-encompassing probabilities are eliminated. This is because my objections rely on the undermining of *any* (noteworthy) ability to act otherwise regarding overall compositions, and this undermining doesn't work without objective probabilities that fix the overall composition in rollback scenarios. However, this fixing was intended to show, by means of the Principle of Alternatives-Transfer, that in a world of thoroughly probabilistic indeterminism there is no *free-will enabling* ability to act otherwise for the individual actions, such that what finally happens is arbitrary in a free-will undermining sense. It is hard to see how, if there is no such ability in a world of thoroughly probabilistic indeterminism, one can facilitate this ability by merely removing the structuring objective probabilities. How could this

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world of thoroughly probabilistic indeterminism are not free-will enabling, so plural voluntary control in a world of thoroughly probabilistic indeterminism doesn't have a free-will enabling advantage over compatibilist forms of control either. This is not to deny that there might be a relevance of ultimate sourcehood that exceeds the relevance of alternative possibilities. I merely claim that if such an independent relevance is given, it seems to have no bearing on *control* and is thus not relevant to the present considerations.

diminish the arbitrariness which undermines the freedom of individual actions in a context of thoroughly probabilistic indeterminism? How could it make plural voluntary control any more superior to compatibilist forms of control than it is in a thoroughly probabilistic world? Although I cannot deliver a fool-proof argument for this claim, it appears to me that if an event-causal response to the luck problem fails in a world of thoroughly probabilistic indeterminism, it also fails in a world of (partly) lawless indeterminism (cf. Furlong 2017: 522, 528).

This looks different for an agent-causal approach. We have seen that if the agent-causal decisions (or its event-level effects) are completely governed by objective probabilities, this undermines the agent's free-will enabling ability to act otherwise. But in contrast to the event-causal case, it is not mysterious at all how removing this probabilistic structure can enhance freedom. In the event-causal case, there is nothing over and above states and events, such that removing the probabilistic structure of events and states doesn't seem to enhance anyone's freedom. But on the agent-causal account there is an irreducible agent whose free-will enabling ability to act otherwise is constrained by the problematic probabilistic structure. If this structure is removed, the agent can exercise his free-will establishing influence (described at the beginning of Section 3) in a less constrained way, such that the formerly missing free-will enabling ability to act otherwise can be given. The irreducible agent can thus be free to determine, in a manner unconstrained by objective probabilities, which of the possibilities that are left open by earlier states becomes finally actualized (cf. Furlong 2017: 523-525).

It is by means of these considerations that the proposed rollback argument does not only show how thoroughly probabilistic indeterminism undermines the credibility of event-causal free will accounts, but that it also motivates how a more satisfactory agent-causal account of free will might be given for a world of (partly) lawless indeterminism. Of course, the commitment to (partly) lawless indeterminism itself might seem demanding (Shabo 2014: 166, fn.15; Schlosser 2017; Furlong 2017) and I did not discuss its acceptability here. What I intended to show is that this commitment is necessary if one wants to allow for the existence of free will, and that it gives agent-causation promising prospects of overcoming the luck problem.



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