

Time Travelers Are Not Free[‡]

Michael C. Rea

University of Notre Dame

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Clare is contemplating an historic journey—a journey back in time. There before her sits her grand invention, the time machine itself. Pristine, untested, built of the finest components on rock-solid theory. There is much to worry about on the first ever time travel journey, even with the very best of machines. Accidental death and dismemberment—of oneself or of innocent bystanders. Arrival in a remote location with inadequate supplies. Permanent exile in a time long forgotten. But these are the *least* of her worries. For, as she reflects on the matter, Clare realizes that the potential physical disasters pale in comparison with what she now takes to be a very likely *metaphysical* disaster. Time travel threatens her very agency, her own free will. Not only hers either. As she thinks the matter through, she realizes to her horror that the freedom of *everyone* temporally downstream of her arrival is at stake. Let us peer in on her reasoning. In doing so, we shall find that even if we disagree with her conclusions, there are startling things to be learned about the relationships between our past, our causal history, and our own free agency.

1.

First, some background.

Clare has a simple goal: to get rich. Her plan is to make two journeys. One trip will take her to December 1979, about six months after she was born, to make a \$10K investment in Eaton Vance stock, the top performing stock between 1979 and 2005 (the year when she began work on her time machine).¹ The other trip will take her to 2005 to cash in the stock and put the proceeds in an offshore bank account. She has very good reason to believe that her journey will be—or has been—successful. In February 2005, while still in graduate school, she received a package which contained (a) all of the paperwork, ostensibly signed by herself only a week before, for the offshore account, (b) a complete explanation of her time travel journeys and their outcome, and (c) detailed plans for building the time machine in which the journeys would be made. She knew that it could be a hoax—

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¹ According to the *Eaton Vance Corp. 2004 Annual Report*, “[a] \$10,000 investment in Eaton Vance stock on December 31, 1979, assuming reinvestment of all dividends, would have grown to \$10,613,474 on December 31, 2004.”

indeed, suspected as much at first. But as she read through the detailed notes on the time travel journey, written in her own hand and bearing on every page the unmistakable traces of her very own dry and self-deprecating sense of humor, she was soon a true believer. In short order she quit her job and withdrew a not inconsequential sum of money from the offshore account to fund what would become an eight year project of building her time machine according to the specs she had been given. She also began the challenging task of rounding up \$10K in pre-1979 US currency.

Trouble comes as the date of the journey approaches and she considers the question of what would happen if she were to chicken out. She has very good reason to believe that the past nine years of her life have been funded by the fruits of two successful time travel journeys. It occurs to her that she could, with confidence, go jump off a cliff right now, secure in the very reasonable belief that, whatever else happened as a result thereof, she would eventually be fine enough to make her journeys, invest her money, and write a letter to herself explaining how it is all to be done. But, being in a more metaphysical frame of mind, she reflects instead on some questions about freedom.

Let us suppose that she was in fact a time traveler in 1979 and 2005. So, in other words, let us suspend the skeptical hypothesis that says she is a victim of an elaborate hoax. These, then, are her two questions:

(Q1) Is Clare now, in 2014, *free* with respect to the act of stepping into the time machine?

(Q2) Is there any act ϕ such that (a) Clare performed ϕ as a time traveler in 1979 or 2005 and (b) Clare performed ϕ freely?

These are also the questions on which the present paper shall focus. In section 2 below, I will consider Q1 and Q2 in some detail and, with Clare, I will answer both questions negatively. In section 3, I will draw some more general conclusions about the relationship between time travel and freedom, arguing for the surprising conclusion that time travel undermines not only Clare's freedom between her earliest arrival point and her latest departure point, but also the freedom of everyone else who exists at those times.

There are other discussions of the tensions between time travel and freedom in the literature. By far the majority position is that the tensions are only apparent. Time travelers are free. The fact that time travelers would fail *en masse* were a great many of them to undertake paradoxical missions to assassinate their own grandfathers or to commit autoinfanticide shows only that time travel is weird in various ways, not that it is impossible or freedom-undermining.² The most important recent attempt to defend the idea that there are limitations on the freedom of time travelers is Kadri Vihvelin's (1996) "What Time Travelers Cannot Do."³ But even she allows that time travelers have quite a bit of freedom throughout the course of their time travel journeys. By contrast, I shall argue that they have none. Moreover, the salient issues raised by her paper are substantially different

² See, e.g., Lewis 1976; Sider 1997; Sider 2002; Goddu 2007; Carroll 2010; Vranas 2010; and Spencer 2013.

³ Most of the papers cited in note 2 try in some way to respond to Vihvelin's argument.

from those raised in the present one. Since her paper has done more than any other to set the course of recent discussion on time travel and freedom, I will close this introductory section by highlighting some of those differences.

Vihvelin, in keeping with trends in the earlier literature on time travel, focuses narrowly on the question whether time travelers are free with respect to specific, paradoxical acts like autoinfanticide. She thinks that time travelers *cannot* (as opposed to *will not*) perform such acts. But, in contrast to what I shall argue, she insists that they are able to do other things that they do not in fact do on their journeys, and that people contemporaneous with them are able to perform the very killings and such that they cannot themselves perform.⁴ Her main argument turns on the thesis that a time traveler *can* perform a particular act only if she *would succeed* were she to attempt it. The Stalnaker-Lewis semantics for counterfactuals then takes center stage in her paper as she argues that, given the semantics, it is false of every time traveler that she would succeed were she to attempt something like autoinfanticide, but it is perhaps not false that she would succeed were she to attempt to perform some other act that she does not in fact perform as a time traveler. The arguments of the present paper, by contrast, rely on no theses about the correct semantics for counterfactuals. Nor do they rely on theses about the semantics for ‘can’ claims, which feature centrally in Lewis’s (1976) discussion of what time travelers can and cannot do, as well as in several of the discussions of Vihvelin’s paper. These differences are important in no small part because the semantics for counterfactuals and the semantics for ‘can’ claims are highly controversial. The assumptions driving the arguments of the present paper, although not universally accepted, are significantly less controversial than those that have animated the literature on Vihvelin’s paper.

Moreover, and most importantly, neither Vihvelin’s paper nor most of the literature that interacts with it explores in significant detail the larger questions that most centrally concern Clare—namely, questions about whether the time travel journey itself can be undertaken freely, whether *any of her acts at all* on the journey can be free, and what the implications of her journey for the freedom of others might be. To the extent that these latter sorts of questions have been addressed, they have typically been raised only obliquely or in passing, verdicts have commonly been announced without much by way of discussion or argument, and the typical verdict has been contrary to the one I shall reach in this paper.⁵

⁴ She imagines an objector asking, “But if your argument works, doesn’t it show that time-travelers are able to do - can do - only what they in fact do?”; then she answers:

No. There are other things time travelers cannot do; for instance, they cannot kill their ancestors before they pass on their genes. But they are able to do lots of other things; they have plenty of abilities which they do not exercise, but could have exercised. (1996: 328)

⁵ Slater 2005 is a notable exception to this general rule. Slater is primarily concerned with the question whether the time travel journey itself might be free, but he also considers the question whether the acts undertaken by a time traveler on her journey might be free. His answer to both questions is that the acts in question are not free, unless we are willing to accept ontic indeterminacy. In contrast to Slater, I do not offer commitment to ontic determinacy as a way of preserving the view that time travel journeys or the actions of time travelers are free. Kristie Lynn Miller (2009: 141)

2.

Let us now begin to examine Clare's two questions. In what follows, I shall assume the truth of eternalism, the thesis that it always has been and always will be the case that everything that ever did exist or will exist does exist. This assumption is optional; it affects the framing of my argument, but not its substance.⁶ I will also assume that freedom is incompatible with determinism. This assumption is not optional. If freedom is compatible with determinism, then there is no reason to doubt that it is compatible with the factors that I take to undermine the freedom of time travelers and of agents existing between the arrival and departure points of a time travel journey. Thus, I take it that considerations that lend support to compatibilism will, as a general rule, also count against at least one of the premises of my arguments.

Let t_1 be the moment at which Clare steps into her time machine. Let us say that *the transition time* for an act A is the latest time at which A is up to, or within the control of, the agent who performs A .⁷ Let t_0 be an arbitrary plausible candidate for the transition time for Clare's act of stepping into the time machine. This will presumably be a time very close to t_1 . Now consider Clare's past at t_0 . What does her past include?

For ordinary purposes, *the past* includes all and only events that are earlier than the present moment.⁸ But this characterization will not do for a time traveler who, for example, travels to a time earlier in her life so that she can observe or affect *her* past. (If her past includes only events earlier than what is, for her, the present moment, she will always find herself temporally ahead of her past rather than somehow present in it.) And yet if the concept of time travel is coherent at all, it

considers the question whether time travel undermines the freedom of others and answers that it does not. In contrast to Miller, I say that time travel *does* undermine the freedom of others.

⁶ One might be tempted to think otherwise. Suppose Clare steps into the time machine at t_1 . Now consider Clare at some earlier time, t_0 as she deliberates whether to step into the time machine. Eternalism says that it is true at t_0 that *the event of Clare's stepping into the time machine exists*. But, one might think, if that is true then Clare cannot refrain from stepping into the time machine at t_1 . How could she? The event "already" exists! In fact, however, I think that this line of reasoning is unsound. The only plausible arguments I am aware of for the conclusion that the mere existence of future acts somehow implies that we cannot refrain from performing them are fatalistic arguments. But, as I have argued elsewhere, it is presentists, not eternalists, that face problems in replying to fatalistic arguments. (See Rea 2006 and Finch and Rea 2008.) The arguments of the present paper are not fatalistic; nor do they even rely on the sorts of transfer principles like van Inwagen's "Rule β " (1983: 94) or Finch and Warfield's "Beta 2" principle (1998: 521) that sometimes drive fatalistic arguments

⁷ The terminology is adapted from Finch 2013. The transition time for an act might be, but need not be, distinct from the time at which the act occurs. If (perhaps due to vagueness) there is no latest time at which a particular act is up to its agent, the transition time will simply be the time that is approached as a limit by all of the times at which the act is up to the agent. Strictly speaking, in that sort of case, the transition time would *not* be a time at which the act is up to its agent. But I shall ignore this complication in what follows.

⁸ Those who deny that there is a privileged present moment (as I do) might add a little sophistication to this characterization by saying, furthermore, that an event $e1$ is earlier than an event $e2$ if, and only if, $e1$ is in the past light cone of $e2$ or $e2$ is in the future light cone of $e1$; and $e1$ is later than $e2$ only if $e2$ is earlier than $e1$.

seems perfectly meaningful to speak of time travelers successfully traveling to their past in order to observe or causally interact with it. What, then, do we mean by these indexed locutions, ‘my past’, ‘her past’, etc., if we don’t mean *the past* in time?

To answer this question, we need two definitions:

at t , $e1$ is a part of x ’s causal history =_{def} $e1$ stands in the ancestral of the causal relation to an event $e2$ that occurs at t and involves x as subject.

the causal history of x at t =_{def} the sum of all events e such that, at t , e is a part of x ’s causal history⁹

Note that it does not follow from these definitions that every event in someone’s causal history has exerted some causal influence on her. More exactly: that follows only if the causal relation is transitive. Maybe it is transitive, but I do not here assume that it is.

As I see it, references to *my past*, *her past*, and so on are to be understood as references to the causal history of the person or object referred to by the relevant possessive pronoun.¹⁰ So, for example, talk about *my past* is (typically—especially if I am a time traveler) talk about my causal history. To say that an event lies in my past is to say that it is (presently) part of my causal history. Similarly for talk about *her past*, *his past*, etc. This means, of course, that events that lie in the future can count as part of a time traveler’s past. Perhaps that sounds surprising, but I submit that it is in fact highly intuitive. It is surprising because when we talk about our past we normally do so under the assumption that we have not been subject to backward causal influences, and so, as noted above, we normally think of *our past* as identical to *the past*. But, of course, where time travel is concerned, the assumption just mentioned is false. Once we see this, there should be no objection in principle to speaking of events in a person’s future as part of her past. Suppose you travel to a year in your own childhood with the goal of advising your younger self never to befriend the person who, in early adulthood, betrayed you so hurtfully as to leave long-lasting emotional scars. Even as you arrive, it makes perfect sense for you to reflect on the fact that you are *scarred by your past*, and this despite the fact that, at the time of your arrival, that very past lies in the future. Talk of our past is usually talk of our own causal history, wherever that may lie in time.¹¹

The contents of *Clare’s past* at t_0 , then, are just the contents of her causal history at that time. Let’s label it ‘CH₀’. What does CH₀ include? Perhaps not *everything* that has happened in the world up until t_0 , for perhaps not everything

⁹ I assume that for any two events there is a distinct event which is their sum. My argument does not depend on this assumption, but rejecting it would obviously force me to redefine the term ‘causal history’ and would perhaps affect the formulation of several other claims herein as well.

¹⁰ Compare Lewis (1976) on the distinction between *external time* and *personal time*. The distinction I wish to draw—between the past (in time) and a person’s causal history is similar, but not identical.

¹¹ Compare Vihvelin, commenting on time-traveling Suzy’s attempt to kill her baby self: “The way Suzy and her surroundings are now is caused not only by the past but also by the future-tensed fact that Baby Suzy will survive to be the adult Suzy.” (1996: 12) I think that the basic idea here is correct. My differences with Vihvelin on this point concern the relata of the causal relation (she places *future-tensed facts* among the relata, whereas I do not), and the generality of the theses we are willing to affirm about what future events might lie in an agent’s causal history at a time. These differences, I think—especially the latter—go some distance toward explaining the differences in the conclusions we reach.

earlier than t_0 stands in the ancestral of the causal relation to an event involving Clare at t_0 . But quite a lot of what has happened up until t_0 will belong to CH_0 , including a great deal of what happened to Clare *qua time traveler* during the course of her time travel journey. For example, Clare owns a time machine at t_0 ; and, as is evident from the story of Clare's life, many of the things that Clare did as a time traveler—investing in Eaton Vance stock, for example, and setting up the offshore account—belong to a chain of causal relations leading up to the completion of Clare's time machine. All of these actions, then, as well as many of the environmental factors that influenced those actions, must be part of her causal history at t_0 . Moreover, since her actions *qua time traveler* are causally dependent upon her stepping into the time machine at t_1 , it follows that Clare's causal history at t_0 also includes her act of stepping into the time machine at t_1 . This last claim—that CH_0 includes Clare's act of stepping into the time machine at t_1 —is the first premise of the main argument. Given my earlier stipulations regarding the use of terms like 'Clare's past', this premise is equivalent to the thesis that Clare's stepping into the time machine lies in her past.

The second premise, informally put, is that no one able to do anything that is precluded by her own causal history. Somewhat more formally, no one is able, at a time later than t , to perform an act of either of the following types: (a) refraining from an act that is already part of her causal history at t , or (b) performing an act such that, for some event e in her causal history, necessarily, she performs the act only if e is *not* in her causal history. Still more formally: Let ' CH_{St} ' abbreviate ' S 's causal history at t ,' and let t be an arbitrary candidate transition time for some particular act φ of which S is the agent at t^* . Then (a) S is able at t to refrain from φ -ing at t^* only if S 's φ -ing at t^* is not part of CH_{St} , and (b) S is able at t to φ at t^* only if there is no event e in CH_{St} such that, necessarily, S φ 's at t only if e is not in CH_{St} .

This second premise embodies a perfectly standard incompatibilist understanding of *ability*. Incompatibilists maintain that an agent is able to do only that which is consistent with the laws of nature and the *hard* or *fixed* facts about the past. It is notoriously difficult to say what exactly it is for an event to be part of the fixed past; but there seems to be general agreement that, at any given time, the fixed past includes every event whose effects lie in the past or the present.¹² If an event

¹² I do not take this general agreement to be *explicitly acknowledged* in the literature. But it is implied by what many philosophers tend to say about (e.g.) the fixity of the past, accidental necessity, and the distinction between hard facts and soft facts. Consider, for example, Alvin Plantinga's (1986) well-known characterization of the conditions under which a proposition is accidentally necessary:

- (42) p is accidentally necessary at t if and only if p is true at t and it is not possible both that p is true at t and that there exist agents S_1, \dots, S_n and actions A_1, \dots, A_n and such that (1) A_i is basic for S_i , (2) S_i has the power at t or later to perform A_i , and (3) necessarily if S_i were to perform A_i at t or later, then p would have been false.

Let t be an arbitrary moment in 2013 before Clare steps into the time machine; let p be the proposition that e occurred, for some arbitrary e in Clare's causal history (past or future) that is not a basic action for Clare. It seems obvious that there is no *basic* action that Clare (or others) can perform later than t whose performance *entails* (e.g.) that Clare does not step into the time machine at t_1 or that Clare did not mail a package to herself in 2005. (Suppose, for example, that *stepping forward* is one sort of basic act and *stepping backward* is another. Suppose further that, at the crucial moment,

has left its mark on the world, it is part of the fixed past. But events in an agent's own causal history have left their mark—perhaps not on the agent herself, but at least on something which has left its mark on something which has left its mark on something...which has left its mark on the agent. Thus, given standard incompatibilist assumptions, one is not able to do anything that is logically incompatible with the occurrence of one of those events. One can give up this notion of ability by denying that the fixed past imposes constraints on what an agent is able to do. But if one is willing to take this route, I cannot see what further motivation one might have for endorsing incompatibilism.

Obviously enough, if time travel is possible then what I have just said implies that future events may be part of one's fixed past. This is somewhat counterintuitive. But that is not my problem; it is just one of the many counterintuitive features of the supposition that time travel is possible. A world with time travel is strange in many ways, and this is one of them. I note in passing that a further implication is that one should not characterize *soft* facts (or the *unfixed* past) as consisting in those facts that in some way depend on the future.¹³ Once time travel enters the picture, this characterization immediately yields the result that facts about an agent's own causal history—facts about whose obtaining neither she nor any other presently existing agent has any choice whatsoever—are soft. But, as I have just explained, this is an unwanted result.

From here, the rest of the argument is straightforward. For completeness, I repeat (using somewhat different wording) the first two premises along with the remainder. Let A_C be the act of stepping into the time machine, which Clare performs at t_1 ; let t_0 be a candidate transition time for A_C ; let 'CH_{*t*}' abbreviate 'S's causal history at t '; and let CH₀ be Clare's causal history at t_0 .

(MA1) Clare's performing A_C at t_1 is part of CH₀. (Premise)

(MA2) Let t be an arbitrary candidate transition time for some particular act φ of which S is the agent at t^* . Then (a) S is able at t to refrain from φ -ing at t^* only if S 's φ -ing at t^* is not part of CH_{*t*}, and (b) S is able at t to φ at t^* only if there is no event e in CH_{*t*} such that, necessarily, S φ 's at t only if e is not in CH_{*t*}. (Premise)

(MA3) Clare is able at t_0 to refrain from performing A_C at t_1 only if Clare's performing A_C at t_1 is not part of CH₀. (From MA2)

(MA4) Therefore: Clare is not able at t_0 to refrain from performing A_C at t_1 . (From MA1, MA3)

(MA5) Necessarily, S performs A freely at t only if at some time t_0 [$t_0 \leq t$], S is (i) able to perform A at t and (ii) able to refrain from performing A at t . (Premise)

Clare steps into the time machine by stepping forward. Still, there are worlds wherein she steps into the time machine by performing a different basic act—e.g., stepping backward. Etc.) Thus (3) is false. But if (3) is false, it is necessarily false; hence the bi-conditional is true; hence, p is accidentally necessary. For a small sampling of other characterizations of accidental necessity, cf. Fischer 2011 and Flint 2012.

¹³ Cf., e.g., Fischer 1983; Fischer 2011, and especially Todd 2013.

(MA6)Therefore; It is not the case that Clare performs A_c freely at t_1 .
(From MA4, MA5)

MA1 is merely stipulative, and MA5 is an entirely natural assumption given incompatibilism.¹⁴ I have already spoken on behalf of MA2 as well. MA3, MA4 and MA6 are valid consequences of the premises cited in support of each. So the conclusion follows: Clare does not step into the time machine freely. Q1 is thus to be answered negatively.

Let us turn now to Q2: Is there any act A such that (a) Clare performed A as a time traveler in 1979 or 2005 and (b) Clare performed A freely? Consider t_2 , the earliest time at which Clare exists as a time traveler in 1979. I take it as obvious that Clare's causal history at t_1 —again, the moment she enters the time machine—includes all of the same events as does her causal history at t_0 , plus a few more. What about her causal history at t_2 ? Does Clare's causal history at t_2 include all of the same events that it included at t_0 ? Of course it does; for it is obviously true that all of the same events in CH_0 (plus some additional ones) belong to a chain of causal relations leading up to an event involving Clare at t_2 . Clare's body is still, upon arrival in 1979, the product of the same processes of biological development that shaped it in the years leading up to t_1 ; Clare's psyche still bears the marks of the joys and trials of her childhood, adolescence, and early adulthood; Clare still has genuine, causally produced memories of her life leading up to t_1 , including (of course) memories of her intentions for her time travel journey. And so on. But if Clare's causal history at t_2 does include all of the same events that comprise her causal history at t_1 , then her causal history at t_2 includes *everything that she will do as a time traveler in 1979*. So, for any act φ that she performs as a time traveler in 1979, we can just reiterate the main argument, substituting a name for φ in place of A_c , and replacing ' t_0 ' with ' t_2 ' and ' t_1 ' with the time when φ is performed. This will give us an argument for the conclusion that Clare does not perform φ freely. And, of course, the same goes for her acts in 2005. Q2 is thus to be answered negatively as well.

3.

In light of the foregoing, it is tempting to conclude that, between the earliest arrival point of Clare's journeys as a time traveler and the latest departure point, Clare does not act freely. But we are not yet entitled to this conclusion. For during some of the time between 1979 and 2014 (namely, those times when Clare is bi-located), Clare not only acts qua time traveler but also as an ordinary, non-time-traveler. I have shown that nothing she does as a time traveler in 1979 or 2005 is free. But I have not yet shown that nothing she does, *period*, in 1979 or 2005 is free.

Indeed, we might doubt that this can be shown. I have said that I wish to remain neutral on the question whether objects persist by having temporal parts.

¹⁴ For discussion, see Finch 2013. One might dispense with MA5 and replace all of the ability claims in the other premises of the argument with claims about freedom—so that, e.g., ' S is able at t to refrain from φ -ing at t^* ' would become ' S is at t free with respect to whether S φ s at t^* '—and make appropriate other adjustments as needed. Doing so would, I think, make the premises of the argument somewhat less immediately intuitive; but, ultimately, I think that they would be no more or less defensible.

But let us drop neutrality for a moment and affirm the doctrine of temporal parts. Do we not find a relevant difference between Clare's time-traveling temporal parts and her non-time-traveling temporal parts? The time-traveling parts are causally downstream from the time-travel journey. Up until she receives the note from herself in 2005, however, matters are less clear for the non-time-traveling temporal parts. Thus, it is unclear that the main argument can be used to show that Clare, insofar as she acts as a non-time-traveler after t_2 in 1979, acts unfreely.

The question turns on the relationship between the causal history of Clare's earliest time-traveling stage¹⁵ (call that stage 'AC1'—'AC' for 'Adult Clare', of course) and the causal history of the younger stage that exists simultaneously with Adult Clare (call that one 'BC1'—'BC' for 'Baby Clare'). AC1's causal history includes the causal history of BC1, obviously. But so long as the causal histories do not overlap on events that occur at t_2 or afterward, the supposition that Clare acts freely as a non-time-traveler throughout 1979 seems unproblematic. On the other hand, if their causal histories do overlap on events that occur at t_2 or afterward (or if the same is true for a pair of later Clare-stages that exist simultaneously with one another in 1979 or 2005), then the main argument does generate a problem. I will consider first the question of overlap, and then I will show just how the problem is generated.

Suppose, first, that the following thesis is and always has been true: Everybody shares the *same causal history* up to some particular time in the fairly recent past. This is obviously not to say that everyone has been affected in exactly the same way by the same events up until some time in the recent past. Rather, it is only to say that from some time in the recent past on backward, every event that stands in the ancestral of the causal relation to an event involving me also stands in the ancestral of the causal relation to events involving every other person in the world. So, for example, the events of September 11, 2001 (both known and unknown) may have affected my life much differently from however they have affected yours. Nevertheless, those same events belong to both your causal history and mine. More formally: For any time t in evolutionary history on earth, all person-stages p that exist at t belong to a system s of causally related events of which the following condition holds: there is some duration d such that, for any event e in s , if the duration between e 's occurrence and t is greater than or equal to d , then every event in e 's causal history is also in p 's causal history. Call this thesis 'LOCAL HOLISM'.

I find LOCAL HOLISM plausible. If it is true, and if the relevant duration d is reasonably short, then fairly soon after t_2 , there will be a time t_3 after which every subsequently existing Clare stage (Adult, Baby, and anything in between) has a

¹⁵ I will use the term 'stage' to refer simply to instantaneous temporal parts of perduring entities, without intending to evoke the rest of what is now known as "stage theory" or "exdurantism". (Cf. Hawley 2001) The following discussion could be recast under exdurantist assumptions without substantial modification. It could be recast under the assumption that endurantism is true by replacing talk of the causal histories of particular stages with region-indexed causal histories, or by recasting the discussion in accord with whatever other strategy one might favor for explaining how Clare could have different intrinsic properties at multiple regions at the same time. Endurantists who cannot accommodate that state of affairs are not among the target audience of this paper, since they cannot accommodate time travel stories of the sort envisioned here.

causal history that includes all of the events in AC1's causal history. The reason is simple: Clare's arrival in 1979 is an event (call it '*e1*') whose causal history is identical to AC1's; and LOCAL HOLISM implies that, from t_3 onward, *every person stage*—and so every Clare stage—has the event comprising *e1*'s causal history in its own. But if this is right, then for any act A that Clare performs *either as a time-traveler or as a non-time-traveler* after t_3 , substituting a name for φ in place of A_C in the main argument above (and making the necessary adjustments in the names for times) will yield an argument for the conclusion that it is not the case that Clare performs φ freely. This is not *quite* the conclusion that *nothing* Clare does between t_2 and t_1 is free; but it is close enough.

Moreover, it should be obvious that we now have the resources to reach a far more general conclusion. As I have just said, from t_3 onward, *every person stage* has AC1's causal history as its own. Furthermore, by LOCAL HOLISM and the supposition that the relevant duration d is fairly short, CH_0 (which is included in the causal history of AC1) includes every event in the causal history of every person-stage from a short time prior to t_0 on backward throughout past time. From this it follows that everyone existing between t_3 and some time shortly before t_0 has at any time in that duration a causal history that includes everything that he or she will do between those times. Appropriate substitutions into the main argument will thus yield, for any one of those acts, an argument for the conclusion that the act is not performed freely.

It is perhaps tempting to raise the following objection to the idea that Baby Clare and Adult Clare can ever have causal histories that overlap on events that happen later in (Baby) Clare's life: Adult Clare has *experienced* events like her fifth birthday, her first kiss, her surprise at receiving a note from herself in 2005, and so on; Baby Clare has experienced none of these things. Thus they have been subject to different influences; thus they have different causal histories.¹⁶ This objection, however, rests on an understanding of 'causal history' that differs from the understanding in play in my argument. The objection has force only under the assumption that a person's causal history includes only events that have, as I have been putting it, "left their mark" directly upon the person herself—events that she has experienced or that have otherwise directly affected her. It has no force, however, if an event counts as part of a person's causal history just in case the event stands in the ancestral of the causal relation to some event involving the person. Returning to an earlier example, the events of September 11, 2001 stand in my causal history; but I have no first hand experience of them and the effects they have had on my life are very different from the effects they have had on the lives of others. All the more so for events that stand in the ancestral of the causal relation to events involving me and others without having had any direct effects upon any of us whatsoever—events that occurred a century ago, for example.

Although I find LOCAL HOLISM plausible, I have no argument to support it. So I simply note that LOCAL HOLISM is among the theses that one would have to reject if one wanted to resist my argument for the conclusion that Clare is unfree between

¹⁶ I owe this objection to Kathrin Koslicki, although I should note that she raised the objection in response to an earlier version of this paper, wherein my resources for replying were far less clear.

her earliest arrival point and her latest departure point. Perhaps you will agree that this assumption is not to be rejected. If so, then you are already committed to the conclusions I hope to reach. If not, then there is the following further argument to consider.

Suppose LOCAL HOLISM is false and consider two stages of two different people, $p1$ and $p2$ —stages that exist at the same time but at some great distance from one another, and whose causal histories fail to overlap on at least one event. Let CH_{p1} be the causal history of the first; let CH_{p2} be the causal history of the second; let e be an event that is part of CH_{p1} 's but not part of CH_{p2} 's. Now, suppose that e 's belonging to CH_{p1} is inconsistent with $p2$'s performing a certain act, A at t . That is, suppose that it is impossible both that e is part of CH_{p1} and that $p2$ performs A at t . Is $p2$ able to perform A at t ?

It is hard to imagine an incompatibilist giving an affirmative answer to this question. To do so is to suppose that there is a possible world in which the following scenario is true at some time t :

(SCENARIO) There is an object x and event e such that (a) e is part of x 's fixed past at t , but (b) someone y is able at t to do something ϕ such that, necessarily, y does ϕ only if e is not part of x 's fixed past.

Incompatibilists should regard SCENARIO as impossible. For, it seems to me, *everyone* should agree that if no one is able to do anything precluded by her own fixed past, then likewise no one is able to do anything precluded by someone (or something) else's fixed past.

We can sum up the salient content of the previous paragraph in a single principle:

(FIXED) No one is able to do anything that is precluded by her own fixed past; and, for any x and y , if e is part of x 's fixed past at a time t , it is part of y 's fixed past at t .

Incompatibilists, as I have just argued, should accept FIXED. But if FIXED is true, and if (as I said earlier), for any x , x 's own causal history is part of x 's fixed past, then it follows that AC1's causal history is part of BC1's fixed past. By reapplication of FIXED, it follows that Clare is not able to refrain from doing anything that she in fact does between t_2 in 1979 and t_1 in 2014, from which it follows that she does not do any of those things freely. We have now (finally) reached our most general conclusion about Clare: Clare does not act freely at any time between the earliest arrival point and the latest departure point of her time travel journey.

As with the argument from LOCAL HOLISM, we are now also in a position to reach an even more general conclusion. Consider an arbitrary time t later than t_2 in 1979. Clare's causal history at t , as we have seen, includes all of the events in AC1's causal history; thus, all of those events are part of her fixed past at t . FIXED implies that all of those events are in the fixed past of everything else that exists at t . Thus, FIXED implies that no one is able—no one is free—to do anything precluded by those events. The implications of this are staggering. No one acting between t_2 and t_1 is able to refrain from any act that had already left its mark, however slight, on something that had left its mark on something...that had left its mark on Clare by the time she stepped into the time machine in 2014. Stock trades, political actions, the mundane decisions of all manner of co-workers, commuters, media personalities,

fans at sporting events, and so on—all unfree. Time travel destroys freedom on a global scale.

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