Back to a New and Improved Future

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Doc Brown Dies and Yet Does Not Die?

It is 2AM in a barren parking lot, and you are a marvelous car. You are, of course, the DeLorean. Souped up and kitted out to do what no car has done before! That, or go out in a blaze of radioactive glory. Doc Brown and Marty mutter, going back and forth with whose-its and what's-its and a few "Great Scott!"s thrown in for good measure. You don't know it yet, but this is the last moment of peace before the rubber really hits the road.

A beaten-up Volkswagen careens into the streetlamp's sickly glow. A man is standing up through the sunroof, unleashing a barrage of machine gun staccato. Doc Brown, beloved mentor, creator, and friend lays dead, gasping out his last feeble breaths from leaky lungs. Marty—brave, impulsive, and always good in a pinch—barrels into the front seat and floors the ignition. They shoot off in a tear, screaming down the asphalt. The odometer crawls up the numbers, inching closer and closer, finally reaching the speed of 88 miles per hour. A crack of light and sound shakes the night, and that barren Indiana parking lot is empty again. Only two flickering streaks of flaming rubber, the wobbling ring of a spinning license plate, and the smallest whimper from a good dog.

Marty has jumped from 1985 to 1955. While in the 1950s, he meets two teenagers that turn out to be his parents. (More on that in a minute.) But he also writes a letter to Doc Brown to warn him about what will happen in that Indiana parking lot 30 years later. Doc does not want to know about the future, so he tears the letter to shreds, and he assists Marty in harnessing the power of a lightning strike at the town square's clocktower to send the DeLorean—and Marty—back to 1985.

The lightning-strike-clocktower plan succeeds and Marty arrives back in the future, ten minutes before Doc's death. Dashing from the clocktower square and the now smoking DeLorean, Marty arrives just in time to see his worst nightmare: Doc is shot. Again. But Robert Zemeckis (co-writer and director of the movie) is not so cruel, and a hopeful crescendo of string instruments heralds Doc shifting and groaning, miraculously alive in a bulletproof vest. Without words, Doc sticks a shaking hand into his lab coat's breast pocket and pulls out the letter, aged and ripped and taped back together. And thus, the day was saved. Marty wakes up the next morning to a new, picture-perfect life, each feature changed and improved because of his influence on the past.

This story seems to contradict itself. How can Doc both be shot dead (and really die) but also survive at the very same time? This apparent contradiction is familiar from time travel stories where a character seems both to be able and not to be able to do something past-altering, such as killing one's own grandfather before he has fathered any children.[i]

One way to try to resolve this issue—though it may introduce other issues as well—would be to suppose that time is multi-dimensional. It is normally assumed that time is linear, but in recent years several philosophers have considered how giving up that assumption may resolve certain paradoxes of time travel, including the grandfather paradox.[ii] In particular, by distinguishing between "time" and "hypertime," we can locate events such as Doc Brown's death and his survival at the very same "time" but at a different "hypertime." In this way, it is possible to model backward time travel that involves changing the past and so, it seems, to make sense of the plot of *Back to the Future*. More on this later.

But even if hypertime helps to explain the plot of *Back to the Future*, some elements of the story may not be coherent—or may be coherent but wildly improbable. It is worth a closer look at *Back to the Future*'s fading photographs, on the one hand, as well as at the movie's ending, when

Marty returns to the future to find that he has the very same two siblings and no doppelganger, on the other hand.

How Doc Can Both Die and Not Die at the Very Same Time

First, a visual metaphor is useful to ease into the abstract and particular theory of hypertime. Imagine a group of generals at a war meeting. The setting is vaguely medieval in the way that most fantasy epics adopt: chainmail, wall sconces, and grim, bearded faces. The war table is covered with an expansive map, useful for the planning of military actions. This map is a flat plane. It has two dimensions, length and width. Only by virtue of a third dimension, height, achieved by their vantage point over the map, can the advisors see both dimensions. They can identify the location of the tokens by reference to two separate data points—length and width. If a child that was only as tall as the table were to wander in, they might be able to stand on their tiptoes to put their line of sight right at the edge of the table. From the child's vantage point, only one dimension is visible. It seems like the tokens are lined up along a straight line. However, the child can only see one of two possible dimensions. Two tokens that are close to each other laterally and very far from each other vertically may seem close together from the child's point of view and very far apart to the advisors.

In this metaphor, we experience time from the child's point of view. One event happened. Another event happened after. We create timelines that reflect this view of time as a string, an arrow, a line. To add another dimension to time is to stand on a chair. When we add hypertime to our understanding of time, we enable more to be said about the precise location of specific moments. The relationship of length to width is distinct from the relationship between time and

hyper time, however, it remains a useful analogy. It challenges us to expand our fundamental understanding of what information there is to be said about time.

A second way to understand the two dimensions of hyper time is explored by Jack Meiland in his aptly named paper, "A Two-Dimensional Passage Model of Time for Time Travel."[iii] One dimension of time is time, represented as $P_{1\text{-}7}$ in Figure 1 below. Time—the dimension that most of us are intimately acquainted with—is represented as P_x, or as $past_x$, because the past is merely consecutive moments of time collected together. The other dimension of time is hypertime, represented as Pt_x, or the past *at* a certain time.

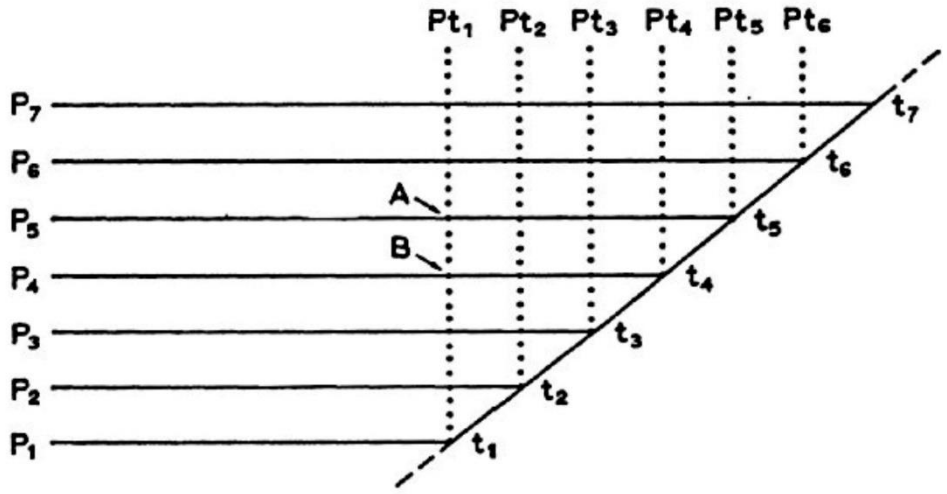

Figure 1: Meiland's Two-Dimensional Model

Each moment has a certain past associated with it. The past at t_1, also known as P_1, involves every moment up until t_1. At t_3, the past, also known as P_3, has grown to include the past as it was up to t_1, plus up to t_2 and t_3. When Meiland proposes that each moment has a different past associated with it, he is careful to define "different" in the manner of *qualitative* differences vs quantitative differences. Meiland is not as interested in the implication of an infinite quantity of pasts. Rather, this model of time aims to describe time as a continuant, something that "exists at different times and therefore can be different at one time from what it is at another."[iv] People are continuants. I exist in 2013 at 11 years old. I also exist in 2023 at 21 years old. In reference to two different times, I have different qualities but retain my selfhood. So too is the past able to exist differently at different times and retain its integrity as the past.

The third approach begins with visual metaphors and ends with graphical representation. The growing block theory, as described by Alex and Phyllis Eisenstein in their 1971 science fiction short story, "The Trouble with the Past," visualizes time as a never-ending chain with an infinite number of beads.[v] One bead is added for every moment that occurs. Others envision time as a block–hence the name–that grows by one slice per moment of time. Ryan Wasserman points out that these images of the growing block theory imply the question: What is the chain? Along what does the block expand? Predictably, the answer is hypertime. In other words, "the 'growth' of the block can … be understood as temporal expansion along the hypertime dimension."[vi]

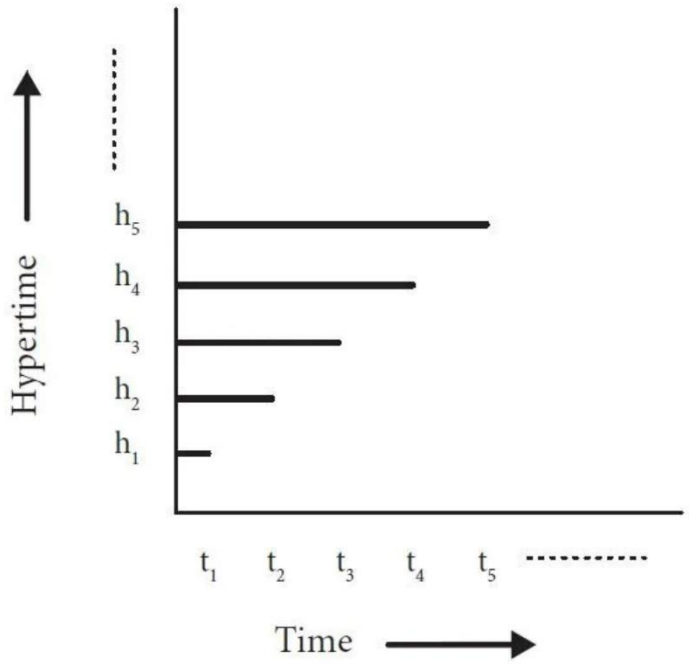

Figure 2: Wasserman's Hypertime Model

The last method to describe hypertime is explored by G. C. Goddu, who considers the possibility that time might be two-dimensional, such that, in David Lewis's words, "an event might be momentary along one time dimension but divisible along the other."[vii] Goddu is concerned with divisions of an instance, with temporal parts not yet explored. Typically, one considers a moment of time to lack temporal parts. It is the simplest unit of time. Goddu proposes that may be so along one dimension, but not the other (the other, of course, being hypertime). Consequently, 'hypertimes' refers to the "temporal parts of temporal instances."[viii] This particular phrasing of the notion of hypertime is quite useful to solving time travel's problem of the fixity of the past. An event that took place at t_1 with a hypertime of Ht_1 may have different qualities than an event that took place at t_1 with a hypertime of Ht_2. They hold different locations, making it perfectly coherent for the same event in time to have different qualities at different hypertimes. It is this feature that allows Doc to die and to live.

In other words, since the specific time that Doc is shot in 1985 exists at least twice—at two distinct *hyper*times—there is no contradiction in saying that he is shot dead but also not shot dead at that *time*. Just as there is no contradiction in your being hungry before breakfast and not hungry after breakfast (two distinct points in time), there is no contradiction in Doc's being dead at $<t_1, Ht_1>$ and alive at $<t_1, Ht_2>$ (two distinct points in hypertime). Marty turns out to be right when he says "History is gonna change"!

A Problem that Does Not Fade Away

While the hypertime model can make sense of Doc Brown's dying and not dying at the very same time, there is another element of the story of *Back to the Future* that remains a problem. While visiting the 1950s, Marty interacts with his parents, who are teenagers and who have not yet become romantically involved. Marty's mother is smitten with him, and it is suggested that Marty is making it less likely that his parents will in fact get together, which Marty believes will erase him—and his two siblings—from existence. Now, even if he were to prevent his parents from getting together, this would not result in a contradiction, assuming the hypertime model of the story, as Marty would still have been conceived by his parents at a different hypertime.

But the writers of *Back to the Future* do not seem to have hypertime in mind, and they run into a problem that surfaces in two places in the story. First, Marty is carrying a family photograph with him, and he periodically looks at it. As he spends more time in the past, his siblings begin to fade from the photograph—first his brother's head, then the rest of his brother, then his sister too. Later, when at the school dance, even Marty fades from the photograph. But whether we accept that time is linear or model the story with hypertime, such fading is incoherent. On the first option, as we have already seen, the past can't change, and so there wouldn't be any way to make sense

of any of *Back to the Future*, let alone someone's disappearance from a photograph. Even on the hypertime model, though, the events at the earlier hypertime that caused the photograph to exist as it initially did are never erased, and so even if in this hyper-later timeline the photograph never comes to be (or somehow, mysteriously, comes to be in exactly the same way, minus Marty's brother's head), there is no basis for the photograph to change.

Second, still at the school dance, Marty himself begins to fade out of existence, first forgetting how to play the guitar and then becoming wispier and more ghostly until his parents share their first kiss, at which time Marty unfades and can once again play the guitar. That there is a problem here has already been recognized. For example, in their introduction to metaphysics, *Riddles of Existence*, Earl Conee and Theodor Sider explain:

> That McFly begins to fade away into nothingness shows that the writers of *Back to the Future* were aware of the problem. But the fade-out solves nothing. Suppose McFly fades out completely after preventing his parents from meeting. He still existed before fading out (it was he, after all, who prevented his parents from meeting). Where then did he come from in the first place? Whatever its literary merits, as a work of philosophy *Back to the Future* fails miserably.[ix]

Conee and Sider recognize that there is a problem with this element of the story, but they have misdiagnosed the problem. Where did Marty come from in the first place? From an earlier hypertime. On this model of time travel (which, as we've seen, the movie requires), there's no contradiction in supposing that Marty prevents his own existence, so long as that prevention takes place at a different hypertime than the one where he originated.

The real problem with Marty's fading away is that he is not affecting his own causal past, and so what he is doing in the past does not bear on whether he has come into existence. Even if it somehow did, moreover, there would be no way for Marty to "half-exist," not knowing how to play the guitar and looking like a ghost; if he really made it so that his parents never got together

and this was a problem for Marty, then he shouldn't be there at all. As it happens, his parents *do* get together, and so there's no reason for him to have ever faded at all.

While incoherent, the fading element of the story is effective in communicating the idea that Marty's existence depends on his parents getting together, and audiences have never had a problem following the narrative of *Back to the Future*. (Perhaps this is why Conee and Sider are content to bracket the movie's literary merits.) What we have suggested, however, is that this idea is fundamentally confused. Even the move to the hypertime model, which solves some of the movie's metaphysical messes, can't resolve this issue.

The Not-Enough-Martys Problem

Let's set aside the fading problem. After all, we could subtract this fading element of the story without much change—the only substantial effects of the fading seem to be on Marty's anxieties and motivations for acting as he does in the past. Supposing we extract the fading and continue to use the hypertime model to avoid the Doc Brown contradiction problem, there is one lingering issue worth exploring, and it has to do with the movie's ending. While not impossible, Marty's changing the past in the ways that he does and still having *the very same siblings* that he does turns out to be wildly improbable.

To see why, consider how, even without time travel, some actions are identity-affecting. Whom we have children with, and when, affects who will exist in the future. Supposing Doc Brown's parents had waited a year longer to get pregnant than they in fact did, some other child, not Doc Brown, would have come into existence. More generally, one's identity depends on the timing of conception.

This point is taken for granted in the philosophical literature on the *non-identity problem*.[x] With this point in mind, consider the following case:

> Lorraine is considering having a fourth child, and her doctor tells her that she has developed a condition such that if she conceives now, any child she conceives will suffer from incurable blindness.
>
> However, her doctor also tells her that this result is not unavoidable. If Lorraine waits to conceive, and instead takes a pill every day for two months prior to conceiving, then she will conceive a child who is not afflicted with incurable blindness.
>
> Had Lorraine waited and taken the pill, she would have conceived and given birth to a perfectly sighted boy she would have named 'George Junior' (after her husband, George).
>
> However, she decides not to take the pill in favor of conceiving immediately. As a result, she conceives and gives birth to an incurably blind baby boy. She names this child 'Sam Junior' (after her father, Sam Baines).[xi]

It seems to many that Lorraine has done something wrong. If she has wronged some*one*, it would have to be Sam Junior. But Lorraine does not make Sam Junior worse off than he otherwise would have been, and so it seems that she has not harmed Sam Junior. And yet wronging someone seems to require harming them, and so it seems that Lorraine has not in fact wronged Sam Junior. How, then, does Lorraine act wrongly, if she does? This is the non-identity problem.

And this isn't a mere puzzle—many real-life situations give rise to the same problem. For example, in his influential statement of the problem, Derek Parfit considers a case in which a community must decide whether to conserve or deplete some natural resource.[xii] It may seem that depleting the resource wrongs future generations (say all of the people in that community 200 years later), but if no future person in the *deplete* scenario would have existed had the resource been conserved, then it seems that no actual person was made worse off, and so no one was harmed, and so no one was wronged.

Now consider again the effects of Marty's antics in the 1950s. Almost certainly, the different set of experiences had by Marty's parents when Marty is there, not to mention the changes

to his father's personality, will result in a slight difference in the set of events that occur immediately following the dance. These differences may balloon out into very different lives for Marty's parents, but even if we reject this "butterfly effect," the odds that Marty's parents would conceive children at slightly different times are incredibly high. Just think about what would be required for the very same conceptions to occur! It is wildly improbable that Marty would have the very same siblings in this altered timeline.

But even if we accept that the improbable has happened—that somehow Marty's parents have conceived the same children in this timeline as they did in the original—then we should expect them to conceive *Marty* in this timeline too! If this were to happen, then when Marty returns back to the future (but in a different hypertime), he would find another version of himself, conceived in this other hypertime. What happens at the end of the movie, however, is that Marty from the original timelines somehow "replaces" the new Marty who was conceived and grew up in this new hypertime. Perhaps a more fitting ending to the movie would have been a funeral.

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[i] See David Lewis, "The Paradoxes of Time Travel," *American Philosophical Quarterly* 13 (1976): 145–52.

ii See, for example, Jack Meiland, "A Two-Dimensional Passage Model of Time for Time Travel", *Philosophical Studies* 26 (1974): 153–73; G. C. Goddu, "Time Travel and Changing the Past (or How to Kill Yourself and Live to Tell the Tale)," *Ratio* 16 (2003): 16–32; Peter van Inwagen, "Changing the Past," in *Oxford Studies in Metaphysics* (Volume 5), Dean W. Zimmerman (ed.), Oxford: Oxford University Press (2010): 3–28; Ryan Wasserman, *Paradoxes of Time Travel*. New York: Oxford University Press (2018).

[iii] Meiland, "A Two-Dimensional Passage Model."

[iv] Ibid., p. 160.

[v] Alex Eisenstein and Phyllis Eisenstein. 1971. "The Trouble with the Past," in *New Dimensions 1*, Robert Silverberg (ed.), Garden City, NY: Doubleday.

[vi] Wasserman, *Paradoxes*, p. 91.

[vii] Lewis, "Paradoxes," p. 146; quoted by Goddu, "Time Travel," p. 20.

[viii] Goddu, "Time Travel," p. 20.

[ix] Earl Conee and Theodor Sider, *Riddles of Existence: A Guided Tour of Metaphysics*, New York: Oxford University Press (2005), p. 59.

x For a short introduction, see Duncan Purves, "The Non-Identity Problem," *1000-Word Philosophy* (2014): https://1000wordphilosophy.com/2014/02/27/non-identity-problem/. Accessed on June 3, 2024. For a book-length treatment of the problem, see David Boonin, *The Non-Identity Problem and the Ethics of Future People*, New York: Oxford University Press (2014). For an unpublished but illuminating discussion of time travel and the non-identity problem, see Sara Bernstein, "Ethical Puzzles of Time Travel," unpublished manuscript: https://www3.nd.edu/~sbernste/EPTT.pdf. Accessed on June 3, 2024.

[xi] This case is modified from one in Purves, "The Non-Identity Problem," which is itself modified from a case in Boonin, *The Non-Identity Problem*, pp. 127-128.

[xii] Derek Parfit, *Reasons and Persons*, Oxford: Oxford University Press (1984).