**‘Pure’ Time Preferences Are Irrelevant to the Debate over Time Bias:**

**A Plea for Zero Time Discounting as the Normative Standard**

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Abstract

I find much to like in Craig Callender's (2021) arguments for the rational permissibility of non-exponential time discounting when these arguments are viewed in a conditional form: viz., if one thinks that time discounting is rationally permissible, as the social scientist does, then one should think that non-exponential time discounting is too. However, time neutralists believe that time discounting is rationally impermissible, and thus they take zero time discounting to be the normative standard. The time neutralist rejects time discounting because they think it is rationally impermissible to prefer to live a worse life in expectation because of arbitrariness. Callender’s attack on the time-neutralist position is the following: the time neutralist relies on a non-arbitrariness argument that assumes the existence of nonexistent 'pure' time preferences. In response, I aim to clarify the time-neutralist position and show that the non-arbitrariness argument does *not* rely on the existence of pure time preferences. Instead, the debate between time neutralism and permissivism about time discounting boils down to a methodological question: can we ever criticize the content of preferences? If so, we should embrace time neutralism.

You are taking part in an extremely serious scientific experiment. Before you lie the cookies, and they look oh-so-tasty. Across the table, a woman in a white lab coat clears her voice and says sternly, “You can have one of these cookies now or two of them tomorrow. We need to know what you prefer and what considerations are relevant to your preference.”

You’re tempted to take one cookie now. Why is that? You can think of many considerations. Perhaps the researcher is lying, and you won't get any cookies tomorrow, or tomorrow you might not be in the mood for cookies, or by then, the cookies might be stale. These considerations all seem relevant. But if you’re honest with yourself, something else sticks out most in your mind. You inform the woman: “I want one cookie now. I guess the main thing is that I get to eat it sooner than I get to eat the two cookies.”

Next, she says you can have one cookie in seven days or two cookies in eight days. Now you feel pulled toward choosing to wait for an extra cookie. Why is that? The considerations concerning staleness and mood no longer seem quite as pressing. Nevertheless, as before, something else sticks out in your mind. You say: “I want two cookies eight days from now. Getting a cookie a day sooner no longer seems relevant, because I already have to wait seven days.”

You notice the woman briefly glance at the enormous mirror to your left. You get the feeling that she disapproves. She begins scribbling in her notepad.

Are you being irrational? And if so, where? There are three views on this — first, the strictest. Time neutralists believe that a problem is apparent right at the beginning. Basing your preferences, even partly, on mere temporal distance from the present is arbitrary, and your arbitrariness lowers the overall amount of pleasure you receive in expectation by your own lights. Thus, favoring one cookie now because you get to have a cookie sooner is irrational.[[1]](#footnote-1)

Second, there is the social scientist's view. They think that the problem becomes apparent only after you answer the second question. If a one-day wait pushes you to prefer one cookie now over two cookies tomorrow, then a one-day wait should push you to prefer one cookie in seven days over two cookies in eight days. For consider: seven days from now, your situation will be relevantly similar to your current one. And thus, seven days from now, you will again prefer one cookie sooner. Your attitudes indicate a *dynamic inconsistency* in your preferences.

Finally, there is the permissive view. According to this view, there is no irrationality apparent in the story. The permissivist accepts that your choice to have a cookie sooner means that you get less pleasure overall in expectation, as the time-neutralist points out. But that’s OK — you reduce your overall pleasure to get *sooner* pleasure. And, as the social scientist points out, you’re dynamically inconsistent. But that’s OK too. You’ll choose now to wait for an extra cookie in eight days, then later you’ll wish you hadn’t, and then a bit later you’ll again be happy you had. There’s no *synchronic* inconsistency in this.

These are our three players: the time neutralist, the social scientist, and the permissivist. Our focus will be on Craig Callender’s (2021) thought-provoking arguments for permissivism against the social scientist and, ostensibly, the time neutralist. Each player has a different view on the rational permissibility of *near bias*: the systematic preference for good things to be temporally near and bad things to be temporally distant. The time neutralist claims that near bias is rationally impermissible, the social scientist that it is rationally permissible only when dynamically consistent, and the permissivist that it is rationally permissible even when dynamically inconsistent.

In this paper, I will attempt to show that Callender's arguments best support a conditional conclusion: if one thinks near bias is rationally permissible, as the social scientist does, then one should think that dynamically inconsistent near bias is too. First, I explain how the debate over “near bias” in philosophy connects with the debate over “time discounting” in the social sciences, and how the time-neutralist’s position on the rationality of time discounting differs from the social scientist’s (see Section 1). I then respond to Callender’s attack on time neutralism: he claims that the “non-arbitrariness argument,” which is favored by time neutralists, relies on the existence of “pure time preferences.” I will show that this claim is false: the non-arbitrariness argument does not assume the existence of pure time preferences (see Section 2). With this established, I argue for the paper's main claim: that the real contenders in the debate over near bias are the time neutralist and permissivist, and that the debate boils down to the question of whether we can normatively criticize the content of preferences (see Section 3).

1. Conceptualizing the Debate Over Near Bias and Time Discounting

The social scientist loves to measure things, and thus they attempt to quantify near bias. Hence, discussions of the rationality of near bias that engage with the social sciences often use the term "time discounting.” A discount rate is a function for determining how much an agent discounts the value of something based on its distance from the present. Some discount functions (e.g., typical hyperbolic functions) create dynamic inconsistency. Other discount functions (e.g., exponential functions) do not create dynamic inconsistency. Because of their aversion to dynamic inconsistency, the social scientist (usually) claims that near bias is only rational when it can be described using an exponential function.

When we talk about what the social scientist claims about discounting, we must be careful to distinguish between the discounting of pleasure (or utility, welfare, or other related concepts) and the discounting of money or goods. When economists discount, they often worry about things like the time-value of money, decreases to marginal value as consumption increases, or other economic considerations — in other words, their discounting reflects a multitude of factors relevant to economic cost-benefit analysis that have nothing to do with near bias. The disagreement between our players concerns whether it is rationally permissible to discount pleasure itself (or some related concept) based on temporal distance, and if so, in what way.[[2]](#footnote-2) John Broome (1999, 46) calls discounting pleasure itself (or some related concept) “pure” time discounting. The rationality of pure time discounting is what is at question.

The “pure” label is potentially misleading because economic discounting reflects a multitude of factors simultaneously. Thus, the pure discounting of pleasure might happen in an analysis that also discounts for considerations unrelated to pleasure, like the time-value of money.[[3]](#footnote-3) Nevertheless, as long as we make it clear that we’re just talking about the discounting of pleasure or welfare — i.e., the “pure” part of time discounting — then we can state the disagreement over the rationality of near bias using the social scientist’s preferred “discounting” terminology: the permissivist thinks non-exponential discounting is rationally permissible, the social scientist demands exponential discounting, and the time neutralist demands zero discounting.

Most of Callender’s arguments for permissivism focus on attacking the social scientist. To allow for time discounting but require it to be *only* exponential, the social scientist must appeal to several axioms. Callender points out weaknesses in the motivations for these axioms. Of particular weakness is the motivation for the “invariance” axiom, which claims that one’s time preferences should not change due to the mere passing of time. I agree with Callender that this axiom is suspect: if it is rationally permissible for different agents to discount at different rates, why must an agent always stick to the same rate?

Callender even supplies a plausible theory of error for the social scientist, which explains what *really* motivates their rejection of permissivism, and how this motivation has been corrupted and twisted into support for exponential discounting. I agree with the spirit of this theory of error (though I propose some amendments to it in Section 3).

So, I think Callender’s arguments against the social scientist are compelling. But in what way do they concern the time neutralist? Callender (1, fn. 1) points out that, mathematically speaking, an exponential discount function may result in zero discounting**.** Thus, on Callender’s way of viewing things, the time neutralist is in the same camp as the social scientist.

Callender’s conceptualization of the debate makes for strange bedfellows. It masks a deep-seated disagreement between social scientist and time neutralist: one allows for time discounting and the other does not. That is to say, the time neutralist puts the restriction at zero discounting while the social scientist allows discounting but requires it to be exponential.[[4]](#footnote-4) And behind this talk of discounting, there is a more fundamental disagreement: is near bias, in any form, rationally permissible? In answering this question, the time neutralist is on one side, and the social scientist and permissivist are on the other.

Callender goes further than merely placing social scientists and time neutralists in the same camp: he claims that the social scientist can appeal to the time neutralist’s non-arbitrariness argument to justify the invariance axiom. This is his “new master argument” for exponential discounted utility theory (Section 3.2).[[5]](#footnote-5)

Consider an application of the invariance axiom. It’s January 1st. You can have a smaller reward today or a larger reward at the end of January. Which do you prefer? Now it’s March 1st. You can have the same smaller reward today or the same larger reward at the end of March. Invariance says that whatever you preferred on January 1st, you should also prefer on March 1st. How can this axiom be justified?

Callender claims that social scientists can justify the axiom by appealing to the arguments of time neutralists. He presents quotes from three time neutralists: Adam Smith, Henry Sidgwick, and John Rawls (p. 15). Here is the quote from Rawls (more on the other two below):

The mere difference of location in time, of something’s being earlier or later, is not a rational ground for having more or less regard for it. (1971, 259)

Callender identifies this as a non-arbitrariness argument and claims that it can be used in support of invariance.

Pace Callender, the time neutralist’s non-arbitrariness argument *cannot* be used to support invariance or exponential discounted utility theory. Let me illustrate the problem with the help of an analogy. Imagine you’re debating tax rates. Your opponent claims that tax rates should be flat. You hold a more permissive view: progressive tax rates are also justifiable, depending on the circumstances. To defend their view, your opponent appeals to a quote from libertarian anarchist Gerard Casey (2012, 1), who writes, “States are criminal organizations…. In taxing the people of a country, the state engages in an activity that is morally equivalent to theft and robbery.” Thus, your opponent concludes, only flat tax rates are justifiable.

You should find this argument curious. Casey is advocating for *zero* tax rates, and not for flat tax rates. It is misleading to say that Casey’s argument supports flat rates over progressive ones, and it’s certainly false to say that it supports your opponent’s tax scheme. Casey’s conclusion contradicts your opponent’s proposal.

This argument over tax rates and Callender’s new master argument for exponential time discount rates suffer from the same problem. It is misleading to say that the non-arbitrariness argument supports invariance: invariance says that your time discount rate, *whatever it is*, should remain the same. Time neutralists like Rawls are saying that your time discount rate should always be *zero* (otherwise, you are reacting to “the mere difference of location in time”).[[6]](#footnote-6) And the conclusion of the non-arbitrariness argument *contradicts* the claim that invariance supports: that exponential time discount rates are the normative standard. The non-arbitrariness argument concludes that zero time discounting is the normative standard.

The same is true of the quotes from Sidgwick and Smith. The claim that "my feelings next year should be just as important to me as my feelings next minute" (Sidgwick, 1871, 113) or that a person's "present, and what is likely to be their future situation, are very nearly the same" (Smith, 1790, VI.i.11) each support the strict view that an agent’s time discount rate must always be zero. So, these philosophers cannot be used to support invariance or exponential discounted utility theory.[[7]](#footnote-7) Their arguments support time neutrality — zero time discounting — and not exponential discounting.[[8]](#footnote-8)

In sum, I hope to have shown in this section that the theories of time neutralists and social scientists are distinct, and they have distinct motivations. Callendar’s arguments would be strengthened if the distinction between social scientist and time neutralist were not papered over. Indeed, at least from the perspective of a time neutralist, many of Callender’s arguments against the social scientist are compelling when viewed in a conditional way: *If* you allow time discounting, you shouldn't restrict the allowance to exponential discounting. The invariance axiom is an excellent place to focus: if we allow that it is rationally permissible for different agents to employ different time discount rates, what justification could there be for making the same agent stick to the same rate?

2. The Irrelevance of ‘Pure’ Time Preferences

As shown in the last section, the time neutralist’s non-arbitrariness argument does not support exponential discounted utility theory, and thus Callender’s new master argument does not succeed. However, Callender (2021, 22–4) thinks that his new master argument fails for a different reason: he claims that the time neutralist’s non-arbitrariness argument relies on the false assumption that ‘pure’ time preferences exist. If this is true, then this would be terrible news for time neutralists. If exponential discounted utility theory is unmotivated, and time neutralism is based on a false assumption, then Callender would be justified in rejecting both of these views.

However, the time-neutralist position does not rely on the existence of pure time preferences. To anticipate: time neutralists and their non-arbitrariness argument rely on the rejection of preferences *partially* grounded in temporal nearness. The non-arbitrariness argument does not require nearness to be the only relevant consideration. Let me first review Callender’s complaint before explaining this response is more detail.

What are pure time preferences, and why does Callender think they are the target of the non-arbitrariness argument? According to Rosemary Lowry and Martin Peterson (2011, 490), a pure time preference is “a preference for something to come at one point in time rather than another … merely because of when it occurs in time.” On Lowry & Peterson's way of viewing things, the rejection of such preferences as arbitrary is the centerpiece of the time-neutralist view. They describe the time-neutralist position as follows: “If people prefer to enjoy something now rather than later, for no other reason than time itself, then this is an irrational concern.” Thus, Lowry & Peterson conceive of time neutralists and their non-arbitrariness argument as attacking pure time preferences.

However, according to Callender, pure time preferences do not exist. First, Callender points to aging: one’s preferences regarding expensive purchases, children, and other significant decisions have a different character as one ages due to the creeping prospect of death (p. 23). Even ignoring death, we must consider anticipated age-related changes to one’s attitudes and capacities for particular enjoyments. These considerations, Callender explains, are both impure and ubiquitous. Second, Callender argues that basic physics considerations like *entropy increase* are an ever-present influence on our temporal perspective (p. 23). Entropy increase is a consideration separate from ‘time itself,’ and thus its influence makes preferences impure. These kinds of considerations are impossible to avoid in real life.

If pure time preferences do not exist in the real world, then we should question why they are relevant. Callender writes:

The people and preferences implicated [as irrational by the non-arbitrariness argument] are those that don’t associate temporal duration with any character at all (e.g., aging), don’t know that life is finite, and more. Even if we admit that discounting in such “pure” worlds is irrational, we still face a serious question of why that is relevant in our world and to us…. I’m pointing out that the process of “purifying” takes us to possible worlds that are so remote as to have little relevance to how you should actually discount. (p. 23)

Thus, Callender concludes that the non-arbitrariness argument only applies to merely imagined situations that are not relevant to reality.

Callender’s argument is valid but an assumption on which it is based is false. If the Lowry & Peterson framework for understanding the non-arbitrariness argument were correct, then Callender would be drawing true conclusions.[[9]](#footnote-9) However, the Lowry & Peterson framework is incorrect: the time-neutralist’s non-arbitrariness argument applies not just to pure time preferences but also to preferences that are partially determined by time bias (we can call preferences at least partially determined by temporal nearness “near-biased preferences”). Therefore, the conclusion that pure time preferences do not exist in the real world poses no threat to the non-arbitrariness argument.

Consider the vignette with which we began. Recall that while you viewed many considerations as relevant to your decision for one cookie sooner over two cookies later, you acknowledged that temporal nearness was a significant influence. We then concluded that because of this, the time neutralist views your preference as irrational. We granted that you might prefer to have one cookie sooner partly because of nearness and partly because of something else. You might say, “I like that the one cookie occurs nearer to the present, and I also like that getting the one cookie is more probable than getting the two cookies. I like both of these things, and that’s why I prefer one cookie sooner.” This, then, is not a pure time preference. Does that mean that we can’t debate whether the preference involves arbitrariness? I don’t think it means that.

What we should say is the following: multipleconsiderations go into your preference for one cookie sooner. One consideration is temporal nearness, and one consideration is probabilities (and perhaps other considerations are aging, entropy increase, and so on). Everyone agrees that preferring things based on probabilities can be rational. But is temporal nearness, in itself, a rationally permissible consideration? That is the crux of the debate between time neutralists and supporters of near bias. Time neutralists, like Rawls, claim that, intuitively, temporal nearness is an arbitrary consideration (or an arbitrary “ground,” as Rawls puts it). In doing so, Rawls can point to your choice over the cookies: he need not appeal to “remote” worlds that have been “purified.”

Let me fill more of the details to help clarify and emphasize the point. Lowry & Peterson follow Rawls in using the term “grounds” to refer to the considerations relevant to your preference. They (2011, 493) explain: “The ‘grounds’ on which you prefer something are the set of considerations which lead to your having the preference, and which would justify the preference, were they considerations of the right kind.”[[10]](#footnote-10) While Lowry & Peterson disagree with Rawls that temporal nearness is a rationally impermissible ground for a preference, they do agree that sometimes a ground can be rationally impermissible. They write:

A preference may be based on irrational grounds…. For instance, suppose you have the following (admittedly bizarre) preference: You prefer to eat from the cheap fish and chip shop on the grounds that it offers a higher chance of food poisoning. If you have no more to say about this preference (i.e., you cannot offer any further reason, such as that you would like an excuse to call in sick to work tomorrow), then the fact that the cheap fish and chip shop offers a higher chance of food poisoning, is a reason to not have a preference for eating at the cheap fish and chip shop. (493–4)

Lowry and Peterson say that your preference is irrational “if you have no more to say” in favor it other than that you might get food poisoning, but notice that the preference might still be irrational even if you *can* say something more. You say, “the fish and chip shop is both likely to give me food poisoning *and it’s cheaper*.” Does this now make for rationally permissible grounds? Clearly not. If the preference wasn’t rational before, it isn’t rational now.

Most importantly, if someone were to claim that the chance of food poisoning is *never* the *entire* grounds for any real person’s preference, would that change things? That is to say, would the food-poisoning ground be rational if no real people ever displayed a ‘pure’ food-poisoning preference for one fish and chips shop over another? Again, no.

That is, in essence, my proposal for how to think about the debate over the arbitrariness of near bias.[[11]](#footnote-11) The debate concerns whether the mere fact that something will occur sooner rather than later is a rational ground for one’s preferences. If one thinks that this is an irrational ground, then one should continue to think that the preference it supports is irrational even if the agent has other grounds. And if temporal nearness is never the sole ground for real people’s preferences, then one can still claim that preferences with such a ground are irrational. Whether pure near-biased preferences exist is irrelevant to the question of whether temporal nearness is an arbitrary ground.[[12]](#footnote-12)

3. A Plea for Time Neutrality

Now let us turn to the normative standard for (impure) near-biased preferences. Are preferences that are at least partly grounded on temporal nearness rationally permissible?

My personal view is that near-biased preferences are rationally impermissible.[[13]](#footnote-13) However, I’d first like to emphasize a slightly weaker and, given the state of the academic literature (at least outside of philosophy), more important, claim. The claim is that the open options in the debate over near bias are permissivism and time neutrality, and given the history of social science — especially that of economics — social scientists are better served by embracing time neutrality. That is, if forced to choose between a permissive theory of near bias that allows for non-exponential time discounting and a time-neutral theory that requires zero time discounting, there are, at the least, some very good reasons for social scientists to side with zero time discounting.

In adjudicating this battle for the hearts and minds of social scientists, it is crucial to understand the underlying intuitive and methodological commitments that have caused social scientists to mistakenly think that exponential time discounting is the normative standard. Callender suggests that what economists who criticize non-exponential time discounting really dislike, deep down, is *steep time discounting*. He writes, “I suspect that part of the moralizing about hyperbolic functions is a relic of the old neoclassical economic or philosophical outcry against steep discounting” (p. 17). He claims that this transfer of moralizing over time, from steep to hyperbolic time discounting, is unjustified. As Callender points out:

Hyperbolic discounters are typically introduced as impulsive characters, people who are unwilling to make now-for-later sacrifices, unable to get up when the alarm clocks sound, and so on. Ignore all of that moralizing and psychologizing. Hyperbolicity, of course, concerns only the form of the discounting function, not the content of the preferences nor the value of the discount rate. The exponential discounter can have preferences for gluttony, greed, exercise avoidance, and more. They may care only about the moment. (p. 16)

Callender is exactly right about this latter point: exponential discounters can be just as gluttonous, greedy, or lazy as hyperbolic discounters. The difference between the two does not lie in their attitude to now-for-later sacrifice, but in their dynamic consistency.[[14]](#footnote-14)

That said, why does Callender claim that the “relic” of neoclassical economics is a sentiment against *steep* time discounting and not against *time discounting*? In his overview of neoclassical economics (Section 2.1), steepness is never mentioned. Callender presents a quote from W. S. Jevons (1871, 72) supporting time-neutralism: “All future events, all future pleasures or pains, should act upon us with the same force as if they were present, allowance being made for their uncertainty … time should have no influence.” Callender then claims that "most in this period agreed that time preference is a kind of character or psychological flaw," and he goes on to discuss more thinkers who argued against “not valuing the future as the present” (p. 4).

The natural conclusion of Callender’s review is that these neoclassical economists were time neutralists: they advocated for zero time discounting. Therefore, either there is more to the story than what Callender presents in his Section 2.1, or it is a mistake to claim that the legacy of neoclassical economics has left contemporary economists with an aversion to steep time discounting. If these neoclassical economists have left a legacy concerning time bias, it is one that nudges towards time neutrality.

Here is an alternative version of the theory. The neoclassical economists were against time discounting and not just steep time discounting; in other words, they were time neutralists. This is clear in their thesis statements. If they tended to focus on steep time discounting in their examples, it was only because negative outcomes manifest more obviously with steep discounting.

The neoclassical argument goes something like this. If, by one’s own estimation, the probabilities and other non-temporal factors line up in a way that would justify a now-for-later sacrifice, but one is unable to make such a sacrifice, then the person prefers to live a worse life overall. This is irrational.

Fast forward now to the "preferences are preferences era" of economics (Callender, 6). This revolution rejects normative evaluation of the content of preferences and instead allows only for sets of preferences to be judged for consistency. Economists now find themselves in a bind. They don't like time discounting any more than the neoclassical economists did, but the preferences-are-preferences methodology rejects normative criticism of the content of preferences. The compromise? They go as far as possible in criticizing time discounting based on consistency alone. Thus, they introduce the concept of “dynamic inconsistency.”

The problem is that dynamic inconsistency is not the same sort of thing, normatively speaking, as synchronic inconsistency. And so the economist has stretched consistency reasoning past where it can reasonably go.

Even though this explanation is similar in spirit to Callender’s, I find it more plausible in its focus on how developments in social science have been influenced by intuitions in favor of time neutralism and not intuitions against steep discounting. And if intuitions in favor of time neutralism continue to have this sort of influence on the social sciences despite the preferences-are-preferences methodology — a methodology that seemingly rolls out the red carpet for permissivism — then that offers some prima facie support for time neutralism over permissivism.

Another point on which our explanations differ concerns the causal influence of the neoclassical economists. I don’t think these economists *caused* a distrust of time discounting through their legacy. Instead, I claim that the attractiveness of time neutralism is the common cause of dislike for time discounting amongst neoclassical economists, philosophically-minded modern economists, and philosophers. For anyone not in the grip of the preferences-are-preferences methodology, near bias should appear extremely unattractive. For consider what it means to be near-biased. Such an agent makes intuitively arbitrary distinctions. Such an agent prefers to lead a worse life in expectation, by their own lights. Indeed, a near-biased agent *prefers to live a worse life by their own lights because of their arbitrariness.* If we *ever* want to criticize the content of preferences, isn’t this the place?

Thus, as the social sciences emerge from the preferences-are-preferences era, social scientists would be best served by returning to time neutralism and not embracing permissivism. If social scientists wanted to embrace permissivism, then this should have happened long ago. Philosophical reflection amongst philosophers and social scientists alike supports time neutralism; it is only the restriction on evaluating the content of preferences that prevents social scientists from fully endorsing it.

4. Conclusion

I have argued for three main claims. First, 'pure' time preferences are irrelevant to the time-neutralist's non-arbitrariness argument. Instead, the time neutralist claims that temporal nearness is an irrational ground for a preference — regardless of whether it serves as the only ground. Second, with the non-arbitrariness argument clarified, Callender’s arguments against exponential time discounting leave the time-neutralist position unscathed. Third, if one is committed to evaluating only the consistency, and not the content, of preferences, then one should adopt permissivism about near bias; i.e., a theory of rational time discounting that allows for non-exponential discounting. If one does allow for at least some normative criticism of the content of preferences, then time-neutralism (i.e., zero time discounting) is the best normative standard. In neither case should one view exponential discounting as the normative standard.[[15]](#footnote-15)

*References*

David O. Brink. Prospects for temporal neutrality. In Craig Callender, editor, *The Oxford Handbook of Time*. Clarendon Press, 2010.

John Broome. Discounting the future. *Philosophy and Public Affairs*, 23(2):128–56, Spring 1994.

John Broome. *Ethics out of Economics*. Cambridge University Press, 1999.

Craig Callender. The normative standard for future discounting. *Australasian Philosophical Review*, 2021.

Gerard Casey. *Libertarian Anarchy: Against the State*. Continuum, 2012.

Tom Dougherty. Future bias and practical reason. *Philosophers’ Imprint*, 15(30):1–16, 2015.

Shane Frederick, George Loewenstein, and Ted O’Donoghue. Time discounting and time preference: A critical review. *Journal of Economic Literature*, XL:351–401, 2002.

Preston Greene and Meghan Sullivan. Against time bias. *Ethics*, 125(4):947–70, July 2015.

William Stanley Jevons. *Theory of Political Economy*. Macmillan, 1911 [1871].

Tjalling C. Koopmans. Objectives, constraints, and outcomes in optimal growth models. *Econometrica*, 35(1):1–15, 1967.

Rosemary Lowry and Martin Peterson. Pure time preference. *Pacific Philosophical Quarterly*, 92:490–508, 2011.

John Rawls. *A Theory of Justice*. Belknap Press, 1971.

Henry Sidgwick. *The Methods of Ethics*. Macmillan, 1874.

Adam Smith. *The Theory of Moral Sentiments*. Oxford University Press, 1790.

Dilip Soman, George Ainslie, Shane Frederick, Xiuping Li, John Lynch, Page Moreau, Andrew Mitchell, Daniel Read, Alan Sawyer, Yaacov Trope, and Klaus Wertenbroch. The psychology of intertemporal discounting: Why are distant events valued differently from proximal ones? *Marketing Letters*, 16(3–4):347–60, 2005.

R. H. Strotz. Myopia and inconsistency in dynamic utility maximization. *The Review of Economic Studies*, 23(3):165–80, 1955–6.

Meghan Sullivan. *Time Biases: A Theory of Rational Planning and Personal Persistence*. Oxford University Press, 2018.

1. See Greene & Sullivan’s (2015, 950–2) discussion of the “philosophical view” of near bias. The final piece of the case against near bias is an evolutionary debunking theory of its origin (For elaboration and further references see Greene & Sullivan, 966–7). [↑](#footnote-ref-1)
2. While it seems that this is a real disagreement between the time neutralist and social scientist at the level of individual preference, it is unclear how far the disagreement spills over into debates concerning economic policy. Broome (1995, 128–9) writes, “When economists and philosophers think of discounting, they typically think of discounting different things. Economists typically discount the sorts of goods that are bought and sold in markets, which I shall call *commodities*. Philosophers are typically thinking of a more fundamental good, people’s *well-being*. There are sound reasons to discount most commodities, and there may well be sound reasons not to discount well-being. It is perfectly consistent to discount commodities and not well-being.” [↑](#footnote-ref-2)
3. See, for example, the US Environmental Protection Agency’s *Guidelines for Preparing Economic Analyses*, 6-2. [↑](#footnote-ref-3)
4. Callender’s conceptualization fuses what Greene & Sullivan (2015, 949–53) call the “philosophical view” (which supports time neutralism) with the “economic view” (which supports exponential discounting). [↑](#footnote-ref-4)
5. Callender does not endorse the new master argument. He rejects it for a different reason than the one I present in this section (I discuss Callender’s reasoning in Section 2). [↑](#footnote-ref-5)
6. There is a different (but related) problem with using Rawls to support the invariance axiom. He claims that preferences for “something” should not be affected by that thing “being earlier or later.” In contrast, invariance is about how preferences change depending on *the agent’s location in time*. Thus, Rawls’ quote and invariance concern different issues. (See also Footnote 6) [↑](#footnote-ref-6)
7. Invariance concerns how the agent’s preferences are affected by *the agent’s* location in time, and not by the location of the agent's feelings or situation. So, as with Rawls, these quotes and invariance seem to be talking about different issues. [↑](#footnote-ref-7)
8. The historical sources that *do* seem to support exponential discounting as the normative standard are Strotz (1956) and the economists that followed him. (See Callender's Section 2.3) [↑](#footnote-ref-8)
9. Callender (p. 15) claims that his understanding of the non-arbitrariness argument comes from both Lowry & Peterson (2011) and Sullivan (2018). However, his discussion of pure time preferences draws only on the Lowry & Peterson framework. Sullivan (2018, 36, emphasis added) writes: "At any given time, a prudentially rational agent's preferences are *insensitive* to arbitrary differences.” Thus, Sullivan’s version of the non-arbitrariness argument speaks only of the “sensitivity” of one’s preferences to mere temporal location, and not of pure time preferences. See also Brink, 2010, 343: “[Temporal neutrality] requires that agents attach no normative significance per se to the temporal location of benefits and harms within someone’s life,” and Dougherty, 2015, 2: “Our preferences should be grounded in facts about the values of various lives, and these values are unaffected by temporal perspective.” Each argument seems to allow that preferences can be sensitive to arbitrary distinctions even when impure. [↑](#footnote-ref-9)
10. A ground seems most noteworthy when your preference ordering would change were it removed. Greene & Sullivan’s (2015, 948) definition of near bias can be interpreted as picking out situations where this kind of counterfactual dependence obtains for the nearness ground. [↑](#footnote-ref-10)
11. A similar proposal applies to the debate over the arbitrariness of future bias. [↑](#footnote-ref-11)
12. This conclusion does not take away from Callender’s point that it is currently impossible for behavioral economists and psychologists to prove whether, and in what way, temporal nearness is a ground for real people’s preferences (p. 25). Indeed, in their reviews of this literature, Frederick et al. (2002) and Soman et al. (2005) draw the same conclusion. However, claiming that temporal nearness as a ground has not been proven is different from claiming that it does not exist. Sensitivity to temporal nearness may have evolved as a heuristic for probability judgments, alongside our many other probability heuristics. This possibility, combined with the phenomenology of intertemporal choice and the (weak) experimental evidence, makes the existence of temporal nearness as a ground plausible. Nevertheless, if Callender accepts that temporal nearness is an irrational ground but denies that it serves as a ground for real people’s preferences, then our disagreement over time bias would only involve an empirical claim. [↑](#footnote-ref-12)
13. My only reservation about this claim stems from what Tjalling Koopmans (1967, 8) called the “paradox of the indefinitely postponed splurge." A desire to avoid the paradox may motivate an allowance for a very slight near bias, and only in the context of eternal life. However, this allowance for near bias is unlike the permissivist's or social scientist's — so unlike, in fact, that I think of it as part of the time-neutralist position. [↑](#footnote-ref-13)
14. For example, both the hyperbolic and exponential discounter might be equally unable to exercise early in the morning. The difference is that the exponential discounter never sets the alarm, while the hyperbolic discounter sets the alarm and then ignores it. [↑](#footnote-ref-14)
15. I thank Tom Dougherty, Kristie Miller, James Norton, and Travis Timmerman for helpful comments on an earlier draft. [↑](#footnote-ref-15)