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ORIGINAL RESEARCH

Against a normative asymmetry between near- and future-bias

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Abstract

Empirical evidence shows that people have multiple time-biases. One is near-bias; another is future-bias. Philosophical theorising about these biases often proceeds on two assumptions. First, that the two biases are *independent*: that they are explained by different factors (the independence assumption). Second, that there is a normative asymmetry between the two biases: one is rationally impermissible (near-bias) and the other rationally permissible (future-bias). The former assumption at least partly feeds into the latter: if the two biases were not explained by different factors, then it would be less plausible that their normative statuses differ. This paper investigates the independence assumption and finds it unwarranted. In light of this, we argue, there is reason to question the normative asymmetry assumption.

Keywords Future-bias · Near-bias · Rationality · Temporal preferences · Experimental philosophy

[1] In what follows we will talk of the location of events, rather than goods, since we will be particularly interested in the location of certain experiences. But nothing is intended to hang on this.

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1 Introduction

Someone is time-biased with respect to some event[1] just in case they have a preference for where in time that event is located, and that preference is sensitive to where in time that event is represented as being. Sometimes this is couched as the claim that they have that preference all else being equal. We think that is not quite right (for reasons that will become apparent later), but for now it will do no harm to think of time-bias in this manner.

So, consider Annie the labradoodle. Annie might prefer to eat her liver cake now, or to eat her liver cake at the end of the day. Suppose Annie prefers to eat the liver cake now. There are various reasons this might be so. Perhaps she thinks that the liver cake will get progressively staler throughout the day, and hence that the liver cake later in the day will be intrinsically less valuable than the liver cake now. Perhaps she thinks it entirely likely that someone else will eat the liver cake during the day if she does not eat it now, so she thinks that the probability of *in fact eating* the liver cake if she decides to eat it now, is much higher than the probability of *in fact eating* the liver cake should she choose to eat it later. Perhaps she thinks that while she is hungry for liver cake now, by the end of the day she will be full. So, the value of the liver cake to her future self is less than the value of the liver cake to her current self.

If factors like these are the sole reasons for Annie's preference—such that absent such factors she would have no preference about when she eats the liver cake—then we will say that her preferences with respect to the temporal location of the liver cake are *time-neutral.* If, however, holding fixed such factors, Annie still prefers the liver cake now, to the liver cake later, then she exhibits a time-bias. In particular, she is *near-biased.*[2]

An agent is near-biased if she tends to prefer that positive events are located temporally near to her, and that negative events are located temporally far from her, holding fixed relevant factors (or, for now, if she has that preference all else being equal).

The conditions under which people are near-biased, the events or goods about which they are near-biased, and the amount by which they are near-biased,[3] has been extensively researched in behavioural economics and psychology.[4] While there is a good deal of intra-personal and inter-personal variation in near-bias even when we limit ourselves to considering the same events (or goods) and even more when we consider different kinds of events or goods,[5] in general it has been shown that people *devalue* future events in a particular way. In particular, we discount those goods according to a hyperbolic function.[6] While there is general agreement that hyperbolic discounting is irrational, there is much less agreement about whether near-bias itself is irrational, or whether it is only irrational when it leads to dynamical inconsistency.[7] Philosophers

[2] In economics and psychology this is sometimes known as having a high time preference (as opposed to having a low time preference). For example, see Fredrick et al. (2002) and Lawless et al. (2013).

[3] Known as the temporal discounting rate: the rate by which we discount the value of a good or event as it becomes more temporally distant from us.

[4] For an overview of work in this area see Lowenstein and Elster (1992).

[5] See Frederick et al. (2002) for an informative meta-analysis.

[6] See Ainslie and Haslam (1992).

[7] See Callender (forthcoming http://philsci-archive.pitt.edu/15451/) for discussion.

have typically taken the former view,[8] and contemporary economists the latter.[9] That is because most philosophers have thought that there is simply no reason to value the utility of temporally nearer selves over the utility of temporally more distant selves.

Near-bias is not the only kind of time-bias. Philosophers have long supposed, going back at least to Hume (1738), that humans exhibit a *bias toward the future.* When it comes to our own pleasant and unpleasant experiences, holding relevant factors fixed (again, for now we can think of this as all else being equal) we prefer that pleasant experiences are located in the future rather than the past, and that unpleasant experiences are located in the past rather than the future. So, for instance, suppose that holding fixed relevant factors (such as the painfulness of the procedure, the deftness of the surgeon, the length of the operation, the likelihood of infection, and the probability of the operation in fact occurring) Annie prefers that her painful dental operation be located in the past rather than the future. And suppose that holding fixed relevant factors (such as the tastiness of the liver-cake, the probability she will receive the cake, and the value of the cake to her recipient self) Annie prefers the experience of eating her liver-cake be located in the future rather than the past. Then her preferences, about these positive and negative events, are future-biased.

While philosophical discussion of the normative status of future-bias has bourgeoned over the last ten years,[10] there are still only a handful of studies that probe the conditions under which we are future-biased.[11]

Until relatively recently it was more or less orthodoxy for philosophers to suppose that near-bias and future-bias have a different normative status. While most philosophers supposed that near-bias was rationally impermissible, most supposed that future-bias was rationally permissible.[12] Call this the *normative asymmetry assumption.*

On the face of it the normative asymmetry assumption might seem puzzling. After all, if there is no reason to value the utility of temporally *nearer* selves, over the utility of temporally more *distant* selves, why should there be reason to value the utility of temporally *future* selves over the utility of temporally *past* selves?

Though this connection has not, to our knowledge, been made explicit, the normative asymmetry assumption has probably seemed reasonable in part because it has been assumed that the explanations for each bias are distinct: that the two biases are *independent*. If the biases are explained by two distinct sets of factors, then it is easy to see why one could be rationally permissible and the other not: one set of factors

[8] See Smith (1790) and Rawls (1971). As Sidgwick (1884, pp. 380–381) puts it "The mere difference of priority and posteriority in time is not a reasonable ground for having more regard to the consciousness of one moment than to that of another. The form in which it practically presents itself to most men is 'that a smaller present good is not to be preferred to a greater future good' allowing for difference of certainty.".

[9] See for instance Strotz (1956) Koopmans (1960), Lancaster (1963), and Fishburn and Rubinstein (1982).

[10] See *inter alia* Prior (1959) Parfit (1984), Hare (2007, 2013), Dougherty (2011, 2015), Greene and Sullivan (2015), Sullivan (2018), Dorsey (2018), Brink (2011), Maclaurin & Dyke (2002), Suhler & Callender (2012), Yehezkel (2014) and Pearson (2018).

[11] See Caruso, Gilbert & Wilson (2008), Greene et al. (2020a, 2020b, 2021a, 2021b, 2022a, 2022b, 2022c) Latham et al. (2020) and Lee et al. (2020).

[12] More recently there have been more philosophers defending a time-neutral view of future-bias, including Sullivan (2018), Dougherty (2011, 2015) and Greene and Sullivan (2015).

might render one bias rationally permissible, and the other set might render the other bias rationally impermissible.

For instance, if future-bias is explained and justified by some kind of asymmetry between the past and the future—an asymmetry that grounds its being rationally permissible to discount the value of past events compared to future ones—this asymmetry would not speak to the normative status of near-bias. We suspect that something like this thought either explicitly or tacitly underlies people's willingness to accept the normative asymmetry assumption.

However, as we will see shortly, our empirical investigation suggests that there is a *shared* explanation for both kinds of preference (though it does not directly speak to the question of what that shared explanation might be). We will thus have a lot to say in what follows about various *candidate* explanations for each of these biases. The most modest inference we can make from our results is that the shared explanation is merely a *partial* explanation. While it could be that the shared explanation is in fact a *complete* explanation for one or both biases, our arguments only presuppose that the candidate explanations are partial. Moreover, while we talk of 'the' shared partial explanation, there may be several shared partial explanations each of which partially explain both biases. Thus, it may be that several of the candidate explanations we consider are shared partial explanations.

In addition, we make no assumption that the candidate explanations we explore exhaust the space of potential explanations for these biases. Our discussion simply takes its cue from the growing literature seeking to explain these biases.

With this clarification in place, we can distinguish a stronger and a weaker version of the independence assumption. The *weak independence assumption* says that the two biases are independent insofar as their *complete* explanations are *different*. The *strong independence assumption* says that the two biases are independent insofar as their complete explanations do not overlap: their complete explanations are *disjoint*. The weak independence assumption entails that there is at least some partial explanation for one bias that is not an explanation for the other; the strong assumption entails that there is no partial explanation that is an explanation for both biases. In this paper we argue that the strong independence assumption is false.

Of course, the truth of the independence assumption, in either its strong or weak form, does not entail the normative asymmetry assumption. Still, if the strong independence assumption is true then explanatory considerations do nothing to undermine the plausibility of the normative asymmetry assumption. If it turns out that the two biases are explained by *entirely different* factors, that would provide no reason to suppose that they will share the same normative status (although of course they might). We suspect that something like this idea has prevented closer scrutiny of the assumption that there is a normative asymmetry between the two biases.

With that said, we will not argue that the weak independence assumption is false. One might think that if the two biases are weakly independent then this is all that is required to ground them having a different normative status. It just needs to be that there is *some* partial explanation of one bias that is not an explanation for the other, and that this confers a normative status upon one bias that is not conferred upon the other.

So, while we think that arguing against the strong independence assumption is important and goes some way to motivating more careful examination of the idea that the two biases have different normative statuses, showing this assumption to be false does not in itself show that the normative asymmetry assumption is false.

To make the case against the normative asymmetry assumption, then, we attempt to do two things. First, we argue that the various candidates to be the shared partial explanation of both biases would, in fact, confer the *same* normative status on each bias. Second, we argue that the remaining non-shared candidate partial explanations do not appear to be ones that ground the biases having a different normative status. Our paper can be seen as a challenge to those who defend the normative asymmetry assumption: to identify the explanatory factor(s) in virtue of which these preferences have a different normative status or provide us with a candidate factor that explains both, but which contributes a different normative status to each.

To be clear, our aim is not to decisively show that the two biases have the *same* normative status. Some of our arguments are, of necessity, somewhat programmatic. Rather, our aim is to shift the burden away from the assumption that the two biases have a *different* normative status and to invite a re-evaluation of their normative statuses, considered jointly. We begin by outlining recent relevant research (Sect. 2), before we outline the methodology and results of a pair of studies that we ran (Sect. 3). Finally, we consider the implications of our findings for the normative asymmetry assumption (Sect. 4).

2 Research to date

To date, while there has been extensive empirical investigation of near-bias, and some investigation of future-bias, each of these investigations has taken place in isolation. Let's begin by considering what is already known about the conditions under which people display future-bias.[13]

We will say that someone is *positively hedonically future-biased* if, holding fixed relevant factors, they tend to prefer positive hedonic events—pleasures—to be in their future rather than their past, and that they are *negatively hedonically future-biased* if, holding fixed relevant factors, they tend to prefer negative hedonic events—pains—to be in their past rather than their future. Recent empirical work has found evidence of both positive and negative hedonic future-bias (Caruso et al. (2008) and Greene et al. (2021a)).[14] Indeed, people are not only positively and negatively hedonically future-biased when the event in question is of intrinsically the same value whether it is past or future. Greene et al. (2022a) found that a significant majority of people are negatively hedonically future-biased even when ten negative past events are weighed against a single negative future event.

[13] For a recent overview of this research see Greene et al. (2022a, 2022b, 2022c, 2022d).

[14] Contrary to philosophical predictions—see footnote 10—recent evidence has also shown that people are future-biased about non-hedonic events (events which are good or bad for a person, but don't involve experiences of pain or pleasure). This is particularly so for negative non-hedonic events (Greene et al., 2021a).

Though there is relatively little evidence to guide theorising about why people are future-biased, several hypotheses have been offered. Latham et al. (2020) distinguish two broad kinds of explanations: temporal metaphysics explanations and practical irrelevance explanations.

Three clarifications are in order here. First, as we will see, these two kinds of explanation are not mutually exclusive. Second, the relevant question for the purpose of this paper is whether one, or both, of these kinds of explanation *at least partially* explain why we are future-biased, leaving open that there may be other partial explanations. Third, we consider some other candidate explanations later in the paper which fall into neither category.

Temporal metaphysics explanations appeal either to certain beliefs about temporal metaphysics, or to certain temporal phenomenologies. According to the temporal passage belief hypothesis, it is the fact that people believe that time robustly passes (that is, passes in the manner espoused by A-theorists) that explains future-bias (Craig, 2000; Prior, 1959; Schlesinger, 1976). Roughly, the idea is that to believe in robust temporal passage is to believe that future events are coming towards one, and past events are receding away from one. If we believe that we are growing progressively closer to future events, and further from past events, then it will make sense to prefer that positively valenced events are future (since then we are approaching them) and negatively valenced events are past (since then we are moving away from them). A second version of the temporal metaphysics explanation is the temporal phenomenology hypothesis, according to which it is the presence of a phenomenology as of robust temporal passage, which explains future-bias, rather than a belief in such passage. Again, the idea is that if it feels as though future events are moving towards us, and past events away from us, then it will make sense to prefer positively valenced events in the future, and negatively valenced events in the past.

Practical relevance explanations, by contrast, appeal to the practical irrelevance hypothesis. According to this hypothesis, past events are practically irrelevant due to our inability to causally influence those events, and thus we attach less evaluative weight to past events because since there is nothing, we can do to affect the past. We disvalue past events because they cannot count for, or against, present choices. Defenders of some version of the practical irrelevance hypothesis include Kauppinen (2018), Parfit (1984, p. 186), Horwich (1987, pp. 194–196), Maclaurin and Dyke (2002) and Suhler and Callender (2012). Latham et al. (2020) results provide some support for the practical irrelevance hypothesis, insofar as they found that when past events are made causally relevant, future-bias was mitigated (though not eliminated).

As just noted, these two explanations are not mutually exclusive. Indeed, not only could they *both* be partial explanations of our being future-biased, but these explanations might be importantly connected. Perhaps people believe that time robustly passes because it does, and perhaps the reason that past events are causally inaccessible and hence practically irrelevant is that time robustly passes, and the direction of causation is tied to the direction of robust passage. Then it might be that we are future-biased because we both believe that, and it seems as though, time robustly passes, and because past events are causally accessible, where the latter might be partially explained by time's robust passing. Moreover, it's worth clarifying that although many defenders of the practical irrelevance hypothesis reject the temporal metaphysics explanation

(including Suhler and Callender (2012) and Maclaurin and Dyke (2002)), they are not thereby suggesting that no aspect of temporal metaphysics plays any role in explaining future-biased preferences: they are simply denying that robust passage does so. It might very well be that part of the explanation of why past events are causally accessible appeals to temporal metaphysics (of the sort that B-theorists posit) even if it doesn't appeal to robust temporal passage.

While the empirical literature on future-bias is still in its infancy, there is a plethora of evidence about our patterns of near-biased preferences. We will say that someone is *prospectively positively near-biased,* if, holding fixed relevant facts, they tend to prefer that positive events are located in their near future rather than their far future, and that they are *prospectively negatively near-biased* if, holding fixed relevant facts, they tend to prefer that negative events are located in their far future rather than their near future. There is evidence that people are both prospectively positively near-biased and prospectively negatively near-based.[15] To a high level of abstraction, evidence shows that across a range of events people are both positively and negatively near-biased, and that they discount the value of future events hyperbolically.[16]

Having said that, evidence also shows that there are conditions under which people are not near-biased but instead are far-biased. We will say that someone is *prospectively positively far-biased*, if, holding fixed relevant facts, they prefer that positive events are located in their far future rather than their near future, and that someone is *prospectively negatively far-biased*, if, holding fixed relevant facts they prefer that negative events are located in the near future rather than the far future.[17]

So far, we've talked of holding fixed *relevant* facts. We noted in the introduction that it is often said that someone is time-biased just in case, all else being equal, they have a preference for where in time events are located. This, we think, is close enough for most purposes. But it is also potentially misleading, insofar as it can lead one to suppose that someone is time-biased just in case *all else being equal*, they have a preference for where in time events are located. We can see this when we consider the various explanations that have been offered for near-bias.

More carefully, when we look at these explanations we see that many of them are really only explanations of what we will call *apparent near-bias*. We will say that someone is *apparently time-biased* with respect to some event[18] just in case they have a preference for where in time that event is located. Someone is *apparently near-biased* with respect to some event just in case they prefer that the event is temporally near if it is positively valenced, and temporally far if it is negatively valenced. On this way of framing the matter, someone may be apparently time-biased because they are in

[15] For example, Thaler (1981) showed that people prefer less given money now to more money given later, and Hausman (1979) found that people were willing to buy cheaper air conditioners with higher operating costs down the line. For overviews see Soman et al. (1790), Frederick et al. (2002), Ainslie and Haslam (1992) and Hardisty et al. (2012).

[16] See Ainslie and Haslam (1992). However, different people discount at different rates, and indeed individuals discount different goods at varying rates; Frederick et al.'s (2002) meta-analysis reports discount rates ranging from 6% to infinity.

[17] See Loewenstein and Prelec (1991), Loewenstein (1987), Baker et al. (2003) and Estle et al. (2006) focus on prospective negative far-bias.

[18] In what follows we will talk of the location of events, rather than goods, since we will be particularly interested in the location of certain experiences. But nothing is intended to hang on this.

fact time-biased, or because they are *merely apparently time-biased:* their preferences might be entirely the result of relevant factors such as their judgments about the probability of some event occurring (e.g., Annie's concern about liver-cake theft), or about its intrinsic value when it does occur (e.g., Annie's concern about stale liver-cake).[19] In such cases people's preferences are not really sensitive to the temporal location of the event, they are only sensitive to facts about its probability and its value. It is time-biased preferences, not merely apparently time-biased preferences, whose normative status philosophers are interested in. For while everyone agrees that being sensitive to, say, the probability that an event will happen is rational, not everyone agrees that being sensitive to where an event is located in time is rational.[20]

So, in what follows when we talk of future-bias and near-bias we refer to biases that are *not merely apparent*. In other words, we refer to *genuine* biases (though we'll usually not repeat the modifier 'genuine').[21]

With this in mind, we can note that some experimenters do their best to avoid some confounds and thereby avoid testing for merely apparent near-bias. They have sought to isolate near-bias, by, for example, offering delayed monetary rewards on a prepaid debit card that will activate at the agreed time, to reassure participants that they will indeed receive a greater reward if they opt to wait.[22] While these experimenters are sensitive to the distinction between apparent near-bias and near-bias, this distinction is not always clearly drawn. So, in what follows we talk about psychological explanations of apparent near-bias: it should be borne in mind that some of these might also be explanations of (genuine) near-bias.

According to one prominent explanation of apparent near-bias, this pattern of preferences is the product of the functioning of three systems (Berns et al., 2007). The first is a valuation network, responsible for computing the subjective value of future events (Kable & Glimcher, 2007). The second is a self-control network responsible for the ability to delay gratifications through cognitive control and conflict monitoring (Hare, 2013). The third is a prospective memory network responsible of the representation of future outcomes (Peters & Buchel, 2010).

The preference to have positive events temporally close has been shown, at least in part, to issue from judgements about the probability of the event occurring as it becomes temporally more distant,[23] and from judgements about a lack of knowledge about what future selves will value.[24] We also know that apparent near-bias correlates with deficits in the prospective memory network. The hypothesis is that a diminished

[19] Or perhaps the reported preference is due to Phillips' (2021) *memory mistake* whereby the agent is really reporting a preference between a mere memory and a future experience, rather than between experiences at different temporal locations. Such a preference would be a merely apparent time-bias.

[20] Callender (forthcoming) argues that it is not so easy to distinguish between sensitivity to temporal location itself, and factors associated with temporal location. We are sympathetic to this general worry, but we think that the conceptual distinction being made here is still important.

[21] What we are calling time biased preferences, then, are what Lowry and Peterson (2011) call pure time preferences.

[22] See Lempert et al. (2020) for a recent example.

[23] See Keren and Roelofsma (1995), Johnson et al. (2020), Reynolds et al. (2008) and Weber and Chapman (2005).

[24] See Loewenstein and Angner (2002).

capacity for episodic future thinking (that is, prospectively imagining or simulating future events) explains this correlation and this is reinforced by the fact that teaching people to anchor time intervals to subject-specific real-life events significantly reduces people's tendency to discount the value of future events (Trope & Liberman, 2000). We also know that there is a correlation between increased rates of discounting and both mood and character traits. This is almost certainly explained by relative differences in the functioning of the self-control network. For instance, people with a depressed mood show greater discounting rates than those with a positive mood (Weafer et al., 2013), as do those with certain impulse control disorders (Moody et al., 2016).

We take it that insofar as apparent-near bias is explained (even if only partially) either by people's inability to delay gratification, or their inability to imagine their future selves, then those people *will* count as being near-biased rather than merely apparently near-biased. That is so despite there being a sense in which not all is equal in such a case. For instance, if Freddie has apparently near-biased preferences because he is unable to delay gratification, then we might think that to hold all else equal would be to imagine that Freddie's capacity to delay gratification is the same for near and far events. Even though the imagined Freddie does not show apparently near-biased preferences, this does not reveal that Freddie's actual preferences are merely apparently near-biased.

Clearly distinguishing explanations of merely apparent time-bias from time-bias is important, since doing so allows us to determine whether a pattern of preferences is in fact time-biased or not. This, in turn, matters, since nobody thinks that merely apparently time-biased preferences are rationally impermissible. If Annie prefers her liver-cake soon rather than later because it will be stale later, then this is surely a rationally permissible preference to have. Indeed, her preferences are better described as non-stale-food-biased than time-biased.

There is dispute about the rational permissibility of near-bias that roughly falls along disciplinary lines. Amongst philosophers, there is widespread agreement that near-bias is irrational: there are no grounds for more highly valuing the experiences of one's temporally near selves over one's temporally far selves.[25] Economists, by contrast, have more typically held that near-bias can be rational, so long as the rate at which we discount the value of future events is one that does not allow certain kinds of exploitation, such as a diachronic Dutch book (whereby an agent is offered a series of bets which by her lights are fair but which will inevitably lead her to lose money no matter the outcomes of the events on which she is betting). Hence, they allow that exponential discounting rates are rational, but hyperbolic rates are not.[26]

There is no such dispute between the disciplines when it comes to future-bias, since economists have not been focussed on the normative status of future-biased preferences. Philosophers, however, who usually suppose that near-bias is rationally impermissible, have until recently taken a different view about the normative status

[25] See Sidgwick (1884), Rawls (1971), Lewis (1946), Nagel (1970), Broome (1991) and Brink (2011).

[26] See Koopmans (1960), Lancaster (1963), Fishburn and Rubinstein (1982) and Strotz (1956).

of future-bias, in supposing it to be at least rationally permissible.[27] In this, such philosophers have accepted the normative asymmetry assumption.[28]

In fact, a small cohort of philosophers has argued that near-bias and future-bias are *both* rationally impermissible.[29] Even those philosophers who argue that the normative status of both biases is the same, however, reach this conclusion by considering each bias separately, and by providing different arguments against the rational permissibility of near-bias, than they do against the rational permissibility of future-bias. For instance, arguments against the permissibility of near-bias often focus on the idea that there is no reason to value the utility of temporally nearer selves, over the utility of temporally more distant selves. By contrast, arguments against the rational permissibility of future-bias have attempted to show that people with such preferences can be overall worse off. For instance, it has been argued that because future-biased preferences are temporally inconsistent, people who have these preferences and are risk-averse can be led to make a series of choices that renders them worse off in all respects (Dougherty, 2011) or to accept diachronically inconsistent exchange rates between hedonic and non-hedonic events (Dougherty, 2015). Greene and Sullivan (2015) argue that in order to avoid regret that arises as a result of their temporally inconstant preferences, future-biased people will postpone positive events for no good reason.

In sum, the pattern of investigation, both empirical, and normative, of these biases is one that treats them as entirely independent. Nothing we learn about one bias, whether empirically or normatively, has been taken to have any impact on what we ought to think about the other. In other words, research to date has implicitly assumed that the independence assumption is true.

This paper takes up the task of investigating that assumption. To do so we restricted ourselves to investigating whether there is an association between future-bias and prospective near-bias for hedonic events.

To that end we ran an experiment to determine whether there is an association between future-bias and near-bias. We predicted that there would be such an association. In particular, we predicted that:

(1) There is a positive association between being future-biased and being prospectively near-biased.
(2) There is a positive association between the strength of people's future-biased preferences and their prospectively near-biased preferences.

[27] See Parfit (1984), Heathwood (2008), Prior (1959) and Hare (2007, 2008, 2013).

[28] An interesting case is Phillips (2021), who argues that unlike near-biased preferences, future-biased preferences are not rationally evaluable. The result is a very different kind of normative asymmetry: rather that one bias being permissible and the other not, one bias is *evaluable* while the other is not.

[29] Dougherty (2011, 2015), Greene and Sullivan (2015) and Sullivan (2018).

3 Methodology and results

3.1 Methodology

3.1.1 Participants

460 people participated in the study. Participants were U.S. residents, recruited and tested online using Amazon Mechanical Turk, and compensated $0.50 for approximately 5 minutes of their time. 245 participants had to be excluded for failing to follow task instructions. This means that they failed to answer the questions (53) or failed one of the attentional check (45) or comprehension questions (147). The remaining sample was composed of 215 participants (96 female; 2 trans/non-binary; mean age 44.12 (SD = 13.98)). Ethics approval for these studies was obtained from the University of Sydney Human Research Ethics Committee. Informed consent was obtained from all participants prior to testing. The survey was conducted online using Qualtrics.

3.1.2 Materials and procedure

The study was a mixed design. Participants were split into two conditions: positive and negative. In the positive condition, participants reported the extent of their future-biased and near-biased preferences in response to a vignette about a positive hedonic event (eating their favourite meal). In the negative condition, participants reported the extent of their future-biased and near-biased preferences in response to a vignette about a negative hedonic event (eating their most disliked meal).

The vignettes we used are amended versions of Greene et al.'s (2021a) positive and negative hedonic vignettes. They are amended in such a way as to try to control for two factors that might lead people to express merely apparent future-biased or near-biased preferences. These factors are more pronounced for near-bias than for future-bias and controlling for them adds some complexity to the vignettes, which explains why they were not included in Greene et al.'s (2021a) study.

The first factor our vignettes aim to hold fixed is the subjective probability of the event occurring (regardless of its temporal location). Since if the meal was dispensed in the past we should have a subjective probability of 1 that it was dispensed, the vignette stipulates that the meal will certainly be dispensed in the future (with a view to trying to get people to attribute a subjective probability that is as close to 1 as possible, that the meal will be dispensed in the future). So, it aims to hold fixed that the future is as certain (or as near as can be) to the past. The second factor our vignettes aim to hold fixed is the intrinsic value of the goods received to the self that receives them. Thus we stipulate that the machine will dispense food based on the preferences of the self who will receive the food, even if that self has different gustatory preferences to the current self.

Since the positive and negative vignettes differ only minimally, we can present them together:

> Imagine you are an astronaut on a 10-year voyage between planets. Fortunately for you, space travel is extremely safe, and you are completely certain that you will survive your voyage.
>
> The ship's food dispenser normally produces bland meals containing only essential nutrients. However, the food dispenser is programmed to dispense, on one day of the voyage, the meal which is your [favourite]/[most disliked] meal on that day. Whenever the meal is dispensed, it will taste just as [good]/[bad] to you, because the food dispenser is able to detect what you like, and do not like, at any particular time, and it will create the meal according. So, for instance, if your tastes change over the course of the journey, the machine will still dispense your [favourite]/[most disliked meal] at the time at which it is dispensed.
>
> The ship's food dispenser is extremely reliable: in over 10000 space journeys that have taken place over 1 million days of travel, a machine has never broken down or misjudged the culinary preferences of an astronaut. So you are completely sure that it will dispense food every day, and that it will dispense your [favourite]/[most disliked] meal on one day.
>
> One morning, you awake from a dream concerning your [favourite]/[most disliked] meal and for a moment you cannot remember whether you have received it yet.

After reading the vignette, participants responded to two attentional check/comprehension questions. The first asked "In this vignette, you were asked to imagine that you were…", to which participants could respond:

(a) An astronaut
(b) A dog
(c) A spaceship
(d) A food dispenser.

The second question asked: "During your 10-year voyage, the ship's food dispenser produces bland meals…", to which participants could respond:

(a) Every day except for one
(b) One day a week
(c) One day a year
(d) Every day.

Participants who failed correctly to answer these questions were excluded from the study. The next questions probed whether, and the extent to which, participants have prospectively near-biased preferences. Participants then saw two sets of questions, one probing whether, and the extent to which, they have prospective near-biased preferences, and one probing whether, and the extent to which, they have future-biased preferences. The order in which they saw these questions was randomised.

Participants were asked to "Please indicate your preference using one of the following statements":

(a) I would prefer to learn that my [favourite]/[most disliked] meal will be dispensed tomorrow, and will not be dispensed 1 year into the future.
(b) I would prefer to learn that my [favourite]/[most disliked] meal will be dispensed 1 year into the future, and will not be dispensed tomorrow.
(c) I have no preference between these options.

Following this forced-choice response, participants indicated the *strength* of their preference on a 7-point Likert scale running from 1 (very weak) through to 7 (very strong). The orientation of all Likert scales was randomised.

Participants were asked to "Please indicate your preference using one of the following statements":

(a) I would prefer to learn that my [favourite]/[most disliked] meal will be dispensed tomorrow, and was not dispensed yesterday.
(b) I would prefer to learn that my [favourite]/[most disliked] meal was dispensed yesterday, and will not be dispensed tomorrow.
(c) I have no preference between these options.

Following this forced-choice response, participants indicated the *strength* of their preference on a 7-point Likert scale running from 1 (very weak) through to 7 (very strong).

3.1.3 Results

Before reporting our results, we will start by summarising our main findings regarding each of our hypotheses. Our first hypothesis was that there would be a positive association between being future-biased and prospectively near-biased. This hypothesis was vindicated; there was a moderate association between them. Our second hypothesis was that there would be a positive association between the *strength* of people's near-biased preferences and future-biased preferences. This hypothesis was vindicated. We found evidence of a small correlation between the strength of people's near-biased preferences and future-biased preferences.

Table 1 below summarises the descriptive data regarding near- and far-biased preferences in experiment 1. The 'NB' column represents the proportion of participants who report positive and negative prospective near-biased preferences. The 'FrB' column represents the proportion of participants who report positive and negative prospective far-biased preferences. The 'NP' column represents the proportion of participants who

Table 1 Descriptive data of people's near- and far-biased preferences

Condition	NB	FrB	NP	χ^2	*p*-value
Positive (N = 114)	57.1% (68)	23.5% (28)	19.3% (23)	30.672	< .001
Preference Strength	5.44 (1.17)	5.21 (1.13)	3.91 (1.59)		
Negative (N = 98)	33.3% (32)	49.0% (47)	17.7% (17)	14.063	< .001
Preference Strength	5.38 (1.29)	5.49 (1.26)	4.47 (2.21)		

Table 2 Descriptive data of people's future- and past-biased preferences

Condition	FB	PB	NP	χ^2	*p*-value
Positive (N = 114)	77.3% (92)	14.3% (17)	8.4% (10)	104.185	< .001
Preference Strength	5.98 (1.14)	5.24 (0.90)	4.20 (1.93)		
Negative (N = 98)	72.9% (70)	12.5% (12)	14.6% (14)	67.750	< .001
Preference Strength	6.09 (1.33)	5.33 (1.16)	4.50 (2.35)		

report a time-neutral preference. We also report the means (and standard deviations) of people's strength of preferences across all conditions. We also include the results of one-way χ^2 tests for each condition. The results of these tests show that, overall, people tend to be positively near-biased and negatively far-biased.

To check whether there was any association between people's reported near- and far-biased preferences and valence (positive or negative) we ran a χ^2 test of independence. This test revealed that there was a significant association between valence and people's reported preference ($\chi^2\,(2, N = 215) = 16.401, p < 0.001$). Post-hoc comparisons with a Bonferroni correction showed that people were more (prospectively) near-biased ($p < 0.001$) and less (prospectively) far-biased ($p < 0.001$) in positive conditions than in negative conditions. There was no association between valence and the proportions of people who reported having no preference.

Table 2 below summarises the descriptive data regarding future- and past-biased preferences in experiment 1. The 'FB' column represents the proportion of participants who report positive or negative future-biased preferences. The 'PB' column represents the proportion of participants who report positive or negative past-biased preferences. The 'NP' column represents the proportion of participants who report a time-neutral preference. We also report the means (and standard deviations) of people's strength of preferences across all conditions. We also include the results of one-way χ^2 tests for each condition. The results of these tests show that most people are positively future-biased and negatively future-biased.

To check whether there was any association between people's reported future- and past-biased preferences and valence (positive or negative) we ran a χ^2 test of independence. This test revealed that there was *no* significant association between valence and people's reported preference ($\chi^2\,(2, N = 215) = 2.080, p = 0.354$). That is, there was no association between the valence of the vignette and the proportions of people who reported being future-biased, past-biased, and time-neutral (i.e., having no preference).

Next, we combined far-biased and no-preference responses into a single new category: *non-near biased*. We also combined past-biased and no-preference responses into a single new category: *non-future biased*.[30] To test whether there was any association between people's reported prospective near- and far- biased preferences and future- and past-biased preferences we ran a χ^2 test of independence. The results revealed a moderate significant association between near- and far- biased preferences

[30] Rerunning analyses excluding no preference responses does not alter the reported results.

and future- and past- biased preferences (χ^2 (1, $N = 215$) = 27.907, $p < 0.001$, $\varphi = 0.36$). Being future-biased was moderately associated with being prospectively near-biased for both positive and negative events. More specifically, being future-biased was associated with more near-bias than non-near bias.[31]

Finally, to test the association between the strength of people's near-biased and future-biased preferences we calculated separate Pearson's correlation coefficients for both positive and negative conditions. To test this, we began by multiplying people's reported preference strength by 1 if they reported being future-biased or near-biased, and -1 if they reported being past-biased or far-biased. People who report no preference were assigned the value 0. This results in two scales that range from -7, strongly past-biased or far-biased, through to 7, strongly future-biased or near-biased, via 0, no preference. The hypothesis that there would be a significant correlation between the strength of people's future-biased preferences and their near-biased preferences for both positive ($r_{119} = 0.217$, $p = 0.018$) and negative events ($r_{96} = 0.236$, $p = 0.021$) was supported.[32]

4 Discussion

We found a moderate association, for both positive and negative events, between people being future-biased and being prospectively near-biased. We also found a significant correlation between the strength of people's future-biased preferences and prospectively near-biased preferences.

The presence of this association suggests that there is likely some factor that partially explains both future-biased and prospectively near-biased preferences. This is evidence against the strong independence assumption. In what follows we will make the case that whichever factor partially explains both kinds of preference, that factor contributes *the same* normative status to both kinds of preference. We also point out that as far as we know, no candidate factors have been suggested which clearly undermine the rationality of one preference but not the other. The onus, then, is on defenders of the normative asymmetry assumption to make the case that there is such a "differentiating" factor and that the factor has sufficient normative weight that it really can ground the normative difference between the two preferences.

Our argument rests on two assumptions that we think uncontroversial. First, we assume that a partial explanation for a preference can contribute to determining the normative status of that preference. Second, we assume that whether a preference is, overall, rationally permissible, or impermissible (or indeed, obligatory) is a function of the various factors that contribute to its overall normative status.

As noted, we found a moderate association between people being future-biased and being prospectively near-biased. But suppose for a moment that we had instead found a perfect association: every participant who reported future-biased preferences also reported near-biased preferences, and vice versa. That result would have suggested

[31] Results of a Breslow-Day test showed that the association between near- and far- biased preferences and future- and past- biased preferences is not associated with valence χ^2 (1, N = 215) = 1.355, $p = .244$.

[32] Rerunning analyses excluding no preference responses does not alter the reported results.

not only that the strong independence assumption is false, but also that the weak independence assumption is false: it would suggest that both kinds of preference are explained by *precisely the same* underlying set of factors.

This would certainly call into question the normative asymmetry assumption. To be sure, evidence that both kinds of preference are explained by the same factors does not *entail* that they have the same normative status, since it could be that precisely the same set of factors explains both, and yet those factors contribute to one kind of preference being rationally permissible, and the other being rationally impermissible. However, without some story as to why this should be so in this particular case, we would be tempted to infer from a perfect association that each bias inherits the same normative status from their shared explanation.

Since the moderate association we in fact observed suggests that there is only a *partial* overlap in the explanations of the two kinds of preferences, matters are more complicated. Even if this shared partial explanation contributes the same normative status to both kinds of preference—say it contributes to each of them being rationally permissible—it does not follow that each has the same normative status all things considered. It could be that *other* contributing factors mean that overall, one is rationally impermissible and the other rationally permissible. Nevertheless, we take it that if a partial explanation for both kinds of preference contributes the same normative status to each, then this puts some pressure on the normative asymmetry assumption in the following sense: in the absence of there being other *known* contributing factors which lead us to suppose that the two kinds of preference have overall different normative statuses, we should suppose them to have the same status.

With those assumptions articulated, we can now present the Normative Symmetry Argument:

1. If explanation E is a partial explanation for both near-bias and future-bias, E confers the same normative status upon both biases.
2. Every proposed partial explanation for near-bias could also partially explain future-bias, and vice versa.
3. Therefore, either (i) both biases share the same normative status (the normative asymmetry thesis is false), or (ii) there is some yet-to-be-articulated explanation of one bias that cannot explain the other, or (iii) a proposed explanation of one bias that could explain the other, in fact does not.
4. We have no reason to suppose that (ii) or (iii) is the case, and if (ii) is the case we have no reason to suppose that this yet-to-be-articulated explanation is a normative difference-maker.

Therefore,

5. We have reason to suppose that both biases share the same normative status.

In a moment we will work through these premises and argue for each. But before we do we want to flag two broader sets of considerations and reflect on what we want to achieve by presenting this argument. Primarily, our aim is not to decisively show that these biases have the same normative status, but rather, to shift the burden of proof to those who think there is an asymmetry. While burden of proof arguments can be

dialectically ineffective, we think that a call to say more about what grounds that asymmetry—rather than simply taking an asymmetry to be the default assumption—will help advance discussion of the rational permissibility of both biases.

Given this, it's worth saying something about this burden. For one might think (as one referee noted) that people have a strong intuition that there is a normative asymmetry, and on those grounds hold that any burden shifting argument would need to be very strong indeed. For instance, one could argue that the mere existence of this strong intuition *is itself a reason* to suppose that there is a yet-to-be-articulated explanation that is a normative difference-maker, and so is reason to think that (4) is false.

Let's suppose that if there were a strong intuition that there is a normative asymmetry, that this would give us at least some reason to think there is such an un-articulated factor (one might deny this; the mere fact that we intuit that there is a normative asymmetry might not be seen as a reason to think that it is). Still, we are not sure whether there is any such strong intuition. As far as we know, there is no empirical evidence that speaks directly to this issue, and this is a place whether further research could profitably be undertaken. Having said that, we know that many economists don't think that near-bias is rationally impermissible. On the plausible assumption that they also don't think that future-bias is rationally impermissible, they, at least, *don't* have a strong intuition that there is an asymmetry here.

Many philosophers do intuit that there is an asymmetry. But even amongst philosophers, plenty reject this asymmetry (notably, all those who think that future-bias is rationally impermissible). We don't know whether most people who are not economists or philosophers have a strong intuition that there is an asymmetry. We also don't know whether most people think that near-bias is irrational, nor whether most people think that future-bias is rational (let alone whether most think both the former and the latter). Perhaps we could infer from people's actual practices to their views about normativity. But if we did that, then we would conclude that since most people are future-biased, future-bias is rationally permissible, but also that since most people are near-biased, near-bias is rationally permissible. In all, then, there *is* no evidence (at present) that most people strongly intuit that there is a normative asymmetry and so we don't think this can serve as a reason (at present) to suppose that there *must* be some yet-to-be-articulated factor doing some normative work in grounding such a difference.

A second set of considerations revolves around the idea that we have a priori reason to think that future-bias and near-bias have a different normative status, because there are ways of being future-biased that are inconsistent with being near-biased.[33] Someone who is absolutely future-biased does not value past events at all (Sullivan, 2018). Consequently, that person does not value temporally nearer past events over temporally further away such events, since neither has any value. Thus, they are not *retrospectively near-biased.* But then the explanation for absolutely future-biased preferences *must* be different from the explanation for near-biased preferences, because those who are near-biased in this way are not absolutely future-biased (and vice versa).

Now, as we see it this is not enough to undermine our argument. After all, we are not arguing against the weak independence assumption: we are not trying to show that

[33] Thanks to an anonymous referee for making this point.

the complete explanation for future-bias is the same as the complete explanation of near-bias. If we were trying to show this, then this consideration alone would indicate that we were mistaken. But it does not follow from the fact that there is an explanation of near-bias that is not an explanation of future-bias, that this explanation confers a *different* normative status on the two biases (by failing to confer any explanation at all on future bias). Nevertheless, we grant that it might do so, and later we consider several candidate explanations to see whether this is likely to be so.

Having said that, in fact we do not think that this consideration is a powerful one. That is because we are focussed on explaining people's *actual* time-biased preferences; the question we ask is whether the various things that explain those preferences confer a different normative status on them. If most people (or indeed, lots of people) were absolutely future-biased, then this would potentially be a powerful consideration. However, we know this is not so. Most people do not absolutely devalue past events, as is apparent from the empirical work on future-bias and retrospective near-bias discussed in Sect. 2. In fact, we doubt that *anyone* is truly *absolutely* future-biased. The absolutely future-biased person, when given the choice between pressing a button that will cause it to have been the case, in the past, that they suffered a year of torture, will be indifferent between pressing the button and not. We suspect no one is like that, even if some people do heavily discount the value of past events.

What we do know is that most people are prospectively near-biased and that most people devalue past events. Further, people's devaluing of past events is at least in part a function of where in the past those events are located. What we are interested in, in this paper, is whether the explanation of this pattern of preferences is one that confers different normative status to near-biased and future-biased preferences of these kinds. Of course, this leaves open questions about the normative status of different kinds of near-biased and future-biased preferences. For example, it does not tell us whether the preferences of someone who is absolutely future-biased and prospectively near-biased have the same normative status. Nor does it tell us anything about the normative status of someone's preferences if they discount past and future events by different fixed-rates. However, this does not matter for current paper as these are not the kinds of preferences that we observe.

That being said, let's work through the argument for normative symmetry.

First, let's consider the inference from (1) and (2) to (3), which assumes that the normative status of a pattern of preferences is a function of what explains those preferences. To resist that inference, one might argue that if we want to know whether a pattern of preferences is rationally permissible or not, we should *only* look to see what having those preferences does for us. Are we better off, worse off, or neither better nor worse off, prudentially speaking, with such a pattern of preferences? If we are worse off, then those preferences are not rationally permissible, and they are rationally permissible otherwise.

If that is right then not only does the argument above fail, but we seem to have reason to accept the normative asymmetry thesis. Near-biased preferences do make us worse off, overall. If Annie prefers to have half a liver-cake now, rather than a whole liver-cake later, then she can act on that preference. In acting on that preference she ends up getting half as much liver cake as she would have, had she not been near-biased. To be sure, Annie can also prefer to have a more painful dental procedure

yesterday, over a less painful dental procedure tomorrow. Then were it the case that Annie could act on her preference, she would be worse off overall: she would undergo a more painful dental procedure rather than a less painful one. But in fact Annie cannot act on any such preference. She either had the more painful dental procedure yesterday or she did not: if she did, there is nothing to be done about that now, and if she did not, then, once again, there is nothing to be done about that now. So, whether Annie has future-biased preferences or not, she cannot make herself worse off by acting on those preferences.

Hence, according to this line of thought, it is rationally permissible to have future-biased preferences but not to have near-biased preferences because the former cannot make one worse off, and the latter can. And we can (and should) come to that conclusion without worrying about what explains our having those preferences. We have a few comments on this line of thought.

First, we take this to be an unusual approach to thinking about the rationality of preferences. It implies that in a world in which as a matter of fact there are no Dutch bookies, it is rationally permissible to have intransitive preferences. Perhaps it is rationally permissible to have such preferences (we have no dog in that race[34]) but if it is, the contingent presence, or absence, of Dutch bookies doesn't seem to be what does the normative work here. As a matter of fact, we do not have causal access to the past, and so Annie cannot bring it about that she did, or did not, have the past more painful dental surgery. But at best this is a contingent feature of our world: it might even only be a contingent feature of our particular location in this world. So, it would be odd if this is what made it rationally permissible to be future-biased.

Second, we take it that the sorts of arguments offered by Dougherty (2011, 2015) and Greene and Sullivan (2015) aim to show that we can be made worse off by being future-biased. More precisely, these arguments aim to show that future-biased preferences make people worse off when adopted alongside certain principles of risk-aversion or regret-aversion. The connection between time-bias and being worse off is thus less tight for future-bias than for near-bias.[35] Importantly, the fact that a combination of preferences renders people worse off leaves open which preferences are to blame for this result.[36] If risk-aversion and regret-aversion are innocuous, rationally permissible preferences, it must be future-bias that is at fault for making risk-averse and regret-averse agents worse off.[37] However, if risk-aversion or regret-aversion are impermissible, then there is no reason to think that future-bias is at fault for making people worse off. Thus, one way to argue for the normative asymmetry thesis is to argue that the normative status of a preference is determined by whether it makes people worse off, and it is *really* risk-aversion and regret-aversion, not future-biased preferences, that make people worse off. Or, alternatively, one might attempt to argue that none of these preferences is, individually, irrational: they are irrational only when conjoined (just as is the case with intransitive preferences). We tend to think that if

[34] Let alone a collection of bets that together guarantee that we will lose money.

[35] Thanks to a referee for impressing upon us the importance of this difference.

[36] Indeed, it leaves open that perhaps neither is. For perhaps it is only the combination of the preferences that is irrational, not either of them severally (as for instance in the case of intransitive preferences).

[37] Assuming that it is not simply the conjunction of the preferences that is irrational, and that one of them is, individually, irrational.

one is of the view that at least one of these preferences must be irrational, that there is some reason to think it is likely future-bias, given that it is the one factor in common between the cases in question, and because it is far from clear that *both* risk-aversion and regret-aversion are irrational. If it could be argued that none of these preferences, alone, is irrational, however, then there would be scope to try and vindicate the normative asymmetry thesis; so, we concede that this may be one way to try to proceed. Notably, however, as far as we know this avenue has hitherto not been explored, and so the onus is on those who want to pursue it, to do so.

More generally, there is a strong intuition that explanations of patterns of preferences do play a role in evaluating their normative status. Those who argue against the rational permissibility of future-bias, for instance, sometimes argue for that view on the grounds that our pattern of future-biased preferences is highly contingent and sensitive to differences that are nor normatively salient. For instance, Brink (2011) and Dougherty (2015) argue that future-bias is not rationally permissible because we are future-biased with respect to hedonic but not non-hedonic events, and we are future-biased with respect to events we ourselves will experience, but not with regard to events that others will experience (so called third-person future-bias).[38] Since those differences appear to be highly contingent, and not to be sensitive to anything normatively relevant, they conclude that the bias is not rationally permissible.

One can imagine similar sorts of arguments being offered regarding near-bias. Suppose we were near-biased with respect to apples but not oranges, Australian dollars but not US dollars, and so on. This might lead one to suspect that our preferences as so highly contingent, and so obviously not based on anything that could be normatively relevant, that they must be rationally impermissible. In both cases these conclusions could be made regardless of whether having those preferences makes one worse off or not.

At any rate, anyone wishing to reject the normative symmetry argument by rejecting this inference will need to provide reasons why the only factors relevant for determining rational permissibility are ones that do not appeal to the explanation for the preferences in question. In lieu of such an argument, for now we will assume that this is not so.

The crucial premises in need of defence, then, are (1), (2) and (4). In what follows we will begin with (1) and (2). To do we will consider the proposed explanations of both near-bias and future-bias, and show that each explanation could explain both biases: (2) is true. We will then argue that that explanation confers the same normative status on both biases: (1) is true.

We set aside explanations that are only explanations of merely apparent future- and near-bias since we have good reason to think that the association we are trying to explain is between (*genuine*) future- and near-bias. So, we set aside explanations that appeal to uncertainty either about the probability of the future event occurring, or uncertainty over how a future self will value the event.

The first candidate partial explanation is one that has been offered for the presence of future-bias: it is the *practical irrelevance hypothesis*. Latham et al. (2020) suggest that future-biased preferences might, at least in part, be the result of a mechanism that

[38] This empirical claim is not in fact borne out, but the point remains that people make arguments such as this.

devalues the past because it is causally irrelevant. Can this hypothesis also explain prospective near-biased preferences? Well, one might argue that the far future is not more causally irrelevant than the near future, and so the practical irrelevance hypothesis cannot explain near-bias. This response, though, is a bit quick. Even though the far future is causally accessible to us, it seems reasonable to think that we generally have better causal control over the near future compared to the far future. It's hard to put in place a causal mechanism that will result in me being hungry at a specific time tomorrow morning: it's harder still to put one in place that will result in me being hungry on a specific morning in 30 years' time.

So, it seems that the practical irrelevance hypothesis could explain both preferences. Importantly, if it does so, then it seems plausible that it confers on them the same normative status. The past is, by and large, causally inaccessible to us, and as a result it is entirely *causally uncontrollable*: we cannot causally control the past at all because it is causally inaccessible. The near and far future are both causally accessible to us, but the far future is less causally *controllable* to us (in certain ways) than the near future. We can less easily or predictably causally control or manipulate the far future compared to the near future. So, we might think, if a relative lack of causal control renders it rationally permissible to devalue that event, then it renders it rationally permissible to be both near-biased *and* future-biased, and if not, then it renders neither near- nor future-bias rationally permissible.

Now, the defender of normative asymmetry might at this point demur. She might argue that the fact that past events are *entirely* causally uncontrollable, while far future events are simply *less* causally controllable than nearer events, can ground a normative asymmetry here. On the face of it, this would be surprising. The natural thing to say, we think, would be that if causal controllability makes a normative difference such that complete lack of control makes it rational to, say, *absolutely* discount past events, then *lesser* degrees of causal control will make it rational to non-absolutely discount those events that are less controllable. But if that were so, it would make it rational to be near-biased (just not absolutely near-biased). To resist this reasoning, the defender of normative asymmetry would need to maintain that if events are causally uncontrollable it is rationally permissible to discount them by any amount whatever, while if they are controllable to any degree whatsoever, it is not permissible to discount them by any amount whatsoever. We find it hard to see what would motivate such a view, but we note that this would be one option that the defender of asymmetry could pursue.

The second candidate partial explanation is also one that has been offered for the presence of future-bias: that the belief (likely tacit) that time robustly passes—that there is an objectively present moment, and that which moment that is, changes—-partially explains future-biased preferences. Might such an explanation also explain prospectively near-biased preferences? It seems that it might. If Annie believes that future events are coming towards her, then it follows that events in the near-future are not only closer to her than those in the far-future, but in virtue of this that they *will arrive sooner* than events in the further future. Indeed, according to this explanation, it is not that Annie believes that there are two future selves (a nearer self and a further self) only one of whom will receive some good, and she prefers that the temporally nearer self receives that good. Rather, Annie believes that her very same self 'stands still' while future events come towards her, some of which will reach her before others.

Belief in a picture like this can explain Annie's near-biased preference: she prefers positive events to arrive sooner, and negative events to arrive later.

Once again, though, if such a belief were the shared partial explanation of these preferences, it is hard to see how it could contribute a different normative status to the preferences. If the belief is justified, then one might think that this contributes to the preferences formed partially on its basis being rationally permissible. By contrast if the belief is not justified, then one might think that this contributes to the preferences formed partially on its basis being rationally impermissible. Alternatively, one might think that even if the belief is unjustified, the preferences formed partially on its basis are still rationally permissible because preferences do not require justification of this kind. Regardless, it seems that *whatever* normative status this partial explanation contributes to each preference, that normative status will be the same.

Once again, at this stage the defender of a normative asymmetry might argue that the way we have framed the temporal metaphysics explanation is not quite right. Perhaps, she will maintain, what explains future-bias is that past events have already happened, while future ones have not. She can point out that those who defend the rationality of future-bias tend to hold that it is because past events are over and done with—*have already happened*—while future events are *yet to happen,* that it is rational to discount the value of past events relative to future ones. But if this is right, then it could support a normative asymmetry between future-bias and prospective near-bias. We ought to discount the value of past events because they have happened, but we ought not discount the value of far future events (compared to near ones) because *neither have happened.*

There are a couple of things to say here. First, it's not obvious that couched in this manner, this is even a *candidate* explanation of either future-bias or near-bias. Consider future-bias first. If we discount the value of past events compared to future ones *because* they are (objectively) past (not future) then, at least on the face of it, you might predict that we would *absolutely* discount the value of past events. But this is not what we find. At the very least, it is certainly the case that this explanation predicts that we will discount the value of all past events equally (whatever that amount) since they are all over and done with. We should not expect to find that people are, for instance, retrospectively near-biased. But this is not what we find (Bickel et al., 2008; Greene et al., 2020). To explain why we differently value events depending on where they are in the past, it seems, we need to at the very least think that the fact that some events are nearer, and some further, in the past, makes a difference to us. But this brings us to back to the explanation as we just offered it, in terms of events moving *receding* further into the past.

Similar considerations apply to explaining near-bias. As just noted, neither near nor far future events *have happened*. If what *explains why* we discount the value of some events over others is whether or not those events have happened, then we have no explanation at all for near-bias. It seems that we need to appeal to the idea that events are coming towards us, and that some of them will reach us sooner than others, if we are to explain near-bias.

Now, we could try to combine these elements into one. We could suggest that it is the fact we believe that future events are coming towards us and past ones receding, alongside the fact that past events *have happened,* while future events are *still to*

happen, that explains both biases, and grounds a normative asymmetry. But it is not clear why we should consider such combined explanation a shared partial explanation of these preferences. Instead, what explains our future-biased preferences is the belief that future events are coming towards us and past ones receding, alongside the fact that past events *have happened*. Whereas what explains near-bias is the belief that future events are coming towards us, and past ones are receding, alongside the fact that future events are *still to happen*. What is partially shared between the explanation of our near- and future-biased preferences is the belief that time robustly passes. But this once again brings us back to the explanation which we started out with. Regardless of whether the belief that time robustly passes is justified or not, the normative status which it conveys to our temporal preferences appears to be the same. If there is a normative asymmetry located here, then it owes to parts of the explanation which are not shared between near- and future-biased preferences.

The third candidate explanation, also offered for the presence of future-bias, appeals to a phenomenology as of robust temporal passage. On this view we have a phenomenology whose content represents that there is an objective present moment, and that as that moment changes, future events come closer to the present, and past events recede. It is the presence of this phenomenology which (partially) explains future-bias. Could this provide an explanation for near-bias? It could, in much the same way as could a belief in robust passage. Namely, if it seems to Annie as though future events are coming towards her, then this can explain why she prefers positive events to be in the near future and negative ones in the far future. For she prefers that positive events reach her sooner, and that negative events reach her later.

Suppose the presence of this temporal phenomenology is a partial shared explanation of both preferences. The same reasoning holds true in this case as in the case of a belief in robust passage. If one thinks that the phenomenology is illusory (as B-theorists do)[39] then one might think that it is illusory in the sort of way that contributes to preferences formed on its basis being rationally impermissible. Or one might think that even if the phenomenology is illusory, this does not contribute to preferences formed on its basis being rationally impermissible. If one thinks that the phenomenology is veridical (as A-theorists/temporal dynamists do) then one might think that this contributes to preferences formed on the basis of that veridical phenomenology being rationally permissible. But whichever of these three views one takes, it seems that one will conclude that the phenomenology in question contributes the same normative status to both sets of preferences: the prospectively near-biased ones and the future-biased ones.

[39] Of course, many B-theorists think that we have a *veridical* phenomenology that they are willing to call 'passage'. These include Deng (2013), Frischhut (2015), Sattig (2019) and Leininger (2015, 2021). However, these philosophers (being B-theorists) do not think that there is any *robust* passage, so they will hold that *if* we have a phenomenology *as of robust passage* that *this* phenomenology is illusory. While some B-theorists do hold that we have an illusory phenomenology as robust passage (see for instance Paul (2010) and Le Poidevin (2007) many deny that we have any such experiences (see for instance Miller et al. (2020), Miller (2019), Deng (2013), Frischhut (2015). Those who deny that we have this phenomenology will, of course, reject this candidate explanation (clearly a non-existent phenomenology does not explain why we are future-biased). Since there is some empirical evidence to suggest that perhaps we do not have such a phenomenology (see for instance Latham et al. (2020) there is some (weak) reason to suppose these latter authors to be correct.

The fourth candidate explanation, also offered for the presence of future-bias, is what we call the *emotional asymmetry hypothesis*. This explanation appeals to an asymmetry in our anticipatory and retrospectory systems (Caruso et al., 2013). Empirical evidence suggests that we anticipate future events and retrospect past ones, but that anticipation is stronger than retrospection (Van Boven & Ashworth, 2007). Hence a positive future event will seem to us more positive than the same event in the past, and a negative future event will seem to us more negative than the same event in the past. Hence, we will prefer positive events in the future, and negative ones in the past. Moreover, research shows that emotional intensity tends to reduce perceived psychological distance (Van Boven et al., 2010). So, it will seem to us as though future events (whose emotional intensity will be stronger) are closer to us, than are past events, even when they are in fact the same temporal distance away. Hence, if we exhibit near-bias, then this will tend to produce future-bias since we will prefer positive events to be in the future (since they will seem temporally nearer) and negative events to be in the past since they will seem to be temporally further). And we do think that patterns of anticipation and retrospection might partially explain near-bias. We can expect to have stronger anticipations for temporally nearer phenomena[40] since episodic future memory will generally be stronger for temporally nearer events. As a result, we will tend to prefer positive events to be in our near future than our far future, and some of us (though, our results suggest, a minority when it comes to the experience of eating one's most disliked meal) will prefer negative events to be in our far future rather than our near future.

But, again, whatever normative status one supposes this emotional asymmetry to contribute to the preferences formed on its basis, it will contribute the same status to both sets of preferences. Perhaps, for instance, one thinks that this pattern of anticipation and retrospection is evolutionarily selected for, and that as a result this contributes to the rational permissibility of the preferences formed on its basis. Or perhaps one thinks that this pattern is an unfortunate by-product of the functioning of some other mechanism, and that as a result this contributes to the impermissibility of preferences formed partially on its basis. Regardless, one will think that this factor contributes the same normative status to both biases.

The fifth candidate explanation is one offered for the presence of near-bias: a deficit in our self-control system. Could a deficit in our self-control system also partially explain future-biased preferences? We think so. The same sort of weakness of will that can lead us to prefer a lesser good now rather over a greater good later—despite recognising that by choosing this option we will be worse off overall—might lead us to prefer to have had a more painful surgery yesterday rather than a less painful surgery tomorrow—despite once again recognising that by choosing this option we will be worse off overall. In both cases it seems that we prefer what we ourselves acknowledge as the option that is less good overall, due to a lack of self-control.

The sixth candidate explanation appeals to facts about the relations in which we stand to past and future selves. Suppose we accept mild egocentric hedonism: that

[40] As Jevons (1905, p. 64) wrote of the anticipation of a planned holiday, "the nearer the date fixed for leaving home approaches, the greater does the intensity of anticipal pleasure become: at first when the holiday is still many weeks ahead, the intensity increases slowly; then, as the time grows closer, it increases faster and faster, until it culminates on the eve of departure".

all other things being equal, one should prefer a pain that is not one's own rather than one's own and prefer a pleasure that is one's own rather than not one's own. Now suppose that each of us perdures over time (we are composed of a series of numerically distinct temporal parts or person stages). Bnefsi (2019) argues that given this, any particular personal stage, P, has reason to prefer a pain that is someone else's rather than its own. So if a person-stage is given a choice between having a pain, and some *other* person-stage having a pain, it should prefer the latter. Likewise, given the choice between itself having a pleasure and some other person-stage having a pleasure, it should prefer the former. Bnefsi thinks that this might make it rational for us to be future-biased. However, as he rightly notes, all these considerations really show is that it is rational for us to be *present-biased:* preferring pleasant events to be in the present and not the non-present, and unpleasant events to be in the non-present and not the present.[41] But, he notes, perhaps differences in the *connection* between person-stages might explain, and render rational, future-bias.

Following McMahan (2002, pp. 65–74) we might put the idea as follows. The strength of one's present prudential reason to care about some events depends on both the value of the event and the degree to which the egoistic concern relation holds between oneself now, and the self whose welfare it affects. Parfit (1984) for instance, holds that the egoistic concern relation is psychological connectedness. He notes that insofar as future selves are less psychologically connected to our present self than are our nearer future selves, we have reason to care *more* about temporally nearer selves, and hence to be near-biased.[42] Braddon-Mitchell and Miller (2020) hold that the egoistic concern relation is the relation of personal-identity, and that the personal-identity relation comes in degrees. Hence, they argue, it is rationally permissible to discount the value of the experiences of selves that 'are oneself' to a degree less than 1. This can make it rationally permissible to be near-biased, on the assumption that temporally nearer selves are oneself to a higher degree than are temporally farther away selves.

On either of these proposals regarding the egoistic concern relation, there is a way to argue for the normative asymmetry assumption. Very plausibly, if the above were right then this would confer rational permissibility on near-bias, *but not* future-bias. Consider the event of a painful surgery and imagine that it can be either 1 day in the past, or 1 day in the future. If we make the fairly plausible assumption that, in general, your present person-stage is equally psychologically connected with you a day ago and with you a day into the future, and that you in a day is you to the same degree as you a day ago, then this being so will confer a different status on future-based preferences: namely, their being rationally *impermissible*. Hence, we have found a potential ground for the normative asymmetry.[43]

We agree that if one were to endorse views like this, it would be a way to preserve, and indeed to defend, the normative asymmetry assumption, but we note that such views are contentious. Moreover, by justifying near-bias but not future-bias, such

[41] For extensive discussion of present-bias see Deng, Latham, Miller and Norton (forthcoming).

[42] See Sullivan (2018) for discussion.

[43] Though it is worth noting that it is not obvious that this would ground future-bias being rationally impermissible in cases of equality (i.e., where the intrinsic value of the event is the same in the past compared to the future).

views preserve the asymmetry in the opposite direction to the direction that most philosophers find intuitive.

Another proposal that could preserve the normative asymmetry assumption is due to Karhu (2022). Karhu denies that the egoistic concern relation is the personal identity relation. He argues, instead, that it is an *asymmetric* relation; one that warrants giving greater consideration to future person-stages than to past ones. To see why we might think this, imagine that tonight you will be vaporised in your sleep, and a random duplicate will later pop into existence in your bed (where this random duplicate in no way counterfactually depends on you). Karhu supposes that we will be *very* displeased to hear this. But now imagine that you are that duplicate. The past that you thought was yours, is in fact not yours at all. You just sprang into existence. Karhu thinks that this will be much less horrifying to us. This, he thinks, gives us a reason to hold that the egoistic concern relation is asymmetric: we care more about what will happen in the future, than we do about what did happen in the past. If Karhu is right, then features of our egoistic concern relation explain why we are future-biased and rationalise our having such preferences. But this asymmetric egoistic concern relation does not make it rational to be near-biased. Hence, once again, there is some normatively relevant feature that can ground there being a normative asymmetry.

We agree that if one accepts that there is an asymmetric relation of egoistic concern, then this could ground the rational permissibility of future-bias, but not of near-bias. So, pursuing this option could represent a way forward for those who wish to preserve and defend the normative asymmetry assumption. Much more would, we think, need to be said about the nature of that relation. We agree with Karhu (2022) when he points out that cases of fission suggest that we should not identify numerical identity with the egoistic concern relation. Nevertheless, we think something more substantive needs to be said about what grounds that relation, and which renders it independently plausible that it is indeed asymmetric.

Karhu motivates the asymmetry by pointing to the fact that *in fact* we tend to care more about being *about* to be vaporised than about having just *been* vaporised. But really, this is just to reiterate the fact that people are future-biased. Positing an asymmetric relation of egoistic concern on the basis that as a matter of fact people are future-biased, and then suggesting that the presence of that relation normatively grounds its being permissible to be future-biased, strikes us as circular. So, while we think there is scope to develop such a view by finding some asymmetric relation that we have independent reason to suppose could ground the egoistic concern relation, at this stage we find little reason to endorse the view that such a relation is asymmetric, and so little reason to suppose that the normative asymmetry can be grounded in the presence of that relation.

Thus ends our defence of (1) and (2). Now consider (4). (4) says that we have no reason to suppose that an explanation of one bias that *could* explain the other, along the lines we have offered above, *in fact* does not, and that if there is a yet-to-be articulated explanation of one bias that cannot explain the other, we have no reason to suppose that this yet-to-be-articulated explanation is a normative difference-maker.

Notice that (4) is not the claim that it *could not be* that there is a partial explanation of one bias that fails to be a partial explanation of the other. To see this, consider the practical irrelevance hypothesis. Even though that candidate explanation can explain

both near-bias and future-bias, it *could be* that in fact it only explains one bias. Suppose it only explains future-bias. Then whatever normative status that explanation confers upon the pattern of preferences it explains (namely future-bias) it does not confer that status on the pattern of preferences it does not explain (namely near-bias). So if the practical irrelevance explanation tends to confer rational permissibly on the preferences it explains, it will be the case that it tends to confer rational permissibility on future-bias, but tends to confer no normative status at all on near-bias. And that could render future-bias rationally permissible, and near-bias not.

Premise (4), however, simply says that we have no reason to think that something like what we just described is so (that there is some explanation for one kind of bias that is not an explanation for the other, and which confers a different normative status on the two biases). As we see it, we have no reason to think that the practical irrelevance hypothesis explains future-bias but not near-bias, or explains near-bias but not future-bias. Likewise, it *could be* that temporal phenomenology or temporal beliefs explain one of the biases but not the other. But we have reason at all to suppose this to be so. In the case of the emotional asymmetry hypothesis we have reason to think that insofar as our emotional symmetries explain one bias, they explain the other: for part of the explanation in question appeals to both biases.

Is there reason to think that there is some yet-to-be-articulated explanation of one bias that cannot explain the other? Perhaps so. We found only a moderate correlation between near-bias and future-bias, which suggests that each has some partial explanation(s) not shared by the other. Even given that this is so, however, it's a stretch to infer that we have a reason to think that this unknown partial explanation is a normative difference-maker: that this unknown factor grounds its being the case that near-bias is rationally impermissible while future-bias is not. After all, it is characteristic of yet-to-be-articulated explanations that we have no idea what they are. To presuppose that such an explanation would confers a different normative status on each kind of preference is really just to assert that near-bias is rationally impermissible and future-bias is not.

Of course, none of this is to say that it could not turn out to be the case that these factors, which can explain both biases, in fact only explain one of them. Our claim is just that on the basis of current evidence we have no reason to suppose this to be so; this is the reasoning behind premise (4).

What, really, does all this tell us, and couldn't we have just worked all this out from the armchair? Aren't we really just saying that it *might* be that there is a shared explanation for both biases, and that it then *might* be that this confers the same normative status on both? If so, surely we didn't need studies to tell us *that*. This, however, is not what we take ourselves to have shown. Rather, we take it that we have found empirical evidence that there is some shared partial explanation of near- and future-bias. Further, given the explanations that have been offered for these biases, we take ourselves to have reason to think that this shared explanation will confer the same normative status on both. We leave open, of course, that there *might* be some hitherto undiscovered shared partial explanation which confers a different normative status on each bias. Still, we think we have gone well beyond mere a priori reasoning here: it is not simply that we have reason to think that it is epistemically possible that there is such a shared partial explanation, but rather, that we have empirical evidence that there is.

At this stage, then, we think the burden on proof lies on the defender of the normative asymmetry assumption to (i) show that one of these candidate explanations we have offered is in fact an explanation of one, but not the other, bias, and that its being so results in one bias being rationally permissible and the other not or (ii) identify a new explanation that partially explains one bias but not the other, and that confers a normative status to that bias which the other bias lacks.

5 Conclusion

Entirely separate investigation of future-bias and near-bias can only be justified if these biases are explained by different completely factors (i.e., if the strong independence assumption is true). However, we found that there is a moderate association, for both positive and negative events, between people being future-biased and being prospectively near-biased. In the light of this evidence, there is reason to doubt the strong independence assumption. We considered several explanations that might partially explain both future- and near-bias. In each case we either concluded that the candidate shared partial explanations tends to confer the *same* normative status on both biases, or, where it does not, that the explanation in question rests on highly contested metaphysical or normative assumptions. We do not think that as yet, this shows that the two biases have a different normative status. We do think, however, that the burden now lies with the defender of this assumption to explain why near-bias is rationally impermissible while future-bias is rationally permissible.

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