**How much do we discount past pleasures?**

**Abstract**

Future-biased individuals systematically prefer pleasures to be in the future (positive future-bias) and pains to be in the past (negative future-bias). Empirical research shows that negative future-bias is *robust:* people prefer *more* past pain to *less* future pain. Is positive future-bias robust or *fragile*? Do people only prefer pleasures to be located in the future, compared to the past, when those pleasures are of equal value (fragile positive future-bias) or do they continue to prefer that pleasures be located in the future even when past pleasures outweigh future ones (robust positive future-bias)? Some arguments against the rationality of future-bias require positive future-bias to be robust, while others require it to be fragile. We empirically investigate, and show that positive future-bias is robust.

**1. Introduction**

Consider the following two scenarios. In the first, your dinner last night was bland and boring, but for dinner tomorrow you will have your favourite meal. In the second, you had your favourite meal for dinner last night, but tomorrow night’s dinner will be bland and boring. Which scenario do you prefer?

If you prefer the former scenario to the latter, you might be exhibiting a certain kind of bias toward the future. In particular, you might have a *positive future-bias:* all else being equal, you prefer positive events—pleasures—to be in your future rather than your past.[[1]](#footnote-1)

Here are two more scenarios. In the first, your dinner last night was bland and boring, and for dinner tomorrow you will have your most disliked meal (which you really dislike). In the second, you had your most disliked meal last night, and tomorrow night’s dinner will be bland and boring. Which scenario do you prefer?

If you prefer the latter scenario to the former, you might be exhibiting a different kind of bias toward the future. In particular, you might have a *negative future-bias:* all else being equal, you prefer negative events—pains—to be in your past rather than your future.[[2]](#footnote-2)

The supposition, amongst philosophers, that people are typically future-biased regarding both positive and negative events, can be traced at least to Hume (1738, sec. 2.3.7.6). Most contemporary work has focused on whether future-bias is rational,[[3]](#footnote-3) irrational,[[4]](#footnote-4) or merely permissible,[[5]](#footnote-5) on its psychological underpinnings,[[6]](#footnote-6) and on how it connects with temporal metaphysics.[[7]](#footnote-7)

There is also a small but growing literature dedicated to empirically testing the extent to which we are future-biased about various kinds of events. This work is a response to empirically tractable descriptive claims, made by philosophers, about the pattern of preferences we in fact have. Where these claims inform arguments regarding the rationality of our preferences, or explanations thereof, discovering the empirical realities can facilitate progress on these philosophical questions.

For instance, Parfit (1984, section 69) has claimed that our first-person future-bias does not extend to our preferences on behalf of others: we are *time-neutral* about *third-person events*. He presents a thought experiment where his beloved mother (with whom he has lost contact) either has experienced several months of pain, or will experience several months of pain. Parfit reports that while he would very much prefer his own pain to be in the past (his first-person preferences are future-biased), he has no preferences about the temporal location of his mother’s pain.

Brink (2011) and Dougherty (2015) endorse Parfit’s descriptive claim, and use this to marshal arguments against the rationality of future-bias on the basis of its arbitrariness. Greene and Sullivan (2015) also reference Parfit in making the case that we are more inclined to have rational preferences about third persons because our evolutionarily instilled emotions impede the formation of rational preferences for first-person events.[[8]](#footnote-8) Thus, these time-neutralists argue that we ought resolve the seemingly arbitrary difference between first- and third-person preferences by concluding that our time-neutral third-person preferences are rational while our future-biased first-person preferences are not.

Empirical work has shed light on this debate. Caruso, Gilbert and Wilson (2008) found support for the assumed first/third-person asymmetry. They found that participants assigned themselves 60% more reimbursement for boring work performed in the future versus the same amount of boring work performed in the past, suggesting that people value their future experiences more than their past experiences. As far as we know, this is the first empirical support for the contention that people exhibit first-person future-bias. In contrast, participants assigned the same reimbursement for past and future work performed by someone else, which suggests that third-person preferences are time-neutral.

In combination with other recent work, we see a more nuanced picture of our third-person preferences. Greene, Latham, Miller and Norton (2021) found that a significant majority of participants exhibited future-bias regarding both first*-* and third-person events. Greene et al. suggest that the difference between their results and those of Caruso et al. stems from the presence or absence of details regarding the third person in question. Greene et al. asked participants about a third person with a name, goals, and gustatory preferences, whereas Caruso et al. asked about an unknown stranger from the local community, without describing any personal attributes. This suggests that the assumption of a thoroughgoing asymmetry between first- and third-person preferences should be reconsidered.

A further question concerns the *strength* of our future-biased preferences. Notably, in the Caruso et al. and Greene et al. studies reported above, the amount of pain and pleasure in the past or future is the same. In other words, whether the pleasure or pain in question is in the past or future, the same amount of pain or pleasure is experienced overall. That people exhibit future-biased preferences in these circumstances is consistent with people having a *fragile* future-bias that merely serves as a tiebreaker when all else is equal. It is also consistent with people having a *robust* future-bias which results in a preference for less future pleasure over more past pleasure, and for more past pain over less future pain. This robust kind of future-bias would sometimes lead us to prefer less pleasure/more pain overall. Indeed, these results are even consistent with the most extreme form of robust future-bias: *absolute* future*-*bias, whereby we completely discount the past when forming our preferences.[[9]](#footnote-9)

Some arguments against the rationality of future-bias rely on the assumption that future-bias is robust. It has been argued that robust future-bias can interact with other principles including risk-aversion (Dougherty 2011) and regret-aversion (Greene and Sullivan 2015), to make people not only prefer to be worse off overall, but to make decisions that in fact make them worse off overall. Dougherty presents cases in which risk-averse robustly future-biased agents make choices that cause them to experience more pain overall while leaving them no better off otherwise. Similarly, Greene and Sullivan present cases in which regret-averse robustly future-biased agents make choices that cause them to experience less pleasure overall while leaving them no better off otherwise. If robust future-bias can lead people to be worse off overall, while fragile future-bias cannot, then the question of whether people display a robust future-bias, or merely a fragile one, matters a great deal to the debate over the rationality of future-bias.

A follow-up paper by Greene, Latham, Miller & Norton (forthcoming) sheds light on this question by investigating future-bias in the case of *unequal payoffs* (or, under *unequal conditions*): they investigated participants’ preferences between more past pleasure versus less future pleasure, and more past pain versus less future pain. Following Parfit’s (1984, p. 165) influential *My Past or Future Operations* thought experiment, they used a past-to-future ratio of 10:1. For example, participants reported whether they would prefer some amount of future pain or *ten times as much* past pain.

Greene et al.’s (forthcoming) results are striking. They found that a significant majority of participants exhibited robust negative future-bias, in both first- and third-person conditions. In other words, when presented with one unit of future pain versus ten units of past pain, most people preferred ten units of past pain. When it comes to negative events, then, people sometimes prefer to be worse off overall. Moreover, if Dougherty (2011) and Greene and Sullivan (2015) are right, these robust future-biased preferences can lead people to in fact be worse off overall.

Regarding positive events, however, Greene et al. (forthcoming) found precisely the opposite pattern of preferences. When presented with one unit of future pleasure versus ten units of past pleasure, a significant majority of participants preferred the greater pleasure in the past, both for themselves and for a third person. Overall, then, while these results make clear that negative future-bias is robust, the nature of positive future-bias remains ambiguous. Greene et al.’s (forthcoming) results are compatible with positive future-bias being (i) fragile, and merely serving as a tie-breaker between otherwise equally preferable options, or (ii) robust—in the sense that positive future-bias will sometimes lead people to prefer less future pleasure to more past pleasure—but weaker than negative future-bias.

In earlier work, Greene et al. (2021) showed that in equal conditions positive future-bias is weaker than negative future-bias. Greene et al. suggest that this might be due to the fact that negatively valenced information impacts people’s judgments to a greater extent than positively valenced information. In light of their results, they suggest that it is thus no coincidence that philosophers wishing to defend the rationality of future bias have tended to focus on our preferences regarding pains and not pleasures.[[10]](#footnote-10) After all, supporters of the rationality of future-bias typically claim that future-bias is the result of emotional responses that are widely shared, and that these emotional responses are rationally permissible. Given the empirical results, one might accuse these philosophers of focusing on cases of pain and ignoring cases of pleasure only because such cases better support their argument. If it turns out that positive future-bias is not robust then that accusation would appear to be legitimate.

Indeed, Greene et al. (forthcoming) point out that their results suggest a new line of argument for time-neutralists. Rather than focusing on the seemingly arbitrary difference between first and third-person preferences, time-neutralists might argue that it is hard to justify as rational the combination of robust negative future-bias and fragile positive future-bias. In contrast, it is easy for evolutionary debunking explanations of future-bias to explain the asymmetry: plausibly, people could have evolved asymmetric attitudes towards pleasures and pains for reasons related to survival. Of course, the viability of this argument depends on whether positive future-bias is in fact fragile. Thus Greene et al. suggest that future work would be valuable testing ratios between 10:1 and 1:1, to determine whether positive future-bias is fragile or robust and, if it is robust, to identify the ‘tipping point’ at which it is outweighed by a preference for more pleasure overall.

Our study takes on the former of these tasks: determining whether positive future-bias is fragile or robust. If positive future-bias is fragile, then it will be outweighed by the presence of even a small inequality, and only act as a tiebreaker under conditions of equality. Thus, we conducted a study using vignettes that are identical to Greene et al.’s (forthcoming), but with a ratio of 2:1, i.e., with twice as much pleasure in the past as in the future. We outline our methodology and results in section 2. If people respond in a future-biased manner, we will have evidence that positive future-bias is robust, albeit weaker than negative future-bias. If people do not respond in a future-biased manner, we will have evidence consistent with positive future-bias being fragile.[[11]](#footnote-11)

As we have indicated above, these results will bear on several prominent questions in the philosophical debate over the rationality of future-bias: i) Are people future-biased in a way that has the potential to make their lives worse? ii) Has the exclusive focus on pain in motivating the rationality of future-bias obscured important aspects of the nature of future-bias? And iii) Is there a mismatch between positive and negative future-bias that helps motivate time-neutralism? Based on the results of Greene et al. (2021) and self-reports in the philosophical literature, we predicted that people would exhibit future-bias under these conditions: people will prefer some amount of future pleasure to twice that amount of past pleasure, both for themselves and for a third person; i.e., we predicted that we would find evidence that positive future-bias is robust. In section 3, we discuss the ramifications of our results for arguments regarding the rationality of future-bias, and regarding the explanation for its existence.

**2. Experimental Design and Results**

**2.1 Method**

*2.1.1 Participants*

195 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. 42 participants had to be excluded for failing to follow task instructions. This means that they failed to answer the questions (11), or failed an attentional check question (31). The remaining sample was composed of 153 participants (aged 23-66; 57 female; mean age 29.84 (SD = 7.98)).

*2.1.2 Materials and Procedure*

The study was a between-participants design, whereby participants were randomly allocated to one of two conditions: first-person and third-person. We used minimally amended versions of vignettes used by Greene et al. (2021, forthcoming).

There are several notable features of the Greene et al. vignettes. First, as with Parfit’s (1984, p. 165) thought experiment, it involves waking and, at least briefly, not remembering what has already occurred. In Parfit’s thought experiment the protagonist wakes and does not remember whether he has had the painful surgery. In the vignettes we use, the protagonist wakes and does not remember whether a particular event has occurred.

The vignettes are also notable for taking place on a spaceship. Greene et al. developed a single vignette that could be minimally amended to either feature a hedonic event (receiving your favourite or most disliked meal) or a non-hedonic event (receiving a prize, or having embarrassing photos released). They situate their vignettes on a spaceship in order to avoid the confound that one finds in Hare’s (2013) original non-hedonic cases, in which the possibility arises of the protagonist being able to intervene on whether the future event occurs (but not the past event). Leaving this possibility open might lead participants to prefer an event to be located in the future because they will have the opportunity to intervene on it. The protagonist is thus set on a spaceship in order to make communication with Earth (and hence intervention) impossible, and likewise for intervening on the schedule of meals the ship dispenses.

Although being so far from Earth is unnecessary when it comes to hedonic events, we used amended versions of the Greene et al. (2021, forthcoming) vignettes in order to allow informal comparison with their results regarding people’s preferences under 10:1 and 1:1 ratios. It was thus important to amend the vignettes as little as possible, and our adapted versions only amend the ratio of past versus future payoffs.

The vignette we used in the first-person condition was as follows:

You are an astronaut on a 10-year voyage between planets. You are 5 years into the voyage. The ship's food dispenser normally produces bland meals containing only essential nutrients. The ship's dispenser has two different meal-dispensing schedules. On schedule one, it is programmed to dispense your favourite meal (which you really like) *once* during the voyage. On schedule two, it is programmed to dispense your favourite meal *twice* during the voyage. So on schedule two, you receive *twice* as many favourite meals as you do on schedule one.

One morning, you awake from a dream concerning your favourite meal and for a moment you cannot remember which schedule your dispenser is programmed with. If it is programmed with schedule two, then you received your favourite meal yesterday and the day before yesterday. If it is programmed with schedule one, then you will receive your favourite meal tomorrow.

The vignette we used in the third-person condition was the same, but with first-person locutions changed to third-person locutions concerning “Freddie”. So, for example, the first sentence was “Freddie is an astronaut on a 10-year voyage between planets.”

In each condition, participants were presented with two separate 7-point Likert scales: future-bias and confidence. Participants were asked to indicate their preference and level of confidence respectively on these scales. The future bias Likert scale ran from 1 (I would *strongly* prefer [to learn that my/Freddie to learn that his] favourite meal was dispensed yesterday and the day before yesterday, and will not be dispensed tomorrow) through to 7 (I would *strongly* prefer [to learn that my/Freddie to learn that his] favourite meal will be dispensed tomorrow, and was not dispensed yesterday and the day before yesterday) via 4 (I have *no* preference between these two options). The confidence Likert scale ran from 1 (Completely unconfident) through to 7 (Completely confident). The orientation of the Likert scale was randomised across participants.

Lastly, participants were asked to respond to the following attentional check question: In the vignette you were asked to read, on which schedule [do you/does Freddie] obtain *more* of [your/his] favourite mean in total? Participants were presented with four options: Schedule 1, Schedule 2, Schedule 3, and Schedule 4. Those participants who failed to choose the correct option, Schedule 2, were excluded from the analyses.

*2.1.3 Analyses*

We ran separate one-sample t-tests to test whether mean preferences significantly differed from 4 (indifference) in each condition. If the mean is significantly above 4, then overall participants *might* be positively future-biased. However, a mean significantly above 4 is consistent with most people not responding positively future-biased (e.g., most people might respond with 4 and 3, while a minority respond with 7 so as to raise the mean above 4). Thus, in those conditions where mean preference was significantly greater than 4 we performed separate one-way 𝜒2-tests to test whether the proportion of participants responding with 5, 6, or 7 versus the proportion of participants responding with 1, 2, 3, or 4 (i.e. future-biased versus non-future-biased) differed significantly from a 50/50 split. The 𝜒2-tests allow us to report on whether there is a preference shared by the majority of participants in a given condition. Finally, we compared the mean reported preferences between conditions using an independent samples t-test and tested for an association between condition and the proportion of participants who are future-biased using Fisher’s exact test.[[12]](#footnote-12)

**2.2 Results**

First, participants were confident in their reported preferences in both the first-person (M = 5.72, SD = 1.12) and third-person conditions (M = 5.62, SD = 1.04). There was no significant difference in confidence between the first-person and third-person condition (*t*(151) = .570, *p* = .570).

Table 1 below summarises the descriptive data from the experiment. The ‘FB’ column represents the proportion of participants who reported future-biased preferences (5, 6, or 7) and the ‘PB’ column represents the proportion of participants who reported ‘past-biased’ preferences[[13]](#footnote-13) (1, 2, or 3). The ‘N’ column represents the proportion of people who reported time-neutrality (4).

*Table 1. Descriptive data and one-sample t-test results.*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Condition** | **%FB** | **%PB** | **%N** | **Mean** | **SD** | ***t-value*** | ***p*-value** |
| **Condition 1:** First-Person (N = 79) | 88.6 | 7.6 | 3.8 | 5.42 | 1.30 | 9.715 | <.001 |
| **Condition 2:** Third-Person (N = 74) | 78.3 | 17.6 | 4.1 | 4.86 | 1.57 | 4.729 | <.001 |

The mean is significantly above 4 in both conditions. However, the one-sample t-tests do not tell us whether the majority of people in a given condition exhibit future-biased preferences: for that we must look to the results of our one-way 𝜒2-tests, reported in Table 2 below.

*Table 2. Results of one-way* 𝜒*2-tests.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **%FB** | **%non-FB** | 𝜒***2*** | ***p*-value** |
| **Condition 1:** First-Person | 88.6 | 11.4 | 47.101 | <.001 |
| **Condition 2:** Third-Person | 78.3 | 21.7 | 23.838 | <.001 |

The results of our one-way 𝜒2-tests confirm that a significant majority of participants exhibit future-biased preferences in both conditions.

When we compare the conditions, the independent samples t-test shows that the mean reported preference is higher in the first-person condition than the third-person condition (*t*(151) = 2.378, *p* = .019). That is, people overall are more future-biased in the first-person condition. However, Fisher’s exact test shows that the proportion of participants who exhibit future-bias does not differ significantly by condition (*p* = .125).

**3. Discussion**

We predicted, on the basis of Greene et al.’s (2021) results and self-reports in the philosophical literature, that we would find evidence of robust positive future-bias, in both first- and third-person conditions. This prediction was borne out, both in the mean responses and the majority. While Greene et al. (forthcoming) found that for a majority of people positive future-bias is not strong enough to outweigh a 10:1 inequality, we now know that it is nonetheless robust: for a majority of people positive future-bias is strong enough to outweigh a 2:1 inequality. Thus, there are situations where people prefer less future pleasure to more past pleasure — situations where people prefer that overall things are worse, even with regard to positive events. What can we take away from this?

On the one hand, our results support time-neutralist arguments against future-bias that appeal to reductions in people’s overall welfare (Dougherty 2011, Greene and Sullivan 2015). While time-neutralists have understood these arguments to apply to both positive and negative future-bias, until now they only had empirical support as applied to negative future-bias. We can now say that there is empirical support for arguments of this form against both negative and positive future-bias.

On the other hand, our results cut against Greene et al.’s (forthcoming) suggested arbitrariness argument for time-neutralism: if positive future-bias were fragile, while negative future-bias were robust (and indeed strong enough to overwhelm a 10:1 inequality), it would look like there was a difference in kind that supports the charge of arbitrariness. But our results suggest the difference is merely a matter of degree. Both biases are robust, and indeed it remains consistent with the empirical results that the ‘tipping points’ for positive and negative future-bias are not far apart (implausibly, but possibly, as close as 11:1 and 9:1). More follow-up work would be helpful on larger ratios for negative future-bias, alongside work on positive future-bias at ratios between 10:1 and 2:1.

In addition, it would be desirable to determine whether the pattern of preferences that emerge when we look at our results alongside Greene et al.’s (2021, forthcoming) is consistent across different kinds of (hedonic) positive events. There is evidence that people display different amounts of near-bias (the preference for positive goods to be temporally near, and negative ones temporally far) depending on exactly which positive or negative goods are in question.[[14]](#footnote-14) It would be useful to see whether there are also such differences with regard to future-bias. It would also be desirable to run similar studies that locate the protagonist in more mundane situations (rather than on a spaceship) to confirm that this change makes no difference.

Finally, these results provide more evidence against the claim that future-bias is a first-person-only phenomenon. While we found that participants were overall *more* future-biased in the first-person condition, there was no significant difference in the *proportion* of participants who reported future-biased preferences in the first- versus third-person conditions. Recent experiments have shown that participants display future-bias when prompted for their first- or third-person preferences in 1:1, 10:1, and now 2:1, conditions. As we noted above, the presence of third-person future-bias may depend on the degree to which participants are provided with details about the person for whom they are expressing a preference. One theory is that such details allow participants to “simulate” the predicament of the third person and report the preference they would have for themselves (Greene et al. 2021).

In all then, these results undermine certain appeals to asymmetry that might otherwise have been marshalled in the service of various arguments, either regarding the rationality of future-bias, or regarding the explanation for its existence. We do not see a difference in kind between first-person and third-person preferences: while people are *more* future-biased about first-person events, a significant majority are future-biased about both kinds of events. Likewise, we do not see a difference in kind between positive and negative future-bias: while negative future-bias is *stronger* than positive future-bias, both are robust. Hence arguments that appeal to the arbitrariness of our pattern of future-biased preferences must begin from a more modest starting point: they can merely cite differences in degree, not differences in kind. At the same time, we have found new empirical support for arguments that appeal to reductions in people’s overall welfare caused by robust future-bias: such arguments apply both to people’s positive and negative future-bias.[[15]](#footnote-15)

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1. To be more precise, you might have a positive *hedonic* future-bias, insofar as your preference concerns the temporal location of a pleasurable experience. See Hare (2013) for a discussion of future-bias regarding *non-hedonic events*—events that are not themselves pleasures or pains (though they can cause these), but which nonetheless can make one’s life better or worse. As our focus in this paper is entirely on hedonic events (pleasures and pains), we will omit the word ‘hedonic’ for concision. [↑](#footnote-ref-1)
2. For a more formal characterisation of future-bias see Greene & Sullivan (2015, pp. 948–9). [↑](#footnote-ref-2)
3. See Prior (1959), Hare (2007, 2008), Kauppinen (2018), Heathwood (2008), Pearson (2018) and Dorsey (2018). [↑](#footnote-ref-3)
4. See Brink (2011), Greene and Sullivan (2015) Sullivan (2018), Garrett (2018) and Dougherty (2015). [↑](#footnote-ref-4)
5. See Hedden (2015). [↑](#footnote-ref-5)
6. See Maclaurin & Dyke (2002) and Suhler & Callender (2012). [↑](#footnote-ref-6)
7. See Yehezkel (2013) and Pearson (2018). [↑](#footnote-ref-7)
8. Debunking explanations of future-bias have often focused on the role of emotions. See Hume (1738, section 2.3.7.6) Smith (1759, pt.6), Horwich (1987), Maclaurin and Dyke (2002), and Suhler and Callender (2012). [↑](#footnote-ref-8)
9. Sullivan (2018, p. 58) thinks we are absolutely future-biased, such that “we assign no value to a merely past painful experience or pleasurable experience.” Parfit (1984, p.173) appears to agree, at least regarding negative events, writing that “I do in fact regard my past suffering with complete indifference. I believe that, in this respect, most other people are like me”. Others, including Suhler & Callender (2012, p. 5) and Yehezkel (2014, p.11) think that we (non-absolutely) discount the past. [↑](#footnote-ref-9)
10. See, e.g., Prior (1959), Hare (2007, 2008) and Heathwood (2008). [↑](#footnote-ref-10)
11. Of course, given this result it could still be that future-bias is robust, just not *very* robust. After all, it could be that people do not report future-biased preferences when the ratio is 2:1, but that they do so at some ratio between 1:1 and 2:1. Given that we in fact find future-bias at the 2:1 ratio, this possibility is moot. [↑](#footnote-ref-11)
12. We used Fischer’s exact test because the number of non-future-biased first-person participants was fewer than 10. [↑](#footnote-ref-12)
13. That is, the inverse of future-biased preferences. [↑](#footnote-ref-13)
14. See Frederick et al. (2002) for an informative meta-analysis. [↑](#footnote-ref-14)
15. Preston Greene would like to thank the Singapore Ministry of Education Academic Research Fund Tier 1 RG134/19(NS) for their support. [↑](#footnote-ref-15)