

Does the Temporal Asymmetry of Value Support a Tensed Metaphysics?

Alison Fernandes

A.Fernandes.1@warwick.ac.uk

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Abstract:

There are temporal asymmetries in our attitudes towards the past and future. For example, we judge a given amount of work to be worth twice as much compensation if the work is described as taking place in the future, compared to the past (Caruso et al 2008). Does this temporal asymmetry of value support a tensed metaphysics of time? By getting clear on the asymmetry's features, I'll argue that it doesn't. To support a tensed metaphysics, the value asymmetry would need to i) be absolute (rather than graded), ii) apply equally to events concerning oneself and others, and iii) be both rational and judged to be so. But the value asymmetry is not absolute, is partially first-personal, and is judged irrational even by subjects whose judgements display the asymmetry. There are, moreover, independent arguments against its rationality. The asymmetry's features suggest instead that it arises as an emotion-driven overgeneralisation from a temporal bias concerning our future *actions*. This explanation points towards mechanisms that can play a role in explaining other instances where we overgeneralise about past and future events, and, ultimately, why we're tempted towards metaphysical pictures of time.

1. Introduction

How much money would be fair compensation to receive now for completing five hours of data entry work? The answer seems to depend on *when* the work is described as taking place. In a study by Eugene Caruso, Daniel Gilbert and Timothy Wilson (2008), people judged they should receive 101% more money if the work is described as taking place one month in the future (\$125.04 on average), compared to one month in the past (\$62.20 on average). The same temporal asymmetry appears in other cases.¹ When asked to select a bottle of wine that would be an appropriate thank you gift for a friend who lets them borrow their vacation home, people selected wine that was 37% more expensive when the vacation was to take

¹ The temporal asymmetry is also investigated cross-culturally (Guo et al 2012) and developmentally (Burns, McCormack et al 2018). Results from these studies are discussed in [Section 4](#).

place in the future, compared to the past (ibid.). When asked to select a bottle of wine that that would be an appropriate thank you gift for *themselves* for helping a neighbour move, people selected wine that was 71% more expensive when the move was to take place in the future, compared to the past. When asked to imagine being on a jury awarding compensation to an accident victim, people awarded 42% more compensation when they imagined the victim's suffering as taking place in the future, compared to the past. Finally, when asked how much money they would be prepared to pay to extend their winter break by 3 days, students reported they would pay 24% more for extending a break in the future, compared to the past. Call this phenomenon 'the temporal asymmetry of value' or 'the value asymmetry'. The temporal value asymmetry is a temporal asymmetry in the value we place *now* in past or future events, measured by judgements of fair compensation, reasonable reward, or acceptable swaps.

What might explain the temporal value asymmetry? Some have argued that related asymmetries should be explained by a 'tensed' metaphysics (or 'A theory') of time (Prior 1959; Cockburn 1998; Craig 2000; Zimmerman 2007). According to these arguments, asymmetries in our attitudes should be explained by (non-indexical) tensed facts about what events are past, present and future. These arguments face standard objections. In the following, I'll present a normative argument from the value asymmetry to a tensed metaphysics that avoids these objections. Ultimately, however, I'll argue that the observed value asymmetry *doesn't* support a tensed metaphysics. If the asymmetry were to support a tensed metaphysics, it should i) be absolute (rather than graded), ii) apply equally to events concerning oneself and others, iii) apply equally to hedonic experiences and other kinds of events, iv) be both rational and judged to be so. But the asymmetry lacks three of these features—it is not absolute, is partially first-personal, and is judged *irrational* even by subjects whose judgements display the asymmetry. There are, moreover, independent arguments against its rationality.

To explain the temporal value asymmetry, we should instead appeal to an evolutionary explanation. According to this explanation, the asymmetry is due to an overgeneralising of a temporal bias of emotion concerning our future *actions*. This explanation not only shows how asymmetries that are justified in metaphysical terms can be explained without recourse

to metaphysics. It also points towards mechanisms that can explain other instances where we overgeneralise from limited asymmetries concerning *some* past and future events to asymmetries concerning *all* past and *all* future events—an essential move in explaining how we come to adopt metaphysical pictures of time in the first place.

Why be concerned with the value asymmetry? As we'll see, considering the value asymmetry is relevant for broader questions about whether temporal asymmetries in attitude can be used to support a tensed metaphysics (Section 1). Getting clear on the asymmetry's features (Section 2) also matters to debates in normative philosophy about the *rationality* of attitude asymmetries. Some arguments against asymmetries of preferences, for example, assume asymmetries are absolute (Greene and Sullivan 2015; Sullivan Ch. 6 2018), and apply only to hedonic experiences (Dougherty 2015; Sullivan Ch. 6 2018). But there is evidence against these assumptions. The rationality of the value asymmetry matters, moreover, because it has practical consequences for the present—such as how much we compensate an accident victim. Finally, even if one thinks it obvious that temporal attitude asymmetries don't support a tensed metaphysics, scientific explanations of the value asymmetry points towards mechanisms that can help explain our adoption of metaphysical pictures of time (Section 4). These mechanisms include overgeneralising from features of some events to the features of the past and future as a whole, and adopting metaphysical pictures that seem to rationalise attitude asymmetries. Developing an empirically formed account of how we come by metaphysical pictures is not only relevant to certain debunking projects in metaphysics—it also matters for understanding the wider role that metaphysical pictures of time play in our thinking.

The paper proceeds as follows. In Section 2, I develop a normative argument from the temporal value asymmetry to a tensed metaphysics—one that avoids standard B-theorist objections. In Section 3, however, I argue that the asymmetry lacks the features required to support a tensed metaphysics, via this argument. In Section 4, I consider an evolutionary explanation of the value asymmetry, and the mechanisms it suggests for how we come to adopt metaphysical conceptions of time.

2. A Tensed Explanation

The temporal value asymmetry studied by Caruso and his team (2008) is an asymmetry in the value we place now in past and future events, of a kind measured either by judgements about fair compensation, or judgements about willingness to swap. People judge the future work to be worth more *now* than equivalent past work. How might the temporal asymmetry of value revealed in the Caruso studies be used to support a tensed metaphysics?

To my knowledge, no one has appealed directly to this asymmetry to support a tensed metaphysics. But some have appealed to related asymmetries. Arthur Prior (1959) famously argued that a tensed metaphysics is required to make sense of attitude expressions such as “Thank goodness that’s over!”. This expression cannot be translated as “Thank goodness that [painful event] is prior in time to May 12th, 2018!” without losing its meaning. After all, why should one be thankful for something that was always the case? So it might seem there must be tensed facts, and therefore a tensed metaphysics, to make sense of the *objects* of tensed utterances. One also might argue that a tensed metaphysics is required to make sense of asymmetries in the *attitudes* themselves, such as why an attitude of relief is appropriate to past pains, but not present (or future) ones. Hoerl (2015) suggests this reading of Prior. Similar arguments are given by Schlesinger (1976), Cockburn (1998), Craig (2000, pp. 151–7) and Zimmerman (2007).² Finally, one might argue that a tensed metaphysics is needed to make sense of why we *prefer* pains to be in the past, and pleasures to be in the future. Parfit (1984, p. 165/Section 64) famously presents a thought experiment in which a patient has either had 10 hours of painful surgery yesterday, or is due to have 1 hour of painful surgery later that day. Parfit takes it to be rational to prefer the greater pain in the past. One might argue that this asymmetry of preference needs to be justified or explained by a tensed metaphysics. Tarsney (2017) provides a similar argument.

Arguments like these have been criticised by B-theorists on two fronts. Firstly, Mellor (1981, Chs. 3–4) argues that even if tensed propositions or beliefs are required, tensed propositions and beliefs don’t imply tensed facts. Tensed propositions should be treated as indexicals like ‘here’ and ‘I’. While an utterance of ‘I spilled the sugar’ cannot be translated as ‘Nora spilled

² Zimmerman (2007, p. 214) in fact argues in favour of a presentist A-theory over other A-theories, but they speak equally against a B-theory.

the sugar' (even if Nora is the one speaking), this does not mean we need a metaphysics of I facts to make sense of such utterances (Perry 1979). Similarly, even though 'The painful event is over' cannot be translated as 'The painful event is prior in time to May 12th, 2018', this does not mean we need a tensed metaphysics. It is enough that we can give tenseless truth conditions for tensed utterances, such as 'The painful event is over' is true just in case the painful event is prior to the utterance. If it is ultimately tensed *beliefs* that explain and justify temporal asymmetries in our attitudes (Mellor 1998, p. 41), then a tensed metaphysics is not needed to make sense of asymmetries in our attitudes.

Secondly, some have argued '*tu quoque*': while it may be mysterious why an event's being *prior* should justify an attitude of relief, it's equally mysterious why an event's being *past* should justify an attitude of relief. So a tenseless theory is no worse off than a tensed theory when it comes to justifying or explaining asymmetries in our attitudes (Mellor 1998, p. 42; Suhler and Callender 2012; Hoerl 2015). Callender argues (2017, p. 292), furthermore, that attitude asymmetries at best support a primitive direction of time, not a tensed metaphysics.

Considerations like these lead Callender and Suhler to declare the thank goodness argument a 'nonstarter' (2012, p. 6). However, there is an argument for a tensed metaphysics that avoid these objections. While I won't ultimately endorse its conclusion, the argument makes sense of why A-theorists have taken attitude asymmetries to support a tensed metaphysics, and why we're more generally tempted towards tensed metaphysical pictures (Section 4). The argument aims to capture two features that A-theorists have claimed are important: a) showing why attitude asymmetries are *justified* (Craig 2000, p. 157), and b) doing so in terms of 'ontological distinctions between the past, present, and future' (ibid.), or otherwise in terms of some 'deep division in reality...[that concerns] some difference between the events themselves' (Cockburn 1998, p. 80). While I'll present the following argument as concerning the temporal value asymmetry, a similar argument could be made concerning other attitude asymmetries.

Consider first what A theories share in common: they divide the events of the world into whether they are past, present or future. For A-theorists, there are non-relative facts, and, in this sense, 'objective' facts about tense. B-theorists, by contrast, deny that events are past,

present or future *simpliciter*. Events are only past, present or future *relative* to other events, times or perspectives. There are only relative facts about tense.³ An A-theorist can argue that if we're to be *justified* in valuing past and future events differently, there have to non-relative facts about *which* events are past and future. Whether an event is past or future can't depend on 'subjective' features—such as where the person doing the valuing, the assessor of value, or some other non-object-relevant person or perspective is located. There have to be 'objective' facts about tense.⁴ An A-theorist might argue from a value asymmetry to a tensed metaphysics as follows:

Normative Argument:

- P1. The temporal value asymmetry is best explained by its being justified.
- P2. If the temporal value asymmetry is best explained by its being justified, it is justified.
- P3. The temporal value asymmetry is justified. (P1 & P2)
- P4. The temporal value asymmetry can only be justified by objective (non-relative) facts about what is past and future.
- C. Therefore there are objective facts about what is past and future.

How plausible is such an argument? The argument is valid, and P2 is a reasonable assumption of empirical enquiry. The controversial independent premises are P1 and P4. Later on, I will provide reasons to doubt P1 and P4. For now, let me consider why they might be plausible, and also how they can come under pressure.

P1 effectively relies on an epistemic assumption—that we are reasonably responsive to normative facts, such that the best explanation of our valuing behaviour is that we are rationally responsive to these normative facts. P1 comes under pressure, however, if the value asymmetry turns out to have features that are *not* well explained by their being justified. While one might still maintain that any *temporal asymmetry* in how we value must be explained its being justified (even if other features of our valuing aren't explained their being justified),

³ Views that deny non-relative tensed facts while still accepting a primitive direction of time (Maudlin 2007) count as B-theoretic in the arguments to come.

⁴ One might argue that values can be relativised to times, without being relativised to subjective features (such as when the valuer is located). However, what time-relative value is *relevant* to a given agent will still depend on when the valuer is located. So value still turn out to be subjective.

P1 loses support, and risks being question-begging, if we can't generally expect features of our valuing to be explained by their being justified.

P4 claims that the temporal value asymmetry can only be justified by objective (non-relative) facts about what is past and future. P4's strongest support comes from committing to a kind of objectivism about value. According to a *Strong Objectivism*, how we value events should *not* depend on facts about the *subject*, such as what desires she happens to have, or where she happens to be located. Instead, how we value events should only depend on facts about the *object*. For example, the fact that saving a drowning child is a valuable activity does not depend on whether you desire to help the child, or whether you happen to be nearby (even though you might be in a better position to help the child if you are nearby). *Strong Objectivism* effectively requires valuers to take an external viewpoint when assessing value that abstracts away from features of the subject. Given *Strong Objectivism*, if temporal location is like spatial location, such that whether an event is past or future depends on the *subject's* temporal location with respect to the object, then value *cannot* depend on whether an event is past or future. Value can only be depend on whether an event is past or future if tense is a non-relative property of the *object*—at least if *Strong Objectivism* is true.

One can weaken *Strong Objectivism* to allow for some domains of subject-relative value, such as personal relationships, or other areas where one acquires obligations and entitlements through activities and commitments. Similarly, one can accept a notion of 'valuable-to-a-given-subject' that is not equivalent to valuable *simpliciter*. So one can accept that features of subjects are sometime relevant to questions of value. Provided one makes these cases the exception (such that the relevance of a subjective property has to be justified), rather than the norm, one can still maintain a sufficiently strong version of *Strong Objectivism* to support P4.

One could try to defend P4 without appeal to *Strong Objectivism*. For example, one could appeal to *Temporal Objectivism*, according to which the value of events does not depend on *temporal* facts about the subject. But giving up *Strong Objectivism* means losing the unified framework by which *Temporal Objectivism* is supported. In the context of assessing support for a tensed metaphysics, such a move risks being question-begging.

One can reject the *Normative Argument* by rejecting *Strong Objectivism* (and therefore P4), or by rejecting the rationality of the value asymmetry (P3), via rejecting the claim that the temporal value asymmetry is best explained by its being justified (P1). I myself reject both *Strong Objectivism* and P3. But I want to suggest that the *Normative Argument* provides the A-theorist with their best case for arguing from the value asymmetry to a tensed metaphysics, because the argument avoids standard B-theorist objections. The *Normative Argument* avoids Mellor's objection that tensed facts aren't needed for tensed propositions, because it makes no appeal to tensed propositions. The argument also avoids the 'tu quoque' objection, because it does not attempt to directly justify (or explain) asymmetries in our attitudes. Instead, the argument claims that a tensed metaphysics is a *precondition* for an adequate justification (and therefore an adequate explanation). Nor does the *Normative Argument* merely support a primitive direction of time. A primitive direction of time would be insufficient to justify the value asymmetry, given P4, since facts about what is prior and later are still relative—nothing is prior simpliciter.

The *Normative Argument* is vulnerable, however, if subject-relative features turn out to be needed to explain how we value (in contexts where the value asymmetry appears). If they do, then either subject-relative features are relevant to how we justifiably value (undermining *Strong Objectivism*), or how we're justified in valuing is not what explains why we value as we do (undermining support for P1). I'll go on to argue that this is precisely what happens in the case of the Caruso studies—subject relative features turn out to be relevant. So, despite force of the *Normative Argument*, the temporal value asymmetry does not support a tensed metaphysics.

3. The Observed Asymmetry

Does the temporal value asymmetry support a tensed metaphysics? I'll now argue that, if it were to, via the *Normative Argument*, the value asymmetry would have to have certain features—several of which it turns out to lack. So the value asymmetry doesn't support a tensed metaphysics. None of the requirements I'll present are strict. One could give any of them up, and still maintain that the temporal value asymmetry provides *some* support for a tensed metaphysics. But the strength of that support is severely weakened, given the features

the asymmetry turns out to lack. While evidence concerning some of the requirements is inconclusive, I include them to build up a fuller picture of the asymmetry's features.

3.1 Absoluteness

The first requirement is that if the value asymmetry is to support a tensed metaphysics:

i) *Absoluteness*: The value asymmetry must be such that past events have no (or almost no) value compared to future events.

Absoluteness implies that temporal distance, in particular, can't play a significant role in how we value past events—this would require that some past events had significant value.

The rationale of this requirement is as follows. Metaphysical tensed facts are standardly absolute—events are either past or not. A-theories don't standardly take distance facts to be explicitly built into the metaphysics (with the exception of theories that take pastness to be a matter of degree). If it is the standard A-theoretic tensed asymmetry that is to explain the value asymmetry, the value asymmetry should be absolute, and not vary with temporal distance. Parfit makes similar arguments preference discounting. Discounting should be absolute, since 'Being in the Past is not a matter of degree' (1984, p. 181/Section 69). See also Greene and Sullivan (2015) and Sullivan (2018, Ch. 5) for similar arguments. More precisely, if *relational* distance facts are required to explain how we value past events, this undermines support for either premise P1 or P4 of the *Normative Argument*. Say relational temporal distance facts are required. Then either relational features contribute to justifying how we value events (undermining *Strong Objectivism*), or there are features of the value asymmetry that are not accounted for by their being justified (undermining P1). I have no strict criterion to offer on whether (non-relative) tensed distance facts are explicitly built into a metaphysics. It is also consistent with a tensed metaphysical explanation that additional features are relevant to how we value (even if not built in directly). So *Absoluteness* is contestable. Nevertheless, if there is to be a close match between the metaphysics and the observed asymmetry, the asymmetry should be absolute if the tensed metaphysics is.

Is *Absoluteness* satisfied for the value asymmetry? It is not. In the Caruso studies (Caruso et al 2008), subjects consistently judge past events to have significant value compared to future events. The relative value of past events ranges between 0.5 (data entry work) and 0.8 (extending one's winter break). There is, moreover, evidence that how we value past events varies with temporal *distance*. Certainly preferences for future events vary with temporal distance—the temporal discounting effect. When asked to choose between less money soon or more money later, subjects consistently choose less money soon, even once uncertainty and other factors are controlled for (Frederick et al 2002). Related studies have argued that our preferences for *past* events also vary with temporal distance (Yi et al 2006; Bickel et al 2008; Dixon and Holton 2009; Radu et al 2011; He 2012).⁵ There is also evidence that how unfair we judge an action to be depends on temporal distance (Caruso 2010). These results are consistent with general arguments by Trope and Liberman (2003) about the role of temporal distance in determining our attitudes.

One might argue that the *rational* value asymmetry is absolute, but is partially masked by a consistency judgement where we (incorrectly) judge that past and future work should be worth the same. However, the temporal asymmetry only appears when subjects *aren't* able to make such consistency judgements (Section 3.4), so such masking can't account for the observed result. One might also argue that the asymmetry is absolute, but is sometimes overlain by a (irrational) distance discounting. But this proposal requires still past events to begin with significant value, implying the value asymmetry is not absolute. One might also argue that the value asymmetry is absolute with respect to *hedonic* states, but that the value of non-hedonic events may depend on distance (Sullivan 2018, Ch. 5). Against this hypothesis, at least in the case of preferences, *future* discounting applies equally to experiences as well as to commodities (Frederick et al 2002; Berns et al 2007). Moreover, a tensed metaphysical explanation of the value asymmetry suggests treating hedonic and non-hedonic states alike (Section 3.3).

3.2 Third Personal

Here's a second requirement. If the value asymmetry is to support a tensed metaphysics:

⁵ Causation is required in interpreting these results. With the exception of Radu et al (2011), the future and past questions may have been intermingled. If so, past discounting may simply be an artifact of future discounting.

ii. Third-Personal: The value asymmetry must hold equally for events concerning oneself (first-personal), and others one is unrelated to (third-personal).

The rationale for *Third-Personal* is as follows. If the asymmetry were first- or second-personal, facts about the agent and her activities, subject-*relative* facts, would be required to explain how we value events as we do. This would either imply that *Strong Objectivism* is false (because relative facts would be needed to justify the asymmetry) or put significant pressure on P1 (because significant aspects of the asymmetry would *not* be explained by their being justified). For example, if one argued that the asymmetry was third personal but masked by a (irrational) tendency to value one's own activities more, irrational tendencies would play a significant role in explaining how we value. Hare (2007, 2008) and Brink (2011) similarly argue that rational preference asymmetries cannot depend on whether an event is first- or third-personal. One could adopt a kind of centred metaphysics that includes first-personal facts about a privileged 'I' (Hare 2007). But, for A-theorists who reject such a metaphysics, person-relative facts cannot be used to explain the asymmetry without undermining the *Normative Argument*.

Is *Third-personal* satisfied in the Caruso studies (2008)? No. The value asymmetry does not hold equally for events concerning oneself and others. Most of the scenarios tested were first- or second-personal—subjects judged what compensation they should receive, or what reward they would offer. But when third-personal scenarios were compared to first-personal scenarios, the observed asymmetry was greatly reduced. In one study, subjects were asked to judge what would be fair compensation now for 5 hours of their own data entry work (1 month in the past or future) compared to that of a 'randomly selected person from the local area' (Caruso et al 2008, p. 799). Subjects judged they should receive 60% more money for future work, compared to past worked, but that the other person should receive roughly the same for future and past work. There is a slight asymmetry in the third-personal case (see Table 1), but the effect is below significance ($p > .05$).

	<i>Time of work</i>	
	<i>Past</i>	<i>Future</i>
<i>First-personal</i>	\$49.76 (\$28.75)	\$79.67 (\$64.12)
<i>Third-personal</i>	\$47.56 (\$19.66)	\$54.15 (\$24.44)

Table 1. Average values (in US dollars) judged to be fair compensation now for 5 hours data entry work for oneself or an unrelated other (Caruso et al 2008, Table 2). Standard deviations are in brackets.

This result may be no surprise. Philosophers have sometimes assumed that preference asymmetries are first-personal, and obtain only for one’s own experiences (Parfit 1984, Section 69, pp. 181–184; Horwich 1987, p. 197; Brink 2011). The value asymmetry is above significance, however, in some third-personal cases (Caruso et al 2008). Subjects awarded an accident victim 42% more money when her suffering was described as taking place in the future, compared to the past. Significant third-personal temporal asymmetries were also found in asymmetries of fairness judgements (Caruso 2010).⁶ A plausible hypothesis is that the moral (rather than prudential) dimension of such cases plays a role in explaining why the temporal asymmetry obtains for some third-personal cases but not others.

Further empirical studies could help determine the relation between third- and first- personal cases. For example, an intriguing possibility suggested by the results in Table 1 is that we treat our past-selves third-personally—accounting for why a first/third person asymmetry disappears in the past case. Studies could also examine to what degree subjects are able to anticipate that others’ valuing will exhibit the same asymmetry. In the case of judgements of fairness, subjects *don’t* anticipate that others choices will exhibit the temporal asymmetry that their own choices do (Caruso 2010). If a similar result holds for value, this puts additional pressure on metaphysical explanations of the value asymmetry, insofar as we take ourselves and others to have equal access to the metaphysical facts.

⁶ Spatial distance doesn’t seem to play a strong role in determining asymmetries, at least with respect to fairness judgements—*contra* Hare (2007; 2008).

3.3 Applies to All Events

Here's a third requirement on the value asymmetry, if it is to support a tensed metaphysics:

ii. *Equal Applicability*: The value asymmetry must hold equally for hedonic states (pleasures and pains) as well as other kinds of events, such as achievements.

The rationale for this requirement is as follows. All events are equally subject to the metaphysical past/future asymmetry. If the asymmetry applies to some events, and not others, the asymmetry is not best explained in metaphysical terms. As with *Absoluteness*, this requirement is contestable. One can still maintain that the *Normative Argument* provides support for a tensed metaphysics, even if the asymmetry holds only for some events. A stronger rationale for *Equal Applicability* could be given, if the distinction between hedonic states and non-hedonic events were subjective. For example, if an experience counts as painful just in case a subject *desires* not to undergo it while she is undergoing it, then subjective states are relevant to explaining when the asymmetry holds—putting pressure on P1 or *Strong Objectivism*. Subjectivism about hedonic states is, however, controversial (Nagel 1986, pp. 156–162; Street 2006, pp. 144–152). Without settling these further debates, *Equal Applicability* is an inconclusive requirement.

Philosophers themselves have often only focussed on attitude asymmetries concerning purely hedonic states (Greene and Sullivan 2015; Sullivan 2018; Dougherty 2011; Tarsney 2017). Some have also thought that asymmetries of care, value or preference apply to hedonic experiences, but not to other kinds of experiences (Horwich 1987, p. 197), or not to other events such as achievements (Hurka 1996, p. 61), disgraces (Brink 2011), disappointments (Hare 2013), or to events that give us pride or shame (Parfit 1984, p. 160/Section 62). Some of the arguments *against* temporal biases in Dougherty (2015) and Sullivan (2018, Ch. 6), moreover, also rely on hedonic experiences being subject to the bias, but not other events (such as the accomplishment of finishing a tough workout, or the good of civic participation).

Is *Equal Applicability* satisfied? Or are normative philosophers right to think that preference

asymmetries only obtain for hedonic states? While results are inconclusive, there is some evidence that the value asymmetry obtains for a variety of experiences. The temporal value asymmetry was found for 5 hours of data entry work (1 month ago), 6 months of painful rehabilitation, 1 week at a friend's vacation home, 1 day spent helping a neighbour move (1 week ago), and 3 days of extended winter break (17 days ago) (Caruso et al 2008). While all these may involve hedonic components, the plausibly least hedonic of these, 5 hours of data entry work, displayed the greatest asymmetry (101% more for future work, compared to past work). However, the degree to which these events were hedonic was not determined. Nor were explicitly non-experiential events like achievements tested.

Overall, results concerning *Equal Applicability* don't count against a tensed metaphysical explanation. Instead, they suggest that discussions in normative philosophy may need to widen their scope.

3.4 Rationality

Here's a final requirement on what the value asymmetry must be like to support a tensed metaphysics.

iv. Rationality: The temporal value asymmetry must be i) rational, and ii) not judged otherwise by subjects whose value judgements exhibit the asymmetry.

The rationale for this requirement is as follows. Regarding i), if the asymmetry were irrational, P3 of the *Normative Argument* would be false. So a tensed metaphysics would not be supported. Regarding ii), if the value asymmetry were *judged* irrational, P1 comes under significant pressure. P1 says that the value asymmetry is best explained by its being justified. But if subjects *judge* the asymmetry to be irrational, this means that, at their more reflective, subjects' judgments *aren't* rationally responsive to the normative facts—even though their less reflective judgements are. This would be a surprising model of how we're rationally responsive to norms that derive from metaphysical features of reality (even if it's an appropriate model for other cases). If subjects judge the asymmetry to be irrational, it doesn't seem that asymmetries in their value judgements should be explained in rational terms.

Is *Rationality* satisfied in the Caruso studies (2008)? Regarding ii), results suggest that subjects judge the asymmetry to be *irrational*. The methodology for the Caruso studies involved ‘counterbalancing’: half the subjects were given the description of the future event first, half the subjects were given the description of the past event first. When the value judgements *within* either of these groups is considered, the value asymmetry drops below significance—see the entries within columns in Table 2. In other words, when you ask people how they value *both* a past and a future event, they report valuing them roughly the same. The value asymmetry only appears above significance when judgements *across* the two groups are compared—a ‘between-person’ analysis. In other words, the value asymmetry appears above significance when you ask some people about the past first, and other people about the future first, and compare their judgements—the entries in bold in Table 2.

<i>Study</i>	<i>Order of evaluation</i>	
	<i>Past event first</i>	<i>Future event first</i>
<i>Study 2a: Compensation for injury</i>		
<i>Past</i>	2.50 (2.42)	3.49 (2.81)
<i>Future</i>	2.62 (2.69)	3.55 (2.75)
<i>Study 2b: Borrowing vacation-home</i>		
<i>Past</i>	89.17 (60.22)	129.06 (86.66)
<i>Future</i>	91.73 (76.57)	121.98 (82.24)
<i>Study 2c: Helping neighbour move</i>		
<i>Past</i>	75.69 (78.06)	120.86 (114.21)
<i>Future</i>	73.77 (81.56)	129.24 (110.74)

Table 2: Average values (in US dollars) judged to be fair compensation now for past or future events (Caruso et al 2008, Table 1). Values concern millions of US dollars (2a), and US dollars worth of bottle of wine (2b and 2c). Bold entries indicate the values compared in a ‘between-person’ analysis. Standard deviations are in brackets.

A straightforward interpretation of this result is that subjects judge that whether an event is past or future should *not* make a difference to its value. So they judge past and future events to be worth roughly the same when asked about both events (Caruso et al 2008). If subjects

did judge the value asymmetry to be *rational*, we would expect the asymmetry to hold (and perhaps be *more* pronounced) when they were asked about both events. Instead the asymmetry disappears. Since subjects judge the asymmetry to be irrational, ii) of *Rationality* is contradicted. More cautiously, even if subjects don't explicitly judge the asymmetry to be rational, the fact that the asymmetry disappears when past and future events are compared suggests that the asymmetry is not to be explained in terms of norms based in metaphysical facts. If subjects judge the asymmetry to be irrational, this also undercuts arguments from the observed asymmetry to its rationality. So i) of *Rationality* is not supported.

One could argue that the asymmetry is rational, even though its rationality is not supported by the observed asymmetry. I won't attempt to settle whether the asymmetry is rational. My own view is that questions of normativity depend heavily on what hypothetical standards we adopt. But let me note the current state of normative debate. Hare (2007, 2008), and, to some extent, Parfit (1984, section 64/pp. 165–7) and Tarsney (2017) argue for the *prima facie* rationality of preference asymmetries.⁷ These arguments proceed, however, largely by eliciting intuitions about hypothetical cases. If one can explain why our intuitive judgements are temporally asymmetric without presuming the rationality of attitude asymmetries (Section 4), our intuitive judgements by themselves don't provide strong support for the rationality of the asymmetry. Moreover, in the case of the temporal value asymmetry, the asymmetry disappears when past and future events are compared—suggesting our intuitive judgements speak against the asymmetry's rationality.

There are also independent arguments against the rationality of related attitude asymmetries. Some risk being question-begging in this context. For example, one cannot reasonably, in this context, argue for the irrationality of the asymmetry by claiming that the difference between the future and past is *arbitrary*, and therefore not normatively significant (Sullivan 2018, Ch. 7). According to A-theorists, the difference between the past and future is a deep

⁷ While these arguments concern asymmetries of preferences, the value asymmetry implies a preference asymmetry, given other assumptions. Roughly, valuing a good future event more (rationally) implies being willing to swap a good future event for more now than one would swap an equivalent past event, indicating a preference for good things to be in the future and, *mutatis mutandi*, bad things to be in the past. See Dougherty (2015) for a discussion of why there might be differences in how preference and value asymmetries manifest.

metaphysical feature, and so is plausibly normatively significant.⁸ But other arguments avoid question-begging. For example, Tom Dougherty (2011) argues that someone with temporally biased preferences will be led to accept a series of swaps that leaves her worse off overall—a case of diachronic ‘money-pumping’. Meghan Sullivan and Preston Greene (2015), also in Sullivan (Ch. 6 2018), argue that someone with temporally biased preferences will be led to unreasonably delay pleasures in order to avoid anticipated regret.⁹

However, these arguments, as well as others defending temporal neutrality (Brink 2011), rely on assumptions about normatively significant forms of personal identity. What happens to you in the future must partly determine what you have reason to do now, if anticipated regret or money-pumping is to be relevant. One can therefore reject Sullivan’s and Dougherty’s arguments by employing a ‘time-slice view’ of rationality: one takes one’s reasons at a time to be independent of one’s states at other times (Moss 2015; Hedden 2015). This move, however, is not available to an A-theorist who accepts a standard package of a tensed metaphysics and an endurantist view of personal identity (that grounds normatively significant facts). Ironically, views that are standardly packaged with a tensed metaphysics generate arguments *against* the rationality of preference asymmetries—arguments that those denying endurantism can avoid.

Overall, the observed asymmetry is not judged rational (at least to the extent that the asymmetry disappears when past and future events are compared), and there are independent arguments against its rationality. So *Rationality* is not satisfied.

The value asymmetry lacks the required features to support a tensed metaphysics via the *Normative Argument*. While there is some evidence the temporal value asymmetry applies to a variety of events (*Equal Applicability*), past events do have significant value (contradicting *Absoluteness*), the value asymmetry applies unequally to first and third-personal cases (contradicting *Third Personal*), and subjects judge the asymmetry to be *irrational* (contradicting *Rationality*). There are, moreover, independent arguments against the asymmetry’s rationality.

⁸ One might still go on to argue, however, that a metaphysical asymmetry can’t rationalise the particular pattern that our temporal biases take. See [Sections 2–3](#) and Sullivan (2018, Ch. 7).

⁹ For discussion of Dougherty and Sullivan’s arguments, see Hare (2013), Greene and Sullivan (2015), Dorsey (2016) and Tarsney (2017).

While one might reject *Absoluteness*, the requirements *Third Personal* and *Rationality* provide strong arguments against the claim that the value asymmetry supports a tensed metaphysics.

Other attitude asymmetries may fair differently with respect to some of the above criteria. For example, unpublished studies suggest that we judge *preference* asymmetries to be rational, at least to the extent that they remain when past and future events are compared (Caruso 2018). The same studies, however, show that preference asymmetries are first-personal to a degree. How preference asymmetries fare with respect to the other criteria is uncertain (although see Hare (2007) for some speculations). Regardless, the temporal value asymmetry provides a model for what features are empirically relevant for whether a given attitude asymmetry supports a tensed metaphysics, and a clear case where a tensed metaphysics is not supported.

4. Explaining Temporal Asymmetry

Features of the value asymmetry that point away from a metaphysical explanation point towards a scientific explanation of the asymmetry. The value asymmetry is stronger regarding events that are nearer in time, and that concern the subject. These features suggest that the value asymmetry is due to an initial asymmetric bias concerning an agent's own immediate *actions* that has become 'overgeneralised' to a degree to include events that are further away in time or don't concern the agent. The fact that the value asymmetry is not fully general (is still centred on the subject), and is judged irrational suggest this overgeneralising isn't driven by implicit or explicit inference. If subjects were *inferring* the future was more valuable than the past, the asymmetry should be fully general, and judged rational.

Moreover, when we look to scientific explanations of the value asymmetry (and related asymmetries) offered by psychologists and philosophers, they take precisely the form suggested: the asymmetry is due to a temporal bias concerning an agent's *actions* that has become overgeneralised through non-inferential mechanisms. According to an evolutionary emotion-based account, for example, the value asymmetry is directly caused by an emotion asymmetry (Caruso et al 2008; Caruso 2010; Suhler and Callender 2012; Callender 2017). We feel stronger emotions when contemplating future events compared to past events, which

leads us to judge them to have greater value. The emotion hypothesis is supported by the fact that when subjects were asked how they felt now when contemplating past or future events the differences in the strength of their reported emotions predicted the differences in their valuation, even when other factors that influence emotion were introduced (Caruso et al 2008).¹⁰

The emotion asymmetry is in turn argued to be due to the evolutionary advantages of an agent's feeling stronger emotions towards contemplated future actions (Caruso 2010; Callender 2017, Ch. 11; van Boven and Ashworth 2007). Evolutionary 'functional' explanations of related asymmetries of care or attention are given by Parfit (1984, Section 65/p. 168–170), Horwich (1987, pp. 196–8), Maclaurin and Dyke (2002) and Greene and Sullivan (2015). These all take the following broad form:

1. Emotions felt now about contemplated events can motivate appropriate action towards achieving those events.
2. Emotional responses are (potentially) evolutionarily adaptive for action-guidance only if the contemplated events are those under our control.
3. Past events are never under our control. So emotional responses to contemplated past events are not evolutionarily adaptive for action-guidance.
4. We control some future events. So emotional responses to contemplated future events are (potentially) evolutionarily adaptive for action-guidance.
5. So we feel stronger emotions towards future events than past events.

According to this evolutionary explanation, the emotion asymmetry ultimately derives from an asymmetry of control. Given we control (some) future events, but no past ones, only a bias towards feeling stronger emotions towards future events is evolutionary adaptive.

¹⁰ Burns, McCormack et al (2018) argue that the emotional asymmetry is developmentally prior to the value asymmetry, which may emerge only between ages 6 and 10, but that the emotion and value asymmetries are uncorrelated. Both this and the above results are, however, consistent with the emotion and value judgements having common causal factors. Note that the evolutionary explanation of the emotion asymmetry I'll consider could be applied to other non-cognitive attitudes and still account for the value asymmetry. What matters to getting the features of the value asymmetry right is that the explanation appeals to *some* sub-inferential attitude that is functional when it centres on events directly relevant to the agent now, but that has become overgeneralised to include events that aren't directly relevant to the agent. For more on the emotion asymmetry and the role of emotion in choice, see van Boven and Ashworth (2007) and Gilbert and Wilson (2009).

The evolutionary explanation sketched above is oversimplified in a number of ways. Firstly, it neglects other potential sources of asymmetry. For example, we are more emotional towards events we are uncertain of. Given that we're typically more uncertain of future events than past events, uncertainty may contribute to the emotion asymmetry—see Caruso (2010) and Suhler and Callender (2012). There may also be contributions from the different social roles of permission and punishment (Caruso 2010 p. 621). A second simplification is that the explanation presumes that if contemplated events aren't under our control, emotional responses to them aren't adaptive for action-guidance (premise 2). This assumption is likely false. Feeling regret about past actions, for example, can help one avoid similar actions in the future (MacLaurin and Dyke 2002). So emotions directed towards events we can't control *can* be evolutionary adaptive, even for action-guidance. These two simplifications can be dealt with, however, without changing the general form of the explanation—by including additional features, and being more nuanced about the ways in which our thinking about the past prepares us for the future.

There is, however, an assumption the explanation makes that is rarely discussed, and yet is crucial: there must be a *mechanism* that drives overgeneralisation. Recall, the evolutionary explanation is supposed to account for why we feel stronger emotions towards future events *in general*, and so why we value future events more. But the explanation above appeals to the adaptiveness of feeling more strongly about future events we *can control*. Yet we don't control all future events. Feeling more strongly towards future events we can't control, moreover, *isn't* in itself adaptive—it's only adaptive when packaged with feeling more strongly about future events we *can* control. For the explanation to work, our emotional responses must overgeneralise such that we feel stronger emotions towards *all* future events. More generally, if we're to explain how we come to have an attitude more towards *future* events than equivalent *past* events (rather than events we control versus those we don't), and if such an explanation is to be based in asymmetries that are directly relevant to agents (such as an asymmetry of control), then some form of overgeneralising will always be required.¹¹

¹¹ Overgeneralising is also required to explain why we bet more optimistically on the future than the past (Strickland, Lewicke, and Katz, 1966), why we judge future actions as more due to the will (Helzer and Gilovich 2012), why we judge past transgressions less harshly (Caruso 2010), and why we judge that future events feel closer than past events (Caruso et al 2013).

Understanding how overgeneralising operates is something metaphysicians should be particularly concerned about. An on-going research program, particularly among B-theorists, has been to account for real or apparent temporal asymmetries in scientific, rather than metaphysical terms. For example, one might appeal to causal relations, laws, probabilities, and contingent asymmetries to explain why only the future is (or appears) open to control (Horwich 1987, Ch. 8; Price 1996, Chs. 6–7; Blanchard 2014; Albert 2015, Ch. 2; Fernandes 2017), why the past is knowable in a way the future is not (Horwich 1987, Ch. 5; Albert 2015, Ch. 2), or why only the future appears open and the past seems fixed (Ismael 2016, Ch. 6; Prosser 2016, Ch. 7; Callender 2017, Ch. 11). These explanations all make crucial use of generalising moves—they explain, for example, why the whole *future* has (or seems to have) certain features (such as appearing ‘open’), by appealing to properties that only *some* future events have (such as being under our control). But, despite their aspirations to be empirically grounded, these accounts don’t discuss possible mechanisms, or provide other empirical support for overgeneralising. Without this, we lack an empirically informed account of how we come to conceive of the past and future themselves as having distinct features.

If we can make sense of how overgeneralising operates in the case of emotion (and value), this gives us indications of how it might work in other cases as well.¹² While I won’t commit to a particular mechanism, something of the following general form is plausible. Van Boven and Ashworth (2007) argue that emotional overgeneralising is due to the adoption of temporal ‘frames’ and associative mechanisms. Contemplating a possible future (versus past) event leads us to adopt a distinct temporal perspective on that event. Because mentally simulating future events is typically more relevant for acting in the present, there becomes an association between adopting a future perspective and simulating events more extensively. Due to the association, adopting a future perspective leads us to simulate *all* future events more extensively. Simulating an event more extensively, in turn, produces stronger emotions now.

¹² Asymmetries in emotion may also play a more direct role in shaping our metaphysical pictures of time, such as by leading us to think of the future more optimistically than the past (Helzer et al 2012).

Other associative mechanisms may contribute.¹³ Van Boven, Kane and McGraw (2010) argue that simulations of the future are less ‘constrained by reality’ than simulations of the past. With regard to the past, we can typically draw more heavily on reliable information, such as memories, to decrease our uncertainty and form more realistic expectations. With regard to the future, we typically have less, and less reliable information. Because simulations of future events typically less constrained by current information, they argue, we tend to simulate all future events as more ‘prototypical’ and extreme.¹⁴ Furthermore, having less information about the future allows us to focus more excessively on particular events and how they might affect us, to the exclusion of other events—an effect called ‘focalism’ (Wilson and Gilbert 2005). If reality constraints and focalism become associated with future framing, we will be liable to form more extreme expectations and focus more on all future events, not just those we control—and so will experience stronger emotions concerning all future events.¹⁵

Finally, Caruso (2010) suggests that feeling less strongly about the past may be an overgeneralised response to feeling less strongly about events that we can (typically) rationalise. Once we believe that an event is past, we begin to incorporate it into our picture of reality. We then see it as more just and inevitable than when it loomed in the future, and so experience less strong emotions towards it. See Wilson and Gilbert (2008) for more on mechanisms that drive affective adaptation towards past events.

Under all these accounts, overgeneralising is driven by a cognitive architecture that divides the world into past and future, and by associative mechanisms that determine how we simulate events. If these hypotheses are right, differences in how we’re often required to

¹³ A number of these hypotheses build on construal level theory (Trope and Liberman, 2003): differences in how we construe events (due to temporal features) lead to differences in evaluation and behaviour. See also D’Armentano and van der Linden (2004) for more on phenomenological differences in how we simulate past and future events. Caruso et al (2013) and van Boven and Caruso (2015) argue that an asymmetry in ‘psychological distance’ (how close events feel) also contributes to the emotion asymmetry. For further discussion, see Burns, McCormack et al (2018).

¹⁴ See Newby-Clark and Ross (2003) for more on our tendency to idealise the future compared to the past. We also form more extreme expectations about how we’ll feel in the future (Miloyand and Suddendorf 2015). Van Boven and Ashworth (2007) argue, however, that this is a minimal contributor to the emotion asymmetry.

¹⁵ Guo et al (2012) argue for an effect of temporal orientation, but one that is reversible and partly determined by culture—those of European background focus more on the future (leading to the value asymmetry above), whereas those of Chinese background focus more on the past (leading to the opposite asymmetry).

simulate some past and future events can lead to differences in how we simulate *all* past and future events. These differences are plausibly what drive temporal asymmetries in our emotional responses towards past and future events, and can lead to higher-level effects, such as temporal asymmetries in how we value past and future events.

Via mechanisms for overgeneralising, the case of emotional and value asymmetries provide a broad model for how broad temporal asymmetries in attitudes can be explained in terms of more limited temporal asymmetries in more basic responses—without recourse to a tensed metaphysics, or requiring that subjects make distinctly metaphysical assumptions about time.

Metaphysical assumptions may still contribute to attitude asymmetries, including those of emotion and value. For example, metaphysical beliefs about the openness of the future may contribute to our feeling stronger emotions towards future events. This possibility could be investigated empirically, such as by manipulating subjects' metaphysical beliefs. For similar manipulations, see Helzer et al (2012). But the same features that speak against a tensed metaphysical explanation of the value asymmetry also speak against metaphysical pictures playing a strong role in explaining emotion and value asymmetries, and other attitude asymmetries that share their features. Firstly, the overgeneralising in the case of value and emotion is still only partial. Stronger emotions and increased value judgements are still centred on the agent. Metaphysical beliefs (at least if fully held) would suggest an asymmetry that was fully general, and not centred on the agent. Secondly, the value asymmetry (at least) appears even when it is judged irrational. Metaphysical beliefs would suggest an asymmetry that was judged rational.

An intriguing possibility is that we might instead be tempted towards certain metaphysical pictures of time in part *because* they seem to rationalise temporal asymmetries in our attitudes—in ways suggested by the *Normative Argument* (Section 2). Metaphysical pictures of time may appear or be reinforced as post-hoc *rationalizations* of attitude asymmetries. We would thereby have a mechanism by which attitude asymmetries could directly contribute to our developing and sustaining tensed metaphysical conceptions of time. This possibility is open to empirical investigation—for example, by investigating how subjects attempt to

rationalise attitude asymmetries, or by investigating how these temporal asymmetries arise developmentally (Burns, McCormack et al 2018).

Regardless of these further results, the value asymmetry provides a striking case where a temporal asymmetry of attitude is not well explained by a tensed metaphysical terms. The scientific explanation of the asymmetry relies, moreover, on mechanisms of overgeneralising that are relevant for understanding our broader adoption of metaphysical pictures of time.

5. Conclusion

A-theorists have appealed to temporal asymmetries in our attitudes to support tensed metaphysics. Empirical studies bear out the existence of a related asymmetry in our value judgements. But, even granting A-theorists a normative argument from the value asymmetry to a tensed metaphysics, the observed asymmetry lacks a number of features required. The value asymmetry is non-absolute, is partially first-personal, and is judged irrational, even by subjects whose judgements exhibits the asymmetry. There are, moreover, independent arguments against its rationality. The asymmetry's features suggest that it instead arises from an emotional asymmetry: we feel more strongly towards contemplated future actions. This emotional asymmetry is in turn due to our feeling more strongly towards events we control—an effect that has become overgeneralised through temporal framing and associative mechanisms. By operating at a relatively basic level, this explanation not only provides a non-metaphysical route to explaining temporal asymmetries in our attitudes. It also suggests mechanisms that can help explain why we conceive of the past and future in distinct terms, and so why we're led to metaphysical pictures of time in the first place.

References

- Albert, David. 2015. *After Physics*. Cambridge, Mass.: Harvard University Press.
- Berns, Gregory S., David Laibson, & George Loewenstein. 2007. Intertemporal choice--toward an integrative framework. *Trends in Cognitive Sciences* 11(11): 482–488.
- Callender, Craig. 2017. *What Makes Time Special*. Oxford: Oxford University Press.
- Bickel, Warren K., Yi, Richard, Kowal, Benjamin P. & Gatchalian, Kirstin M. 2008. Cigarette smokers discount past and future rewards symmetrically and more than controls: Is discounting a measure of impulsivity? *Drug and Alcohol Dependence*. 96(3): 256–262.

- Blanchard, Thomas. 2014. *Causation in a Physical World*. PhD Thesis. Rutgers University.
- Brink, David O. 2011. Prospects for Temporal Neutrality. In *The Oxford Handbook of Time*, Craig Callender (ed.) Oxford: Oxford University Press.
- Burns, Patrick, McCormack, Teresa, Jaroslawska, Agnieszka, Fitzpatrick, Aine, McGourty, Jemma, Caruso, Eugene. 2018. The Development of Asymmetries in Past and Future Thinking. *Journal of Experimental Psychology: General*.
- Callender, Craig. 2017. *What Makes Time Special*. Oxford: Oxford University Press.
- Caruso, Eugene M. Gilbert, D. T., & Wilson, T. D. 2008. A wrinkle in time: Asymmetric valuation of past and future events. *Psychological Science* 19(8): 796–801.
- Caruso, Eugene M. 2010. When the future feels worse than the past: A temporal inconsistency in moral judgment. *Journal of Experimental Psychology: General*, 139(4): 610–24.
- Caruso, Eugene M. Van Boven, L., Chin, M., and Ward, A. 2013. The Temporal Doppler effect: When the Future Feels Closer than the Past. *Psychological Science* 24(4): 530–536.
- . 2018. Why the Future is Bigger (and “Badder”) Than the Past. Presentation at *Temporal Asymmetries in Philosophy and Psychology Workshop*, University of Warwick.
- Craig, W. 2000. *The Tensed Theory of Time*. Kluwer Academic Publishers, Dordrecht.
- Cockburn, D. 1998. Tense and emotion. In Le Poidevin, R., ed., *Questions of Time and Tense*, pp. 77–91. Clarendon Press, Oxford.
- D’Argembeau, A., and van der Linden, M. 2004. Phenomenal characteristics associated with projecting oneself back into the past and forward into the future: Influence of valence and temporal distance. *Consciousness and Cognition* 13: 844–858.
- Dixon, M. R., & Holton, B. (2009). Altering the magnitude of delay discounting by pathological gamblers. *Journal of Applied Behavioral Analysis*. 42, 269–275.
- Dorsey, Dale. 2016. Future-bias: A (Qualified) Defense. *Pacific Philosophical Quarterly* DOI: 10.1111/papq.12176.
- Dougherty, Tom. 2015. Future-Bias and Practical Reason. *Philosophers’ Imprint*. 15(30): 1–16.
- Fernandes, Alison. 2017. A Deliberative Approach to Causation. *Philosophy and Phenomenological Research* 95(3): 686–708.

- Frederick, Shane, Loewenstein, George & O'Donoghue, Ted, 2002. Time Discounting and Time Preference: A Critical Review. *Journal of Economic Literature* 40(2): 351–401.
- Gilbert, Daniel T. & Wilson, Timothy D. 2009. Why the brain talks to itself: sources of error in emotional prediction. *Philosophical Transactions of the Royal Society B*. 364: 1335–1341.
- Greene, Preston and Sullivan, Meghan. 2015. Against Time Bias. *Ethics* 125: 947–970.
- Guo, Tiejuan, Ji, Li-Jun, Spina, Roy, & Zhang Zhiyong. 2012. Culture, Temporal Focus, and Values of the Past and the Future. *Personality and Social Psychology Bulletin* 38(8): 1030–1040.
- Hare, Caspar. 2007. Self-Bias, Time-Bias, and the Metaphysics of Self and Time. *The Journal of Philosophy* 104(7): 350–373.
- . 2008. A Puzzle about Other-Directed Time-Bias. *Australasian Journal of Philosophy*. 86(2): 269–277.
- . 2013. Time – The Emotional Asymmetry. In Heather Dyke and Adrian Bardon (eds.) *A Companion to the Philosophy of Time*. John Wiley & Sons, Ltd, Chichester, UK.
- He, J. M., Huang, X. T., Yuan, H. & Chen, Y. G. 2012. Neural activity in relation to temporal distance: differences in past and future temporal discounting. *Consciousness and cognition*. 21(4): 1662.
- Hedden, Brian. 2015. *Reasons without Persons: Rationality, Identity, and Time*. Oxford: Oxford University Press.
- Helzer, Erik G. & Gilovich, Thomas. 2012. Whatever Is Willed Will Be: A Temporal Asymmetry in Attributions to Will. *Personality and Social Psychology Bulletin* 38(10): 1235–1246.
- Helzer, Erik G., Hanks, K. C., & Gilovich, T. 2012. Common associations to the past and future and their role in the past/future attributional asymmetry. Unpublished manuscript.
- Hoerl, Christoph. 2015. Tense and the Psychology of Relief. *Topoi*. 34 (1): 217–231.
- Horwich, Paul. 1987. *Asymmetries in Time*. Cambridge, Mass.: MIT Press.
- Hurka, T. 1996. *Perfectionism*. Oxford: Oxford University Press.
- Ismael, Jenann. 2016. *How Physics Makes Us Free*. New York: Oxford University Press.
- Maclaurin, James & Dyke, Heather. 2002. 'Thank Goodness That's Over': The Evolutionary Story. *Ratio* 15 (3): 276–292.
- Moss, Sarah. 2015. Credal Dilemmas. *Noûs*. 49(4): 665–683.
- Maudlin, Tim. 2007. *The Metaphysics within Physics*. Oxford: Oxford University Press.

- Mellor, D. Hugh. 1998. *Real Time II*. London: Routledge.
- Miloyan, Beyon & Suddendorf, Thomas. 2015. Feelings of the future. *Trends in Cognitive Sciences*. 19 (4): 196–200.
- Nagel, Thomas. 1986. *The View from Nowhere*. Oxford: Oxford University Press.
- Newby-Clark, I. R., & Ross, M. 2003. Conceiving the past and future. *Personality and Social Psychology Bulletin* 20: 807–818.
- Perry, John. 1979. The Problem of the Essential Indexical. *Noûs* 13(1): 3–21.
- Prior, Arthur. N. 1959. Thank Goodness That's Over. *Philosophy*. 34(128): 12–17.
- Parfit, Derek. 1984. *Reasons and Persons*. Clarendon Press: Oxford.
- Prosser, Simon. 2016. *Experiencing Time*. Oxford: Oxford University Press.
- Radu, Peter T., Yi, Richard, Bickel, Warren K., Gross, James J. & McClure, Samuel M. 2011. A Mechanism for Reducing Delay Discounting by Altering Temporal Attention. *Journal of the Experimental Analysis of Behavior*. 96(3): 363–85.
- Schlesinger, George. 1976. The Stillness of Time and Philosophical Equanimity. *Philosophical Studies*. 30(3): 145–159.
- Street, Sharon. 2006. A Darwinian Dilemma for Realist Theories of Value. *Philosophical Studies* 127: 109–166.
- Strickland, Lloyd H., Lewicki, Roy. J., & Katz, Arnold. M. 1966. Temporal orientation and perceived control as determinants of risk-taking. *Journal of Experimental Social Psychology* 2(2): 143–151.
- Suhler, Christopher & Callender, Craig. 2012. Thank Goodness That Argument Is Over: Explaining the Temporal Value Asymmetry. *Philosophers' Imprint* 12(15): 1–16.
- Sullivan, Meghan. 2018. (In Press.) *A Theory of Rational Planning and Personal Persistence*. New York: Oxford University Press.
- Tarsney, Christian. 2017. Thank goodness that's Newcomb: The practical relevance of the temporal value asymmetry. *Analysis* 77(4): 750–759.
- Trope, Yaacov & Liberman, Nira. 2003. Temporal Construal. *Psychological Review*. 110(3): 403–421.

- Van Boven, Leaf & Ashworth, Laurence. 2007. Looking Forward, Looking Back: Anticipation Is More Evocative Than Retrospection. *Journal of Experimental Psychology*. 136(2): 289–300.
- Van Boven, Leaf & Caruso, Eugene M. 2015. The Tripartite Foundations of Temporal Psychological Distance: Metaphors, Ecology, and Teleology. *Social and Personality Psychology Compass* 9(11): 593–605.
- Van Boven, Leaf, Kane, J., & McGraw, A. P. 2010. Temporally asymmetric constraints on mental simulation: Retrospection is more constrained than prospection. In K. D. Markman, W. M. P. Klein, & J. A. Suhr, eds., *Handbook of imagination and mental simulation*, pp. 131–147. New York, NY: Psychology Press.
- Wilson, T. D. & Gilbert, D. T. 2005. Affective Forecasting: Knowing What to Want. *Current Directions in Psychological Science* 14(3): 131–134.
- Wilson, T. D., & Gilbert, D. T. 2008. Explaining away: A model of affective adaptation. *Perspectives on Psychological Science* 3: 370–386.
- Yi R., Gatchalian K. M., & Bickel W. K. 2006. Discounting of Past Outcomes. *Experimental And Clinical Psychopharmacology* 14 (3): 311–7.
- Zimmerman, Dean W. 2007. The privileged present: Defending an ‘A-theory’ of time. In Sider, T., Hawthorne, J., and Zimmerman, D., eds., *Contemporary Debates in Metaphysics*, pp. 211–225. Wiley-Blackwell, Malden, MA.