

Does the Temporal Asymmetry of Value Support a Tensed Metaphysics?

Alison Fernandes

Abstract:

There are temporal asymmetries in our attitudes towards the past and future. For example, we judge that a given amount of work is worth twice as much if it is described as taking place in the future, compared to the past (Caruso et al 2008). Does this temporal value asymmetry support a tensed metaphysics? 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 a) not vary with temporal distance, b) apply equally to events concerning oneself and others, and c) be rational and judged to be so. But evidence suggests the value asymmetry lacks these features. There are, moreover, independent arguments against its rationality. The asymmetry's features suggest instead that it arises as an emotion-driven generalisation from a temporal bias concerning our future *actions*. This explanation points towards mechanisms that can play a role in explaining other instances where we generalise about the past and future, and why we're tempted towards metaphysical pictures of time.

1. Introduction

There are temporal asymmetries in our attitudes towards the past and future. For example, how much money would be fair compensation to receive now for completing five hours of data entry work? The answers we give 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 for work described as taking place one month in the future (average \$125.04), compared to one month in the past (average \$62.20).¹ Similarly, when asked to select a bottle of wine that would be an appropriate thank-you gift for a friend for borrowing their vacation home, people selected wine that was 37% more expensive when the vacation was to take place in the future, compared to the past (ibid.). The wine they reported they would choose wine for themselves was 71% more expensive when they helped a neighbour move house in the future, compared to the past. The amount students would be willing to pay for extending their winter break by 3 days was 24% higher

¹ The asymmetry is replicated in Guo et al (2012) and Burns, McCormack et al (2018). These studies are discussed in Sections 3–4.

when the break was to take place in the future, compared to the past. Finally, the compensation people reported they would award, on a jury, was 42% higher when an accident victim's suffering was to take place in the future, compared to the past. Call this phenomenon the 'temporal value asymmetry'. The temporal value asymmetry is an asymmetry in the value we place *now* in past or future events, measured by judgements of fair compensation or reasonable reward, or by judgements about what one would be willing to exchange now.² While one of these cases involves merely hypothetical swaps, most involved judgements about fair compensation or reasonable reward, which can directly influence our actions now.

What might explain the temporal value asymmetry? Some have argued that related asymmetries need to 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. I aim to give A-theorists their best shot. Nevertheless, I'll ultimately argue that the observed value asymmetry does *not* support a tensed metaphysics. If the asymmetry were to support a tensed metaphysics, it would need to i) not vary with temporal distance, ii) apply equally to events concerning oneself and others, iii) be both rational and judged to be so. But evidence suggests the asymmetry lacks these features—it varies with temporal distance, is partially first-personal, and is judged *irrational* even by subjects whose judgements display the asymmetry. There are, moreover, independent arguments against its rationality.

A more promising route to explaining the temporal value asymmetry appeals to an evolutionary explanation: the asymmetry is due to an emotional bias concerning future *actions*. This explanation not only shows how asymmetries can be explained without metaphysics; it also points towards mechanisms that can explain other instances where we generalise from limited asymmetries concerning *some* past and future events to asymmetries

² I'll follow Caruso et al (2008) in treating these cases similarly, but further investigation could show they are distinct.

concerning *all* past and *all* future events—and so how we come to adopt metaphysical pictures of time in the first place.

Why be concerned? Firstly, it is worth getting clear on whether temporal asymmetries in attitude in fact support a tensed metaphysics—a live issue in metaphysics (Section 2). Secondly, clarifying the asymmetry’s features matters to debates in normative philosophy about the *rationality* of attitude asymmetries (Section 3). As we’ll see, arguments in this debate sometimes presuppose features that attitude asymmetries lack. Thirdly, explaining attitude asymmetries in scientific rather than metaphysical terms (Section 4) matters to understanding how we come to adopt metaphysical pictures of time, and the wider role they play in our thinking. These upshots depend on understanding why the asymmetry’s features seem to support a tensed metaphysics (Section 2).

The paper proceeds as follows. In Section 2, I develop a normative argument from the temporal value asymmetry to a tensed metaphysics. In Section 3 I argue that the asymmetry lacks the features required to support a tensed metaphysics. In Section 4, I consider an alternative explanation of the value asymmetry, and why we adopt metaphysical pictures of time.

2. A Tensed Explanation

Caruso et al (2008) examined a temporal asymmetry in the value we place now in past and future events. How might this asymmetry be used to support a tensed metaphysics? While philosophers haven’t directly appealed to the value asymmetry to support a tensed metaphysics, they have appealed to related asymmetries. I’ll briefly consider how in order to develop an argument from the value asymmetry to a tensed metaphysics.

Arthur Prior (1959) argues 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, he argues, losing the sense of what one is being thankful for. So it might seem that tensed facts, and a tensed metaphysics, are needed 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, and similar arguments are made by Schlesinger (1976), Cockburn (1998), Craig (2000, pp. 151–7) and Zimmerman (2007). 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. Derek Parfit (1984, p. 165) presents a thought experiment in which a patient is unsure whether he has 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. Christian Tarsney agrees on the *prima facie* rationality of the preference asymmetry, and argues that it ‘cannot be sustained’ without a tensed metaphysics (2017, p. 757).³

There are standard criticisms of these arguments. Firstly, Hugh Mellor (1981, Chs. 3–4) argues that even if tensed propositions (or beliefs) are required to make sense of tensed utterances, they don’t imply tensed facts. Instead tensed propositions should be treated indexically like ‘here’ and ‘I’ (Perry 1979). To make sense of tensed propositions, we only need to be able to give tenseless truth conditions for them—such as ‘The painful event is past’ is true just in case the painful event is prior to the utterance. We don’t need to be able to translate tensed language into tenseless language. Similarly, if it is ultimately tensed *beliefs* that explain and justify asymmetries in our attitudes (Mellor 1998, p. 41), then a tensed metaphysics is not needed to make sense of asymmetries in our attitudes either. Secondly, some respond ‘*tu quoque*’, and argue that a tenseless theory is no worse off than a tensed theory when it comes to justifying or explaining attitudes asymmetries (Mellor 1998, p. 42; Suhler and Callender 2012; Hoerl 2015). 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. For this reason, Callender (2017, p. 292) argues that attitude asymmetries at best support a primitive direction of time, not a tensed metaphysics.

³ 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 why preference and value asymmetries may not manifest in the same circumstances.

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 avoids these objections. While I won’t ultimately endorse the argument’s conclusion, it is an argument worth taking seriously. Firstly, it makes sense of why some A-theorists have appealed to attitude asymmetries to support a tensed metaphysics. It does so by capturing two features that A-theorists have claimed are important: a) attitude asymmetries must be shown to be *justified* (Craig 2000, p. 157), and b) they must be justified 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, my emphasis). Secondly, the argument is independently interesting, because it shifts the argumentative ground from explanations of tensed beliefs, to the normative *justification* of tensed judgements. Whether or not the argument succeeds, it shows how normative debate can be relevant for metaphysical conclusions, and, ultimately, points towards mechanisms that can drive our adoption of metaphysical pictures (Section 4). I’ll present the argument as concerning the temporal value asymmetry, but related arguments could be given concerning other attitude asymmetries.

Consider first what A-theories share in common: they divide the world, at a deep metaphysical level, into past, present and future events. For A-theorists, there are non-relative, and, in this sense, ‘objective’ facts about tense. B-theorists, by contrast, deny that events are ever past, present or future *simpliciter*. Events are only past, present or future *relative* to other events, times or perspectives.⁴ What an A-theorist might then argue is that if we’re to be *justified* in valuing past and future events differently, there have to be 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.⁵ Here’s how this idea could be used to argue for a tensed metaphysics:

⁴ Views that deny non-relative tensed facts while still accepting a primitive direction of time (Maudlin 2007) count as B-theoretic with respect to these arguments.

⁵ One might argue that values can be relativised to times, without being relativised to subjective features. However, what time-relative value is *relevant* to a given subject will still depend on *when* she is located. So value will still seem worryingly subjective (to the objectivist).

The 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 which events are past and future.
- C. Therefore there are objective facts about which events are past and future.

Is this argument sound? The argument is valid, and P2 is a reasonable assumption of empirical enquiry. The controversial premises are P1 and P4. Later on, I will provide reasons against them. For now, here's why they might be plausible, and where they're vulnerable.

P1 assumes that we are reasonably responsive to normative facts, such that what explains our valuing behaviour is that we are responding to what the normative facts are. P1 will come under pressure, however, if the value asymmetry turns out to have features that are *not* well explained by their being justified. If this is the case, it becomes unclear why the *temporal asymmetry* in how we value must be explained by its being justified, even though other features of the value asymmetry needn't be explained by their being justified. An A-theorist might dig her heels in and claim that the temporal *asymmetry* must be explained by its being justified, even though other features needn't. But this move risks question begging in this context. Overall P1 loses support if features of the value asymmetry features aren't generally explained by their being justified.

P4 says that the temporal value asymmetry can only be justified by objective (non-relative) facts about which events are past and future. P4's strongest support comes from adopting an objectivist approach to value. According to *Strong Objectivism*, the value of an event should *not* depend on facts about the *subject*, such as what desires she happens to have, or where she happens to be located. While these may be objective facts about her, they are not the kinds of facts suitable to ground an event's value. Instead, the value of an event should only depend on facts about the *object* of value. For example, the fact that saving a drowning child is valuable 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), but on facts about saving a drowning child. *Strong Objectivism* is closely related to Parfit's 'objectivism about reasons'. According to objectivism about reasons, our reasons to have certain desires and aims, and to do what we can to achieve those aims, are all given by 'facts about the *objects* of these desires or aims, or what we might want or try to achieve' (2011 p. 45, my emphasis), rather than facts about us. Tim Scanlon (2014) defends a similar view. *Strong Objectivism* effectively requires us to take an external viewpoint when assessing value that abstracts away from features of ourselves. Given *Strong Objectivism*, if temporal location is like spatial location, such that whether an event is past or future depends only 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 taste. Provided one makes these the exception, rather than the rule, one can still maintain a sufficiently strong version of *Strong Objectivism* to support P4. While one could try to defend P4 without *Strong Objectivism*, and claim only that value cannot depends on *temporal* facts about the subject, such a move risks question-begging—the unified framework supporting P4 would be lost.

The *Normative Argument* fails if one rejects *Strong Objectivism* (and therefore P4), or if one rejects the claim that that our valuing behaviour is best explained by its being justified (and therefore P1). I myself reject both claims. But if we set aside rejections of these claims that stem from general views about normativity, rather than views about time, then the argument is, *prima facie*, reasonable. It depends on defensible (if controversial) claims that aren't specifically about time. The argument also 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 avoids the '*tu quoque*' objection, because it does not attempt to directly justify (or explain) asymmetries in our attitudes. Instead, the argument is that a tensed metaphysics is a *precondition* for an adequate justification. 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*.

However, the *Normative Argument* is vulnerable in a different way. If subject-relative features turn out to be relative to how we value (in contexts where the value asymmetry appears), P1 or P4 must come under pressure. Either subject-relative features are justified (undermining *Strong Objectivism*, and putting pressure on P4), or features of the value asymmetry *aren't* best explained by their being justified (putting pressure on P1). As I'll argue, this is precisely what happens in the case of the value asymmetry. So, despite the *prima facie* appeal of the *Normative Argument*, the temporal value asymmetry does not support a tensed metaphysics.

3. The Observed Asymmetry

I'll now consider three features that the temporal value asymmetry must have if it is to provide a sufficient degree of support for a tensed metaphysics. I'll argue that the asymmetry lacks these features. My focus will be on the original Caruso studies (2008), with appeal to other studies of the value asymmetry (Guo et al 2012; Burns et al 2018), and further empirical work. Ideally one would want a much broader sample before drawing philosophical conclusions, particularly given replication concerns in psychology. The conclusions drawn here may need to be revisited in light of further empirical work. However, this current sample, while limited, still provides to think the asymmetry does not support a tensed metaphysics. Other asymmetries may fare differently. It is hoped that this examination will aid further work by providing a general framework for investigating attitude asymmetries.

3.1 Absoluteness

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 the amount of a past event (typically duration), or its temporal distance, can't play a role in how we value past events. The rationale for this requirement is

that metaphysical tensed facts are (standardly) absolute—events are either past or not. If they're to fully account for the value asymmetry, the value asymmetry must be absolute as well. Sullivan argues that preference discounting must be absolute—other discount functions are 'implausible' (2018, p. 80). Parfit similarly argues that discounting of past events should not vary with distance, since 'being in the Past is not a matter of degree' (1984, p. 181/Section 69).

One might reject *Absoluteness*, and claim that additional features can be relevant to how we value. Provided these features concern the objects of value, appealing to them is compatible with the *Normative Argument*. While so, failing *Absoluteness* still suggests that a mere asymmetry in time isn't sufficient to account for our valuing, even if it is a precondition. A stronger argument can be made concerning temporal distance. Unless an A-theorist explicitly takes pastness to be a matter of degree (Smith 2002), the varying of value with temporal distance undermines support for either premise P1 or P4 of the *Normative Argument*. Either relational features concerning the distance between the subject and the object contribute to justifying how we value events (undermining *Strong Objectivism* and therefore P4), or there are features of the value asymmetry that are not accounted for by their being justified (undermining P1).

Is *Absoluteness* satisfied for the value asymmetry? It is not. In all studies where the value asymmetry appeared, subjects judged past events to have significant value compared to future events: past values ranged from 0.5 to 0.8 (Caruso et al 2008), 0.75 to 0.8 (Guo et al 2012), and 0.7 to 0.75 (Burns et al Forth.). Similar results are found in unpublished studies of asymmetries of preference.⁶ Even when most participants (92–7%) prefer past pain to equal future pain, and future pleasure to equal past pleasure, just doubling the amount of the past pain or pleasure leads most (53%–54%) to switch their preference (Lee et al 2018). People are also reported to be indifferent, on average, between 5.6 hours of past pain and 2 hours of future pain (Caruso 2018). The *amount* of past pleasure or pain is significant.

Regarding temporal distance, while studies haven't directly examined its effect on the value asymmetry, it's well established that preferences for *future* events vary with temporal distance

⁶ While value and preference asymmetries are distinct (see footnote 3), results in both cases suggest that our asymmetric behaviour can't be accounted for using merely a tensed metaphysics.

(Frederick et al 2002). Related studies argue 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).⁷ There is also evidence that how unfair we judge an action to be depends on temporal distance (Caruso 2010), and that temporal distance is a general determinant of our attitudes (Trope and Liberman 2003).

One might argue that the value asymmetry is absolute, but is partially masked by an *irrational* consistency judgement that past and future work are worth similar amounts. However, since the value asymmetry only appears when subjects *aren't* able to make such consistency judgements (Section 3.3), such masking doesn't straightforwardly account for the observed results. Overall, studies of the value asymmetry don't support *Absoluteness*.

3.2 Third-personal

If the value asymmetry is to support a tensed metaphysics:

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 that if the asymmetry were first-personal, facts about the agent, subject-*relative* facts, would be required to explain how we value events. This would imply that *Strong Objectivism* is false or put significant pressure on P1. Hare (2007, 2008) and Brink (2011) argue that preference asymmetries *should* satisfy *Third-personal*, and Parfit (1984, pp. 181–184), Horwich (1987, p. 197) and Brink (2011) claim they, in fact, don't.

In studies of the value asymmetry comparing first and third-person cases (Caruso et al 2008), *Third-personal* is not satisfied. Subjects were asked to judge what would be fair compensation 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 work, but that the

⁷ Caution 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. There are also difficult questions regarding how preferences regarding past events are to be interpreted—I discuss some of these issues below (Section 3.3).

other person should receive roughly the same for future and past work (an effect below significance, $p > 0.05$)—see Table 1.

<i>Type of case</i>	<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). Standard deviations in brackets.

Unpublished studies also suggest preference asymmetries are first-personal. While 89% of participants preferred painful past surgery to equally painful future surgery for themselves, only 65% have that preference for other people (Caruso 2008). Similarly, preferences for 4 hours past pain to 2 hours of future pain drop from 61% (first-person) to 44–45% (third-person) (ibid.). Similar drops are reported for preferences for future pleasure (Lee et al 2018), and other hedonic goods Greene et al (2019).

The value asymmetry is above significance, however, in some third-personal cases (Caruso et al 2008). Subjects said they would award an accident victim 42% more compensation when her suffering was to take place in the future, compared to the past. Significant third-personal temporal asymmetries are also found in judgements about how unfair a behaviour is (Caruso 2010), how much collective guilt it produces (Cauoutte et al 2012), how much it supports reforming the practice (Roh and Schuldt 2014), and whether it is more intentional, makes subjects more angry, and should be punished more severely (Burns et al 2012). In a second-person case, a temporal asymmetry in intentionality judgements appeared for ‘unfair’ behaviour, but not ‘fair’ behaviour (ibid., p. 228). One hypothesis is that the negative moral valence of some cases explains when the temporal value asymmetry appears, but further work is required.

Further empirical work could also determine the relation between first- and third-personal cases. While some temporal biases remain in third-personal cases, such as those of preference (see above) and how effective the will is (Helzer and Gilovich 2012), others disappear—such as viewing a person as becoming less emotional and more rational over time (O’Brien 2015). 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. In support, Buhler et al (1994) argue that a first/third person asymmetry in how optimistic we are about future performance is due to the adoption of a planning perspective—a perspective not available on our past selves. Pronin and Ross (2006) also explain differences in trait attribution by arguing that we view our past selves from a more observer-like perspective.

Future 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, since we’re likely to take ourselves and others to have access to the same metaphysical facts.

3.3 Rationality

Here’s a final requirement. If the value asymmetry is to support a tensed metaphysics:

iv. Rationality: The value asymmetry must be i) rational, and ii) not judged otherwise by subjects whose 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. Regarding ii), if the value asymmetry were *judged* irrational, even by subjects whose judgements exhibit the asymmetry, pressure is put on P1 (that the value asymmetry is best explained by its being justified). The claim would have to be that, at their more reflective, subjects’ judgements *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 based on metaphysical facts.

Is *Rationality* satisfied? Regarding ii), results from the Caruso et al (2008) studies suggest that subjects implicitly judge the asymmetry to be *irrational*. The studies used 'counterbalancing': half the subjects were given the description of the future event first; half were given the description of the past event first. When the value judgements *within* either of these groups were considered, the value asymmetry dropped below significance—see the entries in the first two columns, or the last two 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 appeared above significance when judgements *across* the two groups were compared—that is, when you ask some people about the past first, and other people about the future first, and compare their judgments (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>Past</i>	<i>Future</i>	<i>Future</i>	<i>Past</i>
<i>Study 2a: Compensation for injury</i>	2.50 (2.42)	2.62 (2.69)	3.55 (2.75)	3.49 (2.81)
<i>Study 2b: Borrowing vacation-home</i>	89.17 (60.22)	91.73 (76.57)	121.98 (82.24)	129.06 (86.66)
<i>Study 2c: Helping neighbour move</i>	75.69 (78.06)	73.77 (81.56)	129.24 (110.74)	120.86 (114.21)

Table 2: Average values judged to be fair compensation now for past or future events (Caruso et al 2008, Table 1). Values concern millions of US dollars (2a), or US dollars worth of bottle of wine (2b and 2c). Standard deviations are in brackets.

A straightforward interpretation of this result is that subjects implicitly judge that whether an event is past or future should *not* make a difference to its value (Caruso et al 2008). They therefore judge the asymmetry to be *irrational*. If subjects *did* judge the value asymmetry to be *rational*, the asymmetry should hold (and perhaps be *more* pronounced) when they're asked to compare future and past events. Instead it disappears. If subjects judge the asymmetry to be *irrational*, ii) of *Rationality* is not met. Nor is the rationality of the asymmetry, i), supported by

the observed asymmetry.⁸ The fact that the asymmetry disappears when past and future events are compared suggests it is not to be explained by norms based on metaphysical facts.

Other studies of the value asymmetry either tested subjects on the past *or* future scenario, a ‘between-persons analysis’ (Burns et al Forth.; Guo et al 2012), or tested subjects on both, but at a 4 week interval (Study 2, Guo et al 2012). Studies of other temporal asymmetries also standardly use only a between-persons analysis (Van Boven and Ashworth 2007; Caruso 2010; Burns et al 2012; Roh and Schuldt 2014; Caouette 2012). Some temporal asymmetries remain when past and future events are compared, such as how effective the will is taken to be (Heltzer and Gilovich 2012), and asymmetries of preferences for hedonic goods (Lee et al 2018; Caruso 2018; Greene et al 2019). Further work could determine why some asymmetries remain and not others. Regardless, results concerning the value asymmetry are evidence that there are factors affecting our asymmetric value judgements beyond those we rationally endorse.

Overall, the value asymmetry lacks the required features to support a tensed metaphysics. Past events 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*). While one might reject *Absoluteness*, the requirements *Third-personal* and *Rationality* provide strong reasons to doubt the value asymmetry supports a tensed metaphysics, via the *Normative Argument*.

4. Explaining Temporal Asymmetry

So far I’ve argued that a tensed metaphysics is not supported by the observed value asymmetry. In this final section, I argue that the features of the value asymmetry that point away from a metaphysical explanation, also point towards a more promising scientific

⁸ Is the asymmetry nevertheless rational? Hare (2007, 2008), and Parfit (1984, section 64/pp. 165–7) and Tarsney (2017) argue for the *prima facie* rationality of preference asymmetries. Others disagree. Sullivan (2018, Ch. 7) argues that preference asymmetries are arbitrary. Dougherty (2011) argues that someone with temporally biased preferences will be led to accept a series of swaps that leaves her worse off overall. Sullivan and Greene (2015), see also Sullivan (Ch. 6, 2018), argue that someone with temporally biased preferences will be led to unreasonably delay pleasures. For criticisms of Dougherty and Sullivan’s arguments, see Hare (2013), Greene and Sullivan (2015), Dorsey (2016) and Tarsney (2017). For criticism of Parfit and discussion of other arguments for temporal neutrality, see Brink (2011).

explanation. The scientific explanation can, moreover, contribute to explaining why we adopt metaphysical conceptions of time in the first place.

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 a bias concerning an agent's own immediate future *actions* that has become 'generalised' to include future events that are further away in time, or that don't concern the agent. The fact that the value asymmetry is still centred on the subject and is judged irrational suggests that this generalising isn't driven by inference. If subjects were *inferring* the future was more valuable than the past, we would expect the asymmetry to be fully general, and judged rational.

Scientific explanations of the value asymmetry (and related asymmetries) in the literature take the form just suggested: a bias concerning future actions has become generalised through non-inferential mechanisms. According to an evolutionary emotion-based account, for example, the value asymmetry is caused by subjects feeling stronger emotions when contemplating future events, which leads them to judge them to have greater value (Caruso et al 2008; Caruso 2010; Suhler and Callender 2012; Callender 2017). This hypothesis is supported by the fact that when subjects were asked how they felt now when contemplating events, the differences in the strength of their reported emotions predicted the differences in their valuation (Caruso et al 2008)—although other studies have failed to replicate this result (Burns et al Forth.).⁹

The emotion asymmetry in turn is explained by the fact that agents are evolutionarily advantaged when they feel stronger emotions towards future actions (Caruso 2010; Callender 2017, Ch. 11; van Boven and Ashworth 2007). For similar evolutionary explanations of asymmetries of care and attention, see also Parfit (1984, Section 65/p. 168–170), Horwich (1987, pp. 196–8), Maclaurin and Dyke (2002), and Greene and Sullivan (2015). These explanations all take the following form:

⁹ For more on the emotion asymmetry and the role of emotion in choice, see Newby-Clark and Ross (2003), van Boven and Ashworth (2007), and Gilbert and Wilson (2009). Guo et al (2012) argue that the value asymmetry is also affected by cultural orientation. Note that acknowledging various higher-level effects on the value asymmetry is compatible with the philosophical points regarding 'generalising' that I go on to make.

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 under our control.
3. We control some future events, but no past events.
4. So emotional responses to contemplated future events, but *no* past events, are (potentially) evolutionarily adaptive for action-guidance.
5. So we feel stronger emotions towards future events than past events.

According to this explanation, the emotion asymmetry ultimately derives from an asymmetry of control.

This evolutionary explanation is simplified in a number of ways. Firstly, it neglects potential non-control based sources of temporal asymmetries, such as uncertainty (Caruso 2010; Suhler and Callender 2012; Callender 2017, Ch. 11), or the different social roles of permission and punishment (Caruso 2010 p. 621). Secondly, 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 is likely false. Feeling regret about past actions, for example, can help one avoid similar actions later (MacLaurin and Dyke 2002). These two simplifications can be dealt with, however, without changing the general form of the explanation—by including additional features that either contribute to or reduce the temporal asymmetry.

There is, however, a third assumption that is rarely discussed, and yet is crucial to the explanation: that there is a *mechanism* that drives generalisation. Recall, the evolutionary explanation is supposed to account for why we feel stronger emotions towards future events *in general*, and why we value future events more—even those we *don't* control (Section 3.2). But the explanation above appeals to the adaptiveness of feeling more strongly about future events *we can control*. Yet feeling more strongly towards future events we can't control, *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 generalise such that we feel stronger emotions towards *all* future events. If we're to explain how we

come to temporally biased attitudes by appealing to asymmetries that are directly relevant to agents (such as the asymmetry of control), some form of generalising will always be required.¹⁰

Generalising is something metaphysicians should be particularly concerned with. An on-going research program, particularly among B-theorists, is to account for real or apparent temporal asymmetries in scientific, rather than metaphysical, terms. For example, causal relations, laws, probabilities, and contingent asymmetries are used to explain why it seems the future is open and the past fixed (Ismael 2016, Ch. 6; Prosser 2016, Ch. 7; Callender 2017, Ch. 11; Fernandes Forth.), why the future is (or appears) controllable (Horwich 1987, Ch. 8; Price 1996, Chs. 6–7; Blanchard 2014; Albert 2015, Ch. 2; Fernandes 2017), and why the past is knowable in a way the future is not (Horwich 1987, Ch. 5; Albert 2015, Ch. 2). These explanations all presuppose the same kind of generalising—they explain, for example, why the *whole* future has (or seems to have) certain features, by appealing to properties that only *some* future events have. But, despite their aspirations to be empirically grounded, these accounts don't discuss possible mechanisms, or provide other empirical support for generalising. Without this, we lack an empirically informed account of how we come to think in terms of a sharp distinction between the past and future.

If we can make sense of how generalising operates in the case of emotion and value, this suggests how it might work in other cases as well. While I won't commit to a particular mechanism, something of the following form is plausible. Van Boven and Ashworth (2007) argue that emotional generalising 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.

¹⁰ For example, generalising is 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 (Caruso et al 2013).

Other associative mechanisms may contribute. Building on construal level theory (Trope and Liberman 2003), van Boven, Kane and McGraw (2010) argue that simulations of future events are less ‘constrained by reality’ than simulations of past events. When thinking about past events, we can typically draw more heavily on reliable information, such as memories, to decrease our uncertainty and form more realistic expectations. Because simulations of future events are typically less constrained by current information, we tend to simulate all future events as more ‘prototypical’ and extreme (Kane et al 2012).¹¹ 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 affect called ‘focalism’ (Wilson and Gilbert 2005). If reality constraints and focalism become associated with future framing, we will tend to form more extreme expectations and focus more on *all* future events—and so will experience stronger emotions concerning all future events. In addition, Caruso (2010) suggests that feeling less strongly about the past may be a generalised 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, and so experience less strong emotions towards it; we ‘affectively adapt’ (Wilson and Gilbert (2008).

No doubt there are other mechanisms to consider (D’Armentano and van der Linden 2004; Caruso et al 2013; van Boven and Caruso 2015; Burns et al Forth.). Regardless, all the above proposals agree that generalising 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 simulate some past and future events lead to differences in how we simulate *all* past and future events. These differences drive temporal asymmetries in our responses towards past and future events, and can lead to higher-level effects, such as temporal asymmetries of value.

Explanations of asymmetries of emotion and value that include generalising provide a model for how temporal asymmetries in attitudes can be explained. These explanations rely only on

¹¹ 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.

limited temporal asymmetries in our responses to *some* past and future events. And they explain attitude asymmetries without appealing to distinctly metaphysical assumptions about time, or to a tensed metaphysics.

To explain how we come to adopt distinctly *metaphysical* pictures of time, further mechanisms are no doubt required. Generalising cannot by itself explain, for example, how we come to think of events as possessing certain features *because* they are in the past or future, and so why we take time asymmetry to be the *source* of other temporal asymmetries. (My thanks to a reviewer for this point.) One possibility appeals to our tendency to ‘essentialise’—to posit an underlying essence that accounts for features that objects of a kind share in common. Essentialist thinking is familiar in the case of natural and social kinds (Medin and Ortony 1989; Rhodes and Mandalaywala 2017), and has been used to account for our behaviour towards a variety of objects, creatures and persons (Gelman 2003).¹² While the mechanisms involved in essentialism are still under debate (see Cimpian and Salomon (2014) and responses therein), evidence suggests it begins early in cognitive development (Graham 2004). Applied to the case of time, perhaps we posit underlying essences that *all* past and *all* future events share in common that account for *why* these events have the features they do—such as being controllable and more worthy of attention (future events) and being uncontrollable and less worth of care and attention (past events). Essentialism is also associated with ‘boundary intensification’ between kinds (Gelman 2003), and so could contribute to explaining the apparent sharpness of the distinction between the past and future. Other mechanisms may also contribute—such as our tendency to think of the past and future as distinct regions (Hoerl and McCormack 2008). While further work is required, existing studies already suggest potential mechanisms that may, along with generalising, explain why we come to conceive of the past and future in distinctly metaphysical terms.

Metaphysical assumptions may also contribute to explaining attitude asymmetries themselves. For example, metaphysical beliefs about the openness of the future may contribute to our feeling stronger emotions towards future events (Helzer et al 2012). But

¹² While essences often concern immutable features of events, this is not always the case—such as when we essentialise about people’s age (Weiss et al 2016). Similarly, even though events change from being future to being past, their properties *now* can still be attributable to essential features of past or future events.

the same features that speak against a tensed metaphysical explanation of the value asymmetry also speak against metaphysical assumptions playing a determining role, at least with respect to asymmetries of emotion and value. Firstly, the generalising in the case of value and emotion is still only partial. 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 assumptions would suggest an asymmetry that was judged rational. While other asymmetries may fare differently on these points, the case of the value asymmetry shows how generalising can take place, even when not driven by a metaphysical picture of time.

A final intriguing possibility is that we may also 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 the fact that we value and feel more strongly towards the future than the past. If so, attitude asymmetries would 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 (Lee et al 2019), or by investigating how these temporal asymmetries arise developmentally (Burns et al Forth.).

5. Conclusion

Temporal asymmetries in our attitudes have been used to argue for tensed metaphysical theories of time. But the value asymmetry provides a striking case where such an asymmetry is not well explained in metaphysical terms. Even granting A-theorists a normative argument from the value asymmetry to a tensed metaphysics, the observed asymmetry has the wrong features to support a metaphysical explanation; evidence suggests the asymmetry varies with temporal distance, is partially first-personal, and is judged irrational, even by subjects whose judgements exhibit the asymmetry. The asymmetry's features suggest instead that it arises from an emotional bias concerning our future *actions* that has become generalised through temporal framing and associative mechanisms to produce general temporal asymmetries of emotion and value. This explanation not only provides a non-metaphysical route to explaining temporal asymmetries in our attitudes. It also suggests mechanisms that can

contribute to explaining why we come to conceive of the past and future in distinctly metaphysical terms.¹³

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.
- Buehler, Roger, Griffin, Dale, & Ross, Michael. 1994. Exploring the “planning fallacy”: Why people underestimate their task completion times. *Journal of Personality and Social Psychology*. 67: 366–381.
- 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. Forth. The Development of Asymmetries in Past and Future Thinking. *Journal of Experimental Psychology: General*.
- Burns, Zachary. C., Caruso, Eugene. M., & Bartels, Daniel. M. 2012. Predicting premeditation: Future behavior is seen as more intentional than past behavior. *Journal of Experimental Psychology: General*. 141: 227–232.
- Callender, Craig. 2017. *What Makes Time Special*. Oxford: Oxford University Press.

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Cimpian, Andrei and Salomon, Erika 2014. The inherence heuristic: An intuitive means of making sense of the world, and a potential precursor to psychological essentialism. *Behavioral and Brain Sciences* 37: 461–480.

Caouette, Julie, Wohl, Michael J. A., & Peetz, Johanna. 2012. The future weighs heavier than the past: Collective guilt, perceived control and the influence of time. *European Journal of Social Psychology*. 42: 363–371.

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.

———. Forth. Freedom, Self-Prediction, and the Possibility of Time Travel. *Philosophical Studies*.

Frederick, Shane, Loewenstein, George & O’Donoghue, Ted, 2002. Time Discounting and Time Preference: A Critical Review. *Journal of Economic Literature* 40(2): 351–401.

Gelman, Susan. A. 2003. *The Essential Child: Origins of Essentialism in Everyday Thought*. New York: Oxford University Press.

- 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.
- Graham, Susan A., Kilbreath, Cari S. and Welder Andrea N. 2004. Thirteen-month-olds rely on shared labels and shape similarity for inductive inferences. *Child Development*. 75(2): 409–427.
- Greene, Preston and Sullivan, Meghan. 2015. Against Time Bias. *Ethics* 125: 947–970.
- Greene, Preston, Latham, Andrew, Miller, Kristie and Norton, James. 2019. Hedonic and Non-Hedonic Bias Towards the Future. Unpublished manuscript.
- Guo, Tieyuan, 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.
- 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.
- 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.
- Kane, Johann, Van Boven, Leaf, and McGraw, A. Peter. 2012. Prototypical prospection: future events are more prototypically represented and simulated than past events. *European Journal of Social Psychology*, 42(3): 354–362.
- Lee, Ruth, McCormack, Teresa, Burns, Patrick, O'Connor, Patrick A., Fernandes, Alison S., Hoerl, Christoph, 2018. The development of a past-future temporal value asymmetry for hedonic goods. Presentation at *European Society for Philosophy and Psychology*, Rijeka.

- Maclaurin, James & Dyke, Heather. 2002. 'Thank Goodness That's Over': The Evolutionary Story. *Ratio* 15 (3): 276–292.
- McCormack, Teresa, Hoerl, Christoph. 2008. Temporal decentering and the development of temporal concepts. *Language Learning* 58: 89–113.
- Medin, Douglas L. and Ortony, Andrew. 1989. Psychological essentialism. In S. Vosniadou and A. Ortony (eds.) *Similarity and Analogical Reasoning*. Cambridge: Cambridge University Press, pp. 179–195.
- 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.
- O'Brien, Ed. 2015. Mapping Out Past and Future Minds: The Perceived Trajectory of Rationality Versus Emotionality Over Time. *Journal of Experimental Psychology: General*. 144: 3, 624–638.
- Parfit, Derek. 2011. *On What Matters*. Oxford: Oxford University Press.
- 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.
- Pronin, Emily, & Ross, Lee. 2006. Temporal differences in trait self-ascription: When the self is seen as an other. *Journal of Personality and Social Psychology* 90: 197–209.
- 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.

- Roh, Sungjong, Schuldt, Jonathon P. 2014. Where There's a Will: Can Highlighting Future Youth-Targeted Marketing Increase Support for Soda Taxes? *Health Psychology*. 33(12): 1610–3.
- Rhodes, Marjorie and Mandalaywala, Tara M. 2017. The development and developmental consequences of social essentialism. *Interdisciplinary Reviews: Cognitive Science*, 8(4): 1–18.
- Scanlon, Tim. 2014. *Being Realistic about Reasons*. Oxford: Oxford University Press.
- Schlesinger, George. 1976. The Stillness of Time and Philosophical Equanimity. *Philosophical Studies*. 30(3): 145–159.
- Smith, Quentin. 2002. Time and degrees of existence: A theory of 'degree presentism'. In C. Callender (ed.), *Time, Reality and Experience*. Cambridge: Cambridge University Press, 119–136.
- 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. *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.

Weiss, David, Job, Veronika, Mathias, Maya, Grah, Stephanie and Freund, Alexandra. 2016. The End Is (Not) Near: Aging, Essentialism, and Future Time Perspective. *Developmental Psychology*. 52(6): 996–1009.

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.