

Temporality and Epistemic Commitment: An Unresolved Question

K. M. Jaszczolt

University of Cambridge

1. Introduction: The Rationale

There is no doubt that the topic of how humans conceptualise time is a complex one. It is complex for various interrelated reasons that fall into four broad categories: metaphysical, epistemic, conceptual, and linguistic. In my *Representing Time* (Jaszczolt 2009), I drew on all four of these domains to put forward arguments in support of the modal conception of time. In brief, I argued that the human concept of time logically supervenes, that is, is dependent in the sense of its definitional characteristics, on the gradable concept of epistemic commitment. In other words, on the underlying level of basic concepts, temporality is epistemic modality, where our temporal concepts of past, present, and future eventualities alike are founded on the degrees of commitment to the truth of the proposition (or, as I explain below, the proposition-like construct) expressing that eventuality. Put differently, these temporal concepts are underlyingly degrees of detachment from certainty of an eventuality.

Now, commonsense judgement would easily allow for the construal on which the past and the future correspond to such non-zero degrees of detachment, the latter understood as certainty of the ‘here and now’. However, as linguistic evidence suggests, even the present yields to such a gradation as long as the object of inquiry is the *concept* of time, that is, internal, psychological time. It is so because just as our memories (the past) and anticipations (the future) can correspond to more, or less, strongly held representations of states of affairs, so the current states of affairs can give rise to more, or less, strongly endorsed representations. Where this epistemic commitment translates into grammatical differences, we have the following parallel: just as one can opt for (1a) or (1b) as a linguistic representation of a past state of affairs, so one can opt for (2a) or (2b) with respect to the present time.

- (1a) Aly went to Kuala Lumpur last summer.
- (1b) Aly may have gone to Kuala Lumpur last summer.

- (2a) Aly is in Kuala Lumpur now.

(2b) Aly may be in Kuala Lumpur now.

This basic linguistic evidence is often overlooked by philosophers who discuss the past and the future as more ‘remote’ than the present.

Having presented in Jaszczolt 2009 a range of arguments in favour of this modal construal of temporality, I then proceeded to giving a semantic representation of temporal expressions, utilising for this purpose a radical contextualist theory of Default Semantics. The main idea was that the modal epistemic underpinnings of temporality can be formally represented by an operator of acceptability (adapted, with substantial modifications, from Grice 2001), indexed for the degree of epistemic commitment and, where appropriate, for the *semantics/pragmatics of the grammatical category* it draws on, and operating on a representation of the intended content (in the Gricean sense of ‘intended by some abstract model speaker’) pertaining to the eventuality. For example, $ACC_{\Delta}^{rf} \vdash \Sigma$ stands for ‘it is acceptable to the degree pertaining to the regular future that it is the case that Σ ’, where Σ (called a ‘merger representation’) stands for the proposition-like construct, representing the outcome of processing of the speaker’s intended meaning – a representation that is by definition compositional, but at the same time drawing on a variety of sources of intended meaning in addition to the logical form of the uttered sentence.¹

Although the thesis of the modal supervenience of temporality was well-supported by theoretical arguments and by evidence from various languages, and it also easily yielded to a Default-Semantic formal analysis, there remained an important Unresolved Question (henceforth UQ). It concerns the translatability of what intuitively seems to be a quantitative difference between the past, the present and the future into quantitative differences, that is differences represented as the ‘delta index’ on the acceptability operator (ACC_{Δ}). In other words, ‘degrees of detachment from certainty’ and equally ‘degrees of commitment to the (truth of the proposition representing an) eventuality’ are quantitative concepts, while the past/present/future distinction intuitively appears to be a qualitative one. If one finds the latter on the former, one has to either provide a way of correlating one with the other, or explain away the intuitive qualitative contrast between the past, the present and the future. Both have been attempted in the philosophical literature. In what follows, I build on the

¹ In what follows I assume basic familiarity with the principles of Default Semantics (henceforth DS, Jaszczolt, e.g. 2005, 2009, 2010). Readers are referred to the overview of the revised version of this contextualist theory in Jaszczolt 2010.

extant philosophical arguments, as well as on linguistic evidence, in an attempt to answer the UQ of the theory of the modal supervenience of time.

The chapter is structured as follows. Section 2 presents a brief overview of the thesis of modal supervenience of time and ends with discussing the UQ of the past-future symmetry. Section 3 discusses temporality and its quantitative underpinnings in the form of ACC_{Δ} against the background of some pertinent tensed and tenseless theories of time, in view of addressing the question of gradability of the underlying concept of epistemic commitment as an explanans for the human concept of time. It goes back to the proposal of logical supervenience and puts together evidence and arguments in favour of the ‘apparent qualitative-to-quantitative’ translation of the concept of time. It also contains two possible answers to the UQ. Section 4 addresses the pertinent question as to whether the tensed or tenseless theories of time are more adequate supporters of the thesis of supervenience on modality. Section 5 follows with a discussion of the universal building blocks of the concept of time that lie underneath the cross-linguistic diversity of means of expressing temporal reference. Section 6 concludes with some observations on the status of the supervenience thesis so revised and strengthened by the two proposed solutions to the UQ.

2. Temporality as Epistemic Modality: Supervenience or Mere Correlation?

The relation of supervenience as understood in what follows has the following characteristics:

“A set of properties A supervenes upon another set B just in case no two things can differ with respect to A-properties without also differing with respect to their B-properties. In slogan form, ‘there cannot be an A-difference without a B-difference’.”

McLaughlin & Bennett (2005: 1).

I begin by a brief summary of where the proposal was left out. In *Representing Time* (Jaszczolt 2009), I put forward a hypothesis of supervenience, understood as logical and conceptual supervenience, of the concept of time on the concept of epistemic detachment. I also entertained there and partly supported the idea of supervenience of the properties of temporality on the properties of space-time. The concept of time was understood there as being founded on (i) the concepts of uncertainty, probability, and therefore epistemic detachment on the one hand, and on (ii) probability and relativity of real time on the other. I

concluded that both the construal of reality and reality itself require modality for their explanation. In other words again, the thesis is that internal, psychological time supervenes on modality *qua* epistemic detachment and also on real time which itself entails various metaphysical possibilities in which world histories and predictions develop – all of them equally real.

Modality was proposed there as an explanans for four related domains: the metaphysical, the epistemic, the conceptual, and the linguistic. I presented some compelling arguments for conceptualising temporality as degrees of epistemic commitment. Such graded commitment (and, equally, graded detachment from the state of affairs presented in the act of communication) was analysed as determined by what is encoded, grammaticalised or pragmatically inferable from linguistic expressions in various languages. For reference, Fig. 1 is an example of the DS-theoretic merger representation (Σ) pertaining to the reading of (3). It is a partial representation, focusing on the representation of the future-time reference. The grammar, lexicon (the WS process), and the inferred future reading of the present-tense verb form (the CPI process)² interact in producing this content. The ‘fp’ index on Δ in ACC_{Δ}^{fp} stands for ‘furate progressive’.

(3) *One Direction* are giving a concert in Cambridge tomorrow.

² See fn 1.

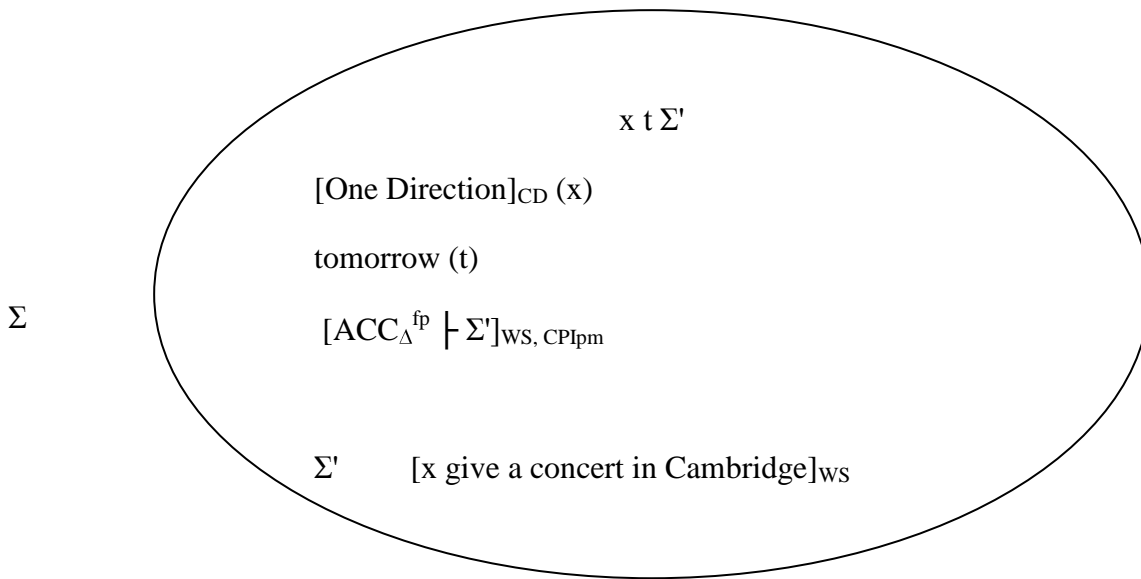


Fig. 1. Σ for the example (3)

Speakers can talk about eventualities with a stronger or weaker degree of commitment using various grammatical forms (simple past tense, modal ‘may’ or ‘might’, evidentials, etc.), various lexical constructions (‘definitely’, ‘certainly’, ‘possibly’, ‘as far as I can tell’) and conveying expectations of various inferential processes on the part of the interlocutor (by communicating indirectly for example). This gradation of commitment pertains not only to talking about the past or future, but also the present. I say more about the status of the present in Section 3.

Time was approached from two angles. First, it was approached from the phenomenological perspective where. Following Husserl (1928), time was seen as, so to speak, ‘coming from within’, being imposed on human experience. It consists of ‘objective’ ‘immanent’ time which has the property of duration, as well as ‘pre-immanent time’ which has the property of flowing and contains the moving actuality (‘now’), as well as what follows and precedes it. What precedes it in its part consists of memories, knowledge and ‘fixed’ experiences; what follows consists of anticipated experiences. The second perspective was the ‘real time’, ‘time in the world’. The big question of external vs. internal time was addressed via evidence from linguistic representations of the human concept of time and it was proposed, to repeat, that, real time of space-time is founded on (real) possibilities for the

universe, while psychological time is founded on an epistemic relation to some ‘stuff from which reality is made’.

It is clear at this point that any further discussion of the possible modal underpinnings of time has to be conducted in terms of the arguments for various versions of the so-called tensism (McTaggart’s (1908) A-theory) and the B-theorists rebuttals. For A-theorists, reality is tensed: time flows, and the past, the present, and the future, or at least the past and the present, or just the present, (depending on the view) are real. B-theorists, on the other hand, claim that reality is tenseless: there is no past, present or future out there and time does not flow. Events are real, and so is their ordering, but that is all: they don’t have pastness, futurity, or present actuality. In other words, supporters of the B-theory advocate real, metaphysical time. Internal, psychological time, on the other hand, exhibits the intuitive three-way distinction into what was, is, and will be.

Approached in this light, we have an illusion of a perfect quantifiability of time. On the B-series where events are placed according to their relative order of precedence/following, there is nothing to stop us from proposing that if we ‘place’ any conscious agent at a random point of the scale, the agent will be at a certain fixed ‘distance’ from any chosen event and this ‘distance’ can be measured according to some agreed conventions. We are here at liberty to superimpose, for example ‘mental distance’ or ‘active interest distance’, or any other non-temporal measure on such a ‘B-series plus an observer’ complex. Equally, on the A-series, quantifiability of time can be achieved when we adopt presentism, that is the view according to which only what is ‘simultaneous with the time of thinking about it’ is real: there is no real past and no real future. If the ‘here and now’ is real, then we can perhaps envisage that moving away from the reality of the *hic and nunc* gives us degrees that are measurable by some agreed conventions. I will say more about degrees and presentism in Section 3.

However, there are loose ends and unresolved questions for both construals. And, likewise, there are unresolved questions for my construal of the graded modality of time where time supervenes on epistemic modality *qua* graded (and quantifiable) detachment. The unresolved questions would not be there if we assumed that the commonsense view of time, according to which there is past, there is the ‘now’, however extended, and the future, and they are all dynamic, need not be squared with some sort of normative philosopher’s concept

of temporality. But it would be unwise to take this route.³ However, if commonsense time and speakers' intuitions are to play a part, then one has to answer the question as to how exactly, if at all, the value associated with the degree of epistemic commitment (or alternatively the *degree of epistemic detachment*) identifies the 'direction' of detachment, into the past and into the future. But not only temporal direction is in need of an explanation: on the modal supervenience account, thoughts and utterances about the present are also characterised by different degrees of epistemic detachment, as was exemplified in (2a,b) above. In my DS-theoretic merger representations (Σ s), I presented this correlation as inheritance from language: the grammar, lexicon, and pragmatic inference interact in producing the effect of conveying temporal location of an eventuality. Demonstrating that this can be achieved, using the sources of information about meaning and processes identified in DS, gave additional support to the arguments gathered there in favour of supervenience. But such a proposal did not exclude the possibility that, after all, this is merely a strong correlation between what we can call speaker's *acceptance*⁴ of a proposition pertaining to a certain, real or imagined, state of affairs and the eventuality's placement in the future, presence, or past (henceforth, F, N⁵, and P). So, supervenience was strongly supported but not exactly demonstrated. To repeat, supposing the difference between F, N and P is not qualitative after all, one needs somewhat stronger support than the availability of merger representations or the linguistic evidence and philosophical arguments amassed there to overcome the overwhelming intuition that F, N and P do indeed exhibit a difference of kind. Cross-linguistic evidence amassed there only demonstrates that there is no clear correlation between temporality and tense, while there are clear correlations between modal and evidential expressions on one hand and temporal reference on the other. It does not demonstrate that there is a P–F symmetry, neither does it demonstrate that there is an analogy between degrees of detachment with respect to P, degrees of detachment with respect to N, and degrees of detachment with respect to F. Swallowing a bitter pill of dissonance between (i) 'philosophers' time' where time is composed of the building blocks of degree of possibility (epistemic and metaphysical likewise) and (ii) 'laymen's time' that flows from the

³ Jackson (2011) entertains this possibility for a philosophers' concept of knowledge in view of the common intuitions in Gettier cases. His arguments against such a move, and in favour of experimental philosophy, are pertinent here.

⁴ See Grice's (2001) unfinished attempt at a unified account of modalities (alethic and 'practical') under a common operator of acceptability that motivated my adaptation (e.g. 2009) of the operator to epistemic modality, operating on Σ s.

⁵ for 'now'

future into the past, will not do.⁶ Alternatively, supposing the difference between F, N and P is qualitative, we can hypothesise, and defend, different ‘values’ or ‘ranges of values’ for the three types of temporal location. Then we will need a good argument or compelling empirical evidence that F, N and P always avail different ‘values’ of detachment. We can also take the route of distinguishing *types* of values but then supervenience on epistemic modality would require a further qualification. Be that as it may, the first steps in addressing the UQ have to be (i) the analysis of the possible P–F symmetry vis-à-vis the tensed/tenseless reality debates and, consequently, (ii) the analysis of the status of the degrees of modality vis-à-vis the ‘degrees of reality’ proposed within presentism. This is attempted in the following section.

3. *Quantifying Time and ‘Degrees of Reality’*

Out of the three categories of temporality, P, N, and F, there is no question that it is N, the present, that is the best candidate for the status of being real, actual, and existing. The boundaries of the ‘now’ may vary among the different applications of the concept but the actuality of ‘now’, when judged by the linguistic expressions pertaining to current events, is its default characteristic. The truth-makers for statements with present-time reference are relatively unproblematic, while truth-makers for statements with past- and future-time reference are up for grabs: we remember some facts about the past, but are memories the same thing as past events? It has been proposed that the past is only as real as its present effects (e.g. Łukasiewicz 1961). The past that does not exist in the present in any form is only a possibility. Equally, arguably, the future exists only in so far as it is to be derived from the present; as Heidegger (1953) says, the future has to be envisaged as the person’s own time, in anticipation of the unavoidable finiteness of life of which one is aware in the expectation of one’s own inevitable death.⁷ This relative status of F and P is well conveyed in natural languages. Languages have hierarchies of epistemic modals and hierarchies of evidentials (Faller 2002). The speaker’s choice of a construction with a stronger or weaker degree of trust in the truth of the embedded proposition, or an indicator of the kind of evidence (in itself weak or strong) can safely be taken as an indicator of the degree of commitment.⁸

⁶ See fn 3.

⁷ See also Harrison (2003: 142-3) on the role of death and death rituals in human life and civilisation.

⁸ I shall leave aside the question as to whether the categories of evidentiality and epistemic reality are related and how. See Aikhenvald (2004) for a powerful defence of the dissociation and van der Auwera and Plungian (1998) and Jaszczolt (2009) for arguments in favour of subsuming evidentiality under modality.

In possible-worlds semantics, the standard view has it that modality interacts with time. The modal base is a construct that is a function from world-time pairs to sets of possible worlds and represents the epistemic state of the speaker. The function is determined by the context. So, the representation of ‘may’ and ‘might’ is as in (4), where MB stands for modal base, and therefore MB(w,t) is the set of worlds compatible with what the speaker knows at time *t*. *P* stands for property, and [t,_) for an interval from *t* to infinity.

$$(4) \quad \lambda P \lambda w \lambda t \exists w' [w' \in \text{MB}(w,t) \ \& \ \text{AT}([t, _), w'P)]$$

(after Condoravdi 2002: 71). In words, in the case of modal statements, there is a world *w'* that belongs to the set of worlds of the speaker’s epistemic state such that the given property is instantiated in this world at a certain interval. Graded modality can then be explained as an ordering of the worlds (Kratzer 1981). Considering that the present is represented as in (5), the interaction of modality with time is evident.

$$(5) \quad \lambda P w [\text{AT}(\text{now}, w, P)]$$

(after Condoravdi 2002: 70). Equally, the perfect interacts with the modals to produce past-time reference with *t'* restricted to intervals preceding *t*. This interaction of modality with the present tense and the perfect, founded on the scopal relations between the modal and the present and perfect operators, is, in spite of appearances to the contrary, perfectly compatible with the claim of the decomposition of the concept of time into degrees of modality. Let us consider the examples in (6).

- (6) John may/might be here tomorrow.
 John may/might be here now.
 John may/might have been here yesterday.

The degrees of dissociation from the eventuality of John’s being at a deictically specified place at a deictically specified time persist across P, N and F. They also, arguably, interact with the concept of temporal reference: ‘may’ in ‘John may be here now’ differs from ‘may’ in ‘John may be here tomorrow’ in that the truth-maker for the first is simple: you, so to speak, ‘go and check’. The truth-maker for the latter either does not exist, as Aristotelian tradition has it, or exists in the present as a prediction, or otherwise exists in the form of some

atemporal, B-theoretic entity. In sum, it would in principle be compatible with Kratzer's (1981) or Condoravdi's (2002) construal to suggest that temporality be composed of such diversified modal atomic concepts as, say, $may_n > may_{n+1} > may_{n+2} \dots$ etc, where '>' stands for the ordering of the strength of expressed commitment. But, to repeat, we can hypothesise here either different degrees of detachment, and supplement the theory with a story concerning the values for the degrees $n, n+1, n+2$ etc. Alternatively, we can adopt a hypothesis that there are different *types* of detachment, as long as we avoid infinite regress: qualitative differences in detachment pertaining to P, N, and F do not affect the thesis of supervenience as long as we can peg the differences on linguistic semantic and conceptual distinctions, while maintaining that the core of graded epistemic commitment is shared. In other words, 'there is no temporal difference without a modal difference', but modal differences themselves are more than meets the eye of a grammarian. It takes a contextualist approach to meaning, where the truth-conditional content of the uttered sentence draws on a variety of sources that are available in the situation of discourse (as e.g. in Recanati 2004, 2010; Jaszczolt 2005, 2010), to account for the modality as the underlying concept for the representation of time.

To sum up: both options, (i) the direct-quantitative view (henceforth DQ), that is the direct reliance on values of $n, n+1, n+2 \dots$, and (ii) shifting the arguably qualitative differences between P, N and F to the also arguably qualitative differences between modal expressions on their occasions of use (the modal-contextualist view, henceforth MC), are feasible hypotheses and candidates for answers to the UQ.

DQ and MC both rely on the well-acknowledged property of modals, namely their malleability in context. Different contextual requirements allow modal constructions to assume different interpretations. Von Stechow and Gillies (2011: 108) dub them "context-dependent quantifiers over a domain of possibilities". This is precisely the kind of property that contextualist accounts are well equipped to represent in that the truth-evaluable content does not rely strictly on the logical form of the sentence but instead incorporates modifications of it – all the way from logical weakening or strengthening (Recanati 1989) to, on radical accounts such as DS, replacement of the logical form of the uttered sentence with that pertaining to the content intended by the speaker when conveyed indirectly. Moreover, it has to be noted that in view of the perspective adopted here, epistemic modality allows for the scale from full commitment to its lack, and hence we are talking here not merely of 'modal constructions' as they are standardly delimited but of all those acts of communication

that convey an epistemic attitude, including those made in, say, straightforward present or past tense forms.

4. In Support of Supervenience on Modality: Tensism or Tenseless Time?

The supervenience of time on modality seems to fit well with the B-theory of time: time is not dynamic, it does not pass. Arguably, it would even be difficult to theorise about the common idea of the passage of time in that the question of ‘how quickly it passes’ is impossible to answer in quantitative terms.⁹ Equally, it would arguably be nonsensical to point out causal links between eventualities if some of them were real and others unreal, as A-theorists have it, for “in order for there to be a temporal relation between two events there must *be* the two events that stand in that relation” (Oaklander 2002: 74; see also Oaklander & White 2007; Le Poidevin 2007, 2011). If all there is is duration and precedence, then the DQ explanation fits the bill: events are ordered on the scale of later-than/earlier-than, and they occupy certain metaphysical and conceptual space in a way that allows the thinking agent to form an attitude to them – an attitude that includes the degree of certainty. This graded attachment in turn translates into the graded belief that a certain state of affairs is (tenselessly) real, which in turn produces the *illusion* (‘time in the mind’) of ‘was/is/will be real’.¹⁰ Supervenience so construed is in fact perfectly compatible with the B-theoretic idea of supervenience already put forward in the philosophical literature, just taking it one step further. For example, Sattig (2006) points to the supervenience of time on atemporal spatiotemporal location. This pertains to supervenience of psychological time on real space-time. Equally, real space-time gives rise to human attitudes towards it that result in the illusion of time passing.

The outcome of this B-theoretic explanation is that we are juxtaposing the metaphysical domain of space-time with the psychological domain and its conception of dynamic reality, and adding to it the middle conceptual level of attitudes and degrees of belief. This shifts P, N and F even further away from the focus on interest than standard B-theorist would have it. Time is not only ‘in the mind’, it is *in the mind as a complex rather than primitive concept*. That is to say, at some level of atomic concepts, time passing is not

⁹ See for example Olson’s 2009 apt argument questioning the sense of the concept of the *rate* of time’s passage.

¹⁰ But see Tallant 2007 on the alleged impossibility to *think in terms of B-time* and Oaklander & White’s 2007 rebuttal.

only not real but P, N and F are not even in the mind at all. Instead there are degrees to which states of affairs are accepted by the agent. The bonus is that if the evidence for past events (memory, written records, etc.) differs from evidence for present ('go and check') and future (planning, fixing, strong prediction through causal links, etc.) events, this is just a problem with the nature of evidence, not with time itself.¹¹ Time can remain underlyingly modal and quantifiable as modal.

But is the thesis of modal foundations of internal time also compatible with the A-theoretic outlook? Intuitively, it should not be compatible in that if reality is tensed, then one would have to reconcile the human arguably underlyingly tenseless conception of reality with the flow of real time. However, the stipulation that reality is tensed comes in various flavours. The most common of them is presentism according to which only the present states of affairs are real. Despite the objections mounted by those who point out that past causes have to be real and so do future effects, presentists claim that P and F are unreal (e.g. Prior 1967, 1968, or, on a linguistic, modal explanation, Ludlow 1999), or have a lower degree of reality than N (Smith 2002). It is the latter, the 'degree presentism', that presents an attractive analogy to our view of time as degrees of epistemic modality.¹² Quentin Smith (2002: 119) aptly captures the intuitions as follows:

"It seems intuitively obvious that what I am doing right now is more real than what I did just one second ago, and it seems intuitively obvious that what I did just one second ago is more real than what I did forty years ago."

The problem with this intuitive view is that, if we are to accept that the adjective 'real' is gradable, we are committed to *degrees of existence* and therefore to highly contentious Meinongian entities. But perhaps the intuition of graded reality can be preserved when it is properly embedded not in A theory but instead in B theory: time is internal, P, N and F are in the mind, and so is the intuition of the degrees of reality. Let us try to superimpose the following passage from Smith (2002: 120) onto B-theory, indexing it as appropriate. The material in square brackets comes from my attempt at this shift to the B-theoretic perspective. Although it is clearly incompatible with Smith's intentions, it produces the right result for my view.

"The degree to which [a representation of] an item exists [in the agent's mind] is proportional to its [perceived] temporal distance from the [agent's] present; the [agent's] present, which

¹¹ Ludlow 1999 explains this difference by reducing the past to evidentials and the future to modals.

¹² For a discussion of asymmetric views see also Bourne 2006.

[often] has zero-temporal distance from the [agent's] present, has the highest (logically) possible degree of existence [in the agent's mind]."

The transfer from the A- to the B-framework clearly removes Smith's overall objective. But it preserves the method for the purpose of my theory, and therefore it would not be right not to employ it while proposing a graded account. It is true that degrees are allocated elsewhere (into modality), but otherwise the method relies substantially on Smith's. In addition to the shift, there is however one alteration in my proposed annotation that makes a qualitative difference even to the method of graded departure itself. That is the addition of the adverbial 'often', to produce in the above passage: "the [agent's] present, which [often] has zero-temporal distance from the [agent's] present". The alteration is necessary because once we move to the domain of internal time and to the domain of the epistemic, there are also degrees of commitment to eventualities reported as present, as was exemplified in (2a,b) in the use of present-time-referring modals. Clearly, present-time referring evidential constructions, even in languages without (grammatical) evidentials such as English, also testify to a graded classification, to compare (2a,b) repeated below with (2c) that seems to lie in-between on the scale of epistemic commitment of the speaker (see also Faller 2002 for a well-developed linguistic analysis).

- (2a) Aly is in Kuala Lumpur now.
- (2b) Aly may be in Kuala Lumpur now.
- (2c) Aly seems to be in Kuala Lumpur now.

Finally, degree presentism, so transposed onto a 'degree internal time' view, well supports the DQ solution to our unresolved question as put forward in the previous section: as Smith (2002: 120) says, we have a difference of degree, rather than a difference of kind, between P, N and F, and these degrees are "immediately given in our phenomenological experience". But next comes an unexpected bonus: Smith claims that for him, 'degrees of existence' mean how an agent *experiences* existence (p. 122). So, losing a limb does not result in a lower degree of existence, but experiencing an event as past rather than present does. Well, if this is not the shift to B-theory I have just proposed then it is not clear at all how Smith can reconcile this claim with his tenacious holding onto presentism. There are degrees, to be sure, but they are in the conceptualisation, not in the world. *A fortiori*, they are in the language, not in the world. They are only in the world in the sense in which agents that hold propositional attitudes, and thereby these agents' mental states, are in the world. Smith has to resort here to relational properties: entities exemplify, tenselessly, relational properties

(‘being alive over 2000 years earlier than now’), producing tensed facts. This results in a rather weak proposal whereby we have merely a shift from time as the explanandum to relational properties, the latter apparently acquired anew as time passes.¹³ However, all in all, it is evident from the use I have made of the graded view that the ‘gradation of reality’ is logically independent of the tensed/tensed reality dispute – a fact with which, no doubt, Smith would have no qualms.

In sum, it seems that the ‘graded reality’ view would fare better if one didn’t conflate the metaphysical level (reality) with the epistemic one. On B-theory, we can separate them, tame allegedly tensed reality to the position of the conception of reality, intuitive time so conceived to internal time, time in the mind, and the bonus is that we can use linguistic evidence to support the view of the speaker’s graded commitment, be it on the DQ or MC construal. Linguistic evidence for the modal foundations of time is what I provided in *Representing Time*; the question of the exact mapping between the modal and the temporal is what, without reinventing the wheel, I am trying to resolve now, having demonstrated with the help of Smith’s arguments that DQ is a tenable solution.

There is one other version of presentism that needs to be explored in connection with our question of the location of the epistemic modal view vis-à-vis the question of reality of time. Presentism can also be held in an ‘asymmetry’ version, whereby P and N are considered to be real and F unreal. ‘Now’ is conceived of as the edge of real time, and the latter simply keeps growing. Needless to say, to hold water, this asymmetry view has to be supported by a good argument from causation (Tooley 1997, 1999) or relational concept (‘x (past) is real as of y (present)’, Button 2006, 2007).¹⁴ The asymmetric view is also in accord with common intuitions but in respects different from those supporting the degree view: the past has already happened and therefore is fixed; the present is fixed in the sense of being actual and observable; the future on the other hand, is not fixed. As Tooley (1997, 1999) says, an alleged fact is not a fact if it can still be prevented, so there are no future facts. Deterministic view aside, common intuitions are well captured by this asymmetric view. Moreover, in view of our earlier discussion of Jackson (2011) on the properties of philosophical concepts, intuitions are what should inform the theory. Causes have to be real at the time when their

¹³ On Smith’s proposal, shifting from N to F results in the acquisition of a new property that is ‘the past –time version of the presently possessed property’ (p. 135). With every infinitesimally small unit of time passing, individuals lose present properties and acquire past-time versions of them instead. The unwelcome regress is diaphanous here and the tenacity with which Smith holds on to tensed facts is only more puzzling.

¹⁴ See also Tallant’s (2011) defeat of the latter.

effects take place, so they have to be past or present, but the effects do not: they can be in the future.

However, independently of his argument for tensed reality (in that, for Tooley, accepting causation presupposes accepting a tensed world), Tooley also argues that tensed concepts can be broken down to and analysed in terms of tenseless ones. He admits that tensed properties cannot be fully explained in tenseless terms, and hence his position on the pertinent supervenience becomes complicated, but it is rescued by relational properties: what facts are actual depends on the time at which they are assessed. Again, analogous to the use we made above of degree presentism, the asymmetric A-theory advocated by Tooley can be broken down, as far as the argumentation is concerned, into two independent parts: his supervenience view and his stance on real time. It is the first that interests us. And, analogous again, his view on real time is perfectly compatible with the modal picture of the degrees of epistemic detachment thanks to the adoption of the supervenience of the tensed on the tenseless. As Tooley observes, one cannot have direct, non-inferential knowledge of the future, neither can one have direct perception of the past. One has present beliefs about the past and present beliefs about the future, and these, *qua* propositional, epistemic attitudes, exhibit properties that epistemic attitudes do, such as being more, or less, certain that a state of affairs did happen, will happen or is happening. Or, to further promote the DS hypothesis, in early stages of language acquisition, children believe things ‘THIS MUCH (+ a gesture indicating a unit of length)’ – a trait that disappears in early childhood but is indicative of the quantitative tendency in approaching knowing and believing that something is the case.¹⁵

5. The Complex Concept of Time and its Foundations

Languages employ an enormous variety of solutions to conveying temporality. Some make use of grammatically encoded temporal distinctions; these differ in kinds and numbers. Others do not grammaticalise temporal reference. Some have a rich repertoire of aspectual distinctions, reflecting situation-internal time, repetitions, habits, and perspectives on eventualities. In some, tense and aspect marking is compulsory in a sentence. In others, it is optional as long as temporal information can be assumed or inferentially retrieved. Some rely principally on the lexicon, mostly on temporal adverbials. Some have a rich system of

¹⁵ This is well attested among pre-schoolers and in early primary-school children but the observation is in urgent need of a systematic empirical study!

evidential markers that help with the inference of temporality. If one were to attempt to classify these means with an aim to give linguistic support to the A- or B-theories of 'real' time, it would become apparent that both A- and B-theoretic concepts alike are lexicalised, grammaticalised and assumed in pragmatic inference. English grammaticalises P and N, but F is tightly interwoven with modality through the various grammaticalisation stages of *will*. Arguably, *will* originated as a modal, then shifted to a marker of tense, and now conveys tense with modal colouring (see Fleischman 1982 on bidirectional semantic shift). French grammaticalises all of them, P, N, and F. These are A-theoretic terms, or terms that a B-theorist would place in the category of mental representation of time. Swahili has consecutive tense: the consecutive-tense marker *ka* signals the order in which events occur, independently of their placement in P, N or F. It seems then that consecutive tense can be classified as a B-theoretic device. Thai uses modal particles whose default reading conveys temporality. For example, the modal auxiliary *d₁ay₁''* in Thai by default assumes past-time reference (Srioutai 2006; Jaszczolt and Srioutai 2011). For Srioutai, modality is the conceptual foundation, the explanans in the theory of modal supervenience, while the A-theoretic concept of temporal location is the explanandum.

What emerges from this diversity is that the lexicon and the grammar are not reliable guides to the conceptualisation of time; one can convey the intentions independently of what is encoded and how. Memories, anticipations, current experiences, as well as their length, ordering, kind of evidence, and certitude are all employed to interrelated ends. As I have argued elsewhere (Jaszczolt forthcoming), there is compelling evidence in support of the view that beneath the linguistic diversity in conveying temporal reference there is a universal concept. The question is, is this a basic, primitive concept or a complex one. Now, if B-theorists are right and P, N and F are in the mind, then P, N and F have to be analysable in terms of tenseless entities. If A-theorists are right, there still can be, or even must be, tenseless analysans, as Smith's and Tooley's reliance on relational properties (discussed in Section 4) suggests.

It seems then that a complex, molecular (as opposed to atomic) concept of time is supported on all fronts. Now, as I argued above, if the concept is underlyingly modal, then the DQ solution applies and we can have different values for different eventualities. For example, remembering V-ing (something) will reflect a stronger degree of epistemic commitment than remembering one's V-ing, which in turn is stronger than remembering that

one V-ed. For example, in DS, (7a) will correspond to a higher value of Δ in $ACC_{\Delta} \vdash \Sigma$ than (7b), and (7b) will have a higher value of Δ than (7c).

- (7a) Tom remembers **PRO** saying that time doesn't flow.
- (7b) Tom remembers **his** saying that time doesn't flow.
- (7c) Tom remembers **that** he had said that time didn't flow.¹⁶

As Higginbotham (2003: 504) says, gerundive complements of the verb 'remember' pertain to *events* of memory rather than remembering propositions. Concerning (7a) and (7b), he also makes an apt observation that it is possible to 'quasi-remember' someone else's experience as one's own (a fact that is well attested empirically), and therefore (7b) differs in strength from (7a). What Higginbotham calls a distinction between memory event and remembering facts on one hand, or remembering and quasi-remembering on the other, easily translates into our scale of epistemic commitment by associating (hypothetical at present) values with Δ .

What remains is to assess what this diversity and the interaction of various means of conveying temporality found in different languages implies for the other possible answer to the UQ, namely the MS view. To repeat, this is a solution on which modal expressions, and also any expressions that convey degrees of epistemic commitment of any degree, acquire their meaning through contextual modifications. The view is clearly supported by cross-linguistic empirical evidence. Lexical, grammatical and pragmatic means of conveying temporal reference interact and languages employ different combinations of these means. By the same token, modal expressions can undergo grammaticalisation to markers of tense (discussed in the example of English *will*), can convey temporality as their default sense (discussed in the example of Thai *d₁ay₁^{II}*), or can convey temporality in context, via pragmatic inference, as in the ambiguous use of 'may in (8).

- (8) He may be in London (now/tomorrow).

Adopting Gricean or post-Gricean principles of rational conversational behaviour as pragmatic universals (see von Stechow and Matthewson 2008; Jaszczolt forthcoming), we assume that the speaker would not have uttered (8) if he/she had not been in a position to

¹⁶ I am ignoring the sequence of tenses phenomenon as it does not bear on this example.

assume that the utterance would not be ambiguous to the addressee.¹⁷ In a normal conversational situation, temporality can be left to pragmatic inference or recovered automatically, by default. In DS-theoretic terms, the processes responsible are either CPI (conscious pragmatic inference), or SCWD (social, cultural or world-knowledge defaults).¹⁸ What matters for the UQ is that on a contextualist construal of meaning, the temporal location in the past, present or future can be conveyed via this interaction of processes of utterance interpretation and the supervenience on epistemic modality can be left intact.

6. Conclusion

In this brief sequel to *Representing Time* (Jaszczolt 2009) I addressed the question that was left unresolved there, namely,

UQ: If the concept of time is underlyingly modal and supervenes on the degrees of epistemic commitment to (or detachment from) the narrated eventuality associated with the speech act by the speaker, then what is the exact correlation between the value of Δ that represents this degree of commitment in DS and the type of temporal reference: P, N or F? In other words, since the thesis of supervenience makes it necessary that there is no temporal difference without modal difference, how exactly are they correlated?

I entertained two possibilities in this paper: that (i) the differences between P, N, and F are underlyingly quantitative rather than qualitative (which I called the direct-quantitative, or DQ view), and that (ii) the differences are qualitative and the value of Δ is contextually established (the modal-contextualist, or MS view). Next, I focused on the DQ view and assessed its compatibility with the tensed and tenseless theories of time, concluding that both uphold it. Finally, I argued that the MS view was also tenable as an answer to the UQ, and was independently supported by cross-linguistic data when the contextualist approach to meaning was adopted.

There is, of course, an independent line of argumentation that comes from the laws of physics. It goes like this. Time may not flow, but events are ordered in a unidirectional sequence. The powerful argument for the asymmetry between the past and the future comes from the second law of thermodynamics, according to which the disorder of a closed system (its entropy) increases with time. In practice, this translates into the fact that physical processes are irreversible: a china cup can break but it cannot reassemble itself back from the

¹⁷ Excluding special situations in which ambiguity may be intentional.

¹⁸ See Jaszczolt 2010 for details.

pieces to a cup. The arrow of time is unidirectional, the asymmetry is explained through external, physical evidence. But we have to remember that real time does not flow: the past and the future have no objective sense. Put simply,

“The labels ‘past’ and ‘future’ may legitimately be applied to temporal directions, just as ‘up’ and ‘down’ may be applied to spatial directions, but talk of the past and the future is as meaningless as referring to the up and the down.”

Davies (2012: 11).

Moreover, this physical evidence also fuels an argument in support of the asymmetry of psychological time (the human concept of time), which is exactly what we want here. Just as entropy is unidirectional, so is memory: memory of an agent increases and produces the illusion of the flow of time.¹⁹ Both the DQ and the MS views proposed here are compatible with this explanation of the essential asymmetry of time.

References

- Aikhenvald, A. Y. 2004. *Evidentiality*. Oxford: Oxford University Press.
- van der Auwera, J. & V. A. Plungian. 1998. ‘Modality’s semantic map’. *Linguistic Typology* 2. 79-124.
- Bourne, C. 2006. *A Future for Presentism*. Oxford: Clarendon Press.
- Button, T. 2006. ‘There’s no time like the present’. *Analysis* 66: 130-35.
- Button, T. 2007. ‘Every Now and Then, no-futurism faces no sceptical problems’. *Analysis* 67: 325-32.
- Condoravdi, C. 2002. ‘Temporal interpretation of modals: Modals for the present and for the past’. In: D. Beaver *et al.* (eds). *The Construction of Meaning*. Stanford: CSLI Publications. 59-88.
- Davies, P. 2012. ‘That mysterious flow’. *Scientific American Special* 21.1: 8-13.
- Faller, M. 2002. ‘Remarks on evidential hierarchies’. In: D. Beaver *et al.* (eds). *The Construction of Meaning*. Stanford: CSLI Publications. 89-111.

¹⁹ There is also a hypothesis, which will not be pursued here, that the illusion of the flow of time can be explained by quantum processes in the brain.

- von Fintel, K. & A. S. Gillies. 2011. ‘“Might” made right’. In: A. Egan & B. Weatherson (eds). *Epistemic Modality*. Oxford: Oxford University Press. 108-30.
- von Fintel, K. & L. Matthewson. 2008. ‘Universals in semantics’. *The Linguistic Review* 25: 139–201.
- Fleischman, S. 1982. *The Future in Thought and Language: Diachronic Evidence from Romance*. Cambridge: Cambridge University Press.
- Grice, P. 2001. *Aspects of Reason*. Ed. by R. Warner. Oxford: Clarendon Press.
- Harrison, R. P. 2003. *The Dominion of the Dead*. Chicago: University of Chicago Press.
- Heidegger, M. 1953. *Sein und Zeit*. Tübingen: Max Niemeyer. Transl. by J. Stambaugh as *Being and Time*. 1996. Albany: State University of New York Press.
- Higginbotham, J. 2003. ‘Remembering, imagining, and the first person’. In: A. Barber (ed.). *Epistemology of Language*. Oxford: Oxford University Press.
- Husserl, E. 1928. *Vorlesungen zur Phänomenologie des inneren Zeitbewusstseins. Jahrbuch für Philosophie und phänomenologische Forschung* IX. Halle: Max Niemeyer. Transl. by J. B. Brough as *Lectures on the Phenomenology of the Consciousness of Internal Time* in: *On the Phenomenology of the Consciousness of Internal Time* (1893-1917). Part A. 1991. Dordrecht: Kluwer.
- Jackson, F. 2011. ‘On Gettier holdouts’. *Mind and Language* 26: 468-81.
- Jaszczolt, K. M. 2005. *Default Semantics: Foundations of a Compositional Theory of Acts of Communication*. Oxford: Oxford University Press.
- Jaszczolt, K. M. 2009. *Representing Time: An Essay on Temporality as Modality*. Oxford: Oxford University Press.
- Jaszczolt, K. M. 2010. ‘Default Semantics’. In: B. Heine & H. Narrog (eds). *The Oxford Handbook of Linguistic Analysis*. Oxford: Oxford University Press. 193-221.
- Jaszczolt, K. M. forthcoming. ‘Cross-linguistic differences in expressing time and universal principles of utterance interpretation’. In: L. Filipović & K. M. Jaszczolt (eds). *Space and Time across Languages and Cultures*. Vol. 1. *Linguistic Diversity*. Amsterdam: John Benjamins.
- Jaszczolt, K. M. & J. Srioutai. 2011. ‘Communicating about the past through modality in English and Thai’. In: A. Patard & F. Brisard (eds). *Cognitive Approaches to Tense, Aspect, and Epistemic Modality*. Amsterdam: J. Benjamins. 249-78.
- Kratzer, A. 1981. ‘The notional category of modality’. In: H.-J. Eikmeyer & H. Rieser (eds).

- Words, Worlds and Contexts – New Approaches to Word Semantics*. Berlin: W. de Gruyter. 38-74. Reprinted in P. Portner & B. H. Partee (eds). 2002. *Formal Semantics: The Essential Readings*. Oxford: Blackwell. 289-323.
- Le Poidevin, R. 2007. *The Images of Time: An Essay on Temporal Representation*. Oxford: Oxford University Press.
- Le Poidevin, R. 2011. 'The temporal prison'. *Analysis* 71: 456-65.
- Ludlow, P. 1999. *Semantics, Tense, and Time: An Essay in the Metaphysics of Natural Language*. Cambridge, MA: MIT Press.
- Łukasiewicz, J. 1961. 'O determinizmie'. In: J. Śłupecki (ed.). *Jan Łukasiewicz. Z zagadnień logiki i filozofii. Pisma wybrane*. Warszawa: Państwowe Wydawnictwo Naukowe. Transl. by Z. Jordan as 'On determinism' in: L. Borkowski (ed.). 1970. *Jan Łukasiewicz: Selected Works*. Amsterdam: North-Holland. 110-28.
- McLaughlin, B. & K. Bennett. 2005. 'Supervenience'. In: E. Zalta (ed.). *Stanford Encyclopedia of Philosophy*. <http://plato.stanford.edu/contents.html>
- McTaggart, J. E. 1908. 'The unreality of time'. *Mind* 17. Reprinted in: J. E. McTaggart. 1934. *Philosophical Studies*. London: E. Arnold. 110-31.
- Oaklander, L. N. 2002. 'Presentism, ontology and temporal experience'. In: C. Callender (ed.). *Time, Reality and Experience*. Cambridge: Cambridge University Press. 73-90.
- Oaklander, L. N. & V. A. White. 2007. 'B-time: A reply to Tallant'. *Analysis* 67: 332-40.
- Olson, E. T. 2009. 'The rate of time's passage'. *Analysis* 69: 3-9.
- Prior, A. N. 1967. *Past, Present and Future*. Oxford: Clarendon Press.
- Prior, A. N. 1968. *Papers on Time and Tense*. Oxford: Clarendon Press. Reprinted in 2003 as *Papers on Time and Tense: New Edition*. Oxford: Oxford University Press.
- Recanati, F. 1989. 'The pragmatics of what is said'. *Mind and Language* 4: 295-329. Reprinted in: S. Davis (ed.). 1991. *Pragmatics: A Reader*. Oxford: Oxford University Press. 97-120.
- Recanati, F. 2004. *Literal Meaning*. Cambridge: Cambridge University Press.
- Recanati, F. 2010. *Truth-Conditional Pragmatics*. Oxford: Clarendon Press.
- Sattig, T. 2006. *The Language and Reality of Time*. Oxford: Clarendon Press.
- Smith, Q. 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.
- Srioutai, J. 2006. *Time Conceptualization in Thai with Special Reference to D₁ay^I, Kh₃oe:y, K₁aml₃ang, Y₃u:^I and C₁a*. PhD Thesis. University of Cambridge.

- Tallant, J. 2007. 'What is B-time?' *Analysis* 67: 147-56.
- Tallant, J. 2011. 'There's no future in no-futurism'. *Erkenntnis* 74. 37-52.
- Tooley, M. 1997. *Time, Tense, and Causation*. Oxford: Clarendon Press.
- Tooley, M. 1999. 'The metaphysics of time'. In: J. Butterfield (ed.). *The Arguments of Time*. Oxford: Oxford University Press. 21-42.