TIME, CONTEXT, AND CROSS-TEMPORAL CLAIMS

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I. Introduction

Tense realism is the tenet that tensed determinations, such as *being past*, *present*, or *future*, are among the ingredients of temporal reality. Famously, McTaggart maintained that the reality of time implies tense realism, but argued that tense realism is incoherent. Tense realists have defended their position against McTaggart's argument in various ways. Granting the coherence of at least certain ways of understanding tense realism, I will present another challenge to the idea that tenses are real.

Consider the simple relational sentence (1) and two *prima facie* obvious considerations about it:

(1) John is taller than Michael

(a) The relation involved in (1) is *being taller than*
(b) Sentence (1) is about John and Michael

Now consider the following question: if (1) is true now, when does the *being taller than* relation hold between John and Michael? The answer is utterly trivial: the relation holds between them *now*, at the present time. In general terms, for every time *t*, if (1) is true at *t*, the relation *being taller than* holds between John and Michael at *t*.

Consider, then, a different relational sentence, for which the two obvious considerations seem to hold as well:

(2) John is now taller than Michael was in 1984

(a') The relation involved in (2) is *being taller than*
(b') Sentence (2) is about John and Michael

Now consider the following question: if (2) is true now, when does the relation *being taller than* hold between John and Michael? Differently from the previous case, there is no obvious answer to such a question. Does the relation hold now? No, because it is possible that now John is *not* taller than Michael, even if (2) is true. Does it hold in 1984? No, because it is again possible that John was not taller than Michael at that time, even if (2) is now true. Does it hold *during* the elapsed time from 1984 to the present time? No; having been taller than Michael during all these years is not a

sufficient condition for John to be now taller than Michael was in 1984. The situation demands a more refined answer. In ordinary speech, we may either say

(H) A relation R *holds* at a time t between $x_1 \ldots x_n$,

or

(E) The terms $x_1 \ldots x_n$ *enter* into a relation R at $t \ldots t^n$, respectively.

The "hold" vocabulary and the "enter" vocabulary differ from each other in their expressive power. When we say that a relation R holds at t between $x_1 \ldots x_n$, we are focusing on *the* time of exemplification of R. By contrast, when we say that $x_1 \ldots x_n$ enter the relation R, we are not constrained to focus on *one* time of exemplification only: we can focus on one time for each term entering R. The puzzle, then, arises because we were formulating the question in the wrong vocabulary. The right question is not when the *being taller than* relation *holds* between John and Michael (that is, when they exemplify it). Rather, the question is when John and Michael *enter* such a relation. The right answer is that they enter it at the present time and in 1984, respectively. In other words, in the "hold" vocabulary, we can express only relations that are *contemporanously* exemplified by $x_1 \ldots x_n$, whereas in the "enter" vocabulary we can define cross-temporal exemplification as follows:

(D) A relation R is *cross-temporally exemplified* by $x_1 \ldots x_n$ if and only if each x_i enters R at a different time than some x_j.

Serious cross-temporality is the thesis that certain relations are cross-temporally exemplified, according to the definition given in (D).

(SC) There are cross-temporally exemplified relations.

In what follows, I will not present an argument in favor of (SC). Rather, I will argue that (SC) and tense realism are incompatible[1]. Given that I take (SC) to be true for independent reasons, the arguments presented below are intended to be arguments against tense realism. However, they are arguments against tense realism only on the condition that (SC) is true.

The remainder of the paper is organized as follows. In §II and §III, I present the semantic framework in which I will formulate the arguments. In §IV and §V, I highlight a problem that serious cross-temporality presents to tense realism: the "no-splitting" problem. I then turn to a solution of this problem that has been recently advanced by Berit Brogaard (§VI). I then show that Brogaard's solution suffers from

[1] In accepting (SC), I follow BROGAARD 2006 and TORRENGO 2006. A common strategy for denying (SC) is to deny (b') and consider (2) as an "a-temporal" comparison between John's and Michael's *heights*. Consequently, (2) is paraphrased as "John has a certain height x now, Michael had a certain height y in 1984, and $x > y$" (See SALMON 1981: 117 n12, VAN INWAGEN 2000, and BOURNE 2006). I will meet this general objection in §V below.

a further problem (the "no-cohesion" problem) that the tense realist cannot solve (§VII). §VIII concludes.

II. Tense Realist and Tense Anti-Realist Semantics

In standard semantics for context-sensitive languages, a context of use *c* (or rather the several elements and aspects that *c* is "composed" of) is represented by a set of contextual parameters C, which can play two different roles in the interpretation and evaluation of an utterance. *Completion* parameters (constituting the *contextual index* C) provide a constituent of the proposition[2] that is expressed. Consider an utterance of (3) in a context *c*:

(3) This is red

Completion parameters in the index C provide the referent of the demonstrative 'this', which in turn is the entity to which we ascribe redness. *Evaluation* parameters (constituting the *point of evaluation i*) provide elements of the *circumstances* against which we evaluate whether what has been claimed (i.e. that the referent of 'this' in (3) is red) is true or false. If someone utters (3) and points to a certain stool (say), then what she has said must be evaluated with respect to the "facts"[3] about it that we find in the actual circumstances[4].

In the literature about the semantics of *tensed sentences,* it is an open question whether tensed sentences are sensitive to *time parameters* playing the completion or the evaluation role[5]. Consider a tensed sentence such as (4) and the time of its utterance t_0:

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[2] I will make only a minimal assumption about the nature of propositions: they are *structured entities* that can function as representations of some sort, and can be evaluated with respect to certain parameters (e.g. possible worlds). For similar assumptions about propositions, see, for instance, KING 2002.

[3] Here, I am talking loosely of 'facts', without thereby committing myself to the existence thereof. The distinction between tensed and tenseless facts is not a distinction between two different ontologies on *what* things exist, but two metaphysical views on *how* things are. See FINE 2006. On "fact ontologies" and the semantic constraints on their feasibility, see NEALE 2001.

[4] In this framework, the evaluation of an utterance of a sentence depends on the truth-value of the proposition it expresses (in the context of use). More precisely, evaluating whether an utterance of a sentence is *correct* or not depends on whether or not the proposition the sentence expresses in the context of utterance is *true*. In turn, the proposition that it expresses is a function of the properties and relation we (contextually) ascribe to entities through language. Thus, the evaluation of a sentence S with respect to a point *i* and an index C boils down to an evaluation with respect to *i* of the proposition expressed by S, given the parameters in C. An index C is always related to *its own* point of evaluation i_C. The standard way to correlate every index to its point of evaluation is to have the set of evaluation parameters as a subset of the set of contextual parameters, for instance, by having world- (*w*), time- (*t*), place- (*p*), and agent-parameters (*a*) in the index C and world- and time-parameters in the point *i.* See KAPLAN, 1989.

[5] See, for instance, RICHARD 1981, RECANATI 2007, KING 2007 and LUDLOW 1999.

(4) I am sitting

If we take t_0 as a completion parameter, an utterance of (4) will express the proposition that *I am sitting at* t_0. All the "temporal slots" of such a proposition are filled in, and any further time specification is irrelevant for its evaluation. A proposition that is thus "saturated" with respect to time is a *tenseless* proposition. The truth value of a tenseless proposition does not vary across times of evaluation. Contrariwise, if we take t_0 as an evaluation parameter, an utterance of (3) will express the proposition that *I am sitting*. Such a proposition needs some temporal specification to be evaluated as true or false. A proposition that is true or false only with respect to a time is a *tensed* proposition. The truth value of a tensed proposition varies across times of evaluation.

The semantic dispute between the proponents of "tensed-propositions semantics" and "tenseless-propositions semantics" is connected to the *metaphysical* dispute between the tense realist and the tense anti-realist. On the one hand, the tense anti-realist thinks that there is a mismatch between certain features of our linguistic representation of reality (i.e tenses) and how reality is. She takes reality to be constituted ultimately by *tenseless facts*; namely, facts that cannot be characterized properly by the use of tensed expressions in ordinary language, such as the fact that *I am sitting at a time t*. On the other hand, the tense realist thinks that certain features of our linguistic representation of reality (i.e tenses) capture the way reality is. She takes reality to be constituted by *tensed facts*; namely, facts that can be characterized by our ordinary tensed language, such as the fact that *I am sitting*[6]. Thus, the tense realist and the tense anti-realist disagree on what makes true tensed sentences true. According to the realist, the truthmakers are tensed facts, while according to the antirealist, the truthmakers are tenseless facts. However, in so far as neither the realist nor the anti-realist takes a stand on whether tensed sentences express tensed or tenseless propositions (if they express propositions at all) we cannot tell whether the mismatch at issue concerns only a semantic feature of sentences or, in addition, affects the proposition expressed. If both parties of the dispute endorse a *strong adequacy requirement on propositions*, such as (SAR), they take the possible mismatch to be confined to a semantic feature of sentences.

(SAR) Tensed/tenseless propositions are made true or false *only* by tensed/tenseless facts

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[6] On this debate, see OAKLANDER & SMITH 1994, LEPOIDEVIN 1998, and CRAIG 2000. More precisely, what is at stake is whether reality is composed by tensed facts, given that certain tense realists accept tenseless facts along with tensed ones (e.g. TOOLEY 1997). Nothing hinges on this for the present discussion; but see the end of §IV below for further reflections on tense realists who accept tenseless facts too. Note that both the tense realist and the tense anti-realist accept the idea that the distinction between non-committing, "ordinary" talk about reality and "substantial", metaphysically loaded talk about reality is meaningful. On this conception of disputes of realism, see FINE 2001. For a critique from a sceptical point of view of the distinction, see HORWICH 2007, and YABLO 1998. For a sceptical stance towards a cognate debate, that between the presentist and the eternalist, see DORATO 2006. Presentism and eternalism will be introduced below in §V.

The idea behind (SAR) is that the relation between the way we represent things to stand by expressing a proposition *p* and how things have to stand for *p* to be true is very close. While (SAR) is clearly sympathetic to the tense realist stance toward the relation between language and reality, a tense anti-realist may not be convinced by it. Indeed, tense anti-realism is compatible with the semantic thesis that tensed sentences express tensed propositions (a thesis often referred to as *taking tense seriously*)[7], and therefore if the tense anti-realist has independent (linguistic) reasons for taking tense seriously she can reject (SAR) and maintain that tensed propositions are made true or false by a tenseless reality. However, for simplicity's sake and given that my arguments are directed primarily against the tense realist, I will assume (SAR) and address the issue of whether a cross-temporal (true) sentence such as (1) can consistently be maintained to express a tensed proposition, and thus whether its truth-maker can be tensed. Nothing really substantial hinges on such an assumption, and all reference to true or false propositions that follows may be recast in terms of reference to putative tensed or tenseless facts obtaining or not—or, more generally, in terms of the tensed or tenselss nature of the truth-makers of tensed sentences. The reasons that I resort to propositions and (SAR) are that (i) it makes my two main arguments easier to state, and (ii) it makes the first one effective against tense anti-realists who endorse taking tense seriously.

III. Time Focus

While the "primary" time of evaluation and interpretation of a *sentence* is always the contextual time t_0 (the time of utterance in a "normal" context), neither the time relative to which the evaluation is carried out (if we take time as an evaluation parameter), nor the time relative to which the content is saturated (if we take time as a completion parameter), need be confined to t_0. The contextual time t_0 is, in a sense, always referred to directly or indirectly by an utterance, but a tensed sentence, in virtue of temporal expressions (such as dates, adverbials, and tense inflections) may also refer to time instant(s) or lapse(s) different from t_0. For instance, consider a sentence such as

(5) Yesterday I had pepperoni pizza

(5) is interpreted and evaluated with respect to a contextual time t_0, but it also refers to a time in the past: yesterday. I will call the time instant(s) or lapse(s) referred to in this

[7] On the difference between "serious tenserism" and tense realism, see ZIMMERMANN 2005. See also TORRENGO 2008.

way the *time focus* (or foci) of an utterance, and say that an utterance of a tensed sentence *targets* its time focus (or foci) [8].

If the time focus does not match the contextual time t_0, we have to be careful to distinguish between the *content* expressed by the utterance, which is a tensed or tenseless proposition according to the option we choose, and the *kernel of the content*. Considering the content as tensed, we can again take an utterance of (5) in a context as an example. The time focus *t* of an utterance of (5) is past with respect to the contextual time: yesterday. Further, the content expressed is a past tensed content: I am ascribing to myself a past tensed property; roughly, that of *having eaten pepperoni pizza*. Therefore, if the content were to be evaluated at the time focus, we would get *incorrect* truth conditions. Obviously, it may be false *yesterday* that yesterday I had pepperoni pizza, even if it is the case that yesterday I had pepperoni pizza. The tensed proposition that is evaluated with respect to the time focus, thus, is not constituted by a past-tensed property. Rather, it is constituted by the present-tense property of *being presently eating pepperoni pizza*. The kernel of (5) is a present-tense version of the proposition expressed by (5); and it is the kernel of (5) that is evaluated relative to the time focus. Similarly, if we construe content as tenseless, what gets saturated by the temporal constituent *t* is a temporally non-saturated version of the ascription expressed by (5), and not a proposition containing a temporal constituent.

IV. The "No-splitting" Problem

Our claims may be "about" –namely target– more than one time point or lapse. That being so, I will talk of the *multiple temporal focus* (and thus of many time foci) of an utterance. Different types of sentence can have more than one temporal focus. Firstly, a sentence may contain more than one time focus because of complex tenses. Consider, for instance, a sentence such as

(6) John will have won the first prize

If we treat a temporal focus as a time at which a proposition is evaluated, we need to split the evaluation time of the proposition expressed by (6), namely the contextual time parameter, into many secondary foci. This is a trivial move. We need only to parse (6) as a case of iteration of (Priorian) tense operators, namely as (6'), which is a sentence of the form (6").

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[8] Roughly, (i) if a past tense sentence is uttered at t_0, it has a time focus *t* that is past with respect to t_0, (ii) if the sentence is in the future tense, the time focus *t* follows t_0; and (iii) in the case of an utterance of a present tense sentence, the time focus *t* is identical with t_0.This is rough, not just because we are bracketing all considerations about adverbials and other expressions that may interact with tenses, but because, as REICHENBACH 1944 argued, for the interpretation of tenses we need there to be a three-place relation R between the time of utterance, the reference time, and the event time (the last of these is what I call the time focus). For an extended formal semantics encompassing Reichenbach's ideas on tenses, see KAMP & RYLE 1994, and PARTEE 1984. Moreover, although R is determined by the tense of the verb, the context may impose further constraints on it. See PARTEE 1973 and the debate on her article. However, nothing in what follows hinges on these simplifications.

(6') It will be the case that (it was the case that (John wins the first prize))

(6'') FPp

The most external tense operator F targets a time with respect to which Pp is evaluated, and P targets a time with respect to which p is evaluated. Thus, the evaluations take place one after another, and each proposition is evaluated with respect to *one* evaluation time. This is trivial in so far as the semantic rules for tense operators are recursive and can be applied to each other[9].

Molecular propositions are another trivial case. Take a conjunction of a future-tensed sentence and a past-tensed sentence, such as (7), which can be parsed as (7'), namely a sentence of the form (7'').

(7) John will be a football player and Michael was a football player

(7') It will be the case that (John is a football player) and it has been the case that (Michael is a football player)

(7'') Fp ∧ Pq

In this case also, we have to split the main time of evaluation, i.e. the contextual time parameter, into two different time foci. Yet this is trivial, because the secondary time foci apply to p and to q respectively, and the evaluation of the whole molecular proposition is a matter of how the two evaluations of p and q combine with each other according to the semantic rule governing ∧.

Consider now a cross-temporal claim, such as

(8) John is taller than Michael was

Under the assumption that cross temporality has to be taken seriously, (8) cannot be construed as having the form of a conjunction of two differently tensed sentences. Rather, (8) expresses a relation that is instantiated by John at present and by Michael in the past. Therefore, (8) does not have the form of a molecular proposition. Yet (8) cannot be parsed as a sentence with iterated tense operators either. Trying to fit (8) into the mould of (7'') would not lead to the right truth conditions. We cannot construe the present tense as an operator that has a past-tensed sentence as its scope, because (8) is not true just in case it is now the case that in the past a certain relation held between John and Michael. Further, we cannot construe the past tense in (8) as operating on a present-tense sentence, because (8) is not true just in case it was the case that now a certain relation holds between them. (8) is true just in case a certain

[9] See PRIOR 1968. More complex cases are substantially analogous. This also holds for interaction of tenses with adverbials. See KAMP & RYLE 1993, and LUDLOW 1999: Chap. 7-8 for a tensed version.

relation holds cross-temporally between John, as he is now, and Michael, as he was at a certain point in his past. No *sentential* operator can ever get the right result[10].

We should note that for the tense anti-realist, who takes time foci as completion parameters, every case of multi-temporal focus is trivial, including cross-temporal claims. At least in so far as the anti-realist relativizes the *terms* of the relation to time foci, she can consider a *single* relational proposition as concerning *many* times, simply by taking each time as characterizing each *term*. Consider (8) again. An utterance of (8) in a context C determines two foci t_0 and t' that characterize the topic of our claim: t_0 characterizes John and t' characterizes Michael. An utterance of (9), therefore, says that the t_0-temporal part of John bears the ordinary relation of *being taller than* to the t'-temporal part of Michael[11]. Evaluating (8) at the time of utterance t_0 amounts to evaluating a tenseless proposition. Contrariwise, the tense realist cannot split the time of evaluation of a cross-temporal sentence into many time foci, because cross-temporal claims can be treated neither as trivial cases of iteration of tenses, nor as conjunctions of differently tensed sentences. Therefore, cross-temporality is ruled out. This is the "no-splitting" problem that the tense realist must face, *if* cross-temporality is to be taken seriously.

Of course, if the tense realist is willing to accept the idea that cross-temporal sentences express tenseless propositions, rather than tensed ones, she would have solved the no-splitting problem. However, it is not clear what her reasons could be for maintaining that a relation such as *being taller* is tensed when contemporaneously exemplified, while it is tenseless when cross-temporally exemplified. If her only reason is to avoid the no-splitting problem, such a solution would seem to be *ad hoc*. In a recent book[12], Francois Recanati has argued that only tensed sentences that do not contain any explicit reference to dates or fixed times express tensed propositions, while tensed sentences that contain explicit reference to dates express tenseless propositions. Recanati's eclectic position is motivated by considerations that are utterly independent from the no-splitting problem. However, by endorsing his position, we allow only *some* cross-temporal claims to express tenseless propositions. Cross-temporal sentences that do not contain dates, e.g. (8), will still express tensed propositions.

V. The Presentist's Purgatory

It is tempting to look for a radical solution to the no-splitting problem: rejecting serious cross-temporal instantiation altogether. If relations are *never* cross-temporally instantiated, there are no cross-temporal propositions and every sentence that seems to have a cross-temporal form has to be construed as having a more "tractable" form, such as (6") or (7"). For instance, (8) should be construed as really saying that John

[10] BROOGARD 2006 was the first to investigate this problem explicitly.

[11] See SIDER 2001 and HAWLEY 2001.

[12] See RECANATI 2007.

now has a certain height and that Michael once had a different, greater height[13]. Presentism is the view that only what is present exists[14]. (SC) is incompatible with presentism, at least in so far as we are dealing with relations that entail the existence of their terms. Thus, if we have independent reasons to endorse presentism, we may use *modus tollens* against (SC), and do away with the no-splitting problem at the outset. Before seeing how far this line of thought will lead us, we have to stress three things. Firstly, tense realism does not entail presentism. Although the two positions often go together, the tenet that reality is composed of tensed facts does not entail that only presently existing entities exist[15]. Secondly, the no-splitting problem impinges on tense realism independently from presentism. As we saw above, what gives rise to the problem is the *form* of cross-temporally instantiated relations: whether the terms exist or not is immaterial to the formulation of the problem itself. Thirdly, the tense realist is not compelled to endorse presentism and the presentist is not compelled to eliminate all cross-temporality from the world. Note that the presentist is at pains to provide a ground for past truths; hence, even non-relational true talk about the past is a problem for the presentist[16]. The presentist has to cook up some story about how it is possible to make true claims about Socrates, say, given that Socrates does not show up in her ontology. Therefore, another way for her to go with respect to cross-temporality may be to adapt such a story to cross-temporal relations[17].

However, cross-temporal relations bring with them a further problem, viz. the no-splitting problem, which remains whether the terms of the (alleged) relation exist or not. Thus, the presentist might be willing to evaluate the theoretical costs of the radical solution of eliminating every instance of cross-temporal relations and endorse such a position in case she is happy to pay them. Of course, not all relations can be reduced to the properties possessed by the terms at (possibly different) particular times. Such a treatment is confined to comparisons such as (8). Other types of relation, for example causal relations, are not kinds of comparison, and neither are reference relations between language and the world. Still, the presentist may eliminate causal and reference relations in alternative ways, and end up by eliminating cross-temporality from the world completely[18]. The idea behind the strategy is that no relation that *can* be cross-temporally exemplified is a genuine relation. Comparisons, whether they are exemplified cross-temporally or not, are merely "determinables"; that is to say, we often talk as if there were a comparison relation between two or more entities, when in fact there are only terms possessing certain properties (possibly

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[13] See, for instance, VAN INWAGEN, 2000.

[14] The alternative to presentism that is most sympathetic to tense anti-realism is eternalism, the view that past, present and future objects all exist in the same way.

[15] FINE 2006.

[16] CRISP 2007.

[17] BROGAARD 2006.

[18] BOURNE 2006 distinguishes (for reasons that are independent from the issue of cross-temporality) between comparisons, reference relations, and causal relations, and furnishes different strategies to eliminate them.

at different times). Something similar goes for causal relations and the referential relation: we talk as if they were genuine relations, but in fact they are not. The presentist, thus, eliminates cross-temporal exemplification by eliminating the *relations themselves* from her metaphysics. Comparisons, causal relations, and reference relations are not genuine relations at all, whether they are exemplified contemporaneously or cross-temporally. Yet in that case, what relations, if any, are genuine? It seems that the maneuver leads us to the conclusion that the only genuine relations are atemporal relations between abstract entities (such as relations between numbers). This can be easily seen if we realize that in so far as a relation can be temporally exemplified at all, it can also be cross-temporally exemplified, and if it can be cross-temporally exemplified, it is not a genuine relation. The only exception is the tenseless temporal relation of *simultaneity*, and possibly other temporal relations that entail it[19]. However, in general, temporal relations are not genuine relations for the presentist; they are just conjunctions of tensed non-relational facts[20]. This means that a presentist who is ready to eliminate cross-temporal exemplification will eliminate virtually all relational facts, with the exception of atemporal facts such as those concerning ratios between quantities[21]. Not surprisingly, a metaphysics that does not contain any relations at all is not concerned with the problem of *cross-temporal* relations! Of course, if one has independent reasons to embrace such a position, this is just a further advantage of one's view. Yet in so far as doing away with all ordinary relational facts is not in one's grand metaphysical view, the price of solving the puzzle is too high.

VI. Brogaard's Solution

It thus seems that avoiding the no-splitting problem by rejecting serious cross–temporality leads to unacceptable consequences. However, such a measure may not be necessary. Berit Brogaard has suggested that, at least in so far as the tensed nature of propositions lies in the relation (or property) expressed, we do not need to reject serious cross-temporality to solve the no-splitting problem; we just need to reject the idea that tenses *always* have sentence-wide scope.

If we take cross-temporality seriously, a sentence such as (8) will present us with a *single* relational proposition that has *many* time foci.

(8) John is taller than Michael was

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[19] Of course, it is always possible to define a relation by introducing in the definition the condition that it has to be contemporaneously exemplified. Yet relations so defined are genuine only when the relation contained in the *definiens* is, and if the definition is not redundant, the relation in the *definiens* will not entail simultaneity.

[20] PRIOR 1968, BOURNE 2006, CRISP 2007.

[21] Spatial distance, and composition are two other relations whose prima facie cross-temporal instantiations can probably be treated in an analogous way by the presentist.

According to Brogaard, the tense realist should accept that *more than one* tense can modify the *same* relation. The relation expressed in (8), then, is multitensed because it is *cross-temporally tensed*. The tensed qualifications apply to the relation all at the same time; but from different sides, so to speak, rather than in succession as with complex tenses. We can represent such a cross-temporally tensed relation with the aid of lambda operators:

(ctR) $\lambda x \lambda y$ [x is taller than y was]

Or slightly more informally, we can label it

— *being an x and a y such that x is taller than y was*

In a manner of speaking, we could say that this relation "points" toward the present in the first position, and "points" toward the past in the second position[22].

It could be argued here that accepting cross-temporally tensed relations still does not amount to taking cross-temporality seriously. Indeed, if (ctR) is the relation in the proposition expressed by an utterance of (8), this relation is instantiated *contemporaneously* by x and y, rather than cross-temporally. If (8) is true, Michael did not enter into the second position of *being an x and a y such that x is taller than y was* in the past, say, at age twelve. Suppose, for instance, that when he was twelve *he had formerly been* taller than John at that time. It is at the present time that he, as much as John, enters into this relation. Yet then the evaluation of the ascription of (ctR) is made with respect to *one* time: the time of the context. Therefore, (8) does not have a multiplicity of time foci, and cross-temporality is only an illusion: accepting cross-temporally tensed relations does not mean accepting that different terms may enter into the same relation *at different times*.

Yet to draw this conclusion would be overly hasty. The tense realist does have a way to take cross-temporality seriously. She can take the double time reference to the past and the present in (8) as a *primitive* and *irreducible* feature of the relation. The time foci do not vanish by construing the relation expressed in (8) as (ctR); they have merely been incorporated in the cross-temporally tensed relation. Although (ctR) is instantiated simultaneously by John and Michael, it is *as if* the relation has a "core" that is instantiated at different times by the two terms. The multiplicity of time foci expressed by (ctR) is reflected in the evaluation of (8); that is, (8) is evaluated with respect to *each* time focus, and this is what matters if we are to comply with the definition of serious cross-temporality that we offered above.

VII. The "No-Cohesion" Problem

[22] See BROGAARD 2006.

By endorsing primitive and irreducible cross-temporality, Brogaard solves the no-splitting problem. However, her solution encounters a further problem. The tense realist maintains that the flow of time is real, and that what is past, present, or future is an ultimate feature of reality itself. Still, the tense realist does not deny that the successive flow of events out of and into the past, the present, and the future constitutes an *ordering* of the events into a time series. Rather, she claims that this order is constituted essentially by the successive obtaining of tensed facts, and not by static temporal relations among tenseless facts. This was the point of McTaggart's distinction between the A-series and the B-series: the two series do not differ in the order of facts or events, but in the nature of the ordering[23]. Indeed, if the tensed facts were not to constitute an ordered series oriented towards the present time, it would be difficult to see tense realism as a philosophical position concerning *time* at all. We experience time as *ordered* along with what comes before and after, and *oriented* towards the present. This is the starting point of every theory about the nature of time. As is well known, McTaggart argued that the ordering implied by the exemplification of tensed determinations implies a contradiction. If the A-series were real, incompatible tensed determinations would be exemplified by the *same* entities. I maintain that even if the tense realist can solve McTaggart's problem, (SC) is incompatible with the tenet that the A-series is real.

The tense theorist talks about what happens in the present, what happened in the past, and what will be the case in the future, through *primitively tensed language*. Different primitive tensed expressions are used at different times in the series of events to refer to (i.e. target) other times in the series. However, for primitive tenses to be in accordance with the order of the series, there has to be a correlation between what a tensed sentence α expresses when used at a certain time t to target a time t' and what other tensed versions of α express when used at other times to target the very same time t'; in particular, with what the present-tensed version of α expresses when used at t'. Tenses have to *cohere with time order*. This is an essential condition of adequacy for any account of tenses[24].

Analyzing tenses in terms of tense operators can easily meet this condition. By endorsing such an analysis, the tense theorist will regard a past-tensed expression as formed by the application of the past-tense operator P to a present-tensed sentence α: $P\alpha$. For a sentence of the form $P\alpha$ uttered at t to be about what happened at a time t' in the past, the tense theorist needs to posit, through her primitively tensed language, a link between what $P\alpha$ expresses at t and what α expresses about t' when used at t'. Within the truth-theoretical framework, this link is provided by the truth conditions for the past-tense operator. In order to refer to what the present-tense kernel α expresses with respect to a past time t', the tense theorist needs tenses in the meta-

[23] MCTAGGART 1908.

[24] BOURNE 2006: 39 acknowledges that a satisfactory theory of time must "accommodate the truth-value links between various times [, namely] the requirement that if p is a true present-tensed proposition, then just in virtue of our concept of tense there are links between the truths which hold at other times, which have to be accommodated and explained"; (on truth-value links, see also DUMMETT 1978).

language. In particular, she needs to resort to tensed truth ascriptions; for instance, by having a past-tense operator WAS (along with a future-tense operator WILL) and a truth predicate T[25]:

(CHp) T (Pα) iff WAS [Tα]

If the truth conditions of Pα had nothing to do with what α expresses in the past, our tensed talk would be completely separated from the flow of time and its order. For instance, it may be the case that one can truly assert now

(9) Charlemagne was crowned Emperor

without it never having been true at a past time that

(10) Charlemagne is crowned Emperor

In general, the tense realist ensures the cohesion of tense and time order by correlating what a tensed sentence S expresses at the present time with what the present tense version of S expresses at the time targeted by the tense in S.

(CH) For every present-tensed sentence α:

> **(i)** T (Pα) iff WAS [Tα]
> **(ii)** Tα iff α
> **(iii)** T (Fα) iff WILL [Tα][26]

The tense realist takes tense operators from the object language and carries them over to the meta-language. Meta-language tenses, such as WAS and WILL, allow the tense theorist to express the conditions that a tensed expression has to meet *in order to cohere with the time order*.

According to the tense realist, the truth conditions of tensed expressions reflect the *structure* of tensed facts, which allows them to combine into a time order[27]. If we take tensed properties and relations to be constituents of tensed facts, cohesion between past-tensed properties (or relations) and present-tensed properties (or relations), will

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[25] See PRIEST 1986. For a semantics of tenses given in a primitively tensed meta-language, see LUDLOW 1999. WAS and WILL are *meta-language* operators. They should not be confused with P and F, which are operators in the object language, although the operators in one set are translations of the operators in the other set (see also the next footnote).

[26] Tensed expressions are primitive for the tense theorist. Thus, they show up both in the object language (P, F) and in the meta-language (WAS, WILL). See SATTIG 2006: Chap. 1. Counterexamples to (CH) are sentences such as 'There have been two kings named Charles in England' or 'Helen of Troy had three husbands'. See LEWIS 2004, and SZABÒ *forthcoming*. I will not take into account the problem of counting through time here.

[27] BOURNE 2006: 46 "The truth-value links have somehow to be a feature of how the facts are structured (as they are on the tenseless theory of time […])".

be intended along the following lines: what past-tensed properties (or relations) are exemplified now by an object *x* depends on the present-tensed properties that *x* possessed in the past (or the relations that *x* entered into in the past)[28].

(CH-f) It is true (now) that a past/present/future-tensed property or relation is exemplified if and only if it *was/is/will be* true that the corresponding present-tense property or relation is exemplified

Tensed facts combine into a temporal order in virtue of their structure, which is made explicit by links between them such as (CH-f). My claim is that if the only way the tense realist has to take cross-temporality seriously is to admit *primitively* cross-temporally tensed relations, she is *not* in a position to explain how the cross-temporally tensed relations cohere with time order. This is trivial in so far as (CH-f) is restricted to contemporary (past/present/future-tensed) relations. Thus, it cannot be applied to cross-temporally tensed relations. However, it might be thought that it is possible to *adapt* (CH-f) to cross-temporal relations. We can think of principles such as the following[29]:

(CH-f') It is true (now) that the relation expressed by "… is taller than … was" is exemplified by *x* and *y* (in that order) iff it *was* true that the relation expressed by "… will be taller than … now" is exemplified by *x* and *y* (in that order).

Can a principle such as (CH-f') allow cross-temporal facts to be added to the temporal order constituted by non-cross-temporal facts? Remember that the relations expressed by "… is taller than … was" and "… will be taller than … now" are primitive, as is the relation expressed by "… is taller than …". They have no structure; therefore, no link between them and other tensed properties and relations can hold in virtue of their structure, in contrast to what happens between a past-tensed property and its present-tense version (i.e. its kernel). In particular, the links between cross-temporally tensed relations and their present tense versions cannot be derived by (CH-f') and have to be postulated. Consider the following piece of reasoning:

(11) John is taller than Michael was three months ago
(12) Three months ago Michael was taller than George is now.

Therefore:
(13) John is taller than George

Such an argument is valid simply in virtue of the time order and the transitivity of *taller than*, but surely it cannot be warranted only by (CH-f') and a principle of transitivity for *taller than*. Cross-temporally tensed facts cannot be integrated within

[28] See BIGELOW 1996, and CRISP 2007.

[29] Thanks to an anonymous referee for a remark that has pushed me to be clearer on the limits of such an option.

the order of other tensed facts, because the latter have a structure that can be analyzed through tense operators, while the former do not have any such structure.

Certain quite twisted "metric" principles may be added to the theory to do the trick, but those would be philosophically "fishy"[30]. Think what happens in non-cross-temporal cases: a tensed content composed only of monadic properties and contemporary relations determines, for every focus *t,* a tensed proposition to be evaluated at *t*. This fact enables the extraction of tense operator(s), which allows us to formulate a condition on the kernel in primitively tensed terms, such that whether or not an entity *x* now instantiates a past-tensed property depends on *x*'s story, i.e., on which present-tensed properties *x* instantiat*ed*. In the tense realist's picture of time and reality, the past, the present, and the future cohere with each other *because of* this dependence link. Indeed, the very idea of the passage of time being part of reality and not being reducible to the relations of earlier and later among events boils down to this dependence link being thought of along the lines of (CH-f), rather than in terms of a primitive earlier/later relation. However, there is no relativized evaluation of the kernel of a tensed proposition that corresponds to the foci of a primitive cross-temporal relation. That being so, the cohesion of cross-temporal relations with the rest of the tensed reality has to be postulated between the primitive relations themselves and is not to be derived from the general behavior of tenses, as it is for non-relational and contemporary facts.

VIII. Concluding Remarks

The conclusions, as promised, are conditional. *If* two or more entities can enter into a relation at different times, the tense realist needs to add a new constituent to her picture: cross-temporally tensed relations. However, the cross-temporal character of those relations does not relate to a tensed reality in the way the tensed character of contemporaneous relations does. There is no correspondence between the time references of an utterance of a cross-temporal claim and the evaluation(s) of a tensed kernel proposition. The world of the tense realist does not seem to be able to accommodate facts concerning cross-temporality. Obviously, the primitive character of cross-temporal relations may be thought of in terms of *brute facts* about cross-

[30] Furthermore, each metric cross-temporally tensed relation is in turn a primitive relation. See also TORRENGO 2006.

temporality. Yet if she takes this option seriously, the tense realist must thoroughly rethink her position[31].

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[31] Older versions of the paper were presented at the following conferences: *Third Arché Graduate Conference*, St. Andrews, Scotland, November 2006; *V Conference of the Spanish Society of Logic, Methodology and Philosophy of Science*, Granada, December 2006; *Seminario di Filosofia Analitica*, Bologna, May 2007; *VI Italian-German Meeting of Analytic Philosophy*, Parma, June 2007; *SIFA Metaphysics of Time Conference*, Bergamo, September 2007. For helpful comments and discussions, I wish to thank: Tiziana Andina, Andrea Bianchi, Francesca Boccuni, Andrea Bottani, Berit Brogaard, Manuel-Garcìa Carpintero, Elena Casetta, Fabrice Correia, Michele Di Francesco, Maurizio Ferraris, Kit Fine, Akiko Frischhut, Alessandro Gatti, Katherine Hawley, Mark Heller, Andrea Iacona, Philipp Keller, Pietro Kobau, Paolo Leonardi, Jonathan Lowe, Friederike Moltmann, Luca Morena, Sebastiano Moruzzi, Thomas Mueller, Kevin Mulligan, Nathan Oaklander, Carlotta Pavese, Françoise Recanati, Marco Santambrogio, Andrea Sereni, Giuseppe Spolaore, Zoltán Gendler Szabó, Achille Varzi, Alberto Voltolini, Elia Zardini, and two anonymous referees of this Journal.

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