Truth-conditions, truth-bearers and the new B-theory of time

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Abstract In this paper I consider two strategies for providing tenseless truth-conditions for tensed sentences: the token-reflexive theory and the date theory. Both theories have faced a number of objections by prominent A-theorists such as Quentin Smith and William Lane Craig. Traditionally, these two theories have been viewed as rival methods for providing truth-conditions for tensed sentences. I argue that the debate over whether the token-reflexive theory or the date theory is true has arisen from a failure to distinguish between conditions for the truth of tensed tokens and conditions for the truth of propositions expressed by tensed tokens. I demonstrate that there is a true formulation of the token-reflexive theory that provides necessary and sufficient conditions for the truth of tensed tokens, and there is a true formulation of the date theory that provides necessary and sufficient conditions for the truth of propositions expressed by tensed tokens. I argue that once the views are properly formulated, the A-theorist's objections fail to make their mark. However, I conclude by claiming that even though there is a true formulation of the token-reflexive theory and a true formulation of the date theory, the New B-theory nonetheless fails to provide a complete account of the truth and falsity of tensed sentences.

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1 Introduction

According to the B-theory of time, tense is not a fundamental feature of the world. There is nothing that ontologically distinguishes the present from the past or the

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future. Events in time lack the irreducible monadic properties of *being-past*, *being-present* or *being-future*. Rather events in time stand in the relations of *is-earlier-than*, *is-later-than* and *is-simultaneous-with*. The B-theorist holds that these relations exhaust the temporal features of the world.

Even though B-theorists deny that tense is a fundamental feature of the world, most admit that tensed sentences are sometimes true. The B-theorist agrees that the sentence 'It is now the age of computers' is true whereas the sentence 'It is now the age of dinosaurs' is false. If there is no such thing as ontological tense, then how can tensed sentences be true? The "Old" B-theorists[1] claimed that tensed sentences have tenseless translations. A sentence like 'The volcano is now erupting' could be translated without loss of meaning into a sentence containing only B-theoretic terminology such as 'The volcano's eruption is simultaneous with this utterance' or 'The volcano's eruption occurs at t'. One implication that can be drawn from work on indexicals by Castañeda (1967), Perry (1979), and Lewis (1979) is that tensed sentences cannot be translated into tenseless sentences without a loss of meaning, and so the project of the Old B-theory has been abandoned. The "New" B-theory acknowledges that tensed sentences do not have meaning-preserving, tenseless translations. Instead it claims that all the B-theorist must do is provide tenseless truth-conditions for tensed sentences. So long as an account of what makes tensed sentences true can be given without appealing to fundamentally tensed properties, true tensed sentences pose no threat to the B-theory.

However, providing tenseless truth-conditions for tensed sentences raises some questions for the B-theorist. Should the account provide tenseless truth-conditions for tensed sentence *types* or for tensed sentence *tokens*? As D. H. Mellor notes in *Real Time* (1981), many tensed sentence types are not true or false *simpliciter*; rather they are true at some times and false at other times. The sentence type 'It is now raining' is true today but was false yesterday. Tokens, on the other hand, are true or false *simpliciter*. My token utterance today of 'It is now raining' is true "without temporal qualification" (Mellor 1981, p. 36). Mellor concludes that "the truth and falsity of tensed sentences, therefore, are properties of their tokens, rather than of their types" (40). The New B-theorist alleges that the truth or falsity of tensed sentences can be fully accommodated by providing tenseless truth-conditions of tensed tokens.[2] So by providing tenseless truth-conditions for tensed sentence tokens, the new B-theorist can acknowledge that tensed sentences are sometimes true in virtue of having true tokens, and maintain that the explanation for what makes tensed sentences sometimes true involves no appeal to irreducibly tensed facts or properties.

There are two distinct methods that have been given for providing truth-conditions for tensed tokens: the token-reflexive theory and the date theory. The token-reflexive theorist claims that what makes a tensed token true is that a B-theory temporal relation obtains between the token itself and the event mentioned in the

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[1] Works associated with the Old B-theory of time include Quine (1960) and Smart (1963).

[2] I take this claim to be essential to the New B-theory of time.

token.[3] Consider tensed tokens of the form 'e is now'. The token-reflexive theory states:

> TR For any token, u, of 'e is now', u is true iff e is simultaneous with u.

Suppose I produce a token utterance of 'The evening news begins now'. My claim is true if and only if the beginning of the evening news is simultaneous with my token utterance. The truth-conditions of tensed tokens are given by a tenseless relation obtaining between the event mentioned in the token and the token itself. In this manner the token-reflexive theory claims to provide tenseless truth-conditions for tensed tokens.

The date theorist provides a different account of what makes a tensed token true. She claims that the token is true because a B-theory temporal relation obtains between the time at which the token is produced and the event mentioned in the token.[4] Consider tensed tokens of the form 'e is now'. The date theory states:

> DT For any token, u, of 'e is now' produced at t, u is true iff e occurs at t.

Suppose that at 6pm I produce a token utterance of 'The evening news begins now'. According to the date theory, my token is true iff the evening news begins at 6pm. The truth-conditions of tensed tokens are given by a tenseless relation obtaining between the event mentioned in the token and the time at which the token is produced. In this manner the date theory claims to provide tenseless truth-conditions for tensed tokens.

Both theories have faced a number of objections by prominent A-theorists such as Quentin Smith and William Lane Craig. Traditionally, these two theories have been viewed as rival methods for providing tenseless truth-conditions for tensed tokens. I argue that the debate over whether the token-reflexive theory or the date theory is true has arisen from a failure to distinguish between necessary and sufficient conditions for the truth of tensed tokens and necessary and sufficient conditions for the truth of propositions expressed by tensed tokens. There is a true formulation of the token-reflexive theory that provides necessary and sufficient conditions for the truth of tensed tokens, and there is a true formulation of the date theory that provides necessary and sufficient conditions for the truth of propositions expressed by tensed tokens. I argue that once the views are properly formulated, the A-theorist's objections fail to make their mark. However, I conclude by questioning the New B-theorist's assumption that the truth and falsity of tensed sentences can be fully accommodated by providing tenseless truth-conditions for tensed tokens.

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[3] This view is laid out in Mellor (1981, pp. 29–46). In Mellor (1998), he renounces the view put forth in Mellor (1981) in light of criticisms given by Smith (1993). The implications of Smith's objections for the token-reflexive theory are discussed below. Despite being renounced by Mellor, the token-reflexive theory continues to be defended by many including Nathan Oaklander (1994), Manual Garcia-Carpintero (1998), Heather Dyke (2002, 2003).

[4] Proponents of this view include Smart (1980), Oaklander (1994), and Le Poidevin (2003).

2 Disambiguating the token-reflexive theory and the date theory

I will claim that there are at least three different formulations of the token-reflexive theory and three different formulations of the date theory depending upon what the theory takes the fundamental bearers of truth to be and what the theory provides truth-conditions for. Both proponents and opponents of the date theory and the token-reflexive theory have failed to distinguish among these formulations. I will show that the objections that have been leveled against each theory succeed only in refuting certain formulations of the theory, and there is a true formulation of each which avoids the objections entirely.

First, there are different views regarding what the fundamental bearers of truth are. One view is that truth applies fundamentally to tokens. On this view, the predicate 'is true' is properly applied only to tokens. Such a view is committed to denying that there are token-independent truths. I will refer to this view as the 'Token View'. A rival view takes truth to apply fundamentally to propositions.[5] On this view, tokens are true or false only derivatively: tokens *express* propositions and a token is true iff it expresses a true proposition. This view does allow for the existence of token-independent truths. A proposition can be true even if there is no token that expresses it. I will refer to this view as the 'Proposition View'.

In addition to these views regarding the fundamental bearers of truth, there are also at least three different senses of 'truth-condition'. According to one sense, truth-conditions are associated with the meaning of a sentence. This use of 'truth-condition' can be traced back to Davidson (1967). The motto associated with this sense is "to know the meaning of a sentence is to know the conditions under which it is true." Suppose I am in a crowded lunchroom and I hear someone utter 'I am hungry'. There is a sense in which I know the meaning of the utterance even though I fail to know who uttered it. I know that there is a rule associated with the utterance such that it is true iff the utterer (whoever that may be) is hungry. In this sense, I know the conditions under which the utterance is true. I will refer to this sense of 'truth-conditions' as *m-truth-conditions*.[6]

The New B-theorist should claim that neither the token-reflexive theory nor the date theory are in the business of providing m-truth-conditions. A brief argument for the claim that neither theory provides m-truth-conditions can be given as follows: My 6pm utterance of 'the evening news begins now' has the same m-truth-conditions as my 7pm utterance of 'the evening news begins now'. My 6pm utterance does not have the same token-reflexive truth-conditions or the same date-theoretic truth-conditions as my 7pm utterance. Therefore, neither the token-reflexive theory nor the date theory provide m-truth-conditions.

Suppose I produce a token utterance, U, and we ask the question, "What are the necessary and sufficient conditions for the truth of U?" There are two additional ways we might understand this question. According to the first way, tokens are true in virtue of expressing true propositions. To provide necessary and sufficient

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[5] Here and throughout the rest of the paper I take propositions to be eternally true or false if true or false at all.

[6] This sense of 'truth-condition' corresponds with Kaplan's notion of character.

conditions for the truth of U is to provide necessary and sufficient conditions for the truth of the proposition expressed by U. The above question can be understood as asking how to complete the right-hand side of the following bi-conditional:

The proposition expressed by U is such that it is true iff _____[7]

I will refer to this sense of 'truth-conditions' as *p-truth-conditions*.

According to another way of understanding the question, we are not interested in necessary and sufficient conditions for the truth of the proposition expressed by U, but rather we are interested in necessary and sufficient conditions for the truth of the token U itself. To state the question in the framework of possible worlds: what conditions are satisfied in all and only those worlds in which U has the property of being true? According to this second way, the above question is understood as asking how to complete the right-hand side of the following bi-conditional:

U is true iff _____

I will refer to this sense of 'truth-conditions' as *t-truth-conditions*.[8] Oftentimes, participants in the debate over the token-reflexive theory and the date theory will speak of providing necessary and sufficient conditions for the truth of a token, and it is unclear whether they have in mind t-truth-conditions or p-truth-conditions. In order to avoid confusion, when I have t-truth-conditions in mind, I will speak of necessary and sufficient conditions *for the truth of a token*. When I have p-truth-conditions in mind, I will speak of necessary and sufficient conditions *for the truth of the proposition expressed by a token*.

Consider my token utterance at 6pm of 'The evening news begins now'. There will be at least three ways of formulating the token-reflexive view depending upon (a) whether we adopt the Token View or the Proposition View and (b) whether we see the task of the token-reflexive view as providing p-truth-conditions or t-truth-conditions. If we adopt the Token View, then the task of the token-reflexive theory will be to provide t-truth-conditions since the Token View denies the existence of propositions. This version of the token-reflexive view can be stated as follows:

TR1 i) The Token View is true and ii) for any token, u, of 'e is now', u is true iff e is simultaneous with u.

If one adopts the Proposition View, then there are two possible ways of formulating the token-reflexive theory depending on whether one assigns the theory the role of providing p-truth-conditions or t-truth-conditions. Suppose one adopts the Proposition View and assigns the token-reflexive theory the role of providing p-truth-conditions. The resulting formulation of the token-reflexive view can be stated as:

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[7] Here and throughout the rest of the paper, I take 'iff' to denote the strict bi-conditional.

[8] Consider one who rejects the existence of propositions and takes tokens to be the fundamental bearers of truth. Such an individual will deny that tokens have p-truth-conditions. One who accepts the existence of both tokens and propositions can accept that tokens have both p-truth-conditions and t-truth-conditions, although she might insist that one is a better candidate for the meaning of 'truth-condition'.

TR2 i) The Proposition View is true and ii) for any token, u, of 'e is now', the proposition expressed by u is such that it is true iff e is simultaneous with u.

If one adopts the Proposition View and assigns the token-reflexive theory the role of providing t-truth-conditions, the resulting formulation of the token-reflexive view can be stated as follows:

TR3 i) The Proposition View is true and ii) for any token, u, of 'e is now', u is true (i.e. expresses a true proposition) iff e is simultaneous with u.

Not surprisingly there are three corresponding formulations of the date theory. If one adopts the Token View, the date theory is given the task of providing t-truth-conditions. This formulation can be stated as follows:

DT1 i) The Token Theory is true and ii) for any token, u, of 'e is now' produced at t, u is true iff e occurs at t.

Again, adopting the Proposition View results in two possible formulations of the date theory depending on whether one assigns the theory the role of providing t-truth-conditions or p-truth-conditions. Assigning the date theory the role of providing p-truth-conditions results in the following formulation:

DT2 i) The Proposition Theory is true and ii) for any token, u, of 'e is now' produced at t, the proposition expressed by u at t is such that it is true iff e occurs at t.

Assigning the date theory the role of providing t-truth-conditions results in the following formulation:

DT3 i) The Proposition Theory is true and ii) for any token, u, of 'e is now' produced at t, u is true (i.e. expresses a true proposition) iff e occurs at t.

3 Evaluating the token-reflexive theory

I will now evaluate the three formulations of the token-reflexive theory in light of objections that have been given by Quentin Smith. Quentin Smith (1993) has provided some formidable objections to the token-reflexive theory.[9] In one objection he argues that the token-reflexive theory does not provide the proper token-reflexive truth-conditions for some tensed sentences.[10] He considers the following tensed sentence:

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[9] Craig (2000) provides objections to the token-reflexive theory that are in many ways similar to those provided by Smith (1993). I think that much of what I say in response to Smith's objections can also be applied to Craig's objections.

[10] In presenting Smith's objections I leave the term 'truth-condition' ambiguous since one of my central claims is that his objections fail to recognize the different senses of the term. In evaluating Smith's objections below, I return to my disambiguated usage.

(1) I am not now uttering anything.

Suppose I produce a token utterance, U, of (1). Smith claims that the token-reflexive truth-conditions for my utterance state that U is true iff:

(2) The event of my not uttering anything is simultaneous with U.

According to Smith, the token-reflexive truth-conditions provide the correct result that U is false. However, Smith notes that some amount of investigation is required in order to determine the truth of (1). Smith states, "But I need not utter [1], I could think it silently to myself... As silently thought, it is true" (Smith 1993, p. 79). However, Smith claims (2) is false a priori. Since (2) is a priori false and (1) is not, Smith concludes that the token-reflexive formula fails to provide the proper truth-conditions for (1).

A second, related objection by Smith concerns what he calls "normal" tensed sentences, namely those that, unlike (1), do not contain explicit reference to a token. Smith considers the following sentence:

(3) The forest is now burning.

He argues that what is expressed by a token of (3) at time t does not have the same truth-value in all possible circumstances as what is expressed at t by the corresponding token-reflexive sentence:

(4) The forest is burning simultaneously with this token.

Smith names what is expressed by a token of (3) at t 'p1' and what is expressed by a token of (4) at t 'p2'. He claims:

> If both p1 and p2 are in fact true when expressed at t, it is nevertheless the case that p1 would have been true at t even if it had not then been expressed by any physical or mental sentence-token, whereas p2 would not have been true at t if it had not then been expressed by any sentence token. In possible worlds terminology, we may say that in all possible worlds similar to our own except in that p1 and p2 are not expressed at t, p1 is true at t in those worlds but p2 is not. (Smith 1993, p. 84)

Smith concludes that since what is expressed by a token of (3) at t has different truth values in some possible worlds from what is expressed by a token of (4) at t, the token-reflexive theory fails to provide the proper truth-conditions for (3).

I will now consider each formulation of the token-reflexive theory given above and determine whether Smith's objections succeed in disproving it. TR1 is the token-reflexive view adopted and defended recently by Heather Dyke (2002). It is clear that she takes the Token View to be true. She states, "My position entails that sentence tokens, rather than propositions, statements or sentences, are the legitimate bearers of truth" (Dyke 2002, p. 346). Elsewhere she claims, "The predicate 'true' applies only to linguistic entities. It is sentence tokens that can correctly be described as true or false" (Dyke 2002, p. 339). Furthermore, as a defender of the

Token View, it is clear that she takes the token-reflexive theory to provide t-truth-conditions (as opposed to p-truth-conditions).

Dyke claims that her view is able to accommodate Smith's objections. Dyke's response to Smith's first objection is to note that it is only if we limit what counts as a token to utterances that (2) is false a priori. If we broaden the theory to include mental tokens, which Dyke points out Mellor (1981, p. 37) accepts, then (2) is not false a priori, some investigation is required to determine whether or not my token, U, is simultaneous with my not uttering anything. So, Dyke claims that if tokens are construed more broadly, Smith's first objection is avoided.

Dyke responds to Smith's second objection by insisting that the question of truth only arises with respect to tokens. She acknowledges the intuitive appeal of the following rule employed by Smith:

> If a normal A [tensed] sentence is used on some occasion to express something true, what the A sentence expresses on that occasion would have been true then even if it had not been expressed. (Smith 1993, p. 83)

However Dyke claims that this natural intuition we have about the nature of truth can be "explained without appealing to the existence of abstract truth vehicles" (Dyke 2002, p. 342). She considers a case in which the forest burns between t1 and t2. She admits that we have the intuition that the sentence 'The forest is now burning' is true between t1 and t2 whether or not any token of it is actually uttered. She claims that this intuition can be explained by appealing to the following counterfactual:

(5) Between t1 and t2, if someone had uttered a token of the sentence type 'The forest is now burning', that token would have been true. (Dyke 2002, p. 342)

Dyke notes that the reason the token would have been true is because the token-reflexive truth-conditions would have been satisfied. She concludes that the intuition behind Smith's rule "can be explained perfectly well without the existence of [abstract truth vehicles]" (Dyke 2002, p. 346).

Dyke's view (TR1) fails not because its account of t-truth-conditions fails but because the Token View is implausible. Dyke's appeal to counterfactuals such as (5) are insufficient for accounting for our intuition that there exist token-independent truths. In order to see this, consider a case similar to Smith's first objection. Suppose I produce a (mental or verbal) token, U, of the following tensed sentence:

(6) I am not now tokening anything.

The token-reflexive t-truth-conditions for my utterance state:

(7) U is true iff the event of my not tokening anything is simultaneous with U.

(7) has the correct result that U is false, however there is an intuition that what is expressed by U might have been true. After all, I might have been knocked unconscious moments before producing U. There is some possible world, W, in

which I am knocked unconscious moments before producing U and, intuitively, what is expressed by U is true in W. Note that a counterfactual of the sort Dyke proposes will not account for the intuition that what is expressed by U is true at W. The following counterfactual

(8)   If I had uttered a token of the sentence type 'I am not now tokening anything', that token would have been true.

is clearly false at W. If I had uttered a token of 'I am not now tokening anything', the token would have been false since it fails to satisfy the token-reflexive t-truth-conditions. With respect to sentences like (6), Dyke's account is unable to accommodate the intuition that what is expressed by a token of (6) might have been true.[11]

There are other cases in which Dyke's counterfactual fails to accommodate our intuition that there exist token-independent truths. There is good reason to believe that there are truths for which there is no linguistic expression. Consider the interval from 9am to 10am this morning. Assuming that time is continuous, this interval contains continuum many moments. It is true of each of these moments that it is past. There are continuum many truths just like the one we would express by saying '9:30am is past'. However a language made up of finitely long sentences is only capable of producing denumerably many sentences. The intuition that there are these truths, one for each moment in the interval, cannot be accounted for by Dyke's counterfactual because for many of these truths there is no linguistic utterance that is capable of expressing it and, so, no corresponding counterfactual.[12]

I conclude that the Token View, the view that truth only applies to tokens, is an implausible one, and therefore TR1 is false. There are instances in which we have a clear intuition that a truth exists even though there is no corresponding token. I have argued that Dyke's appeal to counterfactuals such as (5) fails to adequately account for this intuition.

Having rejected TR1, let us now consider how TR2 fares with respect to Smith's objections. TR2 fails to provide plausible necessary and sufficient conditions for the truth of the proposition expressed by a tensed token (p-truth-conditions). Consider a token utterance, U, of

(3)   The forest is now burning.

TR2 claims that the proposition expressed by U is such that it is true iff the event of the forest burning is simultaneous with U. According to TR2, the truth of the

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[11] Phillip Bricker has pointed out to me that Dyke's counterfactual approach also fails in cases involving "normal sentences" (those that do not contain an explicit reference to the token). Suppose that there is a causal connection between tokening and forest fires such that a (mental or verbal) token produced between t1 and t2 causes the forest fire to be extinguished. Suppose also that there are no tokens produced between t1 and t2. In such a case, the counterfactual (5) is false even though, intuitively, the sentence type 'the forest is now burning' is true between t1 and t2.

[12] This argument is adapted from similar arguments given by Soames (1999, p. 19) and Phillip Bricker (personal communication). Soames uses the claim that there are truths about the real numbers to argue that propositions, rather than tokens, should serve as the fundamental truth-bearers.

proposition expressed by U depends upon whether U is appropriately related to the event mentioned in U. However the proposition expressed by U might not have been expressed by U. The proposition might have been expressed by some other token such as a token utterance of 'the forest is burning now' or by no token at all. In both of these counterfactual cases the proposition is true. So the existence of U standing in the relation of *is-simultaneous-with* to the event mentioned in U is not necessary for the truth of the proposition expressed by U.

The failure of TR2 to provide the proper p-truth-conditions for tensed tokens can be further seen by considering a token utterance, U, of

(6)   I am not now tokening anything.

TR2 provides the following p-truth-conditions for U:

(9)   The proposition expressed by U is such that it is true iff the event of me not tokening anything is simultaneous with U.

TR2 has the correct consequence that the proposition expressed by my utterance is false. However the proposition that I express by U might have been true for the reasons given above. (9) fails to allow for the possibility in which the proposition expressed by U is true. So TR2 provides the wrong p-truth-conditions for U.

The difficulty with TR2 is that there is no reason to think that the truth of the proposition expressed by a token utterance of (3) or (6) is determined by how the token is related to the event mentioned in the token. It is implausible to suppose that necessary and sufficient conditions for the truth of the proposition expressed by token utterances of (3) or (6) involve facts about the tokens used to express them.

TR3 fares much better than TR2. TR3 provides necessary and sufficient conditions for when tensed tokens express true propositions (t-truth-conditions). Consider again a token utterance, U, of:

(3)   The forest is now burning.

According to TR3, U expresses a true proposition iff the event of the forest burning is simultaneous with U. The fact that what is expressed by U would have been true even if U had not been uttered does nothing to undermine TR3, since TR3 acknowledges the existence of token-independent truths but only provides necessary and sufficient conditions for the truth of tensed tokens.

Similarly, my token, U, of:

(6)   I am not now tokening anything

does not raise difficulties for TR3. According to TR3, the token-reflexive t-truth-conditions for U are given as follows:

(10)   U is true iff the event of me not tokening anything is simultaneous with U.

Note that (10) is compatible with the claim that what is expressed by U might have been true. (10) only excludes the possibility of there existing a true *token* of (6). And, after all, the impossibility of a true token of this sort is exactly what we

should expect. TR3 does not force us to abandon the intuition that *what is expressed* by U (namely the proposition) might have been true.

Of the three formulations of the token-reflexive theory considered so far, TR3 is the most plausible. Unlike TR2, the examples involving tokens of (3) and (6) fail to demonstrate that TR3 is false. Unlike TR1, TR3 is not committed to the claim that truth is only a property of tokens, and TR3 can account for our intuition that sentences like 'I am not now tokening anything' might have been true by recognizing the existence of token-independent truth-bearers.

My examination of the three formulations of the token-reflexive theory may be summed up as follows: TR1 is false because it is unable to accommodate the intuition that there are token independent truths. Dyke's attempt to accommodate the intuition in terms of counterfactuals involving tokens is unsuccessful. TR2 is false because it provides implausible p-truth-conditions for tensed tokens. TR3 avoids both of the vices of its sister formulations: it allows for the existence of token-independent truths and provides t-truth-conditions rather than p-truth-conditions. It is plausible that the t-truth-conditions of a tensed token are given in terms of facts about how the token is related to events mentioned in the token. I conclude that TR3 is true.

4 Evaluating the date theory

In this section I will consider how the three formulations of the date theory fare in light of objections that have been raised against it by Quentin Smith. The force of Smith's objections has been acknowledged by a number of B-theorists, and many agree that they succeed in demonstrating that the date theory is untenable.[13] Quentin Smith (1993, 1999) claims that the date theory is prone to an objection whether one adopts a reductionist or a substantivalist account of time. He considers a true utterance of 'Beth is now waking up' uttered at 12pm. According to the date theory, the utterance, call it 'U', is true iff Beth wakes up at 12pm. Smith attributes to the reductionist the view that times are sets of simultaneous events.[14] Call the set of events simultaneous with Beth's waking up 't'. Smith notes that the set t includes Beth's waking, U, and (Smith supposes) a certain ultraviolet ray (henceforth 'Ray') striking the Empire State Building. However, Smith notes, there is some possible world, w1, in which there exists a set of simultaneous events, t1, that includes Beth's waking, U, and all the other events that are members of t except for the event of Ray striking the Empire State Building. Smith notes that U is true in w1, however since sets have their members essentially, t is not identical to t1. Smith concludes that in w1 the event of Beth's waking does not occur at t. So the event of Beth's waking occurring at t is not necessary for the truth of U. Therefore, given a reductionist account of time, the date theory fails.

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[13] See Oaklander (1994), Le Poidevin (1995), Paul (1997), and Dyke (2002).

[14] In Smith (1993) he cites a number of cases in which this view is adopted. I will henceforth follow Smith in using the term 'reductionist' for one who adopts such a view.

Smith argues that a similar objection can be given if one assumes a substantival account of time. Smith takes a substantivalist to be one who holds that, "a time t is a particular that is logically independent of any events that occupy that time" (Smith 1999, p. 237). He again considers a true utterance of 'Beth is now waking up'. He states:

> There is some merely possible world [w2] in which the substantival time t, which is actually occupied by the event of Beth's waking up, is not occupied by this event and in which some other time, [t2], is occupied by this event and by the utterance of "Beth is waking up". This is sufficient for the utterance to state something true in this possible world. Since the utterance states a truth in this world even though the event of Beth waking up is located at [t2] rather than t, it is false that an utterance of "Beth is waking up" at time t states a truth if and only if Beth's waking up occurs at t. Thus the alleged truth conditions proposed by the date-analysis theory are not truth conditions" (Smith 1999, p.119).

In the possible world Smith considers, Beth's waking and U do not occur at 12pm but rather some other time, say, 1pm. Smith claims that U is true in w2 so Beth's waking at 12pm is not necessary for the truth of U. Smith concludes that the date theory fails whether one adopts a substantivalist or a reductionist account of time.

Let us consider first which formulations of the date theory Smith's objections apply to. Note that in both the objection given a reductionist account of time and the objection given a substantivalist account of time, the counterexample involves a possible world in which (a) U is true and (b) Beth's waking does not occur at 12pm. This is meant to show that Beth's waking at 12pm is not necessary for the truth of U. Note however that these objections are aimed at showing that the date theory provides the wrong *t-truth-conditions* for U. Therefore, the objections only apply to DT1 and DT3, both of which attempt to provide t-truth-conditions for tensed tokens. A world in which both (a) and (b) obtain is not necessarily a counterexample to a theory which provides p-truth-conditions for tensed tokens (such as DT2). It might be the case that (a) and (b) both obtain in w1 yet the proposition expressed by U in the actual world is nonetheless true at w1. First, I will consider whether Smith's objections succeed in demonstrating that versions of the date theory which provide t-truth-conditions (DT1 and DT3) are false. Then, I will consider whether Smith's objections provide any threat to a formulation of the date theory that provides p-truth-conditions (DT2).

Do Smith's objections succeed in demonstrating that DT1 and DT3 are false?[15] Smith's objection to the reductionist date theorist differs fundamentally from his objection to the substantivalist date theorist, and so both objections deserve fundamentally different replies. Let us first consider Smith's objection to the date theory given a reductionist account of time. Smith argues that U is true at w1 however Beth's waking does not occur at t (since it occurs at t1 and t1 is not

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[15] In the previous section I gave reasons for the claim that the Token View is false. If those reasons succeed in demonstrating the falsity of the Token View, they will likewise succeed in demonstrating the falsity of DT1. The success of Smith's objections being considered here would provide another, independent reason for rejecting DT1.

identical to t). I will argue that this objection fails to pose any threat to the date theory. Smith makes certain implausible suppositions concerning how a reductionist would determine whether a time at one world is the same as a time at another world. This raises the issue of the identification of times across worlds: what makes t at world w the same time as t′ at world v? One answer to this question is that t at w is the same time as t′ at v if and only if t is strictly identical to t′; if t is literally one and the same time as t′. However a reductionist who takes times to be sets of simultaneous events would be foolish to adopt such an account precisely for the reasons Smith suggests. If times are sets of simultaneous events, then times have their members essentially. If the identity of times across worlds requires strict identity, then there will be no possible world in which 12pm lacks the event of Ray striking the Empire State Building. As a result, the following sentence will come out false on the standard possible worlds analysis of modal claims:

(11) It might have been the case that Ray did not strike the Empire State Building at 12pm.

It is false because there is no possible world in which it is 12pm and Ray does not strike the Empire State Building. Being forced to accept the falsity of (11) would be problem enough, whether one adopted the date theory or not. The view Smith attributes to the reductionist is a non-starter independent of anything having to do with the date theory.

Fortunately for the reductionist who takes times to be sets of simultaneous events, there is another answer to the question of what makes times the same across worlds that results in a more plausible position. She should deny that the sameness of times across worlds is a matter of strict identity. Rather she should claim that the sameness of times across worlds is determined by similarity relations: t at w is the same time as t′ at v iff t′ sufficiently resembles t.[16] The time in w1 that is the same time as 12pm in the actual world will be the time that sufficiently resembles 12pm in the actual world. The features of resemblance that will determine whether a given time at w1 sufficiently resembles 12pm in the actual world (and is therefore the same time as 12pm in the actual world) will include both the extent to which the set of simultaneous events in w1 has the same members as 12pm in the actual world, as well as the extent to which the world segments in which the events in the set are located resemble one another. The time that is 12pm in w1 will be the one that most resembles 12pm in the actual world in these respects. The one that includes all the events simultaneous with Beth's waking minus Ray hitting the Empire State Building is 12pm in w1.

Given this method for identifying times across worlds, (11) comes out true since there is a possible world that contains the same time as 12pm in the actual world in which Ray does not strike the Empire State Building. Furthermore, the possible world that Smith describes fails to show that t is not necessary for the truth of U, since t1 in w1 is the same time as t in the actual world (even though t is not strictly identical to t1). So the reductionist should claim that the identification of times across worlds is not a matter of strict identity, but rather a matter of similarity

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[16] What I am proposing here is a counterpart theoretic treatment of times. For more on this kind of treatment of times see Lewis (1986, pp. 70, 71).

relations between sets of events.[17] So Smith's objection against the date theory given a reductionist account of time fails to pose a threat to any of the formulations of the date theory given above.

It might be objected that denying that sameness of times across worlds is a matter of strict identity, and instead a matter of resemblance relations obtaining between numerically distinct sets of simultaneous events, is an ad hoc reply to Smith's objection. I would acknowledge the force of this response if the move to resemblance relations between distinct sets of simultaneous events was merely a way of avoiding Smith's objection to the date theory and lacked independent motivation. However such a move *is* independently motivated. The reductionist will want to deny that the identification of times across worlds is a matter of strict identity in order to accommodate ordinary modal claims about times. The need to accommodate modal claims such as (11) provides independent grounds for adopting a counterpart theoretic treatment of times. The fact that such a move manages to avoid Smith's objection to the date theory is just a consequence of adopting an account of the modality of times that is on the whole more plausible.[18]

Let us now consider Smith's objection to the substantivalist date theorist. He claims that there is some possible world, w2, in which Beth's waking and U do not occur at 12pm but rather some other time, 1pm. Smith claims that U is true in w2. So Beth's waking at 12pm is not necessary for the truth of U.

Note that this argument can be restated to apply to the reductionist who holds that sameness of times across worlds is a matter of resemblance relations obtaining between sets of simultaneous events. There is some possible world, w2*, in which Beth does not wake up at the time that is the same as 12pm in the actual world (the one that most resembles 12pm in the actual world). Rather Beth's waking and U are

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[17] Denying that sameness of times across worlds is a matter of strict identity does not require one to deny that the sameness of objects across worlds is a matter of strict identity. It is coherent to hold that what makes my coffee mug in the actual world the same as some other-worldly mug is a matter of strict identity even though what makes the actual time at which my coffee cup is first empty the same as some other-worldly time is not a matter of strict identity.

[18] It has been suggested to me by David Ian Spencer and by an anonymous referee for this journal that the reductionist could take times to be mereological sums of simultaneous events rather than sets of simultaneous events. Assuming that mereological essentialism is false, the reductionist who takes times to be mereological sums of simultaneous events could respond to Smith's objection by claiming that t can survive the loss of a part. However, I think the view that times are mereological sums of simultaneous events is *also* most plausibly combined with a counterpart theoretic treatment of the identification of times across worlds.

Call the time that has as parts Beth's waking, the utterance U, Ray striking the Empire State Building and all the other events simultaneous with Beth's waking 'Tibbles'. Call the thing made up of all of these events minus the event of Ray striking the Empire State Building 'Tib'. Now, by hypothesis, if Ray did not strike the Empire State Building, Tibbles would still exist:

(1) Tibbles in @ = Tibbles in w1
(2) Tib in @ = Tibbles in w1
(3) Tibbles in @ ≠ Tib in @
(4) Tibbles in @ = Tib in @ (By 1,2, Transitivity of identity)
(5) Contradiction! (by 3,4)

I take the most plausible resolution of this puzzle to be the denial of (1). Although Tibbles in @ is not numerically identical to Tibbles in w1, Tibbles in w1 is the same time as Tibbles in @ in virtue of sufficiently resembling Tibbles in @.

both located at the time in w2* that most resembles 1pm in the actual world. Intuitively, U is true in w2* even though Beth's waking does not occur at 12pm in w2*. So Beth's waking occurring at 12pm is not necessary for the truth of U. Whereas Smith's objection against the date theory given a reductionist account of time can be avoided by adopting a plausible account of the identification of times across worlds, Smith's objection to the substantival theory can be extended to apply regardless of which account of time one holds. I will henceforth treat the objection Smith aims at the substativalist date theorist as one that applies whether one adopts a substantival or a reductionist account of time. I will henceforth refer to this objection as 'Smith's Objection'.

Smith's Objection succeeds in demonstrating the falsity of DT1 and DT3. Both DT1 and DT3 provide t-truth-conditions for tensed tokens. According to DT1 and DT3, U is true iff Beth's waking occurs at 12pm. The possible world described by Smith provides a case in which U is true but Beth's waking does not occur at 12pm. So it succeeds in showing that Beth's waking at 12pm is not necessary for the truth of U. There is a variant of Smith's Objection that demonstrates that Beth's waking at 12pm is not sufficient for the truth of U. There is a possible world, w3, in which Beth wakes up at 12pm, is fully awake at 1pm and U is produced at 1pm. In w3, Beth's waking occurs at 12pm, so the right-side of the bi-conditional is satisfied, however U is false since Beth is already awake at 1pm. So DT1 and DT3 fail to provide adequate necessary and sufficient conditions for the truth of U.

There is a possible response to Smith's Objection that might be marshaled in defense of DT1 and DT3. Heather Dyke claims that Smith's Objection succeeds, "provided that we allow Smith one crucial assumption" (Dyke 2002, p. 335). The assumption is that token U in w2 is the same as U in the actual world. If U in w2 is not the same as U in the actual world, then w2 fails to show that Beth's waking at 12pm is not necessary for the truth of U. The claim that U in w3 is the same token as U in the actual world might likewise be denied, and it might be claimed that as a result w3 fails to show that Beth's waking at 12pm is not sufficient for the truth of U.

The main reason, I take it, that an objector might deny that U in w2 (U in w3) is the same token as U in the actual world is because U in w2 (U in w3) occurs at a different time than U in the actual world. It might be claimed that tokens have their times essentially and since U in w2 (U in w3) is uttered at a different time than U in the actual world, the tokens are not the same. This response to Smith's Objection strikes me as implausible mainly because there do not seem to be any good reasons for holding that a token has the time at which it is produced essentially. It seems perfectly natural to claim that a token might have been produced later than it actually was. Tokens are, after all, either utterances, inscriptions, firings of neurons in the brain. Why couldn't such events have happened an hour later than they actually did?[19] Consider my actual utterance at 12pm of 'Beth is now waking'.

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[19] The issue might be more complicated than I am suggesting here. It might be that in certain contexts it is perfectly natural to claim that a token might have been later than it actually is. When I emphasize certain features of a token utterance such as its being an utterance produced by the vocal chords, it seems clear that a token (qua utterance) might have been later than it actually was. Perhaps when we emphasize other features of the token, such as its role in a semantic theory, we are more inclined to say that it has its time essentially.

Clearly it makes sense to ask whether the token would have been true, if I were to have uttered it an hour later. One might respond that what I am asking in this case is whether a later, distinct, token of the same type would have been true. However, unless there are independent reasons for claiming that tokens have their times essentially, insisting that U at w2 and U at w3 are not the same as U at the actual world strikes me as an ad hoc response to Smith's Objection.

The lesson to be learned from Smith's Objection, so far, is that the date theory should not be formulated in such a way as to provide t-truth-conditions for tensed tokens. However does Smith's Objection demonstrate that the date theory fails at providing p-truth-conditions for tensed tokens? DT2 states that the proposition expressed by a token of 'e is now' produced at t is true if and only if e occurs at t. This formulation is very much in line with David Kaplan's (1989) directly referential account of indexical expressions. Kaplan claims that 'now' directly refers to the time of the context in which it is produced. So the p-truth-conditions of a token of the form 'e is now' will be identical to the Kaplanian content of the token.[20]

It is clear that DT2 is immune from Smith's Objection. U in the actual world expresses the proposition that Beth is waking at 12pm. In w2, the same token, U, expresses a different proposition, namely the proposition that Beth is waking at 1pm. The fact that U is true in w2 even though Beth's waking does not occur at 12pm does nothing to undermine DT2, since DT2 does not provide necessary and sufficient conditions for the truth of U, but rather it provides necessary and sufficient conditions for the proposition expressed by U in the actual world. The proposition expressed by U in the actual world is the proposition that Beth is waking at 12pm. This proposition is true if and only if Beth's waking occurs at 12pm. W3 also poses no threat to DT2. In w3, U expresses the proposition that Beth's waking occurs at 1pm. Since Beth's waking occurs at 12pm, U is false in w3. However the fact that U expresses a false proposition in w3 does nothing to undermine DT2 since DT2 provides necessary and sufficient conditions for the proposition expressed by U in the actual world. This proposition is true in w3 since in w3 Beth does wake up at 12pm. So the example involving w3 fails to provide a counterexample to DT2.

My considerations concerning Smith's objections to the date theory may be summed up as follows. Smith's objection to the reductionist date theorist fails because it attributes an implausible view to the reductionist about how times are identified across worlds. Smith's objection to the substantivalist date theorist can be restated to apply to the date theorist regardless of whether she adopts a substantival or reductionist account of time. This objection, Smith's Objection, succeeds in demonstrating that the date theory should not be formulated in such a way as to provide t-truth-conditions for tensed tokens. DT1 and DT3 both provided t-truth-conditions for tensed tokens and Smith's Objection shows that they are false. I note however that Smith's Objection fails to undermine DT2, a version of the date theory that is formulated so as to provide p-truth-conditions for tensed tokens. In fact, DT2

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[20] Strictly speaking, Kaplan's own view does not assign contents to tokens but rather assigns contents to expressions in a context which can be thought of as a pair consisting of a sentence type and a context. In the end, I will side with Kaplan in rejecting token theories in favor of something like his expressions-in-a-context theories.

seems to provide exactly the right results with respect to the possible world Smith puts forth as a counterexample to the date theory. I conclude that while DT1 and DT3 are both false, DT2 is true.

5 Conclusion

I have argued that for both the token-reflexive theory and the date theory, there are three different formulations depending upon what one takes the fundamental bearers of truth to be and what sense of 'truth-condition' one has in mind. I argue that there is a version of the token-reflexive theory, namely TR3, that is true and a version of the date-theory, namely DT2, that is true. TR3 provides t-truth-conditions for tensed tokens whereas DT2 provides p-truth-conditions for tensed tokens. I conclude that the token-reflexive theory and the date theory should not be taken to be rival theories but rather should be seen as suited for different purposes. The token-reflexive theory is well suited for providing necessary and sufficient conditions for the truth of tokens (t-truth-conditions), whereas the date theory is well suited for providing necessary and sufficient conditions for the truth of propositions expressed by tokens (p-truth-conditions). To illustrate this point, let us once again consider my utterance, U, at 12pm of 'Beth is now waking'. Suppose we are interested in knowing under what conditions my token utterance is true (i.e., expresses a true proposition). TR3 is best suited for this goal. TR3 says that my token is true if and only if U is simultaneous with Beth's waking. In w2, U is true because U is simultaneous with Beth's waking. In w3, U is false because U is not simultaneous with Beth's waking. TR3 provides us with the correct result in these cases. Suppose we are instead interested in knowing under what conditions the proposition expressed by my token utterance U is true. DT2 is best suited for this goal. DT2 entails that the proposition expressed by my utterance is false in w2 because Beth's waking does not take place at 12pm and it entails that the proposition expressed by my utterance is true in w3 because Beth's waking does occur at 12pm. I believe that the debate over whether the token-reflexive theory is true or whether the date theory is true has arisen from a failure to distinguish between p-truth-conditions and t-truth-conditions. Once this distinction is highlighted, it becomes clear that the date theory and the token-reflexive theory are not rival theories, but instead suited for different conceptual tasks.

I have argued that there is a version of the token-reflexive theory that is true and a version of the date theory that is true. Do these formulations vindicate the New B-theory? Unfortunately, I think not. Both the token-reflexive theory and the date theory arose from an assumption that the truth and falsity of tensed sentences can be fully accommodated by providing truth-conditions for tensed tokens. I think there is good reason to deny this claim. Intuitively, sentences can be true at a time even if they are untokened. Suppose that the forest burns from Monday to Wednesday. Consider once again the following sentence:

(3)   The forest is now burning.

It is plausible that (3) is true on Tuesday even though there is no token of (3) produced on Tuesday. Admitting that (3) is true on Tuesday does not demonstrate that either TR3 or DT2 is false since both admit the existence of token-independent truths. However, neither TR3 nor DT2 can give an account of why (3) is true on Tuesday since both provide truth-conditions (albeit two different kinds of truth-conditions) for *tokens*.

A natural response from the New B-theorist is to claim that TR3 and DT2 can be combined with a counterfactual analysis involving tokens, and that TR3 and DT2, together with this counterfactual analysis, can provide a complete account of the truth or falsity of tensed sentences. Given TR3 and DT2, there are two ways in which we might attempt to accommodate the truth of (3) on Tuesday by appealing to counterfactuals. The first option is to combine TR3 with a counterfactual analysis:

> (3) is true on Tuesday iff the following counterfactual is true: If a token, U, of 'The forest is now burning' were to have been produced on Tuesday, then U would have been true (i.e. would have expressed a true proposition).

The truth of the counterfactual on the right-hand side of the bi-conditional is supported by TR3. In the closest possible world in which U is produced on Tuesday, it is true because U's t-truth-conditions obtain: U is simultaneous with the burning of the forest. Similarly, if the forest was not burning on Tuesday, the bi-conditional would provide the correct result that (3) is false since the counterfactual would be false.

The other option for accommodating the truth of (3) on Tuesday is by combining (DT2) with a counterfactual analysis. This results in the following bi-conditional:

> (3) is true on Tuesday iff the following counterfactual is true: If a token, U, of (3) were to have been produced on Tuesday, then the proposition that would have been expressed by U would have been true.

In this case, the truth of the counterfactual on the right-hand side of the bi-conditional is supported by DT2. In the closest possible world in which U is produced on Tuesday, U's p-truth-conditions obtain: the proposition expressed by U is true because the forest is burning on Tuesday.

However note that both of these counterfactual approaches fail with respect to sentences such as:

(6)   I am not now tokening anything.

As with (3), there is an intuition that (6) can be true at certain times. Suppose I am knocked unconscious moments before 2pm. At 2pm, (6) is true. However consider the following bi-conditional:

> (6) is true at 2pm iff the following counterfactual is true: if I were to have produced a token, U, of (6) at 2pm, then U would have been true (i.e. would have expressed a true token).

This provides the wrong result. The counterfactual on the right-hand side of the bi-conditional is false. In the nearest possible world in which I produce a token of U, U is false. It is false because the t-truth-conditions given by TR3 fail to obtain. Trying to accommodate the truth of (6) at 2pm by appealing to the following bi-conditional also fails.

(6) is true at 2pm iff the following counterfactual is true: if I were to have produced a token, U, of (6) at 2pm, then the proposition that would have been expressed by U would have been true.

The counterfactual on the right-hand side of the bi-conditional is again false. In the closest possible world in which U is produced on Tuesday, the proposition expressed by U is false because the p-truth-conditions given by DT2 fail to obtain. Trying to accommodate the truth of sentences like (6) by appealing to a counterfactual analysis involving tokens does not succeed.

I conclude that, even though TR3 and DT2 are both true, they are unable to provide a complete account of what makes tensed sentences true. I believe that the B-theory can succeed in providing tenseless truth-conditions for tensed sentences, however in order for it to succeed, it must abandon the supposition on which the New B-theory was founded. In *Real Time*, D. H. Mellor realizes that tensed sentence types are not true or false *simpliciter*, but rather true at some times and false at other times. He concludes from this that "the truth and falsity of tensed sentences, therefore, are properties of their tokens rather than of their types" (Mellor 1981, p. 40). Both the date theory and the token-reflexive theory take Mellor's conclusion as their starting point by providing truth-conditions for tokens. I think the B-theorist should reject Mellor's conclusion. The fact that tensed sentence types are not true or false *simpliciter*, but rather true at some times and false at others, should not motivate a move towards taking truth and falsity of tensed sentences to be properties of their tokens. Rather, the B-theorist should evaluate sentence types in a context. Only then will the B-theorist succeed in providing a complete account of what makes tensed sentences true.[21]

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