

Forthcoming in *Philosophy and Phenomenological Research*

*Time Dilation, Context, and Relative Truth**

N. Ángel Pinillos
Arizona State University

ABSTRACT: Focusing on some semantic implications of Albert Einstein's theory of relativity, I argue that truth is relative in the sense recently defended by some prominent Anglo-American philosophers. The semantic relativism defended here differs from all the others proposed in the literature in that it has a strong externalist component.

1. Physics and Semantics

A passenger boards a fast train. It takes her some distance, reverses course, and returns to the starting platform. She reports that according to her clock, the trip took n seconds. An observer who remained behind on the platform gets a different reading. Using his clock, he records a longer time interval m . These claims are compatible with the clocks being in perfect order. Modern physics tells us that time is relative. The duration of the trip, understood as the temporal distance between the departure and the return events, will depend on the chosen frame of reference. The passenger and the observer belong to different frames. This is the source of the discrepancy.

Suppose that the passenger and the observer speak a language that is like ours with possible differences arising from the assumption that no one in their community knows about modern physics. Let us call this language '19th Century English'. Imagine that the agents, in different conversations, utter sentences (1) and (2) respectively:

Passenger: (1) The duration of the trip was n seconds.

Observer: (2) The duration of the trip was m seconds.

* I would like to thank the following people for helpful discussions or comments: David Beisecker, Stew Cohen, Carrie Gillon, Ted Guleserian, John Hawthorne, G. Shyam Nair, Steven Reynolds, Ted Sider and anonymous referees.

Who should we say is right? Here are three possible answers: (A) Exactly one of them asserted something true, (B) Neither one of them asserted anything true, and (C) Both asserted something true.

Option (A) seems arbitrary. First, there is nothing in the structure of space-time that privileges one frame of reference over another. Second, I see nothing in the practices of 19th Century English speakers (or even our present day practices) which suggests one frame of reference must be privileged over the other. Nothing here suggests that in measuring the temporal duration between any two events, the recording clock must be in one particular place (the train) as opposed to another (the platform).¹ Some may wish to recommend a revision of our behavior. But I wish to engage here in a descriptive, not a prescriptive project.

Option (B) says that both assertions are less than true. Presumably, the agents' errors are attributable to their ignorance of modern physics. This option is too uncharitable and wreaks havoc on large swaths of ordinary discourse. Since the theory of relativity equally concerns spatial distance, everyday claims about length will also be defective. The same goes for statements concerning simultaneity. All told, sincere assertions using sentences such as the following would be untrue in 19th Century English: 'The concert and the play begin at the same time', 'The desks are the same length', 'This pencil is x inches long', 'This man is x years old'. Needless to say, this position should only be considered as a last resort. The next option is better.

According to (C), both assertions are true. This option is neither arbitrary nor uncharitable. Moreover, each assertion taken on its own is intuitively true. There is a strong case to be made then for developing an account that respects this perspective, and

this is the approach I take in this paper. But how can these uses of (1) and (2) be true at once? They seem, at least on the surface, incompatible. The philosophy of language and linguistic literature has a ready-made tool to handle this sort of situation. What (1) and (2) express depends on the context of use. It may be then that in the passenger's mouth, (1) expresses something about her frame of reference; and in the observer's mouth, (2) expresses something about his frame of reference. The agents are therefore not making conflicting claims. And this leaves room to say that they are both asserting something true.

Contextualism isn't the only way to make sense of our dilemma. Recently, a brand of relativism has surfaced in the Anglo-American philosophical scene. The idea, on one interpretation, is simple. Truth is not a monadic property.² Propositions or thoughts are true or false only relative to some parameter. Which parameter is advocated, of course, will depend on the theorist.³ When someone with relativist sympathies turns to our case, she may have the following reaction: *The contextualist is wrong in thinking that the passenger and the observer are asserting things or expressing thoughts about different frames of reference. Instead, we should take their words and behavior at face value. It seems like they really are expressing thoughts that are in conflict. Yet, we want to say that both the passenger and the observer asserted something true, but only true relative to their own frames of reference.*

This paper has three main points. First, I argue that truth is relative by showing how sentences such as (1) and (2) admit of a relativistic semantics. I will do this by using existing diagnostics and focusing on the expression 'duration'. Hence, I present a new argument for the relativity of truth. Second, I sketch a theory of how assessments of truth

work for assertions concerning temporal duration. Third, in three parts of the paper (Sections 2.4, 4 and 7), I indicate how the brand of relativism I defend is unlike others offered in the literature. Perhaps its most unique feature is that whether or not ‘duration’ admits of a relativistic semantics is largely determined by facts external to the minds of competent users of that term.

Before we explore these issues, I issue two caveats. First, the thesis I defend raises many further interesting questions that I will not be able to address. I won’t discuss the full range of expressions that require relativization to frames of reference. For instance, I do not give a semantic treatment for ‘simultaneous’, ‘same length as’ or ordinary cases of quantification over times (or spans of time) that may also require relativizing. Such a discussion would involve not only complicated semantic issues concerning tense and aspect, but it would also involve getting into the metaphysics of time. Although these questions are of great interest, the three main points of this paper can be established by focusing only on ‘duration’.

The second caveat is a methodological point. One might worry that before modern physics, the passenger and the observer would not utter (1) and (2) since clocks weren’t that accurate and trains didn’t move that fast. Using the clocks of the era, the readings on the train and on the platform would coincide. As a result, some may protest that there is no need to explain how assertions of (1) and (2) could both be true, contrary to what I am claiming. This idea, in my view, seems to miss what the domain of philosophical and linguistic inquiry should be. We should not only attempt to explain data that arises from actual utterances, but we should also explain data that arises from considerations about what we would assert in this or that circumstance (for example, if

clocks were more accurate and trains were faster). What we *would* assert reveals a great deal about us. Philosophers should be familiar with the general approach taken here. After all, eliciting intuitions about counter-factual circumstances (even remote ones) is a core methodological commitment of philosophical practice.

A related worry about the approach I take here is that since time dilation effects are not detected on a day-to-day basis, then semantic theory can safely ignore it or idealize it away.⁴ This worry should not be seen as a reason to not investigate the sorts of issues I have raised. An analogy might help here. Although higher order vagueness is considered by many to be a genuine phenomenon, its effects aren't often "felt" in our everyday lives. This doesn't make the phenomenon any less real, and it certainly doesn't make it not worth investigating. Furthermore, what theorists say about higher order vagueness might help us understand first order vagueness, which in turn may help us better understand broader issues including logic and reasoning. Hence, it is short sighted to ignore a certain phenomenon simply because it doesn't arise very often or because it only arises in special cases.

2. Contextualism

I will sketch what I think is the best way for the contextualist to handle sentences like (1) and (2). Although the contextualist faces some challenges I do not believe can be overcome, I will show later that some of the tools I develop here (on behalf of the contextualist) can be used by the relativist. But before I get to all that, I need to cover some preliminaries.

Sometimes sentences taken on their own aren't ready to be evaluated for truth. They must first be situated in a context of use. In addition, it is often the case that with

respect to different contexts of use, a single sentence will express different propositions (with differing truth values).⁵ For example, the sentence 'Cristiano Ronaldo is tall' may express a true proposition if uttered in a room full of elementary school students. But it may express a false and distinct proposition if uttered at a tall person convention

I have not said anything about how context and sentence interact to determine the proposition expressed. The details are the subject of intense research in the philosophy of language and semantics. But we have enough to see the big picture. As suggested above, when the passenger uses (1), she expresses some proposition to the effect that the duration of the trip with respect to the frame of reference of the passenger is n seconds. But when the observer uses (2), he expresses some proposition to the effect that the duration of the trip with respect to the frame of reference of the observer is m seconds. Our agents then don't express propositions that in any way conflict. Their thoughts are both true.

Some terminology will be useful as we continue. I will call 'contextualism about temporal duration' or more simply 'contextualism', the thesis that sentences such as (1) and (2), used in 19th century English, are context sensitive along the lines just explained.

2.1 Two Contextualist Construals

I want to consider two ways of carrying out the contextualist suggestion. On one construal, the thought expressed by the uses of (1) and (2) are *directly* about frames of reference. On another construal, the thoughts are only *indirectly* about them.

To make these ideas precise, it will be helpful to think of contents as Russellian structured propositions. Two assumptions about these entities are of importance. First, propositions have constituents. Constituents are what contents are directly about. Second,

if a sentence expresses a content P with respect to a context C and X is a denotation of a meaningful expression in that sentence with respect to C , then X is a constituent of P .

Given this framework, we can be more precise about the "direct" and "indirect" versions of contextualism. On the direct theory, sentences (1)' and (2)' capture the relevant uses of (1) and (2) respectively.

(1)' The duration of the trip with respect to $FR_{\text{passenger}}$ is n seconds.

(2)' The duration of the trip with respect to FR_{observer} is m seconds.

Here, the 'FR' expressions denote the frames of reference in question.⁶ Accordingly, since (1)' and (2)' contain words that denote frames of reference, the latter will be constituents of the propositions in question. In this sense, the thoughts in question will be *directly* about the frames of reference.

I believe that the direct version of contextualism is untenable. To see this, suppose first that what the passenger and the observer express with (1) and (2) respectively are not only propositions they said but also propositions they believe. Now since (1)' and (2)' express what our agents express with (1) and (2) respectively, then the following attributions must be true understood de dicto:

(1)" The passenger thinks that the duration of the trip with respect to $FR_{\text{passenger}}$ is n seconds

(2)" The observer thinks that the duration of the trip with respect to FR_{observer} is m seconds.

However, it doesn't seem like these attributions on their de dicto readings are correct at all.⁷ But if these attributions aren't correct, then it can't be that (1)' and (2)' express what (1) and (2) express respectively. Therefore, the direct view is not a good way to carry out the contextualist proposal.

I turn now to the second construal (the "indirect" theory). The indirect theory says that (1)' and (2)' are not the best representations of what our agents are saying with (1) and (2). (1)''' and (2)''' are better.⁸

(1)''' The duration₁ of the trip was n seconds.

(2)''' The duration₂ of the trip was m seconds.

The idea is that there is a different "duration" concept for each frame of reference. The theory is still contextualist since which duration notion is in play will depend on the context of use.⁹ Now, since there is no word for a frame of reference in (1)''' or (2)''' then there is no requirement that the frames are constituents of the propositions. In this sense, the propositions are only indirectly about frames of reference.

This version of contextualism is immune from the objection I gave against the direct theory. However, one may still worry that contextualism manages to misrepresent the cognitive lives of agents who speak 19th Century English. Since their folk physics is plausibly one that endorses an absolutist conception of time, it would be a mistake to attribute to them thoughts and assertions that are about frames of reference either directly or indirectly. I put this worry aside, however, and continue with the contextualist proposal.

2.2 Which Frame of Reference?

I have been saying that according to contextualism, the passenger's assertion is about her frame of reference, and the observer's assertion is about his frame of reference.¹⁰ This is how they capture the intuition that both agents asserted something true. Here's a question for the contextualist: Why should the passenger's assertion be about her own frame (as opposed to, say, the observer's frame)?

The answer cannot be this: the frame of reference a speaker's assertion is about is the one she *intends* to talk about. Speakers need not have the physics related concept of a frame of reference, let alone have intentions to refer to such things.

A plausible answer to our question is that the passenger's assertion of (1) is about her frame not because it is the frame she intends to talk about, but rather because the conventions of language say that the frame in question must always be the frame of the person making the assertion. Hence:

(3) Assertions made with sentences such as (1) and (2) will always be about the frame of the agent who made the assertion.

This gives us the right results concerning the assertions of the passenger and the observer.¹¹

The proposal, however, is subject to the following problem. Suppose that when the train returns to the platform, a person who did *not* travel in the train takes a reading of the clock *in* the train. This person can sincerely use sentence (1) and assert something true.¹² However, assuming that the non-traveler's frame of reference does not

approximate the passenger's frame, then his use of (1) would be false according to (3). But this isn't what we wanted.

We could modify the principle so the frame of reference concerning uses of sentences like (1) and (2) are the agent's, unless her assertion is based on the reading of some clock. In such a case, the frame of reference involved in her assertion is the clock's frame. This modification would solve the immediate problem, but it is too narrow as the following example shows.

Suppose that X is told about the passenger's trip (which let us suppose lasted only one hour with respect to the passenger's frame of reference—but X isn't told this). X is told that the passenger never left her seat during the trip. Based on this information, X may well conclude: 'The passenger never left her seat. (It must have been that) the duration of the trip was short.' It is intuitive that what X asserted here is true. This means that, on the contextualist construal, X's assertion must be about the passenger's frame of reference (not X's own frame).¹³ But since there are no clocks involved in this example, the revised proposal (which appeals to clocks) will fail. Let us try to come up with a general principle that gets these cases right.

Claims about temporal duration will often be based on some way of estimating or measuring time. The most obvious way utilizes clocks. But as the previous case shows, time may be estimated by focusing on the changes (or lack thereof) of any one of a variety of objects including persons. In this sense, we may say that claims about duration are often *based* on objects:

(3)' Assertions made with sentences such as (1) and (2) will always be about the frame of object Y whenever the assertion is based on Y.

This principle then seems to be closer to what the contextualist needs. At least it gets it right for the cases that we have seen. But (3)' needs further clarification and it needs to be modified. The following four points reveal this.

(i) *The 'basing' relation is epistemic and not merely psychological.* In the cases we have seen, information about the clock and information about the seated passenger constitute evidence for assertions concerning duration. Hence the idea of an assertion being based on an object is epistemic (though I will have to make a small exception to this claim in the next paragraph). The notion is not to be thought of in a purely psychological sense. For instance, it doesn't seem right to say that the object an assertion is based on is the one that the agent is thinking about when making the assertion. This sort of proposal would make the basing notion too unstable. An assertion may be accompanied by any number of thoughts that are irrelevant to the fixing of the object in question.

(ii) *Assertions not based on any objects.* What about duration claims that are not based on any objects whatsoever? In particular, I need to say what to do in cases in which the claims of duration are mere lucky guesses. Perhaps here, we should revert back to the agent's frame as a default. Insofar as we want to say that it is possible for lucky guesses to be true, then choosing the agent's frame seems to be the most natural choice. In order to keep the theory as simple as possible, I propose to extend the "basing" notion to cover this case. So in cases where an assertion is a guess, I will say that the assertion is based

on the agent of the assertion (in the other cases, we will revert to the evidentiary notion). Hence the contextualist will say here that the frame the assertion is about will be the frame of the agent.

(iii) *Transmission*. Suppose you take a reading on a clock and report to me that the duration of a trip was such and such. Your report is based on the clock. Barring a reason to doubt you, I may relay this information on to a third party. My report will also be based on the clock even if I have no acquaintance with it. Hence, in cases where the relevant information is relayed from agent to agent, assertions may inherit the object they are based on from the prior report.

(iv) *Indeterminacy*. Sometimes there will be an issue about what should count as the relevant ‘object’ that an assertion is based on. There might be more than one. Suppose a person makes an assertion about the duration of the trip, gathering evidence from two different clocks inside the train (suppose the person is trying to be extra-cautious). There is no single object that the claim is based on, yet if the person asserts (based on the clocks) ‘the duration of the trip was short’ we want that to come out true. Similarly, the person might use as evidence the fact that every passenger remained in his seat during the ride. There is no single object that his claim is based on here. It would be a mistake to think that the object in question is the fusion of all the passengers (or the clocks). The gerrymandered object will get us the wrong result if our agent (not knowing modern physics) estimates the duration of the trip by looking at the behavior of people inside and outside the train. In this case, we don’t want the frame of reference that the agent’s

assertion is about to be the frame of the schizophrenic fusion (assuming that there is such a frame). The duration with respect to that frame won't always correspond to our intuitions about the truth-value of what is asserted. Instead, I propose that the right thing to say about the multiple object case is that there is indeterminacy about which object the assertion is based on. Hence, there will be indeterminacy about which frame of reference the assertion is about. The indeterminacy here may be handled using the familiar supervaluation framework (Fine 1975). If an assertion corresponds to a class of objects in the sense just discussed, then it is true if for each object in the class, the assertion would be true if based on that object. It is false if for each object in the class, the assertion would be false if based on that object. The assertion is indeterminate otherwise. This approach leads to the correct result in the case where the agent bases his assertion ('the duration of the trip was short') on the multiple clocks inside the train. Moreover, it predicts 'indeterminate' in the case where one's assertion of (1), for example, is based on clocks inside and outside of the train. I take this to be a welcome feature of the approach, since our intuitions seem to be unsettled here.

So far I have tried to sketch a picture of how, from the perspective of the contextualist, frames of reference might play a role in the semantics for sentences such as (1) and (2). It would be a philosophical mistake to make the theory much more complicated or much more precise. Intuitions quickly run out as the cases become more exotic. On the other hand, the preceding discussion shows that there are some intuitions that need to be respected. Hence, any development of the theory along these lines ~~then~~ needs to tread carefully.

Having spent some time sketching a contextualist proposal, I now argue that contextualism has serious difficulties. It fails known diagnostics. Our time has not been wasted, however. I will argue later that the “basing” mechanism introduced so far can be put to good use by the relativist.

2.2 First problem with Contextualism: Disagreement Data.

We can imagine the observer and the passenger getting into an argument. The passenger utters (1) and the observer may reply with 'No, your clock is mistaken...

(4) The duration of the trip was not n seconds

Now, not only would the agents report themselves as disagreeing, but *we* would also be willing to make the same report. Never mind that if they knew all the facts, they would no longer disagree. Plenty of cases of genuine disagreement would be diffused if more facts were known.

According to the contextualist, what the passenger asserts with (1) and what the observer asserts with (4) do not conflict. After all, they are about different frames of reference. The contextualist then has a difficult time explaining what it is that the agents are disagreeing about.¹⁴ In section 2.3.3., I discuss a more technical version of this argument. But it is important to note that the problem arises at this pre-theoretical level.

2.3 Second Problem for Contextualism: Failure of Tests.

There are a number of tests for determining whether a certain construction is context sensitive. Below, I show that sentences such as (1) and (2) unequivocally fail three such tests. This is bad news for contextualism.

2.3.1 The Google Test.

One type of contextualist about 'knows' claims that the term can vary in content depending on the standards invoked at the context of utterance.¹⁵ Peter Ludlow (2005) claims that some evidence for the position comes from observation that people using 'knows' in ordinary speech often make the standards explicit. He gathered this evidence by using the Google internet search engine. His findings uncovered constructions such as: 'known by earthly standards', 'known by academic standards', 'known by any objective standards' and many others.

Similar results can be achieved, though perhaps less reliably, by recalling how people around us use the expressions under study. For example, since people say things such as 'She is tall for a basketball player' or 'he is tall if you compare him to 3rd graders', then this is some evidence that 'tall' is context sensitive. For it looks like people often do make standards explicit.

Applying these ideas to our case, it is easy to see that the contextualist thesis unequivocally fails this test. In 19th century English, people don't mention frames of reference in speech concerning temporal duration.¹⁶

2.3.2 Cappelen and Lepore's Inter Contextual Disquotation (ICD) Test

If a sentence S is context sensitive, it is often the case that the sentence is true if uttered in some contexts and false if uttered in other contexts. Cappelen and Lepore (2005) turn this idea into a test for context sensitivity (ICD test). If S is context sensitive, then there should be true utterances that are instances of the following scheme: 'There are (or can be) false utterances of "S" even though S' (pages 104-105). For example, there is a context in which someone can say the following: 'There are false utterances of "I am an

American" even though I am an American'. This is as it should be, since it is uncontroversial that 'I am an American' is context sensitive. In contrast, it is difficult to come up with a context in which one can say 'There are false utterances of "The President of the United States in 2004 is a Texan" even though The President of The United States in 2004 is a Texan'. Since it is hard if not impossible to find such a context, we have evidence that the sentence 'The president of the United States in 2004 is a Texan' is not context sensitive.

Let us then apply this test to sentences similar to (1) and (2) (of 19th Century English). There doesn't seem to be a context in which people speaking 19th Century English would say something like: 'There are false utterances of "The duration of the trip taken by Sally in 2006 was n seconds" even though the duration of the trip taken by Sally in 2006 was n seconds.' This is evidence that sentences like (1) and (2) are not context sensitive in the intended sense.¹⁷

2.3.3 The Disagree Test.

Cappelen and Hawthorne (2009) describes this test as follows (page 72):¹⁸

...Let u be a sincere utterance of S by A in C and u' a sincere utterance of 'not- S ' by B in C' . If from a third context C'' they cannot be correctly reported by 'A and B disagree whether S ', then S is semantically context sensitive. Meanwhile, if from a third context C'' they can be correctly reported by 'A and B disagree whether S ', that is evidence that S is semantically invariant across C , C' , and C''

Suppose that A and B are facing each other. A utters 'The mountain is to the left' and B utters 'The mountain is not to the left'. It doesn't seem like there is a third context where someone can truthfully utter 'A and B disagree whether the mountain is to the left'. This is evidence that 'The mountain is to the left' is context sensitive and so A and B are in fact not asserting propositions that are negations of each other. If the disagreement report could be made (from a different context) then this would be some evidence against context sensitivity.

Applying this test to (1) and (2) reveals that 19th Century English speakers can easily make the following report: 'The observer and the passenger disagree whether the duration of the trip was n seconds.' This is then good evidence that contextualism is false for (1) and (2).

It is not hard to see why contextualism fails these tests. The tests work because the property of being a context sensitive expression in a person's language is intimately connected with that person having certain linguistic dispositions. Now focusing on 19th century English speakers, we find that their dispositions concerning 'duration' are no different than they would be if they lived in a Newtonian world---where contextualism is false. Since the tests would yield that 'duration' is not context sensitive at the Newtonian world, it is no surprise that they yield the same result here. I will return to these externalist themes below in the discussion of relativism.

2.3.4 A Worry About The Tests.

I have argued that since the 19th Century use of 'duration' fails the tests (Google, ICD, and Disagreement), then we have good reason to think that it is not context sensitive. I want to consider now an objection to this argument.

Objection: The three tests given here (Google, ICD, and Disagreement) are only good for detecting a certain type of contextualism, but not for detecting all types. Let us say that an expression is ‘Internalist Context Sensitive’ (ICS) just in case it is context sensitive and competent users of that term are aware that the term is context sensitive in the sense that this awareness is made manifest through linguistic dispositions of the sort the tests are supposed detect. Let us say that an expression is ‘Externalist Context Sensitive’ (ECS) just in case it is context sensitive but not ICS. It should be clear then that the tests are reliable probes for whether ‘duration’ is ICS but not for determining whether ‘duration’ is ECS. Hence, (so the objection goes) the tests are not reliable probes for detecting whether ‘duration’ is context sensitive. The objection then ends by concluding that I haven’t given good reason to think that ‘duration’ is not context sensitive.

Response: I agree that the tests are not reliable probes for detecting whether or not a term is ECS. But this is a far cry from saying that the tests are not reliable probes for detecting whether or not a term is context sensitive. The reason is, in part, that there may not actually be any (or very many) ECS expressions. Let me explain my point with an example from a different domain. Checking with properly functioning eyes whether a ball looks red is a good test for determining whether that ball is in fact red. However, that test is no good at detecting whether a ball is both red *and* illuminated by a deceiving light (which makes it look non-red). This is because no ball with those two properties will actually look red to properly functioning eyes. Now, part of the reason why the simple test (checking with properly functioning eyes whether the ball looks red) is still good for

detecting red balls is that most red balls are in fact not illuminated by deceiving lights. Keeping this example in mind, let us return to the discussion.

The objection against my use of the tests starts from the premise that the tests are not reliable indicators of whether a term is ECS, and concludes that the tests are not reliable indicators of whether a term is context sensitive. Given the remarks of the previous paragraph, in order for this conclusion to be warranted one needs to show that there are ECS expressions in natural languages. Are there any? Here's a reason to think not. If we survey the class of expressions that are uncontroversially context sensitive (indexicals, demonstratives and perhaps adjectives like 'tall' and 'rich'), we find that they are in fact ICS.¹⁹ It then looks like we can make the inductive generalization from the core and uncontroversial cases to all context sensitive expressions found in natural languages: They are indeed all ICS. So in fact it looks like we have a good reason to think that there are no ECS expressions. Now, we do not need to establish that there are no ECS expressions in natural language to cast doubt on the objection. Rather, it is simply enough to establish that it is unclear that there are any. I think the argument in this paragraph supports that conclusion.

We can produce a parallel response to the objection dropping talk of ICS and ECS. Given that the tests are reliable probes for all the uncontroversial and core cases of context sensitivity, it is reasonable to conclude that it will be a reliable probe for 'duration' as well. The defender of the objection (which says that the test is not a reliable probe for 'duration') needs to do more than to say that it is logically possible that the tests are not reliable in this way. They need to provide evidence that they are not. One thing the defender of the objection can do is to establish that there are some expressions that

are context sensitivity yet fail the tests, and further show how ‘duration’ patterns with those expressions. That would be a good reason to doubt the reliability of the tests as applied to ‘duration’. But I know of no such project. Hence, it is fair to say that the objection hasn’t managed to establish that the tests are unreliable in the relevant way.

2.4 Comparison with ‘Fun’

I have given several arguments against contextualism for ‘duration’ and below I will conclude that we should be relativists about this expression. Since relativism has been thought to apply to expressions of personal taste and preference, it might be thought that the arguments I have given can also be used to show that these expressions are not context sensitive. But it is not at all clear how convincing these arguments might be. To see this, I look closely at ‘fun’.

Let us consider the disagreement diagnostic from section 2.3.3 Hawthorne and Cappelen (2009, 143) don’t find that it supports anti-contextualism about ‘fun’:

Suppose a caterer says of a certain party ‘That party is not going to be fun. I have to cook hors d’oeuvres all night’. Suppose that meanwhile, someone in a separate conversation says of the same party ‘That party is going to be fun. I get to meet lots of school buddies that I haven’t seen in a long time’. In this case we have absolutely no strong sense at all that the people are in disagreement.

It seems like in this case, there are no disagreement intuitions concerning ‘fun’. This weakens the argument against contextualism for that expression. Similarly, consider the “google” test. It is clear that we do use expressions such as ‘fun for kids’, ‘fun for dogs’, ‘fun for adults’ and others. Thus, we can’t use that test as evidence that ‘fun’ is not context sensitive. Finally, I said that 19th Century English speakers might have a Newtonian conception of temporal duration and as a consequence there is some pressure to say their assertions are in no way about frames of reference. The same thing cannot be said about ‘fun’ because ordinary speakers are in some sense aware that ‘fun’ is sensitive to parameters. After all, they do have concepts of the form ‘fun for X’.

The considerations just raised reveal one difference between ‘duration’ and other expressions thought to admit of relativistic semantics. It seems like we can use the following reasoning to support relativism for ‘duration’ in 19th Century English: if ‘duration’ isn’t context sensitive, then it is likely relativistic. However, similar reasoning (at least with the same strength) cannot be used by those who think that ‘fun’ is relative.²⁰ Of course, this should be no surprise for those who believe that expressions like ‘fun’ admit of both contextual and relativistic uses (Lasersohn 2005, Stephenson 2007). The considerations presented here, however, reveal that “dual” theories are not available for 19th Century English uses of ‘duration’.²¹

3. Semantic Relativism

Before I look at (1) and (2) in some detail, it will be useful to review the motivation for relativism from a different domain--predicates of personal taste. Consider a debate about

whether a particular burger is tasty. Relativism gets started by arguing for the thesis that a person who likes it can affirm the proposition that the burger is tasty while someone who doesn't like it can deny that very same proposition. Furthermore, the relativist notes that there is no deep objective fact about whether that burger is tasty. The "relativistic" aspect of the doctrine comes in when we add that there is a good sense in which the person who affirms and the person who denies the proposition are each right. The relativist says the proposition that the burger is tasty is true for some judges and false for others.

Formally, we can think of the propositions concerning gustatory taste as true or false relative to a "judge" parameter. Sentential intensions normally associated with a set of worlds would now be a set of world-judge pairs (or functions from world-judge pairs to truth values). Similarly, assuming relativism, the following approximates the rule that gives the denotation for 'duration':

$\| \text{Duration} \|^{c;w,r} = \lambda x. \text{ the temporal duration of } x \text{ in } w \text{ with respect to frame of reference } r.$

(The semi-colon separates the context of use c from the parameters making up the circumstance of evaluation). 'Duration' (in its temporal sense) denotes a function that takes as input an event (such as the trip) and returns the temporal distance of the event relative to a frame of reference and a world. What is relativistic about the semantics is the fact that which function is denoted by 'duration' will vary with *the circumstance of evaluation*---which includes a world w and a frame of reference r .²²

Relativism then promises to account for the intuition that the passenger's assertion of (1) is true and that the observer's assertion of (2) is also true. This is possible so long

as these evaluations of truth are relativized to different frames. Furthermore, when the observer disagrees with the passenger and utters (4) 'the duration of the trip was not n seconds' we are able to say that our agents are asserting propositions that are negations of each other. And this is something the contextualist cannot say. Below, I develop the relativistic approach further.

3.1 Charity

I started off trying to account for our charitable attributions of truth.²³ I wanted to explain how the passenger and the observer both managed to assert something true. As mentioned above, the relativist can approximate this result. The passenger and the observer each asserted something true with respect to their own frames of reference. But more detail is needed. Ideally, semantic relativism should have a theory to offer about how assessments of truth are supposed to work. Below, I make some claims concerning this very issue. But before I get to that, I turn to an important distinction.

3.1.1. Non-Indexical Contextualism and Relativism

I have officially described relativism as the view that propositions are true or false only relative to some value of a parameter. But I have also talked as if *assertions* admit of relative truth. Yet, one could accept the former and deny the latter. It might be that assertion-truth is an absolute (non-relative) notion that is to be understood in terms of the more basic concept of (relative) propositional truth: An assertion made in a certain situation is true (absolutely) just in case the proposition asserted is true relative to the values provided by the situation in which the assertion was made.²⁴ This idea approximates what MacFarlane (2008) calls Non-Indexical Contextualism.

I don't think that this is the right way to understand 'duration'. Non-Indexical Contextualism predicts that when the passenger evaluates the observer's assertion as false, she would be flat out wrong.²⁵ This result is too uncharitable. After all, our original goal was to vindicate the perspectives of both the passenger and the observer. Furthermore, knowing modern physics, today's speakers may sometimes judge the passenger's assertion as true and sometimes judge that it is false so long as they are careful to qualify these assessments as being relative to the appropriate frame. This flexibility would not be possible if we adopted Non-Indexical Contextualism (or even plain contextualism of the non-relative kind).

Instead of Non-Indexical Contextualism, I endorse the idea that assertions can vary in truth-value depending on the frame of reference invoked in the *context of assessment*.²⁶ In the simplest case, the context of assessment is a context in which a judgment is made to the effect that an assertion, proposition, or sentence use has a particular truth-value. The context of assessment is to be distinguished from a context of use. A context of use is the context in which assertions and other speech acts are performed. MacFarlane (2005b) gives the following gloss on this distinction:

By a 'context of assessment', I mean simply a concrete situation in which a use of the sentence is being assessed. We perform speech acts, but we also assess them; so, just as we can talk of the context in which a sentence is being used, we can talk of a context (there will be indefinitely many) in which a use of it is being assessed (page 325).

The key thing to note here is the relativist's insight that we must sharply distinguish the making of an assertion from assessments of the assertion. Much more could be said about contexts of assessment, but I believe I have said enough for the purposes of the following discussion.

3.1.2. Object Based Assessments

Returning to the business of truth assessments, let us call the passenger's assertion of (1), 'PASS'. You and I know modern physics. According to the relativist, we know what to do to make PASS come out true then. We can deliberately invoke the passenger's frame of reference when we assess PASS as true: This assessment is situated in a context of assessment such that relative to it, PASS is true.

Things are different when it comes to assessments of truth made by speakers of 19th century English. When the passenger assesses her own assertion PASS as true, this will happen in a certain context of assessment that is supposed to "provide" the relevant frame of reference. But it can't do that by appealing to the assessor's intentions to invoke a frame of reference. They don't have the relevant concepts.

At this point, we can revisit my earlier proposed on behalf of the contextualist and the idea that assertions concerning duration are based on objects used to estimate or measure time. Recall (3)':

(3)' Assertions made with sentences such as (1) and (2) will always be about the frame of object Y whenever the assertion is based on Y.

The relativist will borrow the essential elements of the basing notion from the contextualist, but will add that *assessments* of truth can also be object based. As I will explain below, however, they will still need to make use of the idea that assertions are object based (this doesn't mean that they must also be contextualists, since to say that an assertion is based on an object is different from saying that an assertion is about the frame of reference of that object).

The assessments of 19th century English speakers (who don't intend to refer to frames) may be based on objects such as clocks. For example, the passenger may judge that the observer's assertion of sentence (2) is false on account having looked at her own clock. But someone may judge that the observer's assertion is true if they based this on the observer's own clock. Hence a single assertion may be assessed as true or false depending on the object the assessment is based on. As before, the basing requirement here will also be epistemic and not purely psychological.

Similar considerations about 'transmission' should apply here. An assessment of truth can be based on an object even if the agent of the assessment does not have that object in mind. This may happen if she has no reason to doubt to veracity of the assertion she is assessing and trusts the person making the assertion. For example, a person who did not go on the train may correctly assess the passenger's assertion as true (even if the assessor has no other information about the situation). In that case, the object the assessment of that assertion is based on will be the object that the assertion is based on in the sense explained earlier. This is why I said earlier that the relativist still needs the notion of an object-based assertion.²⁷

What about cases where there is indeterminacy concerning which object the assessment is based on? Supervaluations can also help here. Given a class of objects that provide evidence for the assessment of an assertion, the assessment will be true if for any object in that class, the assessment would be true if based on that object. It is false if for any object in that class, the assessment would be false if based on that object. The assessment would be indeterminate otherwise.

I now have enough detail to sketch the rule that assigns a frame of reference to each context of assessment.

(5) A context of assessment determines a frame of reference R if the agent of the assessment intends to invoke R. In the case where there is no intention, choose the frame of the object the assessment is based on.

This principle allows us to unify both present day assessments of truth (when agents intend to invoke frames) with 19th Century assessments (when they don't invoke frames). Thus, a single principle can govern both types of assessments.

I have sketched a relativist theory for assessments of truth concerning assertions of sentences such as (1) and (2). I point out that (5) isn't a principle that must be known by competent language users. As we've seen, speakers need not have the concept of a frame of reference.

I now consider a potential objection to the relativist proposal.

4. Operators

I said earlier that sentences like (1) and (2) will express propositions (in contexts) that determine sentential intensions which are functions from world-frame of reference pairs to truth-values. If this is right, then we should expect there to be sentential operators that are sensitive to intensions of this kind. For example, the operator ‘it is necessary that’ is sensitive in this way to the world parameter in intensions classically construed. We now have the makings of an objection to the present proposal. *If intensions involve a frame of reference parameter, then we should expect there to be an operator that is sensitive to this; But if we look at 19th century English, they don’t have such operators.*

Response: While it is true that there are no operators sensitive to the frame of reference parameter for 19th century English, there is a perfectly simple and good explanation for this. Speakers of that language do not know modern physics. They do not know that temporal duration is relativized to frames. This is why they do not have such operators. One needn’t also explain the lack of operators by saying that sentential intensions don’t involve the frame of reference parameter. Hence, the fact that we can provide an explanation for why there are no such operators for this language is a sensible way to meet this objection. A further point in favor of this rebuttal to the objection is that we seem to have such operators in today’s language. We can say things such as ‘In every frame of reference, the time it takes for light to traverse a mile is the same’ or ‘With respect to the frame of reference of any person on earth, the time it took for that comet to reach X was at least Y years’. Hence there is some plausibility to the idea that what explains the lack of the relevant operators in the past, is that agents weren’t aware of modern physics but not that intensions don’t invoke the frame of reference parameter.

At this point I note a difference between this relativistic proposal and others in the literature. MacFarlane has proposed that ‘knows’ gets a relativistic semantics. The intension of ‘knows’ invokes a parameter for standards of knowledge. Jason Stanley (2005) argues that this can’t be right because we don’t have sentential operators that are sensitive to that parameter. But (unlike the case of ‘duration’) we cannot convincingly respond to this objection by saying that speakers aren’t aware that ‘knowledge’ (in one way or another) is sensitive to varying standards. Ludlow’s point concerning the “Google” test reveals that ordinary agents might in fact be so aware. Thus, the relativistic treatment proposed here has a unique way of dodging the “operator” objection that is not available for relativists about knowledge. This is yet another way in which relativism for ‘duration’ I defend here differs from others available in the literature.²⁸

5. Distinguishing Relativism From The Claim That Some Terms Get Relativistic Semantics.

I have argued that the 19th Century English use of 'duration' gets a relativistic semantics. I have also argued that truth is relative. What is the connection between these two claims? The second claim is what I have been calling relativism. As I defined it, it is the idea that truth is not a monadic property: Propositions are true only relative to a value of a parameter. Notice that this isn't a claim about any natural language. It is about the nature of truth. I have argued in this paper for relativism by making the case that there are propositions (expressed by 19th Century speakers) that we, using our concept of truth, assess as true; and the best explanation for this phenomenon invokes relativism.

On the other hand, the thesis that ‘duration’ gets a relativistic semantics is partly a linguistic claim. This is the thesis that the denotation of 'duration' is sensitive to

parameters invoked in the circumstances of evaluation. Together with elementary assumptions from semantics, the linguistic thesis entails relativism. However, it could be that even if truth is relative, no expression of present day English gets a relativistic semantics. This would happen if every proposition expressible in present day English is such that its truth-value does not vary with the parameters for truth.²⁹

6. Present Day English

The big difference between 19th century speakers and us is that, of course, we belong to a linguistic community where modern physics is known. So it might be thought that contextualism is right (and relativism is wrong) for our temporal (and spatial) duration terms. For example, an ordinary utterance made today such as 'the duration of the trip was 3 hours and 5 minutes' would get a contextualist treatment (either the direct or indirect version).

I don't think that this is quite right. There are many people in our community who aren't aware of modern physics. If we study their idiolects, it is arguable that the standard contextualist tests will fail for their uses of 'duration'. There is something to be said then for extending the relativistic semantics to some present-day uses of 'duration'.

Let us now turn to speakers who know modern physics. It is plausible that these individuals have two uses of 'duration'. On one use, when attending to the physics, the term gets a contextualist treatment. On another use, where physics is not in play, the term gets a relativistic semantics. In these cases, we seem to revert to our "Newtonian" selves. We are temporarily blind to the relevance of frames for physical measurements (think of a physicist making measurements around the house in order to install a carpet). There is precedence for this type of ambiguity thesis in the semantic relativism literature. For

example, Lasersohn (2005) and Stephenson (2007) suggest that expressions like 'fun' admit of relativistic as well as contextualist uses (in the latter, the relevant parameter can be filled at the surface--as in 'fun for me' or 'fun for a graduate student'). I suggest that present-day 'duration' also admits of a similar ambiguity.

7. Externalism About Relativism

Assuming that (1) and (2) admit of a relativistic semantics, we may wonder about what sorts of facts fix this feature of our language. As we have seen, one fact concerns the physical structure of the universe. Imagine a twin-universe that is just like ours (prior to the advent of modern physics) except that the physical laws are Newtonian. Although the twin-earthlings in the twin-universe presumably have the same linguistic dispositions we did (prior to the 20th Century), their use of 'duration' gets an invariantist semantics (neither relativistic nor contextualist): time dilation wouldn't arise in their universe. This indicates that the fact that 'duration' gets a relativistic semantics for us has a strong externalist component.

Compare 'duration' with other terms that have been thought to admit of a relativistic semantics. Take 'fun'. It is difficult to imagine a twin world where people have the same linguistic dispositions and yet their word 'fun' gets an invariantist semantics. Suppose that 'fun' in their mouths instead meant something like 'fun for George Bush' or 'fun for most people', then this fact would have to be reflected in their linguistic dispositions. If I am right about this line of thinking, then the relativism defended in this paper is externalist in the way that other types of relativism defended in the literature are not.

A further point is worth making. We face the possibility that future research could teach us that other notions besides those concerning temporal and spatial duration are non-absolute. And so our present day linguistic expressions referring to these notions would be later discovered to now admit of a relativistic semantics. In some cases, no amount of “linguistic” investigation carried out today could uncover this fact. Yet, the discovery that some notion is non-absolute is not enough to get us the result that terms referring to that notion get a relativistic semantics (after all, contextualism or an error theory might be the right way to go). As we saw, the result also requires reflecting upon our charitable attributions of truth.

8. Conclusion

I have argued that truth is relative. I have done so by paying attention to the semantics of ‘duration’ for 19th Century English speakers. When they use sentences with ‘duration’ they often assert propositions that are true only relative to a frame of reference. Thus, I have provided a new argument for the relativity of truth. I have also provided a sketch of a theory about how assessments of truth are made concerning assertions of duration. Finally, I have also argued that the sort of relativism I have offered here is different from others. First (section 2.4), the argument against ‘duration’ being contextualist (and hence relativist) is stronger than possible arguments against ‘fun’ being contextualist. Second (section 4), it is immune to the ‘operator’ argument in a way that ‘knows’ is not. Third (section 7), and perhaps more importantly, the sort of relativism defended here is externalist in the way that it might not be for expressions such as ‘fun’. More broadly, I hoped to have shown how there is an unexplored and interesting connection to be forged

between what physics tells us about time (and space) and recent debates in analytic philosophy concerning the nature of truth.

References:

Cappelen, Herman and Hawthorne, John (2009). *Relativism and Monadic Truth*. Oxford University Press.

Cappelen, Herman and Lepore, Ernie (2003) 'Context Shifting Arguments' *Philosophical Perspectives* 17

Cohen, Stewart (1999). 'Contextualism, Skepticism and the Structure of Reasons', *Philosophical Perspectives* 13

Egan, Andy (2008). 'Billboard Bombs and Shotgun Weddings', *Synthese* (Special Double Issue on Relative Truth).

Egan, Andy (2007). 'Epistemic Modals, Relativism and Assertion' *Philosophical Studies*, 133:1

Egan, Andy, Hawthorne, John, and Weatherson, Brian. (2005) 'Epistemic Modals and Relative Truth'. *Contextualism in Philosophy: Knowledge, Meaning and Truth* Preyer G. and Peter G. (Eds). Oxford University Press.

Fine, Kit. (1975). 'Vagueness, Truth and Logic'. *Synthese* 30. Pp 265-300.

Hafele, J.C. and Keating, R.E. (1972). 'Around-the-World Atomic Clocks: Observed Relativistic Time Gains.' *Science* 14 July 1972: Vol. 177. no. 4044, pp. 168 - 170

Horowitz, Damon (MS). 'Hermeneutic Contextualism and the Knowledge Predicate'.

Kaplan, David (1989). 'Demonstratives'. In *Themes from Kaplan*. Joseph Almog, John Perry, and Howard Wettstein (Eds.); Oxford University Press.

Kripke, Saul (1979). *Naming and Necessity*. Harvard University Press.

Laserson, Peter (2005). 'Context Dependence, Disagreement, and Predicates of Personal Taste.' *Linguistics and Philosophy*, 28.

Ludlow, Peter (1989). 'Implicit Comparison Classes' *Linguistics and Philosophy* 12, #4.

Ludlow, Peter (2005). 'Contextualism and The New Linguistic Turn in Epistemology' in *Contextualism in Philosophy: Knowledge, Meaning and Truth* Preyer G. and Peter G. (Eds). Oxford University Press.

MacFarlane (2003). 'Future Contingents and Relative Truth' *The Philosophical Quarterly* 53.

MacFarlane (2005a). 'Assessment Sensitivity of Knowledge Attributions', in *Oxford Studies in Epistemology 1*, Tamar Szabó Gendler and John Hawthorne (eds.) Oxford University Press.

MacFarlane (2005b). 'Making Sense of Relative Truth', *Proceedings of the Aristotelian Society*. 105:1 (305-323)

MacFarlane, John. (2007) 'Relativism and Disagreement', *Philosophical Studies*, 132, 17-31

MacFarlane, John (2008). "Non-Indexical Contextualism" *Synthese* (Special Double Issue on Relative Truth).

Richard, Mark (2004). "Contextualism and Relativism" *Philosophical Studies* 119:215-242

Richard, Mark (2008). *When Truth Gives Out*. Oxford University Press.

Stanley, Jason (2005). *Knowledge and Practical Interests*. Oxford University Press.

Stephenson, Tamina (2007). 'Judge Dependence, Epistemic Modals and Predicates of Personal Taste' *Linguistics and Philosophy*. 30: 487-525

¹ I am assuming that 'the duration of the trip' in (1)/(2) co-denotes with 'the time elapsed between the departure and the return of the train'. This might be resisted if one thinks that the clock in the train is the right clock by which to measure the trip (because the trip was taken *in* the train). If you are attracted to this view, just replace (1)/(2) with 'The time elapsed between the departure and the return of the train was n/m seconds'.

² This formulation can be found in Cappelen and Hawthorne (2009). Another type of relativism (Egan 2008, Horowitz MS), possibly more radical, says that what someone

asserts on a particular occasion will vary depending on the assessor. I will say nothing about this here.

³ Some proposed parameters: possible worlds and times (Kaplan 1989), judges of personal taste (Lasersohn 2005, MacFarlane 2007), epistemic possibility (Egan 2005; Egan, Hawthorne and Weatherson 2005), world histories (MacFarlane 2003), standards for knowledge (MacFarlane 2005), and sharpenings as a result of accommodation and negotiation (Richard 2004, 2008) .

⁴ The story is not so far removed from actual experiences. Discrepancies in clock readings have been measured between commercial flights and earth bound observers. See Hafele and Keating (1972).

⁵ I will use 'proposition' (or 'content') in the standard way to mean the object of beliefs, doubts and other attitudes. I will also assume that they are the content of declarative sentences. Following Frege, I will use 'thought' interchangeably with 'proposition'.

⁶ Alternatively, we can take the 'FR' expressions to abbreviate definite description along the lines of 'the frame of reference of such and such'. What I have to say below can be easily accommodated to apply equally well to this interpretation.

⁷ They might be true on their de re reading, but then they wouldn't be attributing the attitude towards the intended proposition.

⁸ Thanks to John Hawthorne for this suggestion.

⁹ Alternatively, it might be thought that duration₁ and duration₂ are homonyms like 'bank' or polysemous like 'take'. I doubt this is the case since ellipses across the two uses would yield infelicitous (homonymy) or incongruous (polysemy) readings. For instance: 'John went to the bank and so did Steve' is infelicitous if it concerns the two senses of

‘bank’. Similarly, ‘I took the train and she the aspirin’ is incongruous for the senses of ‘take’. However, there is nothing odd about a person in one frame of reference saying ‘my trip had a duration of 5.5 minutes...’ and a second person in a second frame of reference completing the speech ‘and mine of 6 minutes’. So it seems like appealing to homonymy/polysemy isn’t the right way to go. However, even if we go that route, the arguments against the contextualist treatment of ‘duration’ (with slight modifications) can also apply here.

¹⁰ A person's frame of reference is naturally understood to be determined by her world line (her life-path through 4-D space-time). The concept of a person's frame of reference might admit of indeterminacy. Indeterminacy in what counts as part of the body will lead to indeterminacy in what a person's frame of reference is supposed to be. I also add that since a person typically accelerates throughout her life, her frame won't be inertial.

¹¹ We may modify this claim to add an “intentions trump” rule to accommodate modern day speakers who may intend to explicitly refer to frames of reference. On the modified claim, (3) is true unless the person making the assertion intends to invoke a frame of reference: in which case, the frame of reference in question will be the intended one.

¹² To fill out the case a bit, we may suppose that it is the person’s job to read the clock in the train and report the reading to his supervisor. So long as he doesn’t make a mistake recording the time displayed in the clock, the report is arguably true.

¹³ To be sure that the assertion would not be about X’s frame, suppose that the trip would not be considered “short” with respect to X’s frame.

¹⁴ An anonymous referee pointed out to me that he or she would be more likely to say that the agents are disagreeing if by this it is meant that they are engaged in a dispute than

if it is meant that they have contradictory beliefs (about whether the duration of trip was n seconds). The referee goes on to say that it is mainly judgments concerning the second notion that create the difficulty for the contextualist. Although I discuss this (second) case in section 2.3.3, I think it is worth pointing out that even the contextualist should grant that our agents still have many conflicting beliefs. And I claim that this is hard to square with the agents not having conflicting beliefs about the duration of the trip. For example, since we can imagine our agents arguing about which clock is working properly, the agents must have conflicting beliefs about whether the clock in the train (which reads n minutes) is working properly. But if we grant that they have conflicting beliefs about which clocks are accurate, then there is some pressure to grant that their beliefs about the duration of the trip must also be in conflict (since their beliefs about the duration of the trip were based on conflicting beliefs about the clocks).

¹⁵ See, for example, Stewart Cohen (1999).

¹⁶ An anonymous referee pointed out to me that a positive result for the Google test might be expected on the indirect but not the direct version of contextualism. Hence, the test is not a reliable probe for contextualism. The idea here would be that only the direct treatment requires an awareness of modern physics on the part of competent users of ‘duration’. Two points about this. First, there are analogous “indirect” contextualist theories for ‘knows’ (and also comparative adjectives) which Ludlow takes to be subject to the Google test. If he is right about that, then there is some reason to think that the test would be applicable here as well. Second, even if the Google test is not a reliable probe for the indirect version of contextualism, it doesn’t follow that it isn’t a good test for

contextualism. A successful refutation of my argument requires a argument for the latter. There is an extended discussion of this point in section 2.3.4.

¹⁷ It might be thought that we can make this sort of utterance (ICD) *today* (since we know modern physics) and so this is evidence that (1) and (2) do not fail the test and are therefore context sensitive after all. The problem with this reply is that the language under investigation is 19th century English and not present day English. The ICD test must use their words and not ours. As I mention below, it could be that awareness of modern physics has altered the semantics of some present day uses of 'duration'. And it might be that it is only by invoking this modern use that we can get the acceptable ICD utterance.

¹⁸ Cappelen and Hawthorne argue that this test, which can be seen as a linguistic version of the "disagreement" remarks I gave against contextualism above, is more reliable than many others (including tests using collective 'says-that' reports). In particular, "disagreement" reports are less likely to concern mixed quotation or distributive readings, which are features that can compromise the reliability of these tests. Nonetheless, even according to this test, (1) and (2) fail to be context sensitive in the intended sense.

¹⁹ The Google test would have to be modified to be a probe for pure indexicals and demonstratives. Although there are no "standards" for 'here' or 'there' we can often be more explicit about locations with expressions such as 'here in New York' or 'there across the lake'.

²⁰ A referee points out that the fact that 'fun' passes the Google and ICD tests for contextualism can be easily accommodated by relativists. I do not disagree with this. In

fact, I think that ‘fun’ is both context sensitive and relative. Rather, my point is simply that insofar as these diagnostics are concerned, the evidence against contextualism for ‘fun’ is weaker than the evidence against contextualism for ‘duration’.

²¹ But see below for the possibility that present day uses of ‘duration’ might admit of both contextual and relativistic uses.

²² I have added worlds to the circumstance of evaluation here only for the sake of maintaining continuity with the existing literature on relativism. This should not be seen as endorsement of the idea that truth must ultimately be relativized to worlds. Here, I only commit to the idea that truth is relative to frames of reference.

²³ I do not want to invoke here a global principle of charity. We can agree that our agents were sayings true things without needing to appeal to some general principle.

²⁴ We can think of an assertion (qua object, not speech act) as an ordered pair consisting of the proposition asserted and the situation in which the speech act was performed. This would be a formal way of distinguishing propositions and assertions (qua objects).

²⁵ Of course the same goes for the observer’s evaluation that the passenger’s assertion was false. He would be flat out wrong.

²⁶ MacFarlane (2005a) calls this view 'relativism'. It differs from my definition of relativism (that propositional truth is relative). That assertions vary in truth-value depending on the context of assessment is simply a fact (in my view) about assertions (and it is not definitional of "relativism").

²⁷ What about cases where the truth assessment of an assertion is a guess? Suppose an agent who did not go on the train is asked to guess whether the passenger’s assertion was true. In response, he flips a coin and judges that it is true. What is the frame of reference

appropriate for this assessment? I do not find that there is a particularly strong inclination for or against choosing the assessor's frame here. I am happy to leave this as an open question.

²⁸ A referee pointed out that if we treat 'In every frame of reference' as an operator sensitive to parameters of truth, then it seems like we should also allow 'By any objective standard' as an operator also sensitive to parameters of truth. Now in the discussion of the Google test, Ludlow takes the fact that people do say things like 'She knows it by any objective standard' as evidence that contextualism is correct for 'knows'. But if 'By any objective standard' is an operator in the intended sense, then that evidence would support relativism and not necessarily contextualism. It is tempting then to think this undermines the reliability of the Google test as a way to distinguish contextualism from relativism. For example, the fact that 'duration' fails the Google test is also bad news for relativism (since we would expect there to be an operator sensitive to the frame of reference parameter). My response to this (which is not surprising given the discussion in the text) is that the relativist can explain the failure of the test by appealing to speakers' ignorance of modern physics. But note that we have left the door wide open for the contextualist to counter by offering the same sort of explanation about why her account also fails the test. I don't think this counter is successful, however, because the contextualist and the relativist don't stand on even footing. There are a lot of expressions that are uncontroversially context sensitive and invoke varying standards (though see Cappelen and Lepore (2005) for a restrictive view about which expressions are context sensitive). They all seem to pass the Google test. Hence, there is good reason to think that awareness of the relevant standards is required for competence of the context sensitive terms in

question (including awareness of physics if ‘duration’ is context sensitive in the relevant way). However, the world index is the only uncontroversial parameter for truth. Although we do find that ordinary speakers are aware of this parameter (witness the operator ‘It is necessary that’), it is harder to generalize to all instances from a single case. Hence, there is less good reason to think that competent speakers must be “aware” of all truth parameters. The point here simply relies on the idea that given our current understanding of language, there are a great number of expressions most of us can agree are context sensitive and they provide a robust set from which to make interesting generalizations. It must be admitted that the same cannot be said about relativism.

²⁹ One may resist this reasoning by holding that if truth is relative, then object language ‘true’ must get a relativistic semantics. Not so fast. It may be that ‘true’ gets contextualist semantics instead. But this raises issues that go beyond the scope of this paper.