

Information Centrism and the Nature of Contexts

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Abstract

Information Centrism is the view that contexts consist of information that can be characterized in terms of the propositional attitudes of the conversational participants. Furthermore, it claims that this notion of context is the only one needed for linguistic theorizing about context-sensitive languages. We argue that Information Centrism is false, since it cannot account correctly for facts about truth and reference in certain cases involving indexicals and demonstratives. Consequently, contexts cannot be construed simply as collections of shared information.

Keywords: context, context-sensitivity, demonstratives, indexicals, reference

1. Introduction

According to one way of thinking about contexts for linguistic utterances, contexts are characterized in terms of relevant facts about utterance

situations, such as who is speaking, when, where, and so forth.¹ According to another way of thinking about contexts, a context is a body of shared information, such as what the conversational participants presuppose or what they believe. In this paper we argue that the latter conception of context is insufficient for the purpose of theorizing about truth and reference. This leads us to reject a view about the nature of contexts, which we call *Information Centrism*. According to Information Centrism, the notion of context as a body of shared information is the only one that is needed for theorizing about context-sensitive languages.

Section 2 provides a statement of Information Centrism and lays out some important assumptions. In section 3, we present the kind of examples we take to be problematic for Information Centrism. In section 4, we discuss these examples and go through a number of possible responses on behalf of Information Centrism. Finally, section 5 briefly charts some options for how to think of the nature of contexts in light of our previous discussion.

¹ There is a lot more to say about the idea that contexts are characterized in terms of relevant facts about utterance situations. Lewis [1980] talks about the location in which a sentence is used. However, one may also talk about a collection of parameters that includes a speaker, a time, and so forth. The view that a context can be identified with such a collection of parameters is sometimes attributed to Kaplan [1989]. See, e.g., Predelli [2005]. It is an open question how these notions are related to each other, and what role they can play in a formal semantic theory.

2. Information Centrism

The view we want to oppose can be summarized as the following two theses:

Information Centrism

IC1. A context is a body of shared information that can be interestingly characterized in terms of the propositional attitudes of the conversational participants.²

IC2. This notion of context is the only one that is needed in order to theorize about context-sensitive languages.

The shared information of the conversational participants, what we call the *Informational Context*, plays an important role in theories of linguistic communication. According to the tradition associated with the work of, among others, Stalnaker [1974, 1978, 1998, 2002], communication proceeds

² Although admittedly vague at this stage, the qualification that contexts be ‘interestingly’ characterized by the propositional attitudes of the participants is intended to rule out ways of characterizing contexts in terms of information that the participants cannot be said to have attitudes towards in any illuminating sense. For example, many of the problems discussed in this paper can be solved by appealing to the information that correctly describes the relevant facts of the utterance situation. We take it to be sufficiently clear that such information is not characterized in terms of the propositional attitudes of the participants in any interesting sense. We discuss a variety of other ways of developing Information Centrism in the paper.

against a background of shared information, and successful communication updates this information.

However, context also plays a role in determining truth and reference in cases involving indexicals and demonstratives. Our goal is to argue that in order to make correct predictions about truth and reference in such cases, theories of context-sensitive languages need to appeal to more than the Informational Context. Hence, Information Centricism is false.

Before proceeding, we want to make four points of clarification. First, we grant that the Informational Context has an important role to play in explaining how communication works. We are only arguing that the Informational Context is insufficient for the purpose of theorizing about truth and reference.

Second, we rely on two assumptions about propositions. The first assumption is that it makes sense to talk about the proposition that so-and-so is the speaker or that so-and-so is the demonstrated female. The second assumption is that it makes sense to talk about the set of possible worlds that are compatible with a set of propositions, intuitively the set of worlds in which the propositions are true. These assumptions, and our arguments more generally, are compatible with different views about propositions, including views on which propositions are sets of possible worlds and views on which they are structured entities.

Third, we assume a broad species of *Anti-Descriptivism* about indexicals and demonstratives. In the tradition from Kripke [1980] and Kaplan [1989], Anti-Descriptivism may be stated as follows:³

Anti-Descriptivism

The sole contribution of indexicals and demonstratives to truth-conditions and propositions expressed is their referents.

Abandoning Anti-Descriptivism may be a way of avoiding some of the problems we raise for Information Centrism. Accordingly, at most our arguments in this paper show that if Anti-Descriptivism is true, we need more than the Informational Context.

The fourth and final point has to do with what makes Information Centrism an interesting view. Stalnaker sometimes seems to endorse some version of Information Centrism. Here is an example:

These two simple observations point to two different roles that context plays: it is both the object on which speech acts act and the source of the information relative to which speech acts are

³ Indexicals and demonstratives have so-called ‘descriptive’ uses, see, e.g., Nunberg [1993], Recanati [1993], and Elbourne [2008]. We assume that the uses of indexicals and demonstratives we are interested in are ordinary referential uses. Even though the uses we discuss here may be, in some sense, reminiscent of descriptive uses, they do not appear to be standard cases of descriptive uses. We therefore do not take the existence of descriptive uses to undermine our arguments.

interpreted. To explain the interaction of the two roles, we need a single conception of context that will represent the information about the situation that is relevant both to the role of context in determining content and to explaining how the content determined then acts on the situation. [...] So I propose to identify a context (at a particular point in a discourse) with the body of information that is presumed, at that point, to be common to the participants in the conversation. [Stalnaker 1998: 98]

Here Stalnaker argues that the Informational Context is the single notion of context needed to handle the two central roles that context plays in linguistic theorizing. Accordingly, many have read Stalnaker as committed to Information Centrism. For instance, Glanzberg [2002] interprets Stalnaker as being committed to a general view about the nature of contexts.⁴

The other prominent approach to context is the *presupposition theory of context*, originating primarily in the work of Stalnaker [1974, 1978, 1998] and subsequently developed in many ways. This theory identifies a propositional attitude of *presupposing* or taking to be common ground in a conversation. The context of an utterance is the

⁴ See also Glanzberg [2005: 78], Szabó [2006: 384, fn. 59], and Gauker [2008a]. Some of Szabó's comments suggest that he endorses an argument that is similar to one that we want to make.

collection of propositions presupposed by participants in the conversation at the point of utterance. [Glanzberg 2002: 337]

As Glanzberg emphasizes, this includes a view of how the reference of *I* is determined.

The expression *I* winds up referring to the speaker because it will be common ground among participants in a conversation who is speaking at a given time, and that *I* picks out that person. [Glanzberg 2002: 337]

Stalnaker sometimes seems to allow that other notions of context may have a role to play in determining the reference of indexicals and demonstratives.⁵ Yet, as we have seen, Information Centrism is treated as a serious option, even if Stalnaker would not fully endorse it.

We think Information Centrism is an interesting view independently of whether anyone has fully endorsed it. It would be a theoretical advantage if a single notion of context could suffice for theorizing about context-sensitive languages. The Informational Context initially seems like a good candidate for that role. However, we aim to show that this is not the case.

⁵ See, e.g., Stalnaker [2014: Ch. 1].

3. Cases

In this section we present the kind of cases we are interested in and describe the relevant facts about truth and reference to be accounted for.

3.1 *Castor, Pollux, Norma, and Shelly*

Consider the following story:

Castor and Pollux

Castor and Pollux are identical twins, and are virtually indistinguishable to the naked eye and ear. In school Castor was a model student, while Pollux got into trouble and was ultimately expelled. Their parents managed to keep this event secret from people, and the twins changed school. After a few years, they and their parents were the only ones to know about Pollux's tainted academic history. Later in life, a series of physical accidents and psychological complications arose, and as a result people got the identities of the twins mixed up so that *everyone*, including themselves, came to believe that Castor is Pollux, and that Pollux is Castor. One day, sitting in a café with some friends, Castor feels the urge to come clean, and after taking a deep breath, says,

(1) I was expelled from school.

Here is another story:

Norma and Shelly

Mike's friend Shelly is a biologist. But for some reason Mike thinks she is a philosopher. One evening Mike, Bobby, and Shelly are at a bar together. Bobby doesn't know Shelly very well. After some time Shelly goes to the bathroom. Some time passes. Sitting at the bar, Mike and Bobby see emerging from the bathroom a woman whom in the dim lighting they both mistake for Shelly. In fact, the woman approaching is Norma, whom none of them know, and who is really a philosopher. Mike and Bobby both believe that it is Shelly who is coming back to join them, and Mike gestures towards the approaching woman and says,

(2) She's a philosopher.

We take it that *I* in (1) refers to Castor. Furthermore, (1) is false and expresses the false proposition that Castor was expelled from school. Similarly, we take it that *she* in (2) refers to Norma. Correspondingly, (2) is true and expresses the true proposition that Norma is a philosopher.

In what follows, we will rely on this description of the cases when arguing against Information Centricism. Apart from being, as far as we can tell, a correct description of what is going on in the relevant cases, these

observations also go naturally together. For instance, if *she* had not referred to Norma, but to Shelly, (2) would not have been true. Beyond that, we will not argue for this description of the cases and will treat it as an assumption going forward.⁶

3.2 Carnap, Agnew, and an Alleged Tuesday

Cases like those above are familiar. Here is a famous example:

Suppose that without turning and looking I point to the place on my wall which has long been occupied by a picture of Rudolf Carnap and I say:

(27) Dthat [I point as above] is a picture of one of the greatest philosophers of the twentieth century.

But unbeknownst to me, someone has replaced my picture of Carnap with one of Spiro Agnew. I think it would be simply wrong

⁶ Well known puzzles concerning cases of mistaken identity arise for these cases. For instance, given that Castor believes that Castor is Castor, one might worry about reconciling this with the observation that Castor believes that Castor and Pollux are distinct, and that Castor believes that he is Pollux. This raises a question about whether Castor holds inconsistent beliefs. A theory of the general issues involving cases of mistaken identity is beyond the scope of this paper. However, we think we have succeeded in describing a recognizable situation. If someone wants to claim that Castor could not believe that he is Pollux, that would require an argument. Thanks to an anonymous referee for helpful discussion.

to argue an “ambiguity” in the demonstration, so great that it can be bent to my intended demonstratum. I have said of a picture of Spiro Agnew that it pictures one of the greatest philosophers of the twentieth century. And my speech and demonstration suggest no other natural interpretation. [Kaplan 1978: 335]

While Kaplan's case is similar to our examples, Kaplan focuses on the role of speaker intentions and gestures or demonstrations in determining the reference of demonstratives. This is not the issue we are addressing.⁷ Our arguments concern the role of shared information. The rejection of Information Centrism is compatible with seeing either speaker intentions or gestures as determining reference.

Here is another example from Gauker [2008a]:

[...] the content of the context that pertains to a given utterance is not determined by the attitudes of the interlocutors in the conversation to which the utterance belongs. For example, the time that a context assigns to “now” need not be the time that the interlocutors *think* it is. So a speaker might say “It is Tuesday now”, and that may be false, because Tuesday is not the time that the context that pertains to his or

⁷ For relevant discussion, see, e.g., Reimer [1991a, 1991b], Bach [1992a, 1992b], Gauker [2008b], Åkerman [2009], and Stokke [2010]. It is also worth mentioning that Kaplan [1978: 336] also makes similar observations about a case involving *I*. See also Barwise and Perry [1983: 148].

her utterance assigns to “now”, even though the speaker thinks that Tuesday is the time that the context that pertains to his or her utterance assigns to “now”. [Gauker 2008a: 194-195]

We agree that, in this case, the speaker says something false. Indeed, Gauker takes his example to support a conclusion similar to the one we are arguing for.⁸ However, in order to establish that cases like this undermine Information Centricism, we need to say more about what the relevant attitudes of the conversational participants are and how reference can be determined given a body of information. That is the main task of the following discussion.

4. Discussion

To make predictions about our cases, two components are needed. First, we need a specification of what counts as the shared information of the conversational participants, that is, of the Informational Context. Second, we need a specification of how reference is determined by the Informational Context. In this section we go through a number of ways of construing these components. We argue that all of them fail to deliver the desired results.

⁸ See, e.g., also Gauker [1997, 1998, 2008b]. For some criticism of Gauker’s [2008b] arguments, see, e.g., Åkerman [2009].

4.1 Shared Belief

It is natural to start by looking at the *beliefs* of the conversational participants. There are two ways of characterizing shared information in terms of participant beliefs. In particular, we distinguish between *Shared Belief* and the *Belief Set*:

Shared Belief

A proposition is Shared Belief if and only if it is believed by every conversational participant.⁹

Belief Set

The Belief Set is the set of possible worlds that are compatible with the Shared Beliefs of the conversational participants.

How is reference determined on this view? There are two salient options. The first is to characterize reference-determination in terms of the Belief Set of the context; the other is to do it in terms of Shared Beliefs. We start by looking at the former option.

To make the idea of reference-determination in terms of the Belief Set of the context precise, we can state the following rules:

⁹ Shared Belief differs from what is typically called 'Common Belief'. A proposition is Common Belief if and only if all the participants believe it, all believe that all believe it, all believe that all believe that all believe it, etc. The distinction between Shared Belief and Common Belief is not important to our arguments.

(3) An occurrence of *I* in a context *c* refers to an individual *x* if and only if (i) the Belief Set of *c* is non-empty and (ii) *x* is the speaker in every world of the Belief Set of *c*.

(4) An occurrence of *she* in a context *c* refers to an individual *x* if and only if (i) the Belief Set of *c* is non-empty and (ii) *x* is the demonstrated female in every world of the Belief Set of *c*.

We remain neutral about what it takes to count as the demonstrated female. Correspondingly, we refrain from assuming any particular story about what the relevant beliefs of the conversational participants are in these cases. We regard it as an open question whether the beliefs concern the intentions of the speaker, gestures, salience, or some other relevant feature. As far as we can see, any plausible answer will generate problems for Information Centrism as long as the relevant beliefs can be false.

Given the proposed rules for determining reference in terms of the Belief Set of the context, there is no plausible way of making the right predictions in the cases presented in the previous section. If all the participants believe that Pollux is the speaker, and they do not believe that Castor is the speaker, all worlds in the Belief Set are worlds in which Pollux is the speaker. In that case, (3) incorrectly predicts that *I* in (1) refers to Pollux and that (1) expresses the true proposition that Pollux was

expelled from school. Similarly, if all the conversational participants believe that Shelly is the demonstrated female, and they do not believe that Norma is the demonstrated female, (4) incorrectly predicts that *she* in (2) refers to Shelly and that (2) expresses the false proposition that Shelly is a philosopher.

Alternatively, one might say that the conversational participants believe both that Castor is the speaker and that Pollux is the speaker. After all, they are looking at Castor and so might form a belief about him on that basis. But this is hardly an improvement. In that case, the beliefs of the conversational participants are inconsistent, and consequently the Belief Set is empty. Consequently, the case of Castor and Pollux is seen as a case of reference failure and we again fail to predict that *I* refers to Castor and that (1) expresses the false proposition that Castor was expelled from school.

In order to make the right predictions in the case of Castor and Pollux by appealing to the beliefs of the participants, we have to assume that the participants believe that Castor is the speaker, but not that Pollux is the speaker. There are good reasons to resist this way of describing the beliefs of the conversational participants. For one thing, the participants would assent to (5), but not to (6).

(5) Pollux is the speaker.

(6) Castor is the speaker.

Moreover, there is reason to think that the participants would act as if they believed that Pollux is the speaker. For instance, if they wanted to take a picture of Pollux speaking, they would take out a camera. Even if it this is not decisive, we take this to be evidence that the conversational participants believe that Pollux is the speaker.

We conclude that it is implausible that the beliefs of the participants can be described such that rules determining reference in terms of the Belief Set will give the right results. Someone who wants to defend Information Centricism should consider different ways of characterizing either the Informational Context or the way reference is determined. We return to an alternative proposal building on the suggestion that the participants have inconsistent beliefs in section 4.2.

These points do not just apply to the case of belief. For instance, Stalnaker [2002] argues that, for the purpose of characterizing what he calls the *Common Ground*, and the presuppositions of the conversational participants, we should talk about *acceptance* instead of belief. One can imagine a proposal according to which reference is determined by an Informational Context characterized in terms of acceptance.¹⁰ However, in

¹⁰ Stalnaker often focuses on what the speaker takes to be Common Ground, or so-called *speaker presuppositions*. See, e.g., Stalnaker [1973: 448]. In our discussion, we rely on Stalnaker [2002]. Here, Stalnaker [2002: 716] takes a proposition to be Common Ground in a group if everyone in the group accepts the proposition and everyone believes that

our cases, it is likely that what is accepted is more or less just what is believed. The Common Ground will contain the false propositions that Pollux is the speaker and that Shelly is the demonstrated female.

4.2 Multiple Referents

If reference is determined by the Belief Set in the way we have been assuming so far, we get reference failure when the Shared Beliefs of the conversational participants are inconsistent. But if reference is instead determined by what is Shared Belief, we may avoid predicting reference failure, even in the face of inconsistent beliefs on the part of the participants.

As suggested earlier, one can maintain that, in the case of Castor and Pollux, the participants believe both that Castor is the speaker and that Pollux is the speaker, and similarly, in the case of Norma and Shelly, that the participants believe both that the demonstrated female is Norma and that the demonstrated female is Shelly. This leads to interesting results if reference is determined by what is Shared Belief and not by the Belief Set. Consider the following rules for determining reference:

everyone accepts the proposition, and everyone believes that everyone believes that everyone accepts the proposition, etc. Even if one adopts a more speaker-oriented view about context, there are still problems involving reference. In our cases, the beliefs and presuppositions of the speaker and the other conversational participants are the same. It does not make any difference whether we focus on the former or the latter.

(7) An occurrence of *I* in a context *c* refers to an individual *x* if and only if the proposition that *x* is the speaker is Shared Belief in *c*.

(8) An occurrence of *she* in a context *c* refers to an individual *x* if and only if the proposition that *x* is the demonstrated female is Shared Belief in *c*.

In general, (7) delivers the same results as the previous proposal when there is only a single individual who is believed to be the speaker by all the conversational participants. But if there are multiple individuals who are believed to be the speaker, (7) instead predicts multiple referents.

It is natural to combine the idea that there are multiple referents with the idea that there are multiple propositions in play. In particular, the claim would be that if the proposition that so-and-so is the speaker is Shared Belief, (1) expresses a proposition about so-and-so. Similarly, if the proposition that so-and-so is the demonstrated female is Shared Belief, (2) expresses a proposition about so-and-so.¹¹

This may look like a step in the right direction. If the participants believe both that Castor is the speaker and that Pollux is the speaker, one might prefer to say that both Castor and Pollux have been referred to. Indeed, this proposal achieves some of the results we wanted. In the case

¹¹ Several theorists have explored the idea that communication can involve multiple propositions. See, e.g., Cappelen [2008a, 2008b], Egan [2009], Weatherston [2009], and von Stechow and Gillies [2011].

of Castor and Pollux, we predict that *I* refers to Castor and that (1) expresses the false proposition that Castor was expelled from school. In the case of Norma and Shelly, we predict that *she* refers to Norma and that (2) expresses the true proposition that Norma is a philosopher.

But this is not the whole story. The proposal also predicts that *I* refers to Pollux and that (1) expresses the true proposition that Pollux was expelled from school. Similarly, it predicts that *she* refers to Shelly and that (2) expresses the false proposition that Shelly is a philosopher. Perhaps this is not such a bad result. There is arguably a sense in which something has been communicated about Pollux and Shelly.

However, we still have some concerns. If we are interested in what is communicated by Castor's utterance of (1), the proposition that Pollux was expelled from school is important, but as far as truth and reference are concerned, there is a clear sense in which it is the proposition that Castor was expelled from school that is relevant.

For instance, in so far as one wants to talk about the truth-values of sentences in contexts, it looks like (1) is false and (2) is true in their respective contexts. One might propose that a sentence *S* is true in a context *c* if and only if *S* expresses a true proposition in *c*. However, this suggestion incorrectly predicts that both (1) and (2) are true. Similarly, if a sentence *S* is false in a context *c* if and only if *S* expresses a false proposition in *c*, the result is that both (1) and (2) are false, which is

equally unsatisfactory. Either way, we get the wrong results, and the proposal fails to predict the right truth-values.

Regardless, we take the multiple referents strategy to be a relatively promising response on behalf of Information Centrism. We are not opposed to the idea that multiple propositions are in play in the cases under discussion. However, we think it fails to vindicate Information Centrism.¹²

4.3 Indexical and Demonstrative Belief

The problem with characterizing the Informational Context in terms of Shared Belief is that sometimes the wrong propositions are Shared Belief. In light of this, one suggestion is that only a subset of the beliefs are relevant, namely the *indexical* or *demonstrative* beliefs. Here is one way of articulating this idea:

- (9) An occurrence of *I* in a context *c* refers to an individual *x* if and only if *x* is the speaker in every world compatible with the indexical and demonstrative beliefs of the conversational participants in *c*.

¹² Something like Kripke's [1979] distinction between speaker's reference and semantic reference might provide a better description of the cases. For instance, in the case of Castor and Pollux, Castor may be the semantic referent while Pollux is the speaker's referent. However, there is still a question of how Castor, and not Pollux, gets to be the semantic referent. We take our other arguments to show that this cannot be determined by the Informational Context.

(10) An occurrence of *she* in a context *c* refers to an individual *x* if and only if *x* is the demonstrated female in every world compatible with the indexical and demonstrative beliefs of the conversational participants in *c*.

In both of our cases, the right beliefs seem to have an indexical or demonstrative element. For instance, in so far as the participants believe that Castor is the speaker, their belief has an indexical or demonstrative element. The participants listening to Castor speak are likely to think of him as *that* person. Their beliefs about Pollux do not seem to have such indexical or demonstrative features. The same goes for the case of Norma and Shelly.

Consequently, given (9) and (10), we get the right results. In the case of Castor and Pollux, (9) predicts that *I* in (1) refers to Castor, and hence that (1) expresses the false proposition that Castor was expelled from school. In the case of Norma and Shelly, (10) predicts that *she* in (2) refers to Norma and that (2) expresses the true proposition that Norma is a philosopher. We also avoid the problematic results from the previous section. We neither predict that *I* in (1) refers to Pollux, nor that *she* in (2) refers to Shelly.

However, we have two main worries with the proposal. First, the proposal is hard to reconcile with Information Centrism. According to Information Centrism, the Informational Context is the only notion of

context we need. In order to deal with problems involving truth and reference, it may be tempting to characterize the Informational Context in terms of the indexical and demonstrative beliefs of the participants. But we also want to make sense of communication. A lot of communication involves matters that the participants do not have indexical or demonstrative beliefs about. If we want to keep track of how speech acts change the Informational Context, the indexical and demonstrative beliefs cannot be all that is relevant. The upshot is that if a single body of information is supposed to do all the work we want it to do, it cannot be characterized in terms of indexical and demonstrative beliefs.¹³

Second, the proposal does not avoid all the problems involving truth and reference. Demonstrative beliefs can be false, and in some cases this can lead to the original problem recurring. To illustrate, consider a modified version of an example given by Perry [2001: 63]:

Buddy and Rocky

Donna and Laura are observing the head of a dog emerging from one side of a pillar and the tail of a dog emerging from the other side. Donna and Laura, neither of whom are experts when it comes to identifying dogs, both believe what they are seeing to be just one

¹³ An anonymous referee suggested that the problem can be solved by letting demonstrative or indexical beliefs trump other beliefs when it comes to determining reference. We think this is an interesting suggestion, but there are still problems concerning false demonstrative or indexical beliefs.

dog. In fact, what they are seeing is the head of Buddy, a German Shepherd, and the tail of Rocky, a Collie. Donna gestures towards Buddy's head, and says,

(11) That dog is a German Shepherd.

In this context, we want to say that *that* dog refers to Buddy and that (11) expresses the true proposition that Buddy is a German Shepherd.

It is not obvious that it is possible to get this result by focusing on the demonstrative beliefs of the participants. While it seems right to say that Donna and Laura believe that Buddy is the demonstrated dog, there is an equally strong sense in which they believe that Rocky is the demonstrated dog. As long as they believe that there is only one dog behind the pillar, if someone were to use a sentence like (12) while gesturing towards Rocky's tail, it makes good sense for Donna and Laura to assent to that use of the sentence.

(12) That is the dog Donna was just pointing to.¹⁴

¹⁴ If one thinks that speaker intentions or what the speaker has in mind is what is relevant to demonstrative reference, the example can be changed accordingly. For instance, we can just as easily consider an utterance of the sentence 'That is the dog Donna had in mind before'.

Similarly, they think of both Buddy and Rocky as *that dog*. Hence, there is a clear sense in which their beliefs about Buddy and Rocky involve a demonstrative element. For instance, they might express their belief that there is only one dog behind the column by means of (13).

(13) That dog is that dog.

In this sense, both their beliefs about Buddy and their beliefs about Rocky seem to be demonstrative beliefs.

That means that even if we are only focusing on the demonstrative beliefs of the participants, both the proposition that Buddy is the demonstrated dog and the proposition that Rocky is the demonstrated dog will be relevant to determining reference. But then the old problems return. It will be difficult to ensure that *that dog* refers to Buddy and that (11) expresses the true proposition that Buddy is a German Shepherd without compromising Information Centrism.

4.4 *Shared Knowledge*

The next suggestion we want to consider is that, to make the right predictions on our cases, we should focus on a factive attitude like *knowledge* instead of a non-factive attitude like belief. We can distinguish between what we will call the *Shared Knowledge* of the participants and the *Knowledge Set* of the context:

Shared Knowledge

A proposition is Shared Knowledge if and only if it is known by every conversational participant.

Knowledge Set

The Knowledge Set is the set of possible worlds that are compatible with the Shared Knowledge of the conversational participants.

Given this, one proposal for determining reference is the following:

(14) An occurrence of *I* in a context *c* refers to an individual *x* if and only if (i) the Knowledge Set of *c* is non-empty and (ii) *x* is the speaker in every world of the Knowledge Set of *c*.

(15) An occurrence of *she* in a context *c* refers to an individual *x* if and only if (i) the Knowledge Set of *c* is non-empty and (ii) *x* is the demonstrated female in every world of the Knowledge Set of *c*.

The advantage of considering knowledge, instead of belief, is that only true propositions can be known. The proposition that Pollux is the speaker is false and therefore cannot be Shared Knowledge. The same goes for the false proposition that Shelly is the demonstrated female. Hence, this

proposal has the advantage of not predicting that Pollux and Shelly, respectively, are referred to in our examples.

But in order to make the right predictions about truth and reference, more is required. The true proposition that Castor is the speaker and the true proposition that Norma is the demonstrated female must be known. This knowledge must come fairly cheap. For instance, knowing that Castor is the speaker must be compatible with falsely believing that Pollux is the speaker. That already looks like a substantive epistemological assumption.

There is also the worry that characterizing the Informational Context in terms of knowledge, instead of belief or acceptance, makes it difficult for the Informational Context to do the work it was originally intended to do. Speakers regularly succeed in communicating falsehoods and communication can proceed smoothly against a background of false beliefs and presuppositions.¹⁵ If we want to keep track of how the shared information evolves as the discourse proceeds, we cannot just consider Shared Knowledge.

4.5 Radicalism and Modesty

A final reaction to consider is to argue that the proponent of Information Centricism does not have to be interested in theorizing about truth and

¹⁵ See, e.g., Stalnaker [2002: 716].

reference, but only in how the Informational Context changes through discourse.

One worry with this route is that it presupposes that it is possible to theorize about communication in isolation from truth and reference. It is natural to think that it is because speakers are interested in communication that they make an effort to speak the truth.¹⁶

Furthermore, we see no reason why facts about truth and reference should be ignored by a theory of context-sensitive languages. It might be argued that we are systematically mistaken about these facts, or that there are no such facts. In either case, this seems to be a problematic stance. If one wants to adopt such a radical response, we would want to see some independent evidence that there are no facts about truth and reference to, or that we are systematically mistaken about them.

More modestly, one can accept a legitimate project of modelling linguistic communication without theorizing about truth and reference. One might maintain that, even though there is a legitimate project of theorizing about facts about truth and reference, this project should be carried out in a different area of theorizing. However, this is not a way of vindicating Information Centrism. In so far as some other notion of context is needed to theorize about truth and reference for context-

¹⁶ There are further issues here. It might be suggested that, since speakers make an effort to speak the truth, we should be interested in theorizing about what speakers take to be true and what they take to be referred to. Thanks to two anonymous referees for helpful discussion.

sensitive languages, this amounts to giving up IC2. We have no problems with this position.

5. The Nature of Contexts

We started out by sketching two ways of thinking about contexts. The first looks to the facts about the utterance situation. The second looks to information shared by the conversational participants. We have argued that the latter is insufficient for making correct predictions about truth and reference. This suggests that something like the facts about the utterance situation also have a role to play.

However, we are not denying that shared information is relevant when studying communication. We may therefore have to find room for both facts and shared information. Along these lines, one option is to say that different kinds of contexts do different kinds of work. Another possibility is to treat contexts as collections of parameters that include a body of information, alongside the usual parameters.

There are no doubt other ways of thinking about contexts and the relationship between the facts about the utterance situation and the shared information of the conversational participants. What we want to note is that there are ways of thinking about contexts that allow us to recognize the role played by shared information in communication while at the same time avoiding a commitment to Information Centricism.

6. Conclusion

We can see no way of characterizing the Informational Context such that it can do all the work contexts need to do in a theorizing about context-sensitive languages. In particular, we have seen that there are problems when it comes to making predictions about truth and reference in cases involving indexicals and demonstratives. This leads us to the conclusion that Information Centrism is false. This also suggests that, in order to make the right predictions about truth and reference, one should make room for facts about the utterance situation. But since the Informational Context has a central role to play in theorizing about communication, it looks like a complete theory of contexts may need to find room for both facts and shared information.¹⁷

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¹⁷ Earlier versions of this paper were presented at the CSMN Work in Progress Seminar (Oslo, 22nd of October 2013) and the Arché PIT Seminar (St Andrews, 4th of July 2013). We are grateful to audiences on those occasions. Thanks also to Derek Ball, Dilip Ninan, Jessica Pepp, Anders Schoubye, Timothy Williamson, and two anonymous referees for helpful comments and discussion.

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