Features of Referential Pronouns
and Indexical Presuppositions[*]

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Abstract

This paper demonstrates that the presuppositions triggered by the 1st and 2nd persons behave differently in important ways from those triggered by the 3rd person and the genders. While the 1st and 2nd persons trigger indexical presuppositions, the 3rd person and the genders do not. I show that the presuppositions triggered by the 1st and 2nd persons are not susceptible to presupposition failure of the kind familiar from ordinary presuppositions. Such failures occur for the 3rd person and the genders. Moreover, the presuppositions triggered by the 1st and 2nd persons do not exhibit the projection behavior of ordinary presuppositions. The 3rd person and the genders do. I sketch a semantics in which the relevant difference is between presuppositions that impose constraints on functions from contexts to intensions (characters) and presuppositions that impose constraints on intensions.

1   Introduction

The primary function of a referential pronoun is to refer to an entity, or a plurality, in the world. But pronouns also encode information about their referents. Most strik-

ingly, pronouns encode person, gender, and number information. These categories (and perhaps others) make up the so-called *phi-features* of pronouns.[1]

This paper concerns the question, what is the semantic and pragmatic role, or roles, of the phi-features? There is a commonsense, pre-theoretical answer to this question. Namely, the features of pronouns help hearers figure out what the speaker intended to refer to. An utterance of (1a) prompts hearers to look for a referent that is 3rd person, female, and singular. (1b) prompts hearer to look for a referent that is 1st person and singular (typically the speaker herself), and so on for other referential uses of pronouns.

(1)   a. She teaches karate.
        b. I teach karate.

As a way of theorizing about this and other roles played by features in interpretation, a long tradition from Cooper (1983), later developed by, among others, von Stechow (2003), Schlenker (2003), Heim (2008), Sauerland (2004), (2008b), Yanovich (2010), Sudo (2012), Del Prete and Zucchi (2017), have seen the features of pronouns as triggering semantic presuppositions, that is, constraints on truth-values.

The presuppositions triggered by features of pronouns differ in important ways. As originally proposed by Cooper (1983) and subsequently defended by Yanovich (2010), some features trigger a certan kind of *indexical presuppositions*. In particular, Cooper and Yanovich argue that gender features trigger presuppositions that must be satisfied in the actual world (the world of the context). Similarly, Heim (2008) takes person features to be indexical in that they are defined in terms of roles in the context of utterance, modeled as parameters of Kaplanian contexts.

My first aim in this paper is to show that the presuppositions triggered by the 1st and 2nd persons behave differently in important ways from those triggered by the 3rd person and the genders. While the 1st and 2nd persons exhibit the pattern we should expect of indexical presuppositions, the 3rd person and the genders do not. First, the presuppositions triggered by the 1st and 2nd persons are not susceptible to presupposition failure of the kind familiar from ordinary presuppositions. Such failures occur for the 3rd person and the genders. Second, the presuppositions triggered by the 1st and 2nd persons do not exhibit the projection behavior of ordinary presuppositions. The 3rd person and the genders do.

My second aim is to show that these observations can be accounted for by revising the idea of an indexical presupposition. In particular, I suggest that the difference is not between presuppositions defined in terms of Kaplanian parameters and those that are not. I sketch a semantics in which the relevant difference is between

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[1]For an overview of linguistic theory on phi-features including cross-linguistic work, see Adger and Harbour (2008).

presuppositions that impose constraints on the domain of characters (functions from contexts to intensions) and presuppositions that impose constraints on the domain of intensions. The former constitute conditions on contexts, regulating whether an intension is assigned at a context or not. The latter constitute conditions on worlds, regulating whether a truth-value is assigned at a world or not.

2   Features as Presupposition Triggers

The approach to features as presupposition triggers is situated within the family of theories according to which pronouns are variables under an assignment.[2] In turn, the features are seen as contributing constraints on the range of possible assignments of values to the variable component of the relevant pronouns. Correspondingly, a central part of the evidence for this approach to the pronouns comes from the observation that all pronouns have bound-variable uses, and much of the literature has been concerned with theorizing about such uses.[3] Less work has been devoted to examining presuppositional views of the features for referential uses of pronouns. Here I focus exclusively on these. In this section I first give a rudimentary summary of the theory in Heim (2005), (2008). I then briefly review two key motivations for the view.

2.1   The Basic Theory

Consider a referential occurrence of *she$_i$*, the singular, feminine, 3rd person pronoun, bearing the numerical index i. We assume that such an occurrence is realized at LF along the lines of the structure below:

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           DP
          /  \
       3rd    \
              sg  \
                 fem   i
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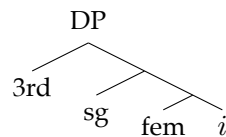
To give a basic semantic treatment of pronouns, we assume, as usual, that $[\![\ ]\!]^{g,c}$ is a function that assigns denotations relative to a context c and an assignment g. The latter assigns values to variables in the standard way, as in (2).

(2) $[\![i]\!]^{g,c} = g(i)$

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[2]The idea that pronouns are variables has a long history that includes Quine (1960), Geach (1962), Partee (1970), Evans (1985 [1977]a), (1985 [1977]b), Kaplan (1989a).

[3]See e.g. von Stechow (2003), Heim (2008), Sudo (2012). See Del Prete and Zucchi (2017) for specific discussion of indexical presuppositions of bound pronouns.

Contexts are modeled following Kaplan (1989b) as tuples of parameters representing facts about the utterance context, with the addition of a parameter for the hearer. So a context c is a tuple $\langle s_c, h_c, t_c, l_c, w_c \rangle$ of a speaker s_c, a hearer h_c, a time t_c, a location l_c, and a world w_c.

Semantically, the features are taken to denote partial identity functions, which serve to constrain the range of values that can be contributed to the composition of the clause in which the pronoun occurs. A simple set of clauses for the 3rd, singular, and fem features are as follows:

(3) a. $[\![\text{fem}]\!]^{g,c} = \lambda x : x$ is female. x
     b. $[\![\text{sg}]\!]^{g,c} = \lambda x : x$ is an individual. x
     c. $[\![\text{3rd}]\!]^{g,c} = \lambda x : x$ includes neither s_c nor h_c. x

Given this, we derive (4) as the denotation of she_i.

(4) $[\![she_i]\!]^{g,c} = [\lambda x : x$ is a female individual distinct from s_c and h_c. $x]\,(g(i))$

Along the same lines, we give analogous treatments of the rest of the features. Here is a set of basic ideas for these:

(5) a. $[\![\text{1st}]\!]^{g,c} = \lambda x : x$ includes s_c. x
     b. $[\![\text{2nd}]\!]^{g,c} = \lambda x : x$ includes h_c. x
     c. $[\![\text{masc}]\!]^{g,c} = \lambda x : x$ is male. x
     d. $[\![\text{pl}]\!]^{g,c} = \lambda x : x$ is a plurality. x

The number features interact with the persons in that, for instance, if x is an individual (as demanded by sg) that includes s_c, x is identical to s_c and so on for the other persons. (In what follows, I will mostly ignore number features.)

There are two main motivations behind this approach to the features of pronouns. The first is that feature violations typically induce reference failure. The second is that feature information projects. We will examine both of these in detail in the next two sections. Below, I briefly review the main ideas behind them.

2.2   Reference Determination and Projection

As seen from the above, a consequence of this semantics is that if the object assigned to an occurrence of *she* is not female, a clause in which it occurs referentially is undefined, that is it lacks a truth-value. Similarly for the other features. Hence, for example, the utterances in (6) will be instances of reference failure and hence will be neither true nor false.

(6) a. *Demonstrating Jack*: #She teaches karate.
     b. *Demonstrating the addressee*: #I teach karate.

This corresponds to the classic view that presupposition failure results in lack of truth value, rather than falsity.

The second kind of motivation for seing the features as presupposition triggers was the observation, originally made by Cooper (1983), that feature information projects. Standard presuppositions usually project globally, that is, they survive embedding in ordinary entailment-canceling environments. Where A_B is a sentence that asserts that A and presupposes that B, ordinary presuppositions usually project globally in all of the constructions in (7).

(7)   a. Not-A_B
       b. Might A_B
       c. If A_B, then q
       d. Either A_B or q
       e. A_B?

For example, all of (8a–e) usually convey that Jack has not always been a Mac user.

(8)   a. Jack hasn't started using Mac.
       b. Jack might have started using Mac.
       c. If Jack has started using Mac, his work must be going better.
       d. Either Jack has started using Mac or he still can't log on.
       e. Has Jack started using Mac?

Person, gender, and number information usually projects globally in all of the constructions in (7). It will be too cumbersome to go through all the instances of this. (9a–c) will have to serve as representative cases. (We will look at more examples later.)

(9)   a. Does she teach karate?
       b. They might teach karate.
       c. You don't teach karate.

(9a) conveys that the intended referent of the pronoun is a singular, female individual, distinct from speaker and hearer. And so on for the other embedding cases in (9).

As seen from the above, the view that features trigger presuppositions is well motivated. However, as we will see in the next two sections, there are important differences in the behavior of the information contributed by different features.

3 Reference and Feature Information

3.1 Reference and Gender Features

If the presuppositional theory of the genders outlined above is right, violations of gender information induces reference failure and consequently lack of truth value. However, as has been noted by Stokke (2010) and Sudo (2012), it is not obvious that we should agree with this consequence of the view. Consider the following example:

(10)   David. *Demonstrating a baby*: She looks just like you!
        Barbara. That's true, he does... It's a boy, you know. (Heim, 2015)[4]

(10) seems to show that even if the intended referent does not satisfy the feminine gender feature, this does not result in reference failure.

Is this evidence that gender features are not presupposition triggers after all? There are reasons to resist this conclusion. For one thing, there is now a wide consensus that judgments about truth values are not a good guide to the difference between truth, falsity, and truth value gaps.[5] But moreover, we can give an explanation for the difference between (10) and the other cases of presupposition failure. Namely, in (10) the hearer is able to identify the intended referent of the pronoun, the baby, and that is why they are able to judge the truth value of the utterance. At the same time, tellingly, there is clearly a feeling of "squeamishness," as Strawson (1964) famously labeled the sense in which, in cases of presupposition failure, the speaker has made a wrong assumption, and some form of repair is needed. Hence, the naturalness of the follow up, "It's a boy, you know," in (10).

We should conclude that, in cases where gender information is violated, if the audience can identify the intended referent, they can judge the sentence true or false by assigning the intended referent. At the same time, this will be accompanied by a sense that something has gone wrong, and a repair is perhaps needed. This is compatible with a presuppositional view of the genders, since there is a plausible explanation for the difference from other kinds of presupposition failure.

3.2 Reference and Person Features

Stokke (2010) and Sudo (2012) further point out that the persons appear to differ from the genders with respect to what we have just noted. In particular, they argue that if the persons are presupposition triggers, there should be analogous cases to (10). Yet there seems to be no analogous cases. This can be illustrated by the following example:

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[4]Cf. Stokke (2010, 100), Sudo (2012, 23).
[5]This has been forcefully argued by Soames (1976), von Fintel (2004), Yablo (2006), Schoubye (2009).

(11) [Context: David and Barbara are looking at a shop window. On the other side of the glass there is a man, Saul, who looks just like him and David therefore mistakes the window for a mirror. Suddenly, he notices that the man's pants are on fire.]
David. My pants are on fire!
Barbara. #That's true, they are... But they're not YOUR pants./No they're not. That's not YOU! (Stokke, 2010)

This case illustrates the often noted sense in which the 1st person seems to invariably refer to the speaker. Here is another example:

(12) [Context: André has gone mad and thinks he is Napoleon.]
André. I won the Battle of Austerlitz!
Lauren. #That's true, you did... But you're not Napoleon./No you didn't. You're not Napoleon! (Stokke, 2010)[6]

Clearly, in this case *I* refers to André, not to Napoleon, and what is said is false.

Although most literature has focused on the 1st person, the same observation can be made about the 2nd person, as illustrated by this example:

(13) [Context: Saul and David are sitting on a sofa. In front of the sofa is a glass wall. Opposite is another sofa. The sofas look exactly the same and two men dressed like David and Saul are sitting in the seats opposite to them. So, from where David and Saul are sitting, the glass wall looks like mirror. Suddenly, David realizes that the pants of the person sitting opposite Saul are on fire.]
David. Your pants are on fire!
Saul. #That's true, they are... But they're not MY pants./No they're not. That's not ME! (Stokke, 2010)[7]

In (13) *your* refers to Saul, the *de facto* addressee, despite the speaker's mistake concerning his identity. Stokke's (2010) and Sudo's (2012) verdict on these cases was that, even though the intended referent violates the 1st or 2nd person, the audience assign the referent that does satisfy those features, that is the speaker or addressee. And furthermore, the truth value of the utterance is judged on that basis, with no attendant squeamishness.

If this is right, it raises a concern about treating the persons in the same way as the genders. If occurrences of *I*, *my*, *you*, *your* etc. are variables associated with presuppositional person features, just as an occurrence of *she* presupposes that its referent is female, we should expect that they can refer to someone other than the speaker

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[6]Adapted from Barwise and Perry (1983, 148). Cf. Sudo (2012, 143).
[7]Cf. Sudo (2012, 98).

or addressee in cases of presupposition failure, with accompanying squeamishness. So the fact that such cases are not found may suggest that the 1st and 2nd persons are not presupposition triggers after all.

However, there is an available explanation for the examples above that is consistent with preserving a presuppositional view of the 1st and 2nd persons. We should reject the conclusion that, in these cases, the intended referent violates the 1st or 2nd person features. That is, we should resist the conclusion that the intended referent is someone other than the speaker or addressee in these examples.

Take (11). There is clearly a natural sense in which David intends to refer to himself in this case.[8] In particular, since David mistakenly thinks he is the man he sees reflected in the glass, he is correctly described as intending to refer to himself. Moreover, in the scenario as we have imagined it, the hearer recognizes this mistake. Hence, it is natural to say that the reason the hearer assigns the speaker as the referent of *my* in (11) is that the referent she recognizes as the intended one (namely, the speaker himself) satisfies the 1st person feature of the pronoun.

Analogous considerations apply to the other examples above. For instance, in (13) David is correctly described as intending to refer to his addressee, Saul. At the same, he is mistaken about Saul being the man he sees in the glass. But this is consistent with the observation that the intended referent satisfies the 2nd person. Moreover, the hearer recognizes this. So the intended referent, Saul, is assigned as the referent, with no sense of presupposition failure, and the truth value of the utterance is judged accordingly.

This suggests that we can uphold the following rule:

(14)   A referential occurrence i of a pronoun PRO refers to x only if (i) the speaker intended to refer to x with i and (ii) x satisfies the features of PRO.

At the same time, as suggested by (10), if the audience can see that the intended referent does not satisfy the features, they can repair the resulting presupposition failure by assigning the intended referent anyway. This will typically be accompanied by Strawsonian squeamishness.

(14) is satisfied in (11)–(13) because the intended referent (the speaker or addressee) satisfies the relevant person feature. Hence, there is no presupposition failure. (14) is not satisfied in (10) because the intended referent (the baby boy) does not satisfy the feminine feature. But because the audience can see who the speaker intended to refer to, they can squeamishly judge the truth value of the utterance based on this recognition.

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[8]See Heim (2008), (2015) for a similar argument. This thought was also mentioned to me by Robin Cooper (p.c.). A similar view of intentions in relation to demonstratives has been suggested by Bach (1992).

3.3 Presupposition Failures and the Persons

If this is right, the question remains whether there are cases with 1st or 2nd person pronouns parallel to (10). That is, whether there are cases in which the audience recognize that the intended referent does not satisfy the person feature and therefore proceed by repairing the resulting presupposition failure and squeamishly judging the truth value.

We might expect cases of this kind to be supplied by the extensive literature on deferred, or recorded, utterances.[9] However, the kind of examples discussed there are arguably not of this kind either. Consider the following:[10]

(15)   [Context: Bill, sitting in his office, writes the following on a post-it note. He then sticks it on the door to the office of his colleague, Joe, in order to inform people of Joe's absence.]
I'm out of office today.

In this case *I* is clearly taken to refer to Joe. In particular, this judgment persists, even if one imagines that the audience know that Bill wrote the note. We can imagine that another colleague, Susan, sees Bill write the note and put it on Joe's door. If she knows that Bill is mistaken and Joe is in fact in the office, she can felicitous say, "That's not true. He's in there right now!"

In this kind of case the speaker intends to refer to someone other than herself with the 1st person. This contrasts with the examples above in which, even though the speaker is mistaken about who she is, it is still clear that the intended referent is herself. So (15), and similar cases, might be taken to show that, just as in (10), if the intended referent fails to satisfy the 1st person, the audience can nevertheless repair.

Yet this is arguably not the right reaction. In particular, there is no sense of presupposition failure in (15). There is no sense in which the speaker has made a wrong assumption and a repair is needed. You cannot follow up (15) with, for example, "That's true, Joe is away today... But you're not Joe," or something similar.

Giving a satisfactory answer to how we should explain the reference of *I* in cases like (15) is beyond the scope of this paper. A promising suggestion is that, as has been argued by Recanati (2010, ch. 6), these examples be explained in terms of pretense. The speaker in (15) pretends to be Joe in a way similar to an actor on stage, or the like. If so, it is not surprising that there is no sense of presupposition failure in this kind of situation. Someone acting on stage can use *I* to refer to the character she is enacting. Yet there is no sense in which this is parallel to cases like (10).

Whatever the right explanation of cases like (15), some theorists have nevertheless proposed that cases of presupposition failure for the 1st person can be found in

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[9]See Cohen and Michaelson (2013) for an overview.
[10]Adapted from Corazza, Fish, and Gorvett (2002).

situations resembling that of (12). Consider, for instance, the following variation on (12) from Charnavel (2019):

(16) [Context: André has gone mad and thinks he is Napoleon. He is watching a documentary about Napoleon on TV and when Napoleon appears on the screen, he points at him and claims:]
I won the Battle of Austerlitz! (Charnavel, 2019)

Charnavel thinks that the intended referent in (16) is Napoleon and therefore this is a case of presupposition failure for the 1st person:

> In this context, just as in [(12)], André wrongly attributes to himself the property of being Napoleon. But this time, he does not point at himself, but at the representation of Napoleon on the TV screen. The individual that the audience can recognize as the intended referent is therefore not André, but Napoleon. [...] Crucially, the sentence is accordingly judged to be true in this case, but is associated with a feeling of squeamishness, which is consistent with the presuppositional account of person features. (Charnavel, 2019, 377)

I take it that most will disagree with this judgment. Most will think that what André said in (16) is false. In particular, I take it that most will not be willing to accept that, even though he is clearly mistaken, what André said is true. Rather, it is natural to think that André's mistake led him to say something false in this case, namely that he won the battle of Austerlitz. Again, one way of bringing this out is to consider follow-ups. Compare the following continuations of (10) and (16):

(17) [Context: as in (10)]
She looks just like you!
Yes, but it's a boy.

(18) [Context: as in (16)]
I won the battle of Austerlitz.
#Yes, but you're not Napoleon.

We can explain this case in the same way as before. Namely, even though André is mistaken about his identity, he nevertheless intends to refer to himself with *I* in (16). To be sure, we can agree with Charnavel that there is a sense in which the intended referent is Napoleon. However, since André thinks he is Napoleon, it is clear that André intends to refer to himself. This explains the judgment that (16) is false.

Here is a similar example:[11]

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[11]I owe this to an anonymous reviewer.

(19)   [Context: The speaker and hearer are looking at an old picture of the speaker's identical twin. The speaker mistakingly thinks that it's her own picture, and tells the hearer:]
Look, I'm wearing Granpa's jacket in this picture.

Again, I take it that most will think that what is said is false in this case and correspondingly take the pronoun to refer to the speaker. This can be seen from considering the analogous follow-up to (18):

(20)   [Context: as in (19)]
Look, I'm wearing Granpa's jacket in this picture.
#Yes, but that's your sister.

As for (16), this contrast with (17). Moreover, as in the other cases, there is a clear sense in which the speaker intended to refer to herself in (19).

As this suggests, there are reasons to think that there are no cases of presupposition failure for the 1st and 2nd persons. Cases of presupposition failure arise when the speaker mistakenly believes that the intended referent satisfies the features. So, a case of presupposition failure for the 1st person is a case in which the speaker mistakenly believes that the intended referent is the speaker. However, any such case is a case in which the speaker can be said to intend to refer to herself. If you think you are Bill, and you use *I* to say something that you think is true of Bill, there is clearly a sense in which you are using *I* to say something that you think is true of yourself. Similarly, if you think your addressee is Joe, and you use *you* to say something you think is true of Joe, there is clearly a sense in which you are using *you* to say something you think is true of your addressee.

A further difference between the 1st and the 2nd person is that, while one can mistakenly think one has an addressee, one cannot say anything without there being a speaker, namely oneself.[12] There can be reference failure for the 2nd person. If you think there is a person in front of you, but it is really just a statue that you see through a gloomy fog, *you* will fail to refer. But note that such cases are not cases of presupposition failure for the 2nd person feature. That is, they are not cases in which there is an addressee who fails to satisfy the 2nd person. Still, there are no cases of reference-failure for the 1st person. When using a 1st person pronoun, I can be mistaken in thinking that I am the one speaking, just as I can be mistaken that I am the one whose pants are on fire. But even in such a case, I am there as a potential referent, and moreover I am clearly (at least in one sense) the very person I intended to refer to.

Finally, what about the 3rd person? As suggested earlier, the 3rd person differs from the 1st and 2nd persons in that it is easy to find cases of presupposition fail-

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[12]Kaplan (1989b, 540) famously suggested a similar point about the 1st person.

ure for the 3rd person. Consider a version of the canonical ancestor of the above examples:[13]

(21) [David and Barbara are looking at a shop window. David sees himself reflected in the glass, but thinks it is someone else. Suddenly he realizes that the person's pants are on fire.]
David. His pants are on fire!
Barbara. That's true, they are... But that's YOU!

This case strongly suggests that the 3rd person behaves similarly to the feminine gender feature. In particular, the audience can assign the speaker as the referent of the 3rd person if they recognize that this person is the intended referent, even though the speaker does not realize that it is herself she intends to refer to. Tellingly, repair is needed, signalling presupposition failure. Here is a similar example:

(22) *Looking at someone in a mirror while being unsure who it is:* He looks like me ... Mhm, he must be me, in fact he *is* me! (Schlenker, 2003, 85)

Again, the 3rd person does not seem to presuppose that its referent is not the speaker.

4 Projection

4.1 Projection and Gender Information

Cooper (1983) and Yanovich (2010) claim that gender information differs from standard presuppositional information with respect to its projection behavior. Cooper's observation was that, in all of (23a–c) the gender information projects out from under the attitude verbs:

(23) a. Bill said that she talked.
b. Bill hopes that she talked.
c. Bill regrets that she talked. (Cooper, 1983)

Cooper (1983, 180) took it that all of these sentences require that (the speaker thinks that) the referent of *she* is female, and do not require that Bill thinks so. Further, Cooper argued that this behavior differs from ordinary presuppositions in that the latter sometimes disappear under attitudes. Take Yanovich's comparison set in (24a–c).

(24) a. Bill said that Mary's wife works for Google.
b. Bill hopes that Mary's wife works for Google.
c. Bill regrets that Mary's wife works for Google. (Yanovich, 2010)

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[13]Adapted from Kaplan (1989b, 537, fn. 64). Cf. Stokke (2010, 97).

Yanovich agrees with Copper that (23) and (24) contrast in that the latter allow local accommodation but the former do not:

> [(24a)] does not inherit the presupposition of existence, because Bill's words might have been wrong or misleading; [(24b)] does not presuppose that Mary's wife exists either, but presupposes that Bill believes so; and [(24c)] does presuppose that Mary has a wife because of the factive properties of regret. But in all examples in [(23)], the whole sentence inherits the presupposition that the referent of she is female [...]. (Yanovich, 2010, 274)

This picture of the projection behavior of gender information can be seen to be inadequate, however. In fact, gender information projects like standard presuppositional information. In particular, while gender information usually projects globally, gender information can be locally accommodated in some cases.

First, as shown by (24), presuppositions triggered in the scope of attitudes can be locally accommodated. These are the readings Yanovich describes, on which the sentences as a whole do not inherit the existence presupposition. This phenomenon is well known and is also found for many other presupposition triggers, as in (25).[14]

(25) [Context: The speaker and hearer both know that Ann has always been a smoker but that she has been keeping this a secret from Bill.]
      We went to a party yesterday, and we saw Ann holding a cigarette. And Bill thought Ann had started smoking!

(25) does not convey that Ann has not always been a smoker, but merely that Bill thought so. Similar cases can be found for the genders:

(26) $Bill_1$ thinks $John_2$ is a woman. And what's more, he_1 thinks she_2's sweet on him_1!

The occurrence of *she* in (26) does not convey that (the speaker thinks that) John is female, but merely that Bill thinks that John is female.

Second, cases of local accommodation are found for indicative conditionals of the following form:

(27) If B, A_B.

As is often observed, standard presuppositions are locally accommodated in this kind of case, as in seen from (28).[15]

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[14]See Heim (1992).

[15]This was noted by Karttunen (1973), Soames (1979).

(28) a. If someone mowed the lawn, it was Jane who mowed the lawn. (Since
      Jane is the only one who would do it.)
      b. If Jack hasn't always been a Mac user, he's started using Mac now. (Since I
      just saw Jack using a Mac.)

In each case the presupposition triggered in the consequent is locally accommo-
dated, in that it is not a presupposition of the conditional as a whole. (28a) does not
presuppose that someone mowed the lawn. (28b) does not presuppose that Jack has
not always been a Mac user.

Geurts (1999, ch. 2) notes that gender information can be locally accommodated
in conditionals of this kind. He gives the following example:

(29) a. Barney: What a nice guy.
      b. Fred: Whaddayamean, 'a nice guy'? Leslie is a woman!
      c. Barney: If Leslie is a woman, she sure has developed her masculine side.
      (Geurts, 1999)

As Geurts says, (29c) can be read "as a genuinely hypothetical claim, in which case
Fred has not (yet) managed to convince his friend." (Geurts, 1999, 68) On that read-
ing the information that Leslie is a woman is locally accommodated.

4.2   Projection and Person Information

We have seen that, despite Cooper's and Yanovich's claims, gender information can
be locally accommodated, even though it usually projects globally. This is strong
evidence that the genders are standard presupposition triggers. By contrast, 1st and
2nd person information can be seen to exhibit the projection behavior that Cooper
and Yanovich claim for the genders. That is, 1st and 2nd person information projects
globally, and moreover cannot be locally accommodated.

First, there is no way of locally accommodating the 1st or 2nd person under
attitudes, as seen from these examples:[16]

(30) a. #$Bill_1$ thinks $John_2$ is talking, and he_1 thinks I_2'm boring everyone.
      b. #$Bill_1$ thinks he_1's talking to $Jane_2$, and he_1 thinks you_2're a good listener.

Second, the same prohibition applies to indicative conditionals of the kind we looked
at above:

(31) a. #If $John_1$ is the one talking, I_1'm eloquent.
      b. #If $Bill_1$ is talking to $Jane_2$, you_2're boring him_1.

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[16]This observation is related to Kaplan's (1989, 510) familiar claim that indexicals "always take pri-
mary scope."

This fact about the 1st and 2nd persons, although not surprising, is enough to show that these person features are not ordinary presupposition triggers.

The 3rd person differs from the 1st and 2nd persons in allowing local accommodation under attitudes:

(32)   a. David doesn't realize that the woman he saw at the library yesterday was me, and now he says he's going to call her.
b. David doesn't realize that the woman he saw at the library yesterday was me, and now he wants to call her.
c David doesn't realize that the woman he saw at the library yesterday was you, and now he says he's going to call her.
d. David doesn't realize that the woman he saw at the library yesterday was you, and now he wants to call her.

In all these cases, the feminine pronoun in the second conjunct does not presuppose that its referent is distinct from the speaker or hearer, but rather that David thinks so. Similarly, the presupposition of the 3rd person is locally accommodated in conditionals of the form in (27):

(33)   a. If the woman David has been talking about is me, I sure hope he doesn't want to call her.
b. If the woman David has been talking about is you, you can only hope he doesn't wants to call her.

As before, the occurrences of *her* in the consequents of these conditionals do not presuppose that their referents are distinct from the speaker and hearer.

5   Indexical and Non-Indexical Presuppositions

Here is a table summarizing what we have found in comparing the persons and genders to standard triggers (represented here by *start*):

	1st	2nd	3rd	fem	*start*
global projection	yes	yes	yes	yes	yes
ps-failures	no	no	yes	yes	yes
local accommodation	no	no	yes	yes	yes

In other words, the only similarity across the board is that, like the standard triggers, all these features give rise to global projection. Apart from that, the 1st and 2nd persons align in all the other dimensions of comparison and differ from the 3rd person and the feminine gender in all of these.

In this section I turn to the question of how to account for these differences in a semantics that takes as its starting point Cooper's ideas about indexical presuppositions.

5.1 Indexical Presuppositions in Intensional Semantics

As we have seen, according to Cooper (1983) and Yanovich (2010), gender presuppositions cannot be locally accommodated, but rather project globally in all cases. From this Cooper concluded that the genders trigger what he called *indexical presuppositions* (Cooper, 1983, 184). By this he meant that gender features must be satisfied in the actual world. In terms of the framework we are assuming here, this notion of an indexical presupposition takes the hallmark of such presuppositions to be that they are defined in terms of one or more parameters of contexts. This is echoed by Heim (2008) on the persons:

> Person features happen to be indexicals, that is, they denote functions defined
> with reference to an utterance context that determines participant roles such
> as speaker and addressee. (Heim, 2008, 37)

The indexical presuppositional semantics for the genders is designed to ensure that the "indexical presupposition will be present even if the sentence is embedded below a verb of propositional attitude as in *Bill said that she runs*, *she* must still be assigned an individual which is female in [w_c]." (Cooper, 1983, 184)

Yet if one adopts a standard semantics for attitudes, this result is not achieved unless one further distinguishes intensions from another layer of meaning, corresponding to Kaplanian characters. To see this consider the following intensional meaning for *she$_i$*:

(34) $[\![\text{she}_i]\!]^{g,c} = \lambda w : g(i)$ is female in w_c. $g(i)$

Suppose further that we adopt the following semantics for *Bill thinks*:

(35) $[\![\text{Bill thinks}]\!]^{g,c} = \lambda p_{<s,t>}.\lambda w.\forall w' \in Dox_{\text{Bill}}(w), p(w') = 1$

Here $Dox_{\text{Bill}}(w)$ is the set of worlds compatible with what Bill thinks in w, defined in the usual way:[17]

(36) $Dox_x(w) = \{w' : \forall p$ such that x thinks that p at w, $p(w') = 1\}$

We can now compute *Bill thinks she$_i$ talked*:

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[17]This reflects the standard semantics for attitude reports in the tradition from Hintikka (1969). The present formulation follows Heim (1992).

$[\![\text{Bill thinks}]\!]^{g,c}([\![\text{she}_i \text{ talked}]\!]^{g,c})$

$= \lambda w.\forall w' \in Dox_{\text{Bill}}(w), [\![\text{she}_i \text{ talked}]\!]^{g,c}(w') = 1$

$= \lambda w.\forall w' \in Dox_{\text{Bill}}(w), [\lambda w : g(i) \text{ is female in } w_c. \; g(i) \text{ talked in } w](w') = 1.$

Since $[\lambda w : g(i)$ is female in $w_c. \; g(i)$ talked in $w](w')$ is only defined if $g(i)$, the referent of *she$_i$*, is female in w_c, the actual world, this means that *Bill thinks she$_i$ talked* does not have a truth value unless for all worlds compatible with what Bill thinks, $g(i)$ is female in w_c, that is unless Bill thinks $g(i)$ is actually female. This is not the right result.

The same problem arises if we assume that, for instance, the 1st person imposes a constraint on intensions, as in (37).

(37) $[\![I_i]\!]^{g,c} = \lambda w : g(i)$ is an individual that includes $s_c. \; g(i)$

Parallel to the above, this will have the incorrect result that *Bill thinks I$_i$ talked* will presuppose that Bill thinks that $g(i)$ is the speaker.

Cooper's (1983) system did impose a distinction of the kind we need. In particular, Cooper's semantics defined rules that assign intensions to expressions. So, for example, the rule associated with *she* will take "some individual which is female in the actual world and then assign *she* the constant function which picks out that individual in all possible worlds, regardless of what her sex is in the other worlds." (Cooper, 1983, 183)

Since they are relativized to parameters like the actual world, Cooper's intension rules are closely related to what Kaplan (1989b) called *characters*, that is, functions from contexts to intensions. So Cooper's indexical presuppositions can be seen as constraining the domains of characters, that is, as regulating whether or not an intension is assigned at a given context. Understood in this way, the hallmark of indexical presuppositions is not that they are defined in terms of parameters of the context, but that they impose constraints on the domain of characters, as opposed to constraints on the domain of intensions. More generally, one can think of constraints on characters as reflecting limitations to assigning contents to utterances, where constraints on intensions are limitations to evaluating contents for truth and falsity.

Below I sketch a character-based framework that implements this difference. The aim is not to set out a fully worked out system. Rather, the aim is to highlight the differences between presuppositions *qua* constraints on characters vs. presuppositions *qua* constraints on intensions, and to suggest some ways of exploiting this difference to account for the behavior of the presuppositions associated with the features surveyed in sections 3 and 4.

5.2 Character-Based Semantics

Setting aside person for the moment, a character for *she$_i$* that incorporates Cooper's constraint on intension assignment is given as follows:

(38) $[\![\text{she}_i]\!]^g = \lambda c : g(i)$ is female in w_c. $\lambda w.g(i)$

This character for *she$_i$* is defined for a context c only if the value of $g(i)$ is female in w_c. If so, it returns an intension that maps any world onto $g(i)$. In other words this is a representation of Cooper's intension rule for *she*.

As is standard, we treat proper names as constants:

(39) $[\![\text{Bill}]\!]^g = \lambda c.\lambda w.$ Bill

Further, taking seriously Kaplan's (1989b, 507) dictum that "The character of the whole is a function of the character of the parts," we assign to intransitive verbs functions from characters to characters:[18]

(40) $[\![\text{talked}]\!]^g = \lambda r_{<c,se>}.\lambda c : c \in dom(r).\lambda w.\ (r(c))(w)$ talked in w

We have defined *talked* so that the character it returns on taking a character as argument inherits any partiality of the latter. In a simple case like *Bill talked*, (40) maps a context to an intension that maps a world to true if and only if Bill talked in that world:

> $[\![\text{talked}]\!]^g([\![\text{Bill}]\!]^g)$
> $= \lambda c : c \in dom([\![\text{Bill}]\!]^g).\ \lambda w.\ ([\![\text{Bill}]\!]^g(c))(w)$ talked in w
> $= \lambda c.\lambda w.\ [\lambda w.\ \text{Bill}](w)$ talked in w
> $= \lambda c.\lambda w.\ \text{Bill talked in } w.$

Now consider *She$_i$ talked*. In this case the argument to *talked* is a partial character that is defined only for some contexts and not all. Specifically, in this case $c \in dom(r)$ if and only if $g(i)$ is female in w_c. Hence, this partiality is reflected in the resulting character for the whole:

> $[\![\text{talked}]\!]^g([\![\text{she}_i]\!]^g)$
> $= \lambda c : c \in dom([\![\text{she}_i]\!]^g).\ \lambda w.\ ([\![\text{she}_i]\!]^g(c))(w)$ talked in w
> $= \lambda c : g(i)$ is female in w_c. $\lambda w.\ [\lambda w.g(i)](w)$ talked in w
> $= \lambda c : g(i)$ is female in w_c. $\lambda w.\ g(i)$ talked in $w.$

Hence, *She$_i$ talked* is assigned an intension only at contexts where $g(i)$ is female in w_c. This means that *She$_i$ talked* has a truth value at a context c and a world w only if this condition is satisfied.

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[18]This requires taking contexts to be a type. I take this to be an innocuous assumption.

Taking genders as constraints on characters in this way, we can generate the global projection readings under attitudes. We assign the following character to *Bill thinks*:

(41) $[\![\text{Bill thinks}]\!]^g = \lambda r_{<c,st>}.\lambda c : c \in dom(r).\lambda w.\forall w' \in Dox_{\text{Bill}}(w),$
  $(r(c))(w') = 1$

So *Bill thinks* takes the character of a sentence and returns a character that maps a context to an intension. Here is what we derive for *Bill thinks she$_i$ talked*:

$[\![\text{Bill thinks}]\!]^g([\![\text{she}_i \text{ talked}]\!]^g)$
$= [\lambda r_{<c,st>}.\lambda c : c \in dom(r).\lambda w.\forall w' \in Dox_{\text{Bill}}(w),$
$(r(c))(w') = 1]([\![\text{she}_i \text{ talked}]\!]^g)$
$= \lambda c : g(i)$ is female in w_c. $\lambda w.\forall w' \in Dox_{\text{Bill}}(w), ([\![\text{she}_i \text{ talked}]\!](c))(w') = 1$
$= \lambda c : g(i)$ is female in w_c. $\lambda w.\forall w' \in Dox_{\text{Bill}}(w), [\lambda w. g(i)$ talked in $w](w')$
$= 1$
$= \lambda c : g(i)$ is female in w_c. $\lambda w.\forall w' \in Dox_{\text{Bill}}(w), g(i)$ talked in w'.

So, according to this semantics, *Bill thinks she$_i$ talked* is assigned an intension at a context only if the referent of the pronoun $g(i)$ is female in the world of the context. If so, then *Bill thinks she$_i$ talked* is true if and only if all worlds compatible with what Bill thinks are worlds in which $g(i)$ talked. That is, if and only if Bill thinks $g(i)$ talked. So, the truth or falsity of the sentence is unaffected by whether or not Bill thinks $g(i)$ is female.

In other words, at least given the standard way of treating attitudes like *think* we have been working with, global projection of features of referential pronouns can be accounted for by taking indexical presuppositions to be constraints on the domains of characters, rather than just seeing such presuppositions as conditions defined in terms of parameters of contexts.

5.3 Local Accommodation

We have seen that gender features do not always project globally under attitudes. Given the above, we should expect that such uses can be accounted for by refraining from associating the genders with indexical constraints on the domains of characters. Consider this alternative character for *she$_i$*:

(42) $[\![\text{she}_i]\!]^g = \lambda c.\lambda w : g(i)$ is female in w. $g(i)$

Given this, we derive the local accommodation readings under attitudes:

$[\![\text{Bill thinks}]\!]^g([\![\text{she}_i \text{ talked}]\!]^g)$
$= \lambda c.\lambda w.\forall w' \in Dox_{\text{Bill}}(w), ([\![\text{she}_i \text{ talked}]\!](c))(w') = 1$

$$= \lambda c.\lambda w.\forall w' \in Dox_{\text{Bill}}(w), [\lambda w : g(i) \text{ is female in } w.\ g(i) \text{ talked in } w](w')$$
$$= 1.$$

Since $[\lambda w : g(i)$ is female in $w.\ g(i)$ talked in $w](w')$ is only defined if the referent of the pronoun is female in w', this means that *Bill thinks she$_i$ talked* has a truth value only if all worlds compatible with what Bill thinks are worlds in which the referent is female. That is, if Bill thinks $g(i)$ is female. If so, then the truth value depends on whether or not Bill thinks $g(i)$ talked. Hence, the truth or falsity of the sentence is unaffected by whether $g(i)$ is female in the actual world.

When the relevant occurrence of the pronoun is unembedded, this kind of non-indexical presupposition imposes a constraint on truth or falsity at the world of evaluation. In unembedded cases that is the actual world. So, in unembedded cases the non-indexical character in (42) generates the presupposition that the referent is female in the actual world:

$$\llbracket \text{talked} \rrbracket^{g}(\llbracket \text{she}_i \rrbracket^{g})$$
$$= \lambda c.\lambda w.\ (\llbracket \text{she}_i \rrbracket^{g}(c))(w) \text{ talked in } w$$
$$= \lambda c.\lambda w.\ [\lambda w : g(i) \text{ is female in } w.\ g(i)](w) \text{ talked in } w.$$

$[\lambda w : g(i)$ is female in $w.\ g(i)](w)$ talked in w is defined only if $g(i)$ is female in w, the world of evaluation. Since, in this kind of case, the latter is the actual world w_c, the sentence has no truth value at w_c, unless the referent of the pronoun is female in w_c. In other words, adopting a character for *she* that triggers a non-indexical constraint on worlds, rather than on contexts generates local accommodation readings under attitudes, and global projection readings in unembedded cases.

However, we nevertheless face the problem that gender features in attitude contexts are usually projected globally. In other words, we are at the following impasse. While the indexical character in (38) predicts global readings under attitudes and when the pronoun is unembedded, the non-indexical character in (42) predicts local readings under attitudes and global readings when unembedded.

(38) $\llbracket \text{she}_i \rrbracket^{g} = \lambda c : g(i) \text{ is female in } w_c.\ \lambda w.g(i)$

(42) $\llbracket \text{she}_i \rrbracket^{g} = \lambda c.\lambda w : g(i) \text{ is female in } w.\ g(i)$

This is an instance of the notorious projection problem for presuppositions, that is, the challenge of accounting for how the presuppositions of compound sentences are determined by those of their parts. Needless to say, we are not in a position to meet this challenge here. Below I describe one option that I take to be promising and which I think deserves to be explored further in future work.

5.4 Global Accommodation and Binding

The strategy I am interested in adopts (42) and then argues that in cases of global accommodation under attitudes, the embedded pronoun is not referential, despite appearances. This suggestion is motivated by orthodox treatments of sloppy identity under ellipsis, as in (43).

(43)   She did her homework, and so did Mike. [sloppy reading]

The standard approach assumes that *she* is raised to bind *her* in the first conjunct, and that ellipsis requires copying of an identical constituent at LF.[19] Moreover, since the sloppy reading does not presuppose that Mike is female, the feminine feature on the bound *her* can be seen to be uninterpreted.

There are different ways of accounting for the phenomenon of uninterpreted features under binding (cf. e.g. Kratzer, 1998, 2009, Schlenker, 1999, Rullmann, 2003, von Stechow, 2003, Heim, 2008). All of them essentially make reference to the role of matching, or on some views, copied, features on a binder and any variables it binds.[20] For our purposes, we can assume that the first conjunct of (43) has the following structure:[21]

(44)   3rd-sg-fem-1 2[~~3rd-sg-fem~~-t_2 did ~~3rd-sg-fem~~-2's homework]

She has been raised to bind *her* and the features on the latter and the trace have been deleted. This means that while (43) presupposes that the referent of *she* is female, the property that is generated by binding is just the property [$\lambda x.\ x$ did x's homework], and so when this property is applied to Mike under ellipsis to produce the sloppy reading, there is no presupposition that Mike is female.

Along these lines, one suggestion is that when the gender presupposition of *Bill thinks she talked* is globally accommodated, the pronoun is raised and the features are deleted on the trace, as in (45).

(45)   3rd-sg-fem-1 2[Bill thinks ~~3rd-sg-fem~~-t_2 talked]

Given this, even if we adopt the non-indexical character for *she* in (42), we should expect to predict that (45) presupposes that *she* is female in the actual world, but does not presuppose that Bill thinks so.

To be sure, given the character-based framework we are assuming here, it is not obvious how to think of binding. According to the framework we have been sketching, t_2 *talked* has the following character:

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[19]This follows the account in Heim and Kratzer (1998, ch. 9).

[20]This requires us to assume that the features are also present on the binder-index. I leave this out for simplicity.

[21]On feature-deletion in ellipsis cases, see especially Heim (2008).

(46) $[\![t_2 \text{ talked}]\!]^g = \lambda c.\lambda w.g(t_2)$ talked in w.

Suppose we think of abstraction as follows:

(47) $[\![2[t_2 \text{ talked}]]\!]^g = \lambda r_{<c,se>}.\lambda c : c \in dom(r).\lambda w.(r(c))(w)$ talked in w.

This is a way of mimicking the usual approach according to which $2[t_2 \text{ talked}]$ is interpreted as $[\lambda x. \ x \text{ talked}]$. Assuming (47), we can calculate (45):

> $[\![3\text{rd-sg-fem-1 } 2[\text{Bill thinks } \text{3rd-sg-fem-}t_2 \text{ talked}]]\!]^g$
> $= [\lambda r_{<c,se>}.\lambda c \ : \ c \ \in \ dom(r).\lambda w.\forall w' \ \in \ Dox_{\text{Bill}}(w), \ (r(c))(w) \text{ talked in } w']([\![3\text{rd-sg-1}]\!]^g)$
> $= [\lambda r_{<c,se>}.\lambda c \ : \ c \ \in \ dom(r).\lambda w.\forall w' \ \in \ Dox_{\text{Bill}}(w), \ (r(c))(w) \text{ talked in } w'](\lambda c'.\lambda w'' : g(1) \text{ is female in } w''. \ g(1))$
> $= \lambda c.\lambda w.\forall w' \in Dox_{\text{Bill}}(w), \ ([\lambda c'.\lambda w'' : g(1) \text{ is female in } w''. \ g(1)](c))(w) \text{ talked in } w'$
> $= \lambda c.\lambda w.\forall w' \in Dox_{\text{Bill}}(w), \ [\lambda w'' : g(1) \text{ is female in } w''. \ g(1)](w) \text{ talked in } w'$

So, for a context c, (45) is assigned an intension which takes a world w to true if and only if all worlds compatible with what Bill thinks in w are worlds in which $[\lambda w'' : g(1) \text{ is female in } w''. \ g(1)](w)$ talked. In other words, unless $g(1)$ is female in the world of evaluation w, we cannot evaluate whether (45) is true at w, that is, (45) will not be assigned a truth-value at w. If $g(1)$ is female in w, (45) will be true at w if and only if all worlds compatible with what Bill thinks in w are worlds in which $g(1)$ talked.

According to this proposal, *Bill thinks she talked* is ambiguous between the LF in (45) and the one in (48).

(48) Bill thinks 3rd-sg-fem-1 talked

For instance, in a case of local accommodation like (49), (48) will be appropriate.

(49) Bill thinks Bob is a woman, and Bill thinks she talked.

Positing that *Bill thinks she talked* can be interpreted according to different LFs on different occasions is no more extravagant than the orthodox claim that, for instance, *She did her homework* has different LFs, respectively, in cases of sloppy and strict identity under ellipsis.

Indeed, the suggestion that *Bill thinks she talked* can have the LF in (45) helps explain cases of global accommodation under ellipsis. For instance, (50) can be used in a context where we know that neither Bill nor John thinks that the referent of *she* is female.

(50)   Bill thinks she talked. And so does John.

We will explain this case by taking *Bill thinks she talked* to have the LF in (45), and so given copying under ellipsis, (50) will not presuppose that either Bill or John thinks the referent of the pronoun is female.

On the other hand, it might be thought that this strategy will run into problems with cases of local accommodation under ellipsis, as in examples like (51).

(51)   Both Bill and John mistook Bob for a woman. Bill thought she was beautiful and so did John.

We want to predict that (51) does not presuppose that the referent of *she* is female, but merely presupposes that both Bill and John thought so. However, (51) is an instance of strict identity under ellipsis. Hence, on the standard approach it will have a structure roughly like this:

(52)   Both Bill and John mistook Bob for a woman. Bill thought 3rd-fem-sg-1 was beautiful and John ~~thought 3rd-fem-sg-1 was beautiful~~.

Given the character in (42), (52) will presuppose that Bill thought $g(1)$ was female and that John thought $g(1)$ was female, but will not presuppose that $g(1)$ is actually female.

On this approach, while the feminine gender is a non-indexical constraint on the domain of intensions, there is a difference between cases in which an embedded pronoun is raised to produce a global accommodation reading and cases in which an embedded pronoun remains *in situ* to produce a local accommodation reading. Further, as we have seen, taking the feminine gender to be a constraint on worlds generates global accommodation readings in unembedded cases, since the world of evaluation (the actual world) will be required to satisfy the gender presupposition. If one thinks of the character-intension distinction in broadly Kaplanian terms, taking genders to be constraints on intensions is a way of formalizing the idea that genders do not represent limitations to assigning contents but to evaluating contents for truth and falsity.

5.5   The 1st and 2nd Persons

We have seen that the 1st and 2nd persons robustly project globally, and hence conform precisely to the behavior of Cooper's indexical presuppositions. Accordingly we take the characters of *I* and *we* to be as follows:

(53)   a. $[\![\mathrm{I}_i]\!]^g = \lambda c : g(i)$ is an individual that includes s_c. $\lambda w.g(i)$
       b. $[\![\mathrm{we}_i]\!]^g = \lambda c : g(i)$ is a plurality that includes s_c. $\lambda w.g(i)$

Corresponding to what we argued earlier, the 1st person carries the presupposition that its referent include the speaker. We saw that this view explains apparent problem cases like (12) (indexed here for convenience).

(12) [Context: André has gone mad and thinks he is Napoleon.]
André. I_i won the Battle of Austerlitz!

The observation was that, even in this case, it is clearly true to say that the intended referent of *I*, that is $g(i)$, is the speaker, s_c. Hence, (53) does not predict presupposition failure in this case, and instead, (12) will be true or false depending on whether $g(i)$, André, won the Battle of Austerlitz.

Further, in analogously to what we saw above, (53a–b) generate global projection under attitudes and when unembedded.[22] For instance, we derive the following character for *Bill thinks I_i talked*:

$[\![\text{Bill thinks}]\!]^g([\![I_i \text{ talked}]\!]^g)$
$= [\lambda r_{<c,st>}.\lambda c : c \in dom(r).\lambda w.\forall w' \in Dox_{\text{Bill}}(w),$
$(r(c))(w') = 1]([\![I_i \text{ talked}]\!]^g)$
$= \lambda c : g(i)$ is an individual that includes s_c. $\lambda w.\forall w' \in Dox_{\text{Bill}}(w),$
$([\![I_i \text{ talked}]\!](c))(w') = 1$
$= \lambda c : g(i)$ is an individual that includes s_c. $\lambda w.\forall w' \in Dox_{\text{Bill}}(w), [\lambda w. \ g(i)$
talked in $w](w') = 1$
$= \lambda c : g(i)$ is an individual that includes s_c. $\lambda w.\forall w' \in Dox_{\text{Bill}}(w), g(i)$
talked in w'.

So, *Bill thinks I_i talked* is assigned an intension at a context c only if $g(i)$, the referent of *I*, is the speaker in c. If so, the sentence is true at a world w if and only if Bill thinks $g(i)$ talked, regardless of whether Bill thinks $g(i)$ is the speaker.

Since, the 1st person, on this proposal, must impose a constraint on the context, this explains why there is no way of locally accommodating the 1st person, in cases like (30a).

(30) a. #Bill_1 thinks John_2 is talking, and he_1 thinks I_2'm boring everyone.

Since $g(2)$ must be s_c, the speaker of (30a), *I* cannot refer to John, unless John is also the speaker of (30a).

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[22](53a–b) do not specify in which world we require the presupposition of the 1st person to be satisfied. For the singular 1st person pronouns, the condition that $g(i)$ be an individual that includes s_c is equivalent to the condition that $g(i)$ be identical to s_c. This condition either holds in no world or in all worlds. For the 1st person plural, it is safe to assume that the condition that $g(i)$ be a plurality that includes s_c likewise either holds in no worlds or in all worlds. E.g. the plurality consisting of Anna, Paul, and $g(i)$ is not the same plurality as the plurality consisting of Anna and Paul alone. Hence, the former is distinct from the latter in all worlds.

At the same time, the 1st person is sometimes uninterpreted in cases of sloppy identity under ellipsis, as in (54).[23]

(54) I did my homework, and so did you. [sloppy reading]

We account of this in the same way as above, by assuming that the first conjunct has a structure along the following lines:

(55) 1st-sg-1 2[~~1st-sg~~-t_2 did ~~st-sg~~-2's homework]

Accordingly, the property that is applied under ellipsis will not generate the unwanted presupposition that the referent of *you* is the speaker.

Again, understanding abstraction along the lines of (47), we calculate (54) as follows:

$[\![$1st-sg-1 2[~~1st-sg~~-t_2 did ~~st-sg~~-2's homework]$]\!]^g$
$= [\lambda r_{<c,se>}.\lambda c : c \in dom(r).\lambda w.(r(c))(w)$ did $(r(c))(w)$'s homework in $w]([\![$1st-sg-1$]\!]^g)$
$= \lambda c : g(1)$ is an individual that includes s_c. $\lambda w. ([\![$1st-sg-1$]\!]^g(c))(w)$ did $([\![$1st-sg-1$]\!]^g(c))(w)$'s homework in w
$= \lambda c : g(1)$ is an individual that includes s_c. $\lambda w. g(1)$ did $g(1)$'s homework in w

In other words, (54) presupposes that the referent of *I* is the speaker.

So, associating the 1st person with indexical presuppositions, understood as constraints on the domain of characters, provides a way of accounting for the fact that the 1st person invariably projects globally, while also accommodating the observation that the 1st person does not give rise to presupposition failures. I will refrain from going through the similar proposal for the 2nd person, and I assume that it is clear enough that the results will be analogous.

5.6   The 3rd Person and Maximize Presupposition

By contrast, we noted that the 3rd person behaves like ordinary presuppositions in being susceptible to local accommodation. Given this, one suggestion is to treat the 3rd person analogously to the way we have treated genders above, that is, as imposing a constraint on the domain of intensions. Given the basic way of understanding the 3rd person as triggering the presupposition that the referent be distinct from s_c and h_c, a character that includes both the gender and person constraints for *she*$_i$ is given as follows:

(56) $[\![$she$_i]\!]^g = \lambda c.\lambda w : g(i)$ is female in w distinct from s_c and g_c. $g(i)$

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[23]Cf. Heim (2008).

(56) will generate local accommodation of the presupposition that the referent be a female distinct from speaker and hearer under attitudes. However, while this is desirable for the gender features, it is arguably incorrect for the persons. Consider (57).

(57)   Bill mistook Bob for a woman, and now he thinks she called him!

Given (56), (57) will presuppose that Bill thinks Bob is female and distinct from s_c and h_c. But the latter is not obviously right. Bill may not have any beliefs about whether Bob is identical to the speaker or hearer of (57), without this being a reason to take the sentence to be neither true nor false.

Luckily, as many theorists have argued, there are independent reasons for treating the 3rd person as not encoding any semantic presuppositions at all. In light of this, these theories take the 3rd person to denote the unrestricted identity function, in other words as not imposing any semantic presuppositions concerning person.[24] Nevertheless, the standard use of the 3rd person clearly conveys that the referent is distinct from the speaker and hearer. To explain this, many treatments assume that the person features form a scale, as follows:

(58)   a. $[\![1\text{st}]\!]^{c,g} = \lambda x : x$ includes s_c. x
        b. $[\![2\text{nd}]\!]^{c,g} = \lambda x : x$ includes h_c and excludes s_c. x
        c. $[\![3\text{rd}]\!]^{c,g} = \lambda x. x$

In turn, such views assume a principle admonishing speakers to make their utterances presuppose as much as possible.[25] Here we reproduce Schlenker's (2012, 393) "preliminary statement" of the principle:[26]

> **Maximize Presupposition** (Schlenker, 2012)
> If a sentence S is a presuppositional alternative of a sentence S' and the context c is such that
>
>   (i) the presuppositions of S and S' are satisfied within c;
>
>   (ii) S and S' have the same assertive component relative to c;
>
>   (iii) S carries a stronger presupposition than S',
>
>   then S should be preferred to S'.

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[24]Schlenker (2003), Sauerland (2004), (2008a), (2008b), Heim (2008).

[25]Cf. Heim (1991), Sauerland (2004), (2008a), (2008b), Percus (2006), Chemla (2008), Schlenker (2012).

[26]Slightly modified for present purposes.

In the presence of Maximize Presupposition, using the 3rd person generates the implicated presupposition that the speaker is either assuming that the referent is neither 1st nor 2nd person (and hence includes neither speaker nor hearer) or she is violating Maximize Presupposition. Similarly, using the 2nd person generates the implicated presupposition that the referent does not include the speaker, while semantically presupposing that the referent includes the hearer.

This scalar approach to the persons can be directly mirrored in a character-based semantics. Consider the following characters, which incorporate the non-indexical gender presuppositions we adopted earlier:

(59) a. $[\![I_i]\!]^g = \lambda c : g(i)$ is an individual that includes s_c. $\lambda w.g(i)$
      b. $[\![you_i]\!]^g = \lambda c : g(i)$ is an individual that includes h_c and excludes s_c. $\lambda w.g(i)$
      c. $[\![he_i]\!]^g = \lambda c.\lambda w : g(i)$ is a male individual in w. $g(i)$
      d. $[\![she_i]\!]^g = \lambda c.\lambda w : g(i)$ is a female individual in w. $g(i)$

For instance, given (59d), *She$_i$ talked* will require that $g(i)$ be female in the world of evaluation (the actual world), but will not require that $g(i)$ be distinct from the speaker and hearer. Instead, the claim will be that the latter is inferred via Maximize Presupposition given that the speaker chose neither of the stronger alternatives, that is, the 2nd or 1st person.

6 Conclusion

The presuppositions triggered by the 1st and 2nd persons differ from those triggered by the 3rd person and the genders. While the latter behave like standard presuppositions, the former exhibit the behavior of the kind of indexical presuppositions that were identified by Cooper (1983). The 1st and 2nd persons do not give rise to cases of presupposition failure. In cases where the speaker is mistaken about who the speaker or the addressee is, the intended referent nevertheless satisfies the 1st or 2nd person feature. The 1st and 2nd persons do not allow local accommodation. By contrast, the 3rd person and the genders can be locally accommodated.

A character-based semantics can be spelled out to implement Cooper's original device of indexical presuppositions. Yet the interesting distinction is not between constraints defined in terms of parameters of contexts, but between constraints on the domain of characters vs. constraints on the domain of intensions. In Kaplanian terms, this distinction can be conceptualized as a difference between presuppositions that regulate assignments of contents and presuppositions that regulate evaluating contents for truth and falsity.

Taking the 1st and 2nd persons to impose constraints on the domain of characters accounts for their presuppositions being invariably globally accommodated.

By contrast, assuming that the genders impose constraints on intensions explains local accommodation under attitudes and global accommodation when unembedded. Further, taking cases in which genders under attitudes project globally to be bound in the same way that pronouns are bound in cases of sloppy identity under ellipsis predicts why they are not locally accommodated.

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