INDEXICAL PRESUPPOSITIONS OF PRONOMINAL GENDER FEATURES

IGOR YANOVICH

Abstract. Gender features on anaphoric pronouns are often analyzed as presupposition triggers, after Cooper, 1983. I argue that, first, “presuppositions” arising in sentences with gendered pronouns have a peculiar projection behavior different from that of regular presuppositions, and second, that such special indexical presuppositions, rather than being contributed by morphological features directly, arise because of a rule-of-use constraint requiring the pronominal gender feature to match “the real gender” of the pronoun’s referent if the referent is human.

1. Introduction

The presuppositional analysis of gender features on anaphoric pronouns dates back to Cooper, 1983, and is by now adopted widely enough to be found in textbooks on formal semantics. For instance, Heim and Kratzer, 1998 provide the following lexical entry for a gendered English pronoun:

\[(1) \quad [\text{she}]^g = \text{female}(g(i)) \cdot g(i)\]

The presuppositional analysis immediately derives a number of good predictions about the behavior of anaphoric pronouns. Consider 2. First, there is an intuition that the feminine pronoun in 2 somehow conveys the idea that its referent is female.

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1 Throughout this paper, I only discuss gendered, as opposed to gender-neutral, pronouns. All English and Russian pronouns in the examples are to be read as non-gender-neutral.

2 In the “dot notation” used in 1, and throughout this paper, the \(\lambda\)-term after the dot is the assertion part of the meaning, whereas the term before the dot is the presuppositional part.

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Second, that idea is not a part of the assertion: if 2 were uttered with the intention that her, refer to a male, the sentence would not be simply false, it would be inappropriate to assert.

(2) Mary met her₁.

Furthermore, for the case when a gendered pronoun is bound by a quantificational DP, as in 3, the presuppositional analysis in 1 generates the presupposition that all individuals in the domain of quantification are female. That agrees with speakers’ intuitions: 3 is indeed only appropriate in a context where all students in the domain are female. In short, the presuppositional analysis gets a lot of facts just right.

(3) [Every student]₂ saw herself₂.

The aim of this paper is to show that despite those successes, we need to make two major adjustments to the presuppositional analysis of gender features on pronouns. First, once we look closer, it turns out that the “presuppositions” which are generated in examples with gendered pronouns do not actually project like regular presuppositions, and thus are a different kind of a semantic constraint. Second, those irregularly-behaving presuppositions, which I will call indexical below, are not a part of the meanings of gender features. Features do play a role, of course, but it is not features themselves which trigger indexical presuppositions.

The data in support of my claims will come from English and Russian. Section 2 illustrates the peculiarities of projection for pronominal presuppositions using English data. Russian data on projection are the same, as Section 3 briefly discusses. But the real reason to look into Russian, and the main subject of Section 3 is that the special presuppositions associated with anaphoric pronouns are not triggered by features on those pronouns directly: Russian data show that indexical presuppositions only arise for human-denoting pronouns, and not across the board for pronouns bearing morphological gender features. Section 4 concludes the paper.

2. IRREGULAR PROJECTION OF PRONOMINAL PRESUPPOSITIONS

If-clauses are known to be presupposition filters: when the antecedent of a conditional entails a presupposition p triggered in the consequent, the conditional as a whole does not presuppose p. For example, in 4, the presupposition trigger too in the consequent induces a presupposition p = ‘somebody else is female’; since the antecedent entails p, the sentence as a whole does not presuppose it.

(4) If the queen’s son were female, then the countess’ son would be female, too.

3Discussing presupposition projection, I will use a Karttunen-style classification of linguistic expressions into holes, plugs, and filters. To show that pronominal presuppositions do not behave like regular presuppositions, we will not need more than a purely descriptive classification of this kind.
Given the filtering behavior of conditionals, the meaning for she as in 1 predicts that 5 should be as good as 4. But it is not.4

(5) *If [the queen’s son]2 were female, then she2 would be smart.

By 1 she2 in 5 should trigger the presupposition that the pronoun’s referent g(2) is female. The antecedent [the queen’s son]2 were female entails that g(2) is female, so we expect to see the sentence as a whole to be fine and to inherit no presuppositions induced by the pronoun. But instead, the sentence is bad. It becomes good if we change the pronoun to a masculine one:

(6) If [the queen’s son]2 were female, then he2 would be smart.

Clearly something goes wrong when we combine the standard filtering condition for if-clauses and the meaning in 1 for the pronoun. It is not that the pronoun’s gender feature does not matter, as a comparison between 5 and 6 shows. But semantic conditions which are associated with the pronouns in 5 and 6 are not regular presuppositions. Let’s adopt the name of indexical presuppositions for those conditions, whatever they are.

The term indexical presupposition was originally coined by Robin Cooper, in the same work [Cooper, 1983] that introduced the presuppositional analysis in 1. Cooper argued that while bound pronouns should be assigned meanings as in 1, free pronouns should be treated differently, as semantic constraints they invoke “behave neither like normal entailments nor normal presuppositions”, [Cooper, 1983, p. 181]. Cooper proposed the following meaning for free pronouns:6

(7) \[she,]^{g,c} = female(g(i))(world(c)) . g(i),
    where world(c) is the world of the context c.

The meaning in 1 does not include an explicit index at which the expression female(g(i)) is to be evaluated. Supplying such an index is then taken care of by

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4Throughout this paper, I use indices on DPs as an informal device signaling that they either “have the same referent”, or are in a binding relation. Such indices are not meant to be a part of the syntactic representation and simply highlight the intended reading.

5Having the same referent” is a self-explanatory term for definite DP antecedents. For “referential” indefinite DPs, a pronoun has the same referent with such a DP if it picks the witness for it. For quantificational DPs which do not have a single referent however one looks at them, co-indexing signifies syntactic binding.

6For some speakers, 5 and parallel Russian examples significantly improve if a predicate DP is used (e.g., a girl instead of female). This is surprising as a predicative DP, just as a predicative AP, is not supposed to provide a discourse referent or affect subsequent anaphoric pronouns in any way, and yet there appears to be a difference between the two kinds of predicates. I leave that effect for future research, and use only predicative adjectives in the examples.

6I recast Cooper’s actual notation to highlight the relation between 1 and 7.
rules of composition and higher operators in the sentence. The meaning in 7 instead specifies explicitly at which world \textit{female}(g(i)) should be evaluated, regardless of where exactly in a sentence the pronoun appears. In the Kaplan-style framework that Cooper used, context \(c\) is an unshiftable evaluation parameter, and thus \textit{world}(c) always refers to the actual world. Whatever syntactic environment the pronoun finds itself in, with the meaning in 7 it is predicted to trigger a presupposition about the actual world. On the surface, such a presupposition would look as if it projects all the way to the matrix context.

There are many adjustments which we will have to apply to Cooper’s original proposal about indexical presuppositions. For instance, we will see below that indexical presuppositions arise not only in sentences with free, but also with bound pronouns. What will survive after all amendments, though, is the intuition behind Cooper’s notion of indexical presupposition that such a presupposition concerns some “real” property.

Starting to work our way through the adjustments we need to make to 7, consider 8 and 9, which demonstrate that a gendered pronoun can refer to an object which does not exist in the actual world, and yet pose a non-vacuous semantic constraint:

(8) If the queen had [a female child]$_2$, she$_2$ would be smart.
(9) *If the queen had [a female child]$_2$, he$_2$ would be smart.

As the female child introduced in the \textit{if}-clause of 8 and 9 does not exist in the actual world, the analysis in 7 predicts that either both of those sentences should be OK, or neither. Yet 8 is good, and 9 is bad. From that we can conclude that what seems to matter for the indexical presupposition is not necessarily the actual world.

Thus indexical presuppositions don’t behave like regular presuppositions, and they don’t behave the way Cooper analyzed them. How then do they behave? To see that, let’s work through several examples illustrating how indexical presuppositions interact (or don’t) with their environment.

Consider presupposition plugs \textit{say} and \textit{accuse}. Regular presuppositions triggered in complements of those verbs do not project to the matrix level. Thus neither 10a nor 11a presuppose that there exists a donkey belonging to the girl. If indexical presuppositions behave the same way, we’d expect 10b and 11b to be OK: just as the presupposition of a definite DP can be accommodated in the scope of \textit{say} and

\footnote{It is easy to see that applying 1 instead is of no help. Suppose we try to explain 8 by saying that the presupposition triggered by the pronoun analyzed as in 1 is satisfied in the counterfactual context created by the \textit{if}-clause in 8 whereas in 9 there is no context at all which would satisfy it: in the actual world, the referent does not exist, and in the counterfactual worlds, the referent is female. But if having the corresponding property in the counterfactual worlds were enough, 9 should also be good, which it is not. Using 1 as the meaning for the pronoun cannot explain the difference between 5 and 8.}
accuse, so would the presupposition induced by the pronoun’s gender feature if it were a regular presupposition. For instance, [10b] would have conveyed something like this: “The girl’s classmate said that the girl’s donkey does not bite, and that classmate also believes that the girl is a boy”. Surely accommodating a wrong assessment of gender on the part of the classmate poses no more difficulty than accommodating the same person’s belief in the existence of a donkey strong enough for that person to ascribe highly contingent properties to that donkey. But both [10b] and [11b] are out, which shows that such local accommodation is not an option, and that indexical presuppositions do not respect plugs.

(10) a. [The girl]₁’s classmate said that her₁ donkey does not bite.
    b. *[The girl]₁’s classmate said that his₁ donkey does not bite.

(11) a. [The girl]₁’s classmate accused Bill of stealing her₁ donkey.
    b. *[The girl]₁’s classmate accused Bill of stealing his₁ donkey.

As long as the speaker does not know  \( p \) to be false, presupposed  \( p \) may be accommodated within the scope of an epistemic modal, as we can see in [12a]. The factive verb stop triggers the presupposition that Mary smoked in the past. The first sentence of [12a] conveys that the speaker cannot tell whether Mary ever smoked, so the triggered presupposition cannot be satisfied in the matrix context. But the mini-discourse is fine, as it is possible to accommodate the presupposition in one of the epistemic possibilities accepted by the speaker. However, for the indexical presupposition in [12b], the accommodation option is out: if the speaker does not know whether Sasha (which is a gender-neutral name) is female or male, it is impossible to use a gendered pronoun referring to Sasha.

(12) a. I do not know if Mary₃ ever smoked. She₃ might have stopped smoking.
    b. *I do not know if Sasha₄ is male or female. I might have seen her₄ yesterday.

The pattern is reproduced when instead of local accommodation we have local satisfaction of the presupposition.⁸

(13) a. I know that Mary₃ never smoked. But Bill thinks that she₃ smoked and stopped smoking.

⁸Given that there is no natural relation between the first and second embedded clauses in the second sentence of [13b] the sentence is abnormal in more than one way. Unfortunately, as the property of being female or male does not correlate with almost any other property, it is close to impossible to build examples which would not suffer from that problem. Fortunately, though, many speakers are capable of ignoring such causal abnormalities and assessing the grammatical well-formedness instead, if prompted to do so.
b. *I know that Sasha$_4$ is male. But Bill thinks that Sasha$_4$ is female and likes her$_4$ donkey a lot.

In [13a], the presupposition that Mary smoked, triggered in the scope of the attitude verb *think*, is satisfied locally: in Bill’s belief worlds, Mary smoked, and that is enough to satisfy the presupposition. In [13b], in Bill’s belief worlds Sasha is female, but that is not enough to satisfy the indexical presupposition that Sasha is female.

The pattern of projecting past different operators which interact with normal presuppositions is observed with quantificational antecedents as well. Suppose there are three students in the room, two of them female, one of them male. However, Anne mistakenly thinks they are all female. In such a context, [14] is not a good sentence, unless one interprets she as a gender-neutral rather than gendered pronoun.

(14) *Ann believes [every student in the room]$_1$ handed in her$_1$ paper on time.

Example [14] illustrates the fact that indexical presuppositions arise not only for free pronouns, but for bound pronouns as well.

So far, facts that we observed followed the same pattern: whenever we had a gendered pronoun, the referent of the pronoun had to be of the corresponding gender either in the actual world or in a world closest to the actual world. Thus for referents which exist in the actual world, the gender feature had to agree with the actual gender, whereas for imaginary individuals, the feature had to match their gender in the set of worlds where those imaginary individuals were introduced. Descriptively, up to this point we could just say that an indexical presupposition has to project to the highest index where the referent of the pronoun exists.

However, there is one type of presuppositional filter which does interact with indexical presuppositions: realis conditionals. Consider the following scenario. I am invited to visit my new friends for the first time. They have a child named Sasha, but I don’t know whether Sasha is female or male. I very much like to give presents, so I plan to bring something for Sasha, and right now I am in the process of deciding what exactly to buy. In the middle of my deliberations, I might say this:

(15) If Sasha$_3$ is female, I should buy her$_3$ a toy train.

Even though I do not know Sasha’s gender, [15] is considerably better than, say, [5] or [9] above. What is the difference between [5] and [15] which makes [5] bad, and [15] good? In [5], the actual-world gender of the prince is known: the queen’s child is male. Even though the counterfactual conditional introduces a set of worlds where the prince is female, there is a mismatch between the gender feature of the pronoun in [5] and the actual gender property. In contrast to that, Sasha’s actual gender is not settled in the scenario above. Among my epistemic alternatives, there are worlds where Sasha is male, and worlds where Sasha is female. If we analyze the semantics of conditionals à la Kratzer, the conditional clause restricts the domain of evaluation of
the consequent to those epistemic alternatives where Sasha is female. The difference between the two cases is that in 5, we try to match the gender feature to agree with the gender property in a set of worlds which is clearly non-actual, whereas in 15, the female-Sasha epistemic alternatives that we consider have as good a claim on actuality as those where Sasha is male. The generalization that emerges is thus as follows: when there is a competition between a “more actual” and a “less actual” gender, the “more actual gender” wins, but when the competition is between two equally “actual” genders, and we restrict the domain of evaluation with an \( if \)-clause, it becomes possible to use a gendered pronoun.

Finally, consider the case of the speaker’s friend Robin, a male-to-female transgender woman. At time \( t_0 \) when I utter 16 or 17, Robin expresses herself as female. But during her childhood, she was treated by the society, including the speaker, as a boy, not a girl. So at moment \( t_1 < t_0 \) at which the content of the \( when \)-clause of the second sentence of 16 or 17 is evaluated, the speaker would have addressed Robin as a male. However, the only way to refer to Robin from inside that \( when \)-clause is by using a feminine pronoun: only 16 is acceptable in this situation. Indexical presuppositions thus interact with temporal indices the same way they interact with world indices: the matrix index wins over the lower index.\(^9\)

(16) Robin\(_1\) changed the physical expression of gender\(^{10}\) several years ago. < ... >

When she\(_1\) was little, we used to play a lot.

\(^9\)There may be contexts where using 16 may be not quite acceptable either. For instance, speakers may hesitate to use a feminine pronoun talking about a male-to-female transgender woman’s childhood experience of singing in an all-boys choir. In terms of the constraint in 18 below, such cases feature a conflict between what is perceived to be the “real gender” of the individual and the fact that the past events under discussion were very much shaped by the socially assigned gender of the pronoun’s referent. Overall, the less the socially assigned gender matters for the correct understanding of the described events, the better the use of a pronoun matching the current gender expression of the referent becomes for speakers.

This effect can receive an explanation in the general framework of [Simons et al., 2010]. Simons et alia argue that only not-at-issue content, that is, only content not relevant for the current Q(uestion) U(nder) D(iscussion) (see [Roberts, 1996]) projects, and that this feature is common across different kinds of projective content including regular presuppositions, conventional implicatures, etc. Sometimes, what is conventionally signaled to be not-at-issue content in fact bears on the QUD, and that makes the discourse deviant. This seems to be exactly what happens in the contexts that make examples like 16 problematic: when heavily gendered events are discussed, there will be a lot of inferences that can be drawn from the atomic fact that a certain individual belongs to a particular gender; those contextual inferences may easily be relevant for the QUD, in which case the gender property of the pronoun’s referent becomes at-issue, even though conventionally it should be not-at-issue, and that creates the conflict.

\(^{10}\)In casual speech, one would usually say “changed \{the/her\} gender” instead. However, one of the readings of that more casual construction implies that Robin belonged to a different gender in the past. While it is true that she has been assigned to a different gender by social conventions,
(17) *Robin$_1$ changed the physical expression of gender several years ago. < ... > When he$_1$ was little, we used to play a lot.

with the masculine pronoun provides an important clue about what exactly indexical presuppositions aim for. If somebody were to utter [17] with masculine he, that may be a very offensive act rather than a harmless grammatical mistake. But why? The analysis in [18] explains that: if the speakers take the pronominal gender feature to match what they construe as the essential gender property of the relevant individual, then using a mismatching pronoun may signal the speaker’s attempt to determine unilaterally what other people’s “real genders” are.

(18) The “real gender” constraint:

The gender feature on a gendered anaphoric pronoun (referring to a human) corresponds to the real gender of the pronoun’s referent. Real gender is taken by speakers to be an intrinsic property of human individuals. When an individual has two different gender properties at different indices, speakers use the property which they consider “the real one”.

The constraint in [18] states that language users essentialize human gender: they use gendered pronouns in a way that presupposes that gender is an intrinsic property of human individuals. Needless to say, the constraint is a description, not a prescription, and is only intended to capture the actual behavior. In the actual world, there is no “real” gender, or even real “biological sex” for that matter (see, e.g., [Fausto-Sterling, 2000]), beyond different classifications developed by humans for various purposes. But language users act as if there existed one “right” way to gender all humans, and obey the constraint in [18]. The workings of the constraint then surface as pronominal indexical presuppositions. Let’s see how [18] explains the indexical presuppositions of the examples we considered above.

In [5], the individual in question is male in the actual world, and female in counterfactual worlds introduced by the if-clause. Given a conflict between an actual and

for many transgender people their self-perception of internal gender never matched their socially-assigned gender. From the inside, gender transition for such people involves not changing the gender as such, but only the physical expression thereof. To sum up, as long as “to change one’s gender” may be an appropriate casual reference to a transition, it masks the fact that “one’s gender” may only refer to the socially-assigned gender when the phrase is used. The less casual wording in [16] and [17] avoids the ambiguity.

In case the pronoun is bound by a quantificational DP, read “each individual in the domain of quantification” instead of “the pronoun’s referent”.

Such essentializing behavior towards gender and other socially relevant categories is not peculiar to linguistic phenomena, but a part of a larger pattern studied in modern sociology. See, e.g., [Bourdieu, 1998] for how human societies de-historicize social categories that are very easy to show to be the product of a very particular set of historical circumstances.
a counterfactual property, the actual property is selected as “the real gender”. In 8 and 9, the queen’s daughter only exists in counterfactual worlds, yet there is no question which gender would be “the real one” for that imaginary individual: she was construed as a girl, so “the real gender” is female, and pronouns referring to her must be feminine. In 15, the speaker does not know which gender is Sasha’s “real gender”. However, within the set of epistemic alternatives where Sasha is female, female is her real gender, hence we can use the feminine pronoun in 15. Finally, in 16 and 17 there is no question about what the real gender of the person who changed their expression of gender is. If a mismatching pronoun is used, that serves as a signal that the speaker takes a different gender to be “the real gender” of that person, hence the offensiveness of 17.

The data pattern that we just discussed could in principle be accounted for without invoking the notion of “real gender”: a bunch of stipulative constraints specifying which indices those special entities called indexical presuppositions should be evaluated at would do the job. But the real-gender theory in 18 gives us more mileage than such a “binding theory” for index variables on pronouns.

First, the real-gender constraint explains why indexical presuppositions project the way they do, and do not share their projection behavior with other types of projective content (see Tonhauser et al., 2012 for a recent overview of different kinds of such content). With 18, the projection behavior of pronominal indexical presuppositions follows from more general principles, and we do not expect to find a pattern in any language of the world where some special kind of presupposition would, for instance, be specified for always projecting to the second index from the top of the sentence.

Second, given the vagueness and the extra-linguistic nature of the notion of “real gender”, we expect to see a lot of speaker confusion in cases of gender property conflicts. That prediction is borne out: while the overall pattern of judgments reported above is fairly stable across the dozen of English speakers who I consulted, individual speakers may hesitate to provide judgments for some of the examples. Choosing which gender is “real” may involve a judgment call in some cases, which is manifested in some speakers’ uncertainty.

Third, the real-gender theory predicts that when there is disagreement between speakers about whether one should say 16 or 17, that disagreement would most often be framed not as disagreement about what constitutes proper grammar (the way one can quarrel over, say, split infinitives), but rather as a disagreement about what the “real gender” of the referent is. And indeed, people insisting on using sentences like 17 referring to male-to-female women commonly justify that insistence by appealing to the “natural”, or “biological”, or, well, “real” gender of the referent.

13See Yanovich, 2010 for a sketch of how that can be done.
Finally, as we will see in the next section using data from Russian, indexical presuppositions only arise for pronouns that refer to humans. That fits very well with the constraint in [18] the social notion of “real gender” is only defined for humans, and does not apply to either inanimates or non-human animates, therefore the requirement to align the “real gender” of the pronoun’s referent with the pronoun’s gender feature only applies to human-referring pronouns.

3. Indexical presuppositions are only for humans

English non-neuter pronouns almost exclusively have human referents. As sentences with such pronouns also give rise to indexical presuppositions, it looks as if those indexical presuppositions are a part of the semantics of gendered pronouns as such. One can often find in the literature analyses which describe the semantic contribution of the gender feature on a pronoun as a presupposition (cf. [Kratzer, 2009], a.m.o.) Russian data, however, show that the association of the (indexical) presupposition with the morphological feature itself is an illusion created by the peculiar properties of English.

Russian masculine and feminine pronouns can refer not only to people, but to inanimate objects and animals as well. Yet, as we will see below, only those instances of such pronouns which refer to humans give rise to indexical presuppositions. What that means is that such presuppositions are not triggered by gender features on the pronouns, but rather arise via some different mechanism (for instance, the one we sketched in [18] above).

Just like in English, in Russian there are three morphological agreement classes (that is, genders): FEMININE, MASCULINE and NEUTER. But unlike in English, where FEMININE and MASCULINE features mostly appear on DPs referring to humans, in Russian inanimate DPs are morphologically gendered in an essentially arbitrary fashion. There is no semantic significance in the fact that pisjmo ‘letter’ is neuter, and kniga ‘book’ is feminine.

Morphological gender in Russian manifests itself on three levels in a sentence: on N-s, in DP-internal agreement, and in DP-external agreement. On the N-internal level, declension types go together with gender restrictions. For instance, o-declension nouns can only be neuter, while a-declension nouns can be either feminine or masculine. Thus the set of endings an N has correlates with the gender feature of its stem. In DP-internal agreement, the morphological gender feature of the common noun normally matches the gender features on adjectives and participles, manifested by adjectival inflectional endings. Finally, DP-external agreement is agreement between a DP as a whole and other elements in the sentence, including relative pronouns, finite verbs, and, importantly for our purposes here, coreferring anaphoric pronouns.
Normally, gender features are matched on all three levels, as in (19). The neuter ending of the noun okno shows the inherent gender feature of that particular stem. The neuter ending of the adjective vtoroje is an instance of DP-internal agreement. The neuter endings of the copula bylo and the participle otkryto, together forming an analytical past tense passive, are instances of DP-external agreement.

(19) Vtor-oje okn-o byl-o otkryt-o.
    Second-neut window-neut was-neut open-neut
‘The second window was open’

However, as in other Slavic languages with similar gender agreement systems, there can be mismatches in the “chain of agreement”. In particular, agreement at the three different levels just mentioned can be misaligned (see [Wechsler and Zlatić, 2000] for a comprehensive review of a similar system in Serbo-Croatian; the particular division into three levels that I use is essentially due to Wechsler and Zlatić, though I changed the labels of the three categories). One case of such misalignment is illustrated in (20). DP-internally, the matrix subject DP in (20) is masculine. But the anaphoric pronoun that it binds in the embedded clause is feminine, so the DP-external feminine agreement is misaligned with the DP-internal masculine agreement. The semantics of the example is the same as that of the English translation: (20) is only appropriate to assert if the new doctor is female.

(20) [Novyj vrac]5 govorit, ėsto eto vremja ej5 udobno.
    new.masc doctor says that this time she.dat convenient
‘[The new doctor]5 says that this time is convenient for her5’

There exist further complications in the agreement system of Russian. To name a few: not all nouns allow freely the misalignment pattern in (20); agreement may be misaligned within what we called “the DP-internal level” and “the DP-external level”; misalignment of agreement between the N-internal level and the DP-internal level is more common in Nominative than in oblique cases; and so forth. In what follows, I will only discuss those complications which will be relevant for our argument. A fuller description of the system of gender agreement in Russian may be found in [RG, 1980, §1134-1146], a.o.

Now that we have reviewed the general form of the system of Russian morphological gender, what can we say about indexical presuppositions? Do they exist in Russian? When we consider DPs denoting humans, we see exactly the same pattern as in English.

First, we can replicate in Russian sentences like (2) and (3) which supported Cooper’s presuppositional analysis for English gender features, cf. (21) and (22).

(21) Maša uvidit ejo4.
    Maša will see her
‘Masha will see her.

(22) [Každ-yj vrač]$_5$ govorit, što $\text{ejo}_5$ vremja $\text{ej}_5$ udobno.

Every-MASC doctor says that her time she.DAT convenient

‘[Every doctor]$_5$ says that her (assigned) timeslot is convenient for her.$_5$’

21 can only be used if the referent of $\text{ejo}_4$ is female, just as was the case for 2. 22 can only be used when all the doctors in the domain of quantification are female, just as in English 3. (Note that DP-internal agreement within the matrix subject DP in 22 is masculine. Feminine DP-internal agreement would have been just as good.)

Furthermore, the English counterfactual conditional pattern from 5 and 6 can also be replicated in Russian, though with a certain quirk. In Russian counterfactuals, both the antecedent and the consequent feature the same analytic verb form which looks like a combination of a finite past tense form with the subjunctive particle by. The quirk is that such past verb forms mark gender, unlike English verb forms, or some other tense forms of Russian. Thus in the Russian counterparts of 5 and 6, namely 23 and 24, there has to be DP-external agreement on the verb, not only on the anaphoric pronoun as in English. However, the quirk does not actually create additional complications to the pattern in this case: in 23 and 24, mismatch in gender between the subject and the verb is not allowed in either clause of either sentence.

As far as anaphoric pronouns go, the pattern in 23 and 24 is the same as it was in English 5 and 6: the pronoun’s gender cannot match the counterfactual gender of the prince, but it can match his actual gender.

(23) * Esli by [syn korolevy]$_2$ byl ženskovo pola, to ona$_2$

If SUBJ son queen.GEN was.MASC female.GEN gender.GEN then she
byla by subj umna.
was.FEM SUBJ smart.FEM

‘If [the queen’s son]$_2$ were female, then she$_2$ would be smart.’

(24) OK Esli by [syn korolevy]$_2$ byl ženskovo pola, to on$_2$

If SUBJ son queen.GEN was.MASC female.GEN gender.GEN then he
byl by subj umjon.
was.MASC SUBJ smart.MASC

‘If [the queen’s son]$_2$ were female, then he$_2$ would be smart.’

Other tests we applied in Section 2 can also be replicated in Russian, and the results are the same as long as we only consider human-referring pronouns. For instance, 25 is a Russian counterpart of 10b and 26, a counterpart of 13a.

$^{14}$As we noted above, not all DPs allow for misalignment between DP-internal and DP-external agreement of the kind shown in 20. In particular, neither syn korolevy ‘the queen’s son’, nor personal pronouns in allow for such mismatches.
(25) * Odnoklassnik [devoˇcki]1 skazal, što evo1 oslik ne kusajetsja.
   ‘[The girl]1’s classmate said that his donkey does not bite’

(26) * Ja znaju što Saˇsa4 mužskovo pola.  A Bill dumajet, što Saˇsa4
   I know that Sasha male GEN but Bill thinks that Sasha
   źenskovo pola i ljubit, kogda ejo4 oslik raščosan.
   female GEN and likes when her donjey is groomed
   ‘I know that Sasha4 is male. But Bill thinks that Sasha4 is female, and
   likes when her4 donkey is groomed.’

Thus for pronouns referring to humans, English and Russian show the same pattern
of indexical presuppositions. But as soon as we turn to Russian pronouns bearing
FEMININE and MASCUlINE, but referring to non-humans, indexical presuppositions
suddenly disappear.

In 27 the feminine pronoun refers to a book, but the use of the FEM feature has no
semantic significance. For instance, if the book contains a novel, the speaker could
just as well refer to the same object with etot roman ‘this novel. MASC’, and the pro-
noun would have to be masculine in that case. For inanimate objects, morphological
gender functions as an arbitrary agreement class, with no associated semantics.

(27) Ja ostavil zdesj [etu fem knigu]3 specialjno štoby Maˇsa udivela ejo3.
   ‘I left [this book]3 here in order that Maˇsa saw her.’

One might be tempted to explain the semantic vacuousness of gender on inanimate
DPs by appealing to the fact that objects like books or letters have no biological
sex. However, for animals that do have biological sex, gender features on anaphoric
pronouns also fail to induce indexical presuppositions. Even though the speaker of
28 is well aware of the fact that the rat in question is male, and explicitly underscores
the importance of that fact, he can successfully use a FEM pronoun referring to the
rat.

(28) [Eta fem krysa]4 samec, tak čto ja ostavil ejo4 zdesj specialjno dlja
   [this fem rat FEM] male, so I left MASC her here specially for
   Maˇsi, ona menja prosila ostavitj samca.
   Maˇsa, she asked me to leave a male
   ‘[This rat]4 is a male, so I left it4 here specially for Masha, she asked me
   to leave a male’.

Thus the generalization is as follows:

(29) a. When Russian anaphoric pronouns refer to humans, they give rise to the
    same indexical-presupposition effects as English pronouns.
b. When not referring to humans, gender features on Russian anaphoric pronouns have no semantic import.

It should be stressed that morphologically, MASC and FEM features in Russian look exactly the same regardless of whether they apply to humans, animals, or inanimate objects. There is no formal reason to think that features on human-referring DPs are somehow different from those on non-human-referring DPs. Thus it is not morphological gender features on pronouns that trigger indexical presuppositions: if they did, we’d have seen such presuppositions triggered for animal-denoting DPs.

Of course, if for some reason one wants to maintain either that all gender features trigger presuppositions, or that indexical presuppositions in particular are triggered by gender features, there are easy technical ways to achieve that. As [Dowty and Jacobson, 1988] discuss, there are reasons to assign semantic content even to purely arbitrary gender features, including FEMININE on kniga ‘book’ and MASCULINE on avtobus ‘bus’. Meanings which Dowty and Jacobson assign to gender features are roughly as follows (the bracketed part before the dot is the contributed presupposition, of propositional type, and the part after the dot is the assertive part, of type e):

(30) \[ \text{[FEMININE]} = (x \text{ is an object which is normally referred to using a FEMININE noun}) \cdot x \]

If one analyzes all morphological gender features this way, that would help to account for deictic uses of gendered pronouns, as [Dowty and Jacobson, 1988] discuss, and at the same time all gender features would be presupposition triggers.

As for the notion that indexical presuppositions in particular are triggered by morphological features, there are several technical ways to maintain that, too. One of them is to stipulate a disjunctive indexical presupposition so that for a human referent, it is required that its “real gender” matches the pronoun’s feature, whereas for a non-human referent, something like 30 applies. Or, alternatively, one can stipulate an ambiguity between MASCULINE\textsubscript{1} restricted to humans and triggering an indexical presupposition, and MASCULINE\textsubscript{2} restricted to non-humans and not a presupposition trigger. My claim above that indexical presuppositions are not triggered by pronominal gender features directly thus needs a qualification. But even though we can find technical ways to avoid making that claim, we would still need to reproduce the crucial distinction between human-referring and non-human-referring DPs in the analysis. Saying that morphological features as such do not trigger indexical presuppositions simply seems to be the most straightforward way to state that.

But if indexical presuppositions are not a part of the semantics of gender features, where do they come from, and why do they only apply to human-referring DPs? The real-gender theory in 18 answers those questions. The constraint the effects of
which we see in the form of indexical presuppositions has little to do with language. It requires speakers to observe certain rules regarding the social category of human gender, namely, mark people’s gender with appropriately gendered pronouns. That constraint does not apply to non-human-referring DPs because for non-humans, the social category of gender does not apply, and speakers are free to do anything.

It should be stressed that the behavior gender features on anaphoric DPs is not the only phenomenon where the pattern for human-referring DPs is different from the pattern for non-human-referring DPs.

For example, I mentioned earlier that misalignment between DP-internal agreement and DP-external agreement as in [20] is possible only for a limited number of common nouns. It turns out that when we look at the class of N-s which allow such misalignment, all of them describe humans. While [31] with a human-referring DP is good both with masculine and feminine agreement on the verb, in [32] not only olenj ‘deer’, but any other masculine noun describing animals would still require masculine agreement.

(31) Referring to a female doctor:

\[
\begin{align*}
\text{Novyj vrač} & \quad \{ \text{OK} \text{vošla} / \text{OK} \text{vošol} \} \text{ v komnatu.} \\
\text{New.MASC doctor} & \quad \text{entered.FEM entered.MASC into room}
\end{align*}
\]

‘The new doctor entered the room.’

(32) Referring to a female deer:

\[
\begin{align*}
\text{Bystryj olenj} & \quad \{ *\text{vyskočila} / \text{OK} \text{vyskočil} \} \text{ iz kustov.} \\
\text{fast.MASC deer} & \quad \text{jumped.FEM jumped.MASC out.of bushes}
\end{align*}
\]

‘The fast deer jumped out of the bushes.’

Second, when referring to groups of humans which include people of both genders, it is only appropriate in standard Russian to use a common noun which bears morphological N-internal MASCULINE.

(33) Referring to a group of female and male students:

\[
\begin{align*}
\text{OK studenty} & \quad \text{‘students.MASC’} \\
* \text{ studentki} & \quad \text{‘students.FEM’}
\end{align*}
\]

\[\text{In the plural, agreement gender is neutralized: plural pronouns, adjectives, finite verbs, etc. do not distinguish genders. Thus the only gender we can see in the plural is the N-internal gender on plural common nouns. We know which gender the nouns in [33] belong to because of those nouns’ behavior in the singular.}\]
If we only considered human-denoting DPs, we could have ended up concluding that this pattern supports the claim in [Sauerland, 2008, p. 79] that “the masculine gender is uniformly less marked than the feminine”, under the assumption that when there is a conflict between two competing values of a category, the less marked value surfaces.

But as soon as we look at non-human-denoting DPs, it becomes clear that masculine in the language as a whole is not less marked than feminine: not one pattern as in (33) but all four logically possible patterns are observed for animal groups containing individuals of both biological sexes. For deer, the unmarked noun bears masculine. For ducks, the unmarked noun is feminine. For geese, there are two terms neither of which can be used for a mixed group. Finally, for horses, there are two unmarked nouns of different genders suitable for reference to a mixed group.

(34) Referring to a group of female and male deer:

\[
\begin{align*}
\text{OK} & \quad \text{oleni} \quad \text{‘deer.PL.MASC’} \\
* & \quad \text{olenixi} \quad \text{‘deer.PL.FEM’}
\end{align*}
\]

(35) Referring to a group of female and male ducks:

\[
\begin{align*}
* & \quad \text{selezni} \quad \text{‘ducks.MASC’} \\
\text{OK} & \quad \text{utki} \quad \text{‘ducks.FEM’}
\end{align*}
\]

(36) Referring to a group of female and male geese:

\[
\begin{align*}
* & \quad \text{gusaki} \quad \text{‘geese.MASC’} \\
* & \quad \text{gusyni} \quad \text{‘geese.FEM’}
\end{align*}
\]

(37) Referring to a group of female and male horses:

\[
\begin{align*}
\text{OK} & \quad \text{koni} \quad \text{‘horses.MASC’} \\
\text{OK} & \quad \text{lošadi} \quad \text{‘horses.FEM’}
\end{align*}
\]

The existence of all four possible patterns shows that it is not the features masculine and feminine that create the effect in (33), but rather something special to

\[\text{\textsuperscript{16}}\text{Though there is another noun } \text{gusj ‘goose’ which can be used to refer to mixed groups. For other pairs of nouns in this class, such as } \text{kozly ‘goats.MASC’ and } \text{kozy ‘goats.FEM’, some speakers allow one of them to refer to a mixed group, while others do not. The robustness of this particular pattern thus may be questionable for some speakers. The other three patterns exemplified in (34), (35), and (37) are stable.}\]
human-denoting expressions. Once we consider the unmarkedness of masculine for human-referring DPs in the larger context of the society speaking the language in question, the pattern can be immediately explained by sociological facts external to language.

To sum up, there are several different phenomena where morphological gender features are treated in a special way on DPs referring to humans. Moreover, such phenomena often cannot be explained language-internally, but immediately can be recognized as linguistic correlates of well-studied social patterns.

Indexical presuppositions arising in sentences with gendered pronouns referring to humans is one of such phenomena. Human societies pay a lot of attention to the “real gender” of people, and treat gender as an intrinsic, essential property. One of the ways in which that manifests itself is the constraint that a pronoun’s gender feature match the referent’s “real gender”, \[18\]. That constraint creates the pattern of indexical presupposition projection which we described above.

4. Conclusion

This paper has argued for two claims regarding the semantics of gender features of anaphoric pronouns: first, that projective implications that we see in sentences with gendered pronouns are not regular presuppositions, for they do not project as regular presuppositions do; second, that those special indexical presuppositions are not built into the semantics of gender features per se, but rather arise because of the constraint in \[18\] requiring that speakers match the gender features of human-referring pronouns with the “real gender” of the referents. This real-gender theory of indexical presuppositions simultaneously explains their peculiar projection behavior, and the otherwise mysterious fact that such presuppositions only arise for human-referring pronouns.

References


