PERSON AND GENDER IN PRONOUN PARADIGMS: A SEMANTIC ACCOUNT OF A MORPHOLOGICAL PATTERN[*]

Bronwyn M. Bjorkman, Isabelle Boyer, Elizabeth Cowper, Daniel Currie Hall, Louise Koren & Dan Siddiqi
Queen's University (Bjorkman); Carleton University (Boyer, Koren, Siddiqi); University of Toronto (Cowper); Saint Mary's University (Hall)

1.   Introduction

This paper investigates a well-known typological asymmetry in how gender marking is distributed within pronominal paradigms. In languages that mark gender on pronouns, gender is often marked only in the third person, often in the third person singular alone (see, e.g., Greenberg 1966; Siewierska 2013). Based on the survey of patterns of syncretism in pronominal systems reported in Bjorkman et al. (2022), we first confirm this typological generalization, and then propose a formal account of it.

We argue in section 3 that the association of gender with the third-person singular resists explanation in purely morphological terms. Feature dependencies of this kind are often accounted for in terms of feature geometries, as in Harley and Ritter (2002), but both the arguably underspecified status of third person and the existence of some languages where gender does appear on participant pronouns make a feature-geometric account of this asymmetry precarious. Conversely, while the morphological mechanism of Impoverishment in Distributed Morphology might account for this asymmetry in any single language, it does not predict any general typological association.

In section 4 we consider the possibility that the asymmetry could be explained by a syntactic difference between third-person and participant pronouns, if (in at least some languages) gender features are introduced high in the nominal functional spine, on a head that does not occur in participant pronouns. However, from a purely syntactic perspective, it is less clear why this difference would exist in the first place.

We argue that the syntactic explanation for the asymmetry between third-person and participant pronouns is correct, but that it is due to a difference in the semantic type of different person features. The ϕ-features of participants (1st and 2nd persons) produce expressions denoting individuals (type e), while the ϕ-features of non-participants (3rd persons) produce predicates (type $\langle e, t \rangle$). We argue that gender features are of type $\langle et, et \rangle$, and can thus only compose with predicates: if they compose with person features, they will not be compatible with participants, but only with third person. In section 5, we discuss these results in the context of our larger project on 'upstaging', which investigates why some

dimensions of morphosemantic contrast are realized at the expense of others.

2. The phenomenon

2.1 Previous typological work

The tendency for gender to be expressed in the third person and in non-singular numbers is well established in the typological literature; as noted by Siewierska (2013): "Gender oppositions in personal pronouns are characteristic of the third rather than the first or second person." Greenberg (1966) identifies the following interactions of morphological gender with person (1) and number (2):

(1) **Universal 44.** If a language has gender distinctions in the first person, it always has gender distinctions in the second or third person, or in both (Greenberg 1966: 76).

(2) **Universal 37.** A language never has more gender categories in non-singular numbers than in the singular (Greenberg 1966: 75).

Universal 45. If there are any gender distinctions in the plural of the pronoun, there are some gender distinctions in the singular also (Greenberg 1966: 76).

More recently, Plank and Schellinger (1997) refine Greenberg's generalizations based on evidence from additional languages:

(3) Plank and Schellinger (1997: 94) on gender, number, and person:

i. A gender distinction in the singular authorizes the same gender distinction in non-singular numbers of the corresponding person.

ii. A gender distinction in 3rd person singular authorizes the same gender distinction in 1st and/or 2nd person non-singular.

iii. A gender distinction in 3rd person non-singular needs no special authorization.

iv. If gender is limited to non-singular, a gender distinction in 3rd person authorizes the same gender distinction in 2nd person, which in turn authorizes the same gender distinction in 1st person.

Even assuming that these generalizations remain unfalsified as more languages are examined, it is not obvious how such disjoint implicational universals can be formalized— or whether they should be.

2.2 Confirmation in a new survey

Unsurprisingly, the observed correlation between third person, singular number, and gender marking is confirmed in our survey of upstaging patterns in pronominal systems. As described by Bjorkman et al. (2022), this project investigates patterns of syncretism in paradigms with respect to person, number, gender, and case; this includes not only nominal paradigms but also a preliminary survey of verbal agreement paradigms in the same languages.

Our survey starts from Bliss and Ritter's (2009) pronouns database, and currently extends to 112 languages. The overall goal of the project is to identify asymmetries in which some dimensions of contrast are preserved at the expense of others. For example, if there is a syncretism in a pronominal paradigm, is it more likely that a distinction in person will be preserved at the expense of a distinction in number, or vice versa?

All data are drawn from published grammatical descriptions, typically reference grammars but in some cases supplemented by pedagogical sources or articles. Generalizations thus pertain to a 'standard' variety in some sense, and do not reflect either within-community variation or recent changes.

For the purposes of this survey, a language was counted as marking gender in its pronominal system if it had any distinction that could not be characterized in terms of either participant features (i.e. inclusive vs. exclusive pronouns) or politeness. For the most part, languages treated by us as marking gender made some set of distinctions including either masculine/feminine or animate/inanimate.

Of the 112 languages in our survey, 55 mark gender on at least some pronouns; these are shown in Table 1. Of those 55, 42 mark it only in the third person, and of those 42, gender is limited to the third-person singular in 17.[1] Only one language surveyed so far (Iraqw; Cushitic, Nordbustad 1988) marks gender on participant pronouns—specifically 2nd person—but not on 3rd person pronouns.

Table 1: *Gender marking by person*

ONLY PARTICIPANTS	PARTICIPANTS AND NON-PARTICIPANTS		ONLY NON-PARTICIPANTS
2nd only	1st, 2nd & 3rd	2nd & 3rd only	3rd only
Iraqw	Djingli, Ngandi, Rikbaktsa, Slovenian (Lithuanian) (Spanish)	Arabic, Bandjalang, **Hausa**, Hebrew, Tamazight, Tunica	**Ainu**, Albanian, Arapesh, Asheninca, **Awtuw**, Basque, Catalan, **Chinook**, **Cubeo**, Czech, **Dieri**, **Dutch**, **(Old) English**, **German**, Godie, Greek, Halkomelem, **Hinuq**, Ho, IsiXhosa, Kaingang, Kannada, Latin, Latvian, **Lushootseed**, Marshallese, Mixteco, Mohawk, Pakaasnovos, Palauan, Polish, **Pomo**, Romanian, **Somali**, Sotho, **Swedish**, **Telugu**, **Welsh**, **Wolaytta**, **Xokleng**, Yimas, Zapoteco
1	6	6	42
	12		

Czech (West Slavic; Janda and Townsend 2002) exemplifies the pattern in which gender contrasts are marked in the 3rd person in both numbers, but not in any other person, as

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[1]In Table 1, languages where gender is marked in third-person singular only are indicated in boldface.

shown in Table 2. Awtuw (Sepik; Feldman 1986) exemplifies the pattern in which gender contrasts are more narrowly confined to 3rd-person singular, as in Table 3.

In sum, the association between pronominal gender marking and non-participant person is striking, as is the association with singular number. The question is how this association should be accounted for, and whether it arises from the interaction of grammatical features. We turn to these questions in the next section.

Table 2: *Czech pronouns: Gender marked in 3rd person only*

		SING.	PLUR.
1		*já*	*my*
2		*ty*	*vy*
3	MASC.	*on*	*oni*
	FEM.	*ona*	*ony*
	NEUT.	*ono*	*ona*

Table 3: *Awtuw pronouns: Gender marked in 3rd person singular only*

		SING.	DUAL	PLUR.
1		*wan*	*nan*	*nom*
2		*jen*	*an*	*om*
3	FEM.	*tej*	*ræw*	*rom*
	NON-FEM.	*rej*		

3. The theoretical challenge

3.1 A functional intuition

An intuitive functional interpretation of the cross-linguistic pattern in person and gender is that gender is simply less 'useful' in the first and second person than in the third. The author and the addressee are uniquely identifiable by their roles in the discourse, while additional information such as gender (either grammatical or biosocial/conceptual) can help to disambiguate the reference of a third-person pronoun. A pronoun like English *I* normally refers unambiguously to the author of an utterance, regardless of their gender.[2] A pronoun like English *she,* on the other hand, narrows the range of possible referents from all sufficiently salient or familiar non-discourse participants to the subset that are conceptually/biosocially feminine.[3] And in languages with grammatical gender, such as French, a pronoun like *elle* indicates that the referent either is conceptually/biosocially feminine or corresponds to a grammatically feminine noun. Grammatically gendered nouns need not carry conceptual or biosocial gender, as with grammatically feminine epicene nouns such as *la personne* 'the person', or inanimate ones such as *la table* 'the table').

In the absence of a specific formal implementation, this functional account does not rise to the level of an explanation. By itself, it makes no testable predictions that go beyond the generalization that inspired it. And, if one considers pronoun systems from a functional

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[2]We set aside cases such as free indirect discourse (on which see, e.g., Reboul 2019) and generic uses of participant pronouns (Nunberg 1993), which we believe can be accommodated pragmatically without affecting the analysis of the pronouns' basic semantic content.

[3]For an explanation of the terms *biosocial gender* and *conceptual gender,* see Ackerman (2019: §2).

perspective to see what predictions might be made *a priori* about the interaction between person and gender, the establishment of reference is not the only purpose gender can serve. Marking gender and other socially relevant properties on first- and second-person pronouns can contribute to establishing and reinforcing social roles and relationships. Indeed, many languages have complex and diachronically fluid pronoun systems that encode nuanced information about gender, social status, register, and affect. Japanese is one example, as reflected in the overlapping paradigms of first-person forms used by men and women in Table 4.

Table 4: *Gender and register in Japanese first-person pronouns (Miyazaki 2004: 257, citing Ide 1997: 73)*

	Men's speech	Women's speech
Formal	*watakushi* *watashi*	*watakushi* *atakushi*
Plain	*boku*	*watashi* *atashi*
Deprecatory	*ore*	∅

All that can be said from this functional perspective, then, is that there are some reasons to mark gender on first- and second-person pronouns, and other reasons not to. While reference resolution might assign greater utility to gender marking on third-person pronouns than to gender marking on participant pronouns, other factors could make the opposite calculation. If there is a kernel of truth to the reference-resolution story, it needs to be made formally explicit if it is to make testable predictions.

3.2   Formal assumptions

We adopt the general syntactic assumptions of Minimalism (Chomsky 1995 et seq.), and the principles of Distributed Morphology (Halle and Marantz 1993, 1994; Harley and Noyer 1999) regarding the morphophonological realization of syntactic structures. In particular, we assume the following:

Late insertion: Vocabulary items (VIs) are inserted in the mapping to PF to spell out combinations of features.

Underspecification: To be eligible for insertion, a VI need not realize all the syntactic features on the element being exponed, but it cannot realize any features not specified on that element. A given underspecified VI may therefore be compatible with multiple slots in a paradigm.

Competition: In the realization of any set of features, the most highly specified compatible VI is selected.

We also take what Cowper and Hall (2017) call a **neo-parametric** approach to formal features and the syntactic structures in which they appear. Under this view, features are not universal, but the mechanism by which they are acquired is (Cowper and Hall 2014). The syntactic configuration of features is also not universal (*contra* cartographic approaches such as that of Cinque and Rizzi 2008), but is constrained by the requirements of feature-checking and semantic composition.
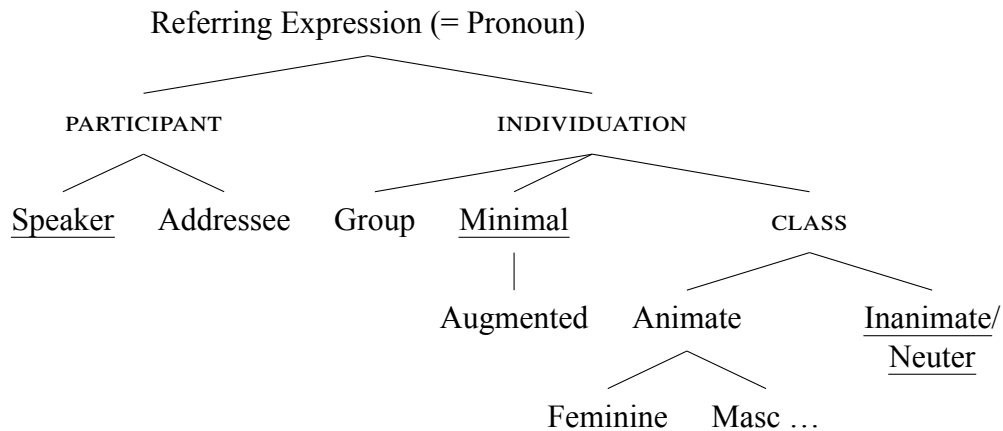
Within the space of these theoretical assumptions, there are several ways to account for asymmetries. In the next two subsections we review two that are unsuccessful, and in section 4 we present a third, syntactic account that can be motivated, not morphologically or syntactically but rather semantically.

3.3 Feature geometry

Feature geometries express implicational entailments among features, and offer a way to encode, if not explain, feature dependencies. Feature geometries have seen much use in recent Minimalist treatments of patterns of ϕ-agreement, particularly those that reflect hierarchies or dependencies among features.

Feature-geometric accounts have also been offered for the types of dependencies we find in upstaging. For example, Harley and Ritter (2002) account for Greenberg's (1966: 74) Universal 36 ("If a language has the category of gender, it always has the category of number") by making CLASS (gender) dependent on INDIVIDUATION (number) in their proposed feature geometry for pronouns.

(4) Harley and Ritter's (2002: 486) feature geometry for pronouns

Referring Expression (= Pronoun)

PARTICIPANT   INDIVIDUATION

Speaker   Addressee   Group   Minimal   CLASS

Augmented   Animate   Inanimate/
                                Neuter

Feminine   Masc …

However successful this might be as an account of the association of gender with singular number, there is no good way to make gender dependent on third person, in (4) or in another feature geometry. In privative feature systems, 3rd person is represented by the *absence* of a feature such as [PERSON] (Bonet 1991), [PARTICIPANT] (Harley and Ritter 2002) or [PROX] (Ackema and Neeleman 2013); in binary systems (e.g., Noyer 1992; Harbour 2016; Cowper and Hall 2019), 3rd person is typically represented by negative feature values. In either case, there is no feature that third person has, for gender to be dependent on, that first and second persons lack.

And feature geometry in general cannot account for the kind of typological interaction we see between gender and person. If the geometry is universal, gender cannot be a dependent of 3rd person, because several languages also mark gender on participants. If the geometry is language-specific, it is a mystery that gender marking on participants only (as in Iraqw) is so much rarer than gender marking in 3rd person only. For these reasons, a feature geometry does not offer a plausible path towards explaining the frequent association between gender and third person.

3.4 Impoverishment

In Distributed Morphology, the operation of **Impoverishment** (Bonet 1991; Halle and Marantz 1993) can delete features. Unlike feature geometry, Impoverishment provides a way to stipulate that some marked feature is realized only in the *absence* of another marked feature. In the situation at hand, for example, we could claim that in many (but not all) languages, gender features are deleted in the context of [PARTICIPANT].

But this account is not an explanation, as Table 5 shows. Singular pronouns of Korana (Table 5a; Central Khoisan) distinguish gender in all persons (Siewierska 2013, citing Meinhof 1930). The gender-in-3rd-person-only pattern is represented in Table 5b by Québécois. This pattern can be derived by the Impoverishment rule shown, which deletes the marked gender feature, non-crucially assumed to be [FEM], in the context of marked person ([PART]).

However, an Impoverishment rule deleting [PART] in the context of [FEM] would be equally simple and natural. This rule generates the unattested paradigm in Table 5c, with distinct pronouns for 'I$_M$', 'you$_M$', and 'he', but a single form for 'I$_F$/you$_F$/she'). The Impoverishment approach thus completely fails to address, or even raise, the question of why person upstages gender (Table 5b), but not vice versa (Table 5c).

Table 5: *Korana, Québécois, and unattested singular pronoun paradigms*
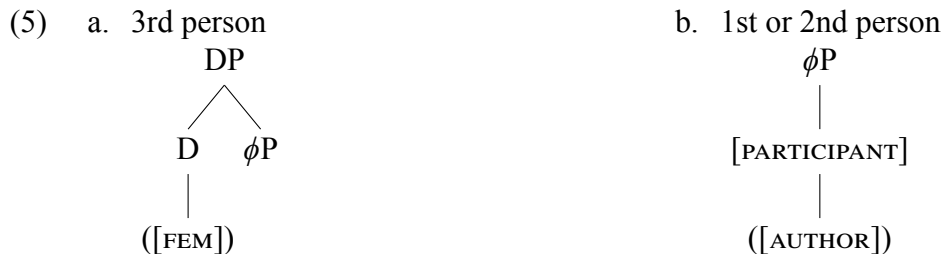
a. Korana

	MASC.	FEM.
1st	*tire*	*tita*
2nd	*sats*	*sas*
3rd	*ll'dib*	*ll'dis*

No impoverishment

b. Québécois

	MASC.	FEM.
1st	ʒ	ʒ
2nd	t	t
3rd	i	a

[FEM] → ∅ / [PART]

c. Unattested

	MASC.	FEM.
1st	ʒ	a
2nd	t	a
3rd	i	a

[PART] → ∅ / [FEM]

4. Proposal

We propose to locate the solution in the syntactic structure, through semantic constraints on where gender features occur.

4.1 A syntactic difference

Third-person pronouns often pattern with demonstratives (see, e.g., Ritter 1995 and Diessel 1999). We might therefore posit that, in at least some languages, third-person pronouns have a layer of syntactic structure that participant pronouns lack, and that gender features are on this additional head. (5) shows what this might look like, with gender on D.

(5)   a. 3rd person
    DP
    / \
    D ϕP
    |
    ([FEM])

    b. 1st or 2nd person
    ϕP
    |
    [PARTICIPANT]
    |
    ([AUTHOR])

But why should this be? What would prevent a D head from combining with a ϕP that contains [PARTICIPANT]? There is no obvious morphosyntactic motivation for such a restriction. We suggest instead that the restriction arises from principles of semantic composition.

We propose that participant and non-participant ϕPs have different semantic types, and thus different potential for composing with further syntactic heads. This builds on Bjorkman et al.'s (2019) analysis of Heiltsuk (see also Cowper and Hall 2022 on Marshallese). In §4.2 we first summarize the proposal from Bjorkman et al. (2019), and then in §4.3 we show how it can be extended to account for the typological distribution of gender.

4.2 Background: The Heiltsuk story

Heiltsuk (Wakashan), known as Haíłzaqvḷa by its speakers, is the language of the Heiltsuk nation, located on the Pacific coast in the province of British Columbia. All data cited here comes from Rath (1981), a descriptive grammar and dictionary.

Heiltsuk has demonstratives and third-person pronouns that indicate proximity to the speaker, ones indicating proximity to the addressee, and ones indicating neither, but none indicating proximity to a third person. This is illustrated by the demonstrative paradigm in (6): I–II are speaker-oriented; III–IV are addressee-oriented; and V–VII are not proximal to either discourse participant.

(6)   Heiltsuk demonstratives (Rath 1981: 87–88, 91, cited in Bjorkman et al. 2019)

	CLITIC	FULL	GLOSS
I	$ga\chi^w$	$gáq^w$	'this' (here with me)
II	$gaʦ\chi^w$	$gáʦq^w$	'this' (here with me, invisible)
III	$qu\chi^w$	$qúq^w$	'that' (there with you)
IV	$qu\chi^w ʦ\chi^w$	$qú\chi^w ʦq^w$	'that' (there with you, invisible)
V	$qi\chi^w$	$qíq^w$	'that' (over there / under discussion)
VI	$qiʦ\chi^w$	$qíʦq^w$	'that' (over there / under discussion, invisible)
VII	$qki\chi^w$	$qkíq^w$	'that' (absent / gone)

Bjorkman et al. (2019) adapt Harbour's (2016) analysis of person and location. Harbour proposes an ontology of persons that includes a unique author (i), a unique addressee (u), and arbitrarily many others ($o, o', o'', o''', \ldots$). Following Cowper and Hall (2019) we encode these via the features [±author, ±participant]. Harbour also proposes a locative element χ that generates a three-way distinction among demonstratives (near, middle, far) from the basic division among persons.

Bjorkman et al. (2019) treat χ as a function from individuals (type e) to the property of being near those individuals (type $\langle e, t\rangle$). An approximation of χ's denotation is in (7).

(7) $[\![\chi]\!] = \lambda x \,.\, \lambda y \,.\, \textsc{near}(y, x)$

Features denoting discourse participants—i.e., person feature bundles with a + value for at least one of [±participant] or [±author]—are of type e, and can combine with χ:

(8) a. $\begin{bmatrix} +\text{author} \\ -\text{participant} \end{bmatrix} = i$ b. $\begin{bmatrix} -\text{author} \\ +\text{participant} \end{bmatrix} = u$ c. $\begin{bmatrix} +\text{author} \\ +\text{participant} \end{bmatrix} = iu$

The third person feature combination [−author, −participant] is not of type e. Rather than denoting an individual, it denotes the property of not being a discourse participant, and is of type $\langle e, t\rangle$:

(9) $\begin{bmatrix} -\text{author} \\ -\text{participant} \end{bmatrix} = \lambda x \,.\, x \in \{o, o', o'', o''', \ldots\}$

Bjorkman et al. (2019) propose that in Heiltsuk, a πP with first- or second-person features can be an argument by itself, as in (10). A πP with third-person features, as in (11), or one in which participant features combine with χ, as in (12), needs an additional head (D) to convert it to an e-type argument.

(10) Second person
      πP
      e
      |
      π
$\begin{bmatrix} -\text{author} \\ +\text{participant} \end{bmatrix}$

(11) Third person
      DP
      e
D $\langle\langle e, t\rangle, e\rangle$ πP $\langle e, t\rangle$
      |
      π
$\begin{bmatrix} -\text{author} \\ -\text{participant} \end{bmatrix}$

(12) Near addressee
      DP
      e
D $\langle\langle e, t\rangle, e\rangle$ πP $\langle e, t\rangle$
  χ $\langle e, \langle e, t\rangle\rangle$ e
      π
$\begin{bmatrix} -\text{author} \\ +\text{participant} \end{bmatrix}$
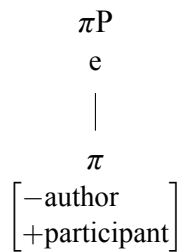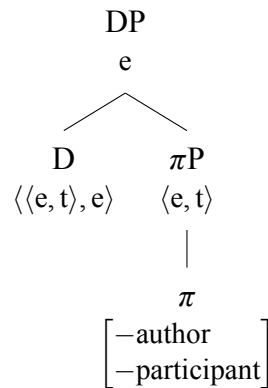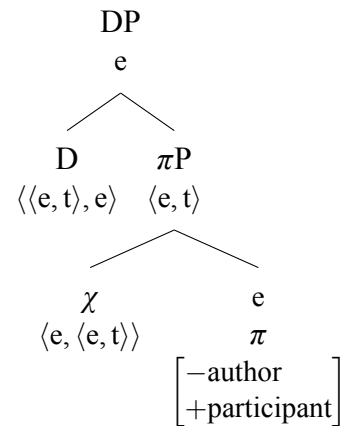
4.3 Extending the analysis to gender

Suppose that, just as χ can compose only with constituents of type e, gender features can compose only with something of type $\langle e, t \rangle$, which they modify intersectively as in (13):[4]

(13) a. $[\![\text{MASC}]\!] = \lambda F.\lambda x.F(x) \,\&\, \text{MASCULINE}(x)$
     b. $[\![\text{FEM}]\!] = \lambda F.\lambda x.F(x) \,\&\, \text{FEMININE}(x)$
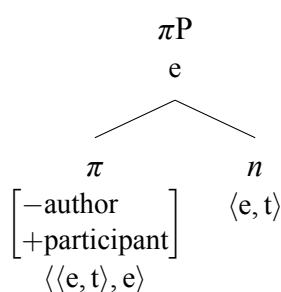
Suppose further that pronouns are built on a nominal core (n), which is of type $\langle e, t \rangle$. This is analogous to the 'referring expression' root node of Harley and Ritter's (2002) feature geometry. Finally, assume that, rather than directly denoting either e-type participants or $\langle e, t \rangle$-type third persons, person feature bundles are functions from $\langle e, t \rangle$ to those types.

If gender is structurally higher than person, then features like those in (13) will compose with third persons, as in (14), but not with participants, as shown in (15) and (16).
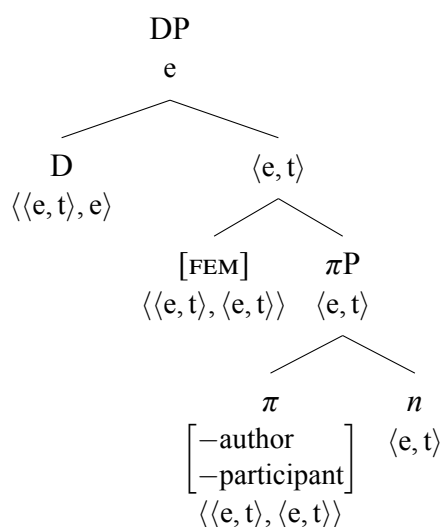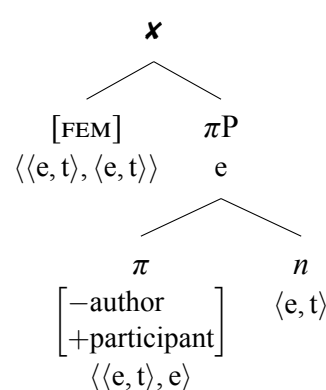
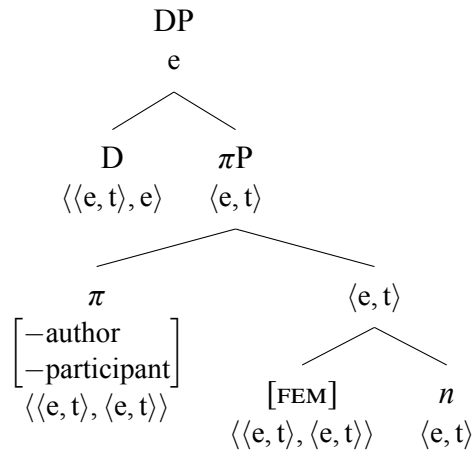(14) 3rd feminine   (15) 2nd person   (16) *2nd feminine

In such a system, only third-person pronouns can have gender features at all; gender contrasts are systematically excluded from the first and second person.

However, if gender features are structurally below person features, they will be freely able to combine with the $\langle e, t \rangle$ element n, giving an $\langle e, t \rangle$ constituent that can in turn combine with any of the person feature bundles, as in (17).

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[4]The predicates MASCULINE(x) and FEMININE(x) can be satisfied based on biosocial and/or grammatical gender, depending on the system of a particular language. We assume that other kinds of gender/animacy/noun-class features have the same compositional property. If gender/animacy/noun class should be analyzed in different terms for a given language—as for example animacy in Blackfoot has been analyzed as a form of nominal aspect by Ritter (2014)—it would fall outside the scope of our proposal here.

(17) a. Third-person feminine:

$$
\begin{array}{c}
\text{DP} \\
e
\end{array}
$$

D ⟨⟨e,t⟩,e⟩   πP ⟨e,t⟩

π $\begin{bmatrix} -\text{author} \\ -\text{participant} \end{bmatrix}$ ⟨⟨e,t⟩,⟨e,t⟩⟩   ⟨e,t⟩

[FEM] ⟨⟨e,t⟩,⟨e,t⟩⟩   n ⟨e,t⟩

b. Second-person feminine:

$$
\begin{array}{c}
\pi\text{P} \\
e
\end{array}
$$

π $\begin{bmatrix} -\text{author} \\ +\text{participant} \end{bmatrix}$ ⟨⟨e,t⟩,e⟩   ⟨e,t⟩

[FEM] ⟨⟨e,t⟩,⟨e,t⟩⟩   n ⟨e,t⟩
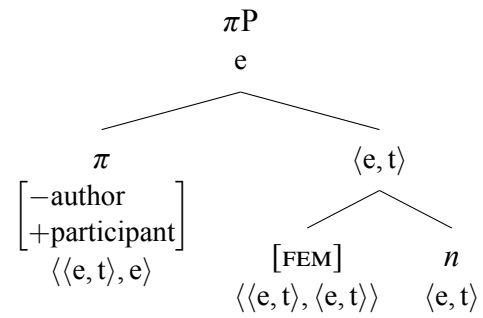
The existence of two possible structural positions for gender features predicts that languages with gender above person will have gender contrasts only in third-person pronouns, while languages with gender below person will potentially have gender contrasts in all persons. The Iraqw pattern—with gender marking in second person but not third—is not ruled out by this typology, but it is not predicted to be common. Under the account just proposed, Iraqw would have low gender, allowing gender contrasts in all persons, but would coincidentally lack distinct vocabulary items to realize those contrasts in both first and third persons.

If our proposal is correct, it provides support for proposals, like that of Ritter (1993), that the locus of gender varies crosslinguistically, as opposed to Kramer's (2016) arguments that gender is always low, on N or *n*. Specifically, our account is consistent with Ritter's claim that gender is low in full DPs in Hebrew. For us, the fact that Hebrew has gender marking on participant pronouns, as illustrated in Table 6, means that gender is also low in Hebrew pronouns.

Table 6: *Hebrew singular possessive clitic pronouns*

	MASC.	FEM.
1st	*i*	*i*
2nd	*xa*	*ex*
3rd	*o*	*a*

5.   Conclusions: Remaining puzzles and future directions

We have offered a semantically motivated syntactic account of the association between gender and third-person pronouns. However, there remain two typological asymmetries that our account does not explain. The first is that among participant pronouns, second

person is more likely to show gender contrasts than first person. The second is that in all persons, singular pronouns are more likely to show gender than plural; this is the association accounted for by Harley and Ritter (2002) in geometric terms.

5.1 An asymmetry between participants?

Gender is more likely to appear in second persons than in first persons. Recall from Table 1 that only 13 languages mark gender on participants, out of 55 that mark gender on any pronouns. Of the 13 languages that mark gender on participants, 7 mark it only in second person, while **none** mark gender in first person but not in second.

A further complication is that among the 13 languages that mark gender in all persons, two (Lithuanian and Spanish) show gender in participants only because the the participant pronouns are morphologically complex. They contain a non-pronominal element, either a numeral or an adjective, which is inflected for gender. This is illustrated in Table 7 for Lithuanian, where dual pronouns all contain the numeral 'two', which inflects for gender (as do most other Lithuanian numerals less than ten; see Ambrazas 1997: 166).

Table 7: *Lithuanian nominative pronouns (Ambrazas 1997; Plank and Schellinger 1997)*

		SING.	DUAL	PLUR.
1	MASC.	*àš*	*mù+**du***	*mẽs*
	FEM.		*mù+**dvi***	
2	MASC.	*tù*	*jù+**du***	*jū̃s*
	FEM.		*jù+**dvi***	
3	MASC.	*jìs*	*jiẽ+**du**, juõ+**du***	*jiẽ*
	FEM.	*jì*	*jiẽ+**dvi**, juõ+**dvi***	*jõs*

Setting aside Spanish and Lithuanian, the remaining 11 languages with at least some gender contrasts in participant pronouns show a clear asymmetry: 7 of them mark gender in second person but not in first, 4 mark gender in all persons, and none mark gender in first person but not second. Under our proposal, the four languages with gender in all persons are taken to be typical of this set; we would explain them as exhibiting 'low' gender.

Languages marking gender in second but not first person would also have low gender, if we are correct in analyzing these as involving accidental syncretism. It remains to be determined whether the absence of languages with gender in first but not second person is an accidental gap in our sample of languages, or a real asymmetry requiring explanation. If the latter, it could be that there is a further structural distinction giving rise to multiple possible interactions among person features, number, and gender. A larger data set, and a closer examination of languages with gender marking in participant pronouns, is required in order to determine whether this apparent asymmetry is real, and if so, how to account for it.

5.2 Interaction with number

As noted in section 2, gender also interacts with number. Of the 55 languages in our sample that mark gender on pronouns at all, 19 mark gender only in the singular. Only two, Marshallese and Palauan, mark gender only in the plural. This asymmetry is even more pronounced in the 42 languages where gender contrasts are expressed only in the third person. Of these 42 languages, 23 mark gender in both third person singular and plural, while 17 mark gender only in the third person singular, and two mark it only in the plural.

Table 8: *Gender marking by number in languages with gender marked in 3rd person only*

ALL NUMBERS	SINGULAR ONLY	PLURAL ONLY
Albanian, Arapesh, Asheninca, Basque, Catalan, Czech, Godie, Greek, Halkomelem, Ho, IsiXhosa, Kaingang, Kannada, Latin, Latvian, Mixteco, Mohawk, Pakaasnovos, Polish, Romanian, Sotho, Yimas, Zapoteco	Ainu, Awtuw, Chinook, Cubeo, Dieri, Dutch, (Old) English, German, Hinuq, Lushootseed, Pomo, Somali, Swedish, Telugu, Welsh, Wolaytta, Xokleng	Marshallese, Palauan
23	17	2

Recall that in section 3.3 we saw that Harley and Ritter's (2002) feature geometry encoded the interaction of gender with number, but not with person. While our account links the interaction of person and gender to semantic interpretation, the interaction of number and gender remains to be explored.

5.3 Future directions

The work reported here is part of a broader research program on what we have called **morphological upstaging**. In Bjorkman et al. (2022) we reported that person is the feature most likely to 'upstage' another in pronoun/demonstrative paradigms, followed by number. Here, we have addressed an apparent tendency to realize person and number at the expense of gender. We will turn in future work to the realization of ϕ-features in verbal agreement, where number so far appears to be the feature most likely to upstage the others.

In the longer term, we hope to identify which upstaging patterns are robust enough to need explanation, and determine whether all upstaging patterns can be attributed to independent factors such as syntactic structure, semantic type requirements, or some other as-yet unnoticed factor. It is in principle possible that some upstaging patterns may have to

be attributed to irreducible hierarchies among features—hierarchies that stipulate that certain features must be realized even at the cost of others. Such hierarchies could easily be encoded as extrinsic rankings between equally specific Vocabulary Insertion rules, but for us, such an account would be the analysis of last resort.

The semantically based structural account of the interaction of person and gender features in pronouns given above shows one way to derive a 'preference' for one kind of feature over another without stipulating Impoverishment rules or feature hierarchies, and without changing the basic assumptions of vocabulary insertion in Distributed Morphology. To the extent that it is correct, it supports the neoparametric view of formal features and their mapping to syntactic structure, and suggests that it should be possible to find principled explanations for other such preferences, or tendencies, that have been observed.

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