Tense and the Realization of the Feminine Plural in Hindi-Urdu

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This paper examines several intricacies in the realization of the plural feature in Hindi-Urdu, with reference to Indo-Aryan more broadly. We demonstrate that there are two general and pervasive classes of configurations that differ in how plural agreement is morphologically expressed in the feminine. In one class, plural is realized as nasalization; in the other, it is systematically neutralized. We argue that what distinguishes these two cases is the presence of a finite T in the immediate vicinity of the agreement: number morphology in the feminine is realized only in the context of finite T. We then demonstrate a second, more elusive conditioning factor of plural morphology. We show that a covert auxiliary induces number neutralization on a participle if the overt form of this auxiliary shows portmanteau morphology. That is, plural morphology is conditioned by morphological properties of covert material in its vicinity. We propose that portmanteau morphology diagnoses the application of morphological fusion rules, which alter parts of the syntactic structure and thereby induce number neutralization. Crucially, fusion applies to feature structures irrespective of whether these structures receive overt exponence or not. Fusion thus provides the tool to capture morphological properties of covert elements and their impact on number neutralization on adjacent elements. Our analysis gives a detailed treatment of agreement morphology in Hindi-Urdu and provides an independent way of characterizing finiteness in the language.

Keywords: finiteness, tense, portmanteau morphology, fusion, number neutralization, agreement, participial agreement, auxiliaries, Hindi-Urdu

1 Introduction

This paper examines the realization of the plural feature in the context of the feminine feature in Hindi-Urdu. We argue that the plural feature is only realized in the presence of a feminine feature if this plural feature is in the context of finite tense. Our analysis gives a detailed treatment of agreement morphology in Hindi-Urdu and provides an independent way of characterizing finiteness in the language.

In agreement environments, Hindi-Urdu displays pervasive neutralization of the plural feature in the context of the feminine feature. This can be exemplified by the oft-cited paradigm for the agreeing genitive marker *ka:*, which displays the three-way distinction in *ka:/ke/ki:* and not a four-way distinction in *ka:/ke/ki:/kĩ:*. We document this pattern of neutralization and contrast it with closely related languages such as Punjabi, Marathi, Kashmiri and Sindhi where we show that there is no such neutralization. We show that plural is in fact realized by nasalization in the context of the feminine feature in certain environments. We argue that these environments all involve the agreeing participle in the context of tense. Further we show that to determine whether the plural is realized or not, we cannot just make reference to the surface forms. Whether the plural is realized or not depends upon the morphosyntactic properties of the silent auxiliary verb involved in these contexts. The proposal deepens our understanding of Hindi-Urdu agreement morphology, the structural location of participles and the representation of Tense in Hindi-Urdu.

2 Plural Neutralization in the Feminine

Hindi-Urdu displays agreement in both gender and number. However number is neutralized in the context of the feature feminine. This seems quite systematic and can be seen with adjectives, the past/passive participle, the habitual participle, the progressive auxiliary, the infinitive, and the agreeing genitive postposition.

Adjectives agree in number and gender with the subject if they are predicative and with the noun phrase they modify if they are attributive. The agreement is visible only with adjectives that end in *-a:*.

(1) certain adjectives that end in *a:*, e.g. *lamba:* 'tall' (both attributive and predicative contexts)

	SG	PL
MASC	lamba:	lambe
FEM	lambi:	lambi:

The adjectivalizer *va:la:* inflects in a similar fashion: *va:la:/va:le/va:li:/va:li:* as do modifiers of adjectives like *itna:/utna:/jitna:/kitna:* 'this/that/how$_{rel}$/how$_{q}$ much'.

The passive/past participles, the habitual participle, and the progressive auxiliary agree with their subject/object depending upon the case borne by these arguments.

(2) passive/past participles, e.g. *ka:ṭ-a:* 'cut-Pfv'

	SG	PL
MASC	ka:ṭ-a:	ka:ṭ-e
FEM	ka:ṭ-i:	ka:ṭ-i:

(3) habitual participle, e.g. *ka:ṭ-ta:* 'cut-Hab'

	SG	PL
MASC	ka:ṭ-ta:	ka:ṭ-te
FEM	ka:ṭ-ti:	ka:ṭ-ti:

(4) the progressive auxiliary *raha:*

	SG	PL
MASC	raha:	rahe
FEM	rahi:	rahi:

Infinitival verbs agree but only in contexts of long distance agreement where they agree with a long-distance agreeing object.

(5) infinitive, e.g. *ka:ṭ-na:* 'cut-Inf'

	SG	PL
MASC	ka:ṭ-na:	ka:ṭ-ne
FEM	ka:ṭ-ni:	ka:ṭ-ni:

Finally we turn to the genitive postposition which agrees in number and gender with the possessum.

(6) the genitive postposition e.g. *Tina ka:* 'Tina Gen'

	SG	PL
MASC	Tina ka:	Tina ke
FEM	Tina ki:	Tina ki:

The similative postposition *jaisa:* 'like' and the suffixal genitive in *-ra:* that appears with personal pronouns pattern with the genitive postposition and agree with the noun that follows it.

We can abstract a common agreement pattern across all these contexts: *-a:/-e/-i:*. Note that this pattern of agreement makes a three-way distinction and not a four-way distinction. Number is neutralized in feminine contexts in Hindi-Urdu. The neutralization of number in feminine contexts is not a general characteristic of Indo-Aryan languages. Punjabi, Marathi, Sindhi and Kashmiri do not neutralize number in feminine contexts. Here are examples of some of these contexts for Punjabi where we see number being expressed in feminine contexts.

(7) certain adjectives that end in *a:*, e.g. *caŋga:* 'good' (both attributive and predicative contexts)(Punjabi, Bhatia (1993), page 83, ex. 258)

	SG	PL
MASC	caŋga:	caŋge
FEM	caŋgi:	caŋgiã:

The Punjabi adjectivalizer *va:la:* inflects in a parallel fashion: *va:la:/va:le/va:li:/va:liã:*.

(8) past participles, e.g. *uʈʰia:* 'rise-Pfv' (Punjabi, from Tolstaya (1981), Chapter 3, page 45)

	SG	PL
MASC	uʈʰia:	uʈʰe
FEM	uʈʰi:	uʈʰiã:

Habitual participles in Punjabi inflects similarly: from the verb *likhṇa:* 'to write', we get *likhda:/ likhde/ likhdi:/ likhdiã:* and so do infinitives (Gurmeet Kaur p.c.).

(9) the genitive postposition e.g. *da:*: (Punjabi, Bhatia (1993), page 182)

	SG	PL
MASC	da:	de
FEM	di:	diã:

The Punjabi progressive auxiliary *ría:* behaves similarly: *ría:/ráe/rái:/ráiã:*

We see here that Hindi-Urdu and Punjabi agreement in the environments differs systematically with respect to neutralization of number in feminine contexts: Hindi-Urdu neutralizes number systematically in the presence of the feminine feature while Punjabi does not. We find a similar systematicity in Kashmiri (Wali and Koul (1997)), Marathi, and Sindhi (Trumpp (1872), pages 327-328).

(10) Adjectival Agreement without number neutralization in contexts of Feminine agreement:

	MSG	MPL	FSG	FPL
PUNJABI	-a:	-e	-i:	-iã:
MARATHI	-a:	-e	-i:	-ya:
SINDHI	-ō	-ā	-ī	-iũ:
KASHMIRI	-mut	-mɨt’	-mɨts	-mɨtsɨ

(Marathi also has neuter gender; the forms for those are *-ə/-i:*. The paradigm shown for Kashmiri is for the perfect participle. Unlike the other languages, the adjectival agreement paradigm is not purely concatenative.)

Of the languages surveyed, only Gujarati patterns with Hindi-Urdu in neutralizing number in the feminine. It also has neuter as a gender and there is no number neutralization with the neuter.

(11) certain adjectives that end in *-o* e.g. *saro* ‘good’ (Doctor (2004), page 26)

	SG	PL
MASC	saro	sara
FEM	sari	sari
NEUT	sarũ	sarã

The adjectival agreement paradigm for Gujarati – *-o/-a/-i/-ũ/-ã* – is also the agreement paradigm used by all the agreeing participles (the present participle, the past participle, the future participle, the remote past participle, the future agentive participle, and the future imperative participle which is identical to the gerundial infinitive) (Doctor (2004), pages 39-40, 45-47), modifiers of adjectives that end in *-o* (Doctor (2004), page 67) and agreeing postpositions (the genitive *-no*, *jevũ, sərkhũ* ‘like’) (Doctor (2004), pages 32, 71).

Looking across these languages, we note two generalizations. The first is that the same pattern of inflection, which we can call the participial pattern, holds across a range of syntactic environments – underived adjectives, infinitives, agreeing postpositions, modifiers of adjectives, and participles. The second is that in the languages where there is no plural neutralization in the feminine, the plural feature is realized by a distinct segment – *-ã:* in Punjabi, *-a:* in Marathi, *-ũ:* in Sindhi, and -ɨ in Kashmiri – in addition to a segment that realizes the feminine feature. In this, it contrasts with the expression of plural in the context of the masculine feature. All four languages use a single morpheme that expresses both the masculine feature and the plural feature.

Having set up this crosslinguistic background, it is worth noting that the neutralization of number in feminine contexts is a fact about agreement contexts. There is no such systematic neutralization of number in feminine contexts with nouns, where the number and gender features can be thought of as intrinsic.

(12) *laṛka:* ‘boy’ vs. *laṛki:* ‘girl’

	SG	PL
MASC	laṛka:	laṛke
FEM	laṛki:	laṛkiyã:

That this is a restriction related to agreement can be seen by looking at the *va:la:* construction. This construction can be used to construct properties. So ‘X va:la:’ denotes a property associated with X when it modifies an NP. ‘X va:la:’ can also stand on its own as an argument and in that case it denotes the one associated with X.

(13) a. *nakhre va:la: laṛka:*
tantrums VALA.MSg boy
'the boy with tantrums'
b. *nakhre va:la:*
tantrums VALA.MSg
'the (masculine) one with tantrums'

But when we look at the full inflection of *va:la:* when it modifies an NP versus when it stands on its own, we see that the modifier *va:la:* neutralizes number in the feminine while the freestanding one does not.

(14) modifier *va:la:*

	SG	PL
MASC	nakhre va:la: laṛka:	nakhre va:le laṛke
FEM	nakhre va:li: laṛki:	nakhre va:li: laṛkiyã:

(15) free standing *va:la:*

	SG	PL
MASC	nakhre va:la:	nakhre va:le
FEM	nakhre va:li:	nakhre va:liyã:

The fact that the freestanding form does not display number neutralization tells us something important: number neutralization is not simply a general syncretism of the feminine singular and the feminine plural in Hindi-Urdu. The freestanding contexts show us that the language is perfectly capable of making the distinction. Our characterization of number neutralization needs to be sensitive to the structural configuration in which the participle finds itself.

3 Environments where there is no Number Neutralization in the Feminine

Plural is not always neutralized in the presence of the feminine feature. We survey here environments where plural is in fact realized in the presence of the feminine feature. These environments will involve some of the elements that we used to demonstrate number neutralization in the first place: the past participle, the habitual participle, and the progressive auxiliary.

3.1 The Freestanding Past Participle

A notable environment where there is no number neutralization is that of the free standing perfective participle that marks past tense. Plural in the presence of the feminine is obligatorily realized via nasalization.

(16) freestanding past participle, e.g. *ka:ṭ-a:* 'cut-Pfv'

	SG	PL
MASC	ka:ṭ-a:	ka:ṭ-e
FEM	ka:ṭ-i:	ka:ṭ-ĩ:

The freestanding past participle is to be distinguished from the past participle and the passive participle. The realization of the feminine plural aside, these have the same form. The distinction between the freestanding

past participle and the (non-freestanding) past/passive participle is a syntactic one: the freestanding participle is the highest verbal element in a minimal finite clause while the others are further embedded. The embedding can involve being the complement of an auxiliary verb or being embedded as an NP modifying reduced relative.

We see this contrast in (17). In (17)a, the participle is the highest verbal element and we see that feminine plural marking with nasalization is obligatory. In contrast, in (17)b, the participle combines with a past auxiliary to form the past perfect. In this structure the participle is not the highest verbal element in its clause and we see that the participle appears without nasalization.[1]

(17) a. *Ram=ne ṭehniyã: ka:ṭ-ĩ:/*ka:ṭ-i:*
Ram=Erg branches.FPL cut-PFV.FPL/cut-PFV.FSG
'Ram cut the branches.'

b. *Ram=ne ṭehniyã: ka:ṭ-i: thĩ:/*thi:*
Ram=Erg branches.FPL cut-PFV.FSG be.PST.FPL/be.PST.FSG
'Ram had cut the branches.'

Expression of FPl via nasalization is impossible when this participle is used as a passive participle and when it is used to form a participial relative.

(18) a. *ṭehniyã: kal ka:ṭ-i:/*ka:ṭ-ĩ: gayĩ:/gayi:*
branches.FPL yesterday cut-PFV.FSG/cut-PFV.FPL GO.PST.FPL/GO.PST.FSG
'The branches were cut yesterday.'

b. *[[kal kaṭ-i:/*kaṭ-ĩ:] ṭehniyã:]*
yesterday cut_{unacc}-PFV.FSG/cut_{unacc}-PFV.FPL branches.FPL
'the branches (that were) cut yesterday'

3.2 The Habitual Participle and the Progressive Auxiliary

Unlike the past participle, the habitual participle and the progressive auxiliary cannot be freestanding in the sense defined above. To form a well formed sentence, an auxiliary is needed. (19) with the habitual participle in *-ta:* and (20) with the progressive auxliary *raha:*, both involve a present auxiliary, but a past auxiliary or a future auxiliary would do just as well.

(19) *ve laṛkiyã: seb kha:-ti: *(hɛ̃)*
those girls apple eat-HAB.F be.PRS.PL
'Those girls eat apples.'

(20) *ve laṛkiyã: seb kha: rahi: *(hɛ̃)*
those girls apple eat PROG.F be.PRS.PL
'Those girls are eating apples.'

[1]We are being cautious here and not claiming that nasalization is impossible here. In our judgement, feminine plural marking on the participle is dispreferred but it seems to be well attested online. Non-nasalization is also equally well-attested. So for now our claims are limited to the environments where FPl must be expressed via nasalization. We will return to environments where there is optionality/speaker variation with respect to the expression of FPl.

As discussed earlier, we find number neutralization in these environments.[2] But if we examine environments where the habitual participle and the progressive auxiliary become freestanding, then the pattern changes and plural must be realized in the context of the feminine feature, as nasalization. We turn to two such environments next.

3.2.1 Negation Triggered Auxiliary Deletion

Bhatia (1979) noted that in the presence of negation, participles/auxiliaries that otherwise require a tensed auxiliary can be freestanding.

(21) Progressive: Aux obligatory

a. *Ram seb kha: raha: *(hɛ)*
Ram apple eat PROG.M.SG be.PRS.SG
'Ram is eating apples.'

Progressive + negation: Aux optional

b. *Ram seb nahĩ: kha: raha:*
Ram apple NEG eat PROG.M.SG
'Ram is not eating apples.'

(22) Habitual: Aux obligatory

a. *Ram seb kha:-ta: *(hɛ)*
Ram apple eat-HAB.M.SG be.PRS.SG
'Ram eats apples.'

Habitual + negation: Aux optional

b. *Ram seb nahĩ: kha:-ta:*
Ram apple NEG eat-HAB.M.SG
'Ram does not eat apples.'

For reasons that we don't understand, the negated freestanding participle/auxiliary can only be interpreted as a present tense sentence as indicated in the translations of the freestanding structures in ((21)) and ((22)). The restriction does not directly follow from properties of *nahĩ:* 'neg', which is compatible with both past and present auxiliaries.[3]

(23) a. *Ram seb nahĩ: kha: raha: hɛ/tha:*
Ram apple NEG eat PROG.M.SG be.PRS.SG/be.PST.SG
'Ram is/was not eating an apple.'

b. *Ram seb nahĩ: kha:-ta: hɛ/tha:*
Ram apple NEG eat-HAB.M.SG be.PRS.SG/be.PST.SG
'Ram does/did not eat apples.'

In other words, *nahĩ:* allows the present auxiliary, but not the past auxiliary, to go missing. What happens to the habitual participle and the progressive auxiliary when the presence of *nahĩ:* allows them to be freestanding? We find that as with the freestanding past participle, plural must be marked as nasalization in the presence of the feminine feature.

[2] As with the case of the past participle discussed in the previous section, we will largely focus on environments where there is no number neutralization i.e. expression of the Plural feature is obligatory. Judging from online usage, there are speakers who allow for nasalization of non-freestanding habitual participles/progressive auxiliaries. Based on our own introspective judgements we assume that such nasalization is optional. We cannot rule out the possibility that there are speakers for whom nasalization is obligatory in these environments. If such speakers exist, we can analyze their grammars as being like that of the languages discussed in §4 which do not display number neutralization.

[3] That said, *nahĩ:* is crucial for allowing the present tense auxiliary to go unexpressed. The negation marker *na:* does not allow the present tense auxiliary to be absent.

(24) Freestanding progressive:

a. *ve laṛkiyã: seb nahĩ: kha:*
those girls apple NEG eat
*rahĩ:/*rahi:*
PROG.F.PL/PROG.F
'Those girls are not eating apples.'

Freestanding habitual:

b. *ve laṛkiyã: seb nahĩ:*
those girls apple NEG
*kha:-tĩ:/*kha:-ti:*
eat-HAB.F.PL/eat-HAB.F
'Those girls don't eat apples.'

3.2.2 The Past Habitual and the Counterfactual

Another environment where the habitual participle can be freestanding involves the counterfactual. In fact, in these environments an overt auxiliary is impossible.

(25) counterfactuals

a. *agar Ram mehnat kar-ta: (*hɛ/*tha:), to zaru:r pa:s ho ja:-ta:*
if Ram hardwork do-HAB.M.SG be.PRS.SG/be.PST.SG then definitely pass be GO-HAB.M.SG
*(*hɛ/*tha:)*
be.PRS.SG/be.PST.SG
'If Ram had worked hard, he would've definitely passed.'

b. *ka:sh Ram mehnat karta: (*hɛ/*tha:)*
wish Ram hardwork do-HAB.M.SG be.PRS.SG/be.PST.SG
'I wish Ram worked hard.'

And as one might might expect now, in these environments, we find that there is no number neutralization in the feminine. Plural must be marked as nasalization in the presence of the feminine feature.

(26) counterfactuals

a. *agar ve laṛkiyã: mehnat kar-tĩ:/*kar-ti:, to zaru:r pa:s ho*
if those girls hardwork do-HAB.F.PL/do-HAB.F then definitely pass be
*ja:-tĩ:/*ja:-ti:*
GO-HAB.F.PL/GO-HAB.F
'If those girls had worked hard, they would've definitely passed.'

b. *ka:sh ve laṛkiyã mehnat kartĩ:/*kar-ti:,*
wish those girls hardwork do-HAB.F.PL/do-HAB.F
'I wish those girls worked hard.'

A related case is that of the narrative past habitual. In sequences of sentences describing past habitual actions, the participle can be freestanding. In these cases, unsurprisingly the freestanding participle only has past reference. What is surprising is that auxiliary cannot go missing when describing a sequence of present habitual actions.

(27) *un dinõ Ram 6 baje uṭh-ta:. sna:n kar-ta:. aur phir 7 baje skuul ja:-ta:.*
those days Ram 6 o'clock rise-HAB.M.SG bath do.HAB.M.SG and then 7 o'clock school go-HAB.M.SG
'Those days Ram would wake up at 6am. He'd take a bath and then go to school at 7a.m.'

We've now seen three ways in which a past habitual can become freestanding – via negation, which yields a present tense meaning, via the narrative past habitual and via the counterfactual. So in principle the same string can have three different interpretations: negative present habitual, negative past habitual, and negative counterfactual. This is shown below. In the following example, the subject has feminine plural features and we see that there is no number neutralization; plural must be realized.

(28) negative present habitual

a. *ve subah sna:n nahĩ: kar-tĩ/*kar-ti:*
3.PL morning bath Neg do-HAB.F.PL/do-HAB.F
'She (honorific) doesn't bathe in the morning.'

Narrative Past habitual

b. *un dinõ Auntie-ji: 6 baje uṭh-tĩ:/*uṭh-ti:. ve subah sna:n nahĩ:*
those days Auntie-Hon 6 o'clock rise-HAB.F.PL/rise-HAB.F 3.PL morning bath Neg
*kar-tĩ:/kar-ti:. si:dhe skuul ja:-tĩ:/*ja:-ti:.*
do.HAB.F.PL/do.HAB.F directly school go-HAB.F.PL/go-HAB.F
'Those days Auntie would wake up at 6am. She wouldn't bathe in the morning but would go directly to school.'

Counterfactual

c. *ka:sh ve subah sna:n nahĩ: kar-tĩ:/*kar-ti:*
wish 3.PL morning bath Neg do-HAB.F.PL/do-HAB.F
'I wish she (honorific) bathed in the morning.'

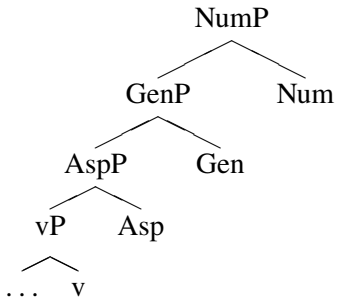
We see here that the same string can correspond to three different meanings. Therefore we take this to tell us that these freestanding structures involve extra inaudible structure which is responsible for the meaning differences we find.

4 An initial generalization and an initial analysis

The generalization that has emerged so far seems quite straightforward: there is number neutralization in the context of the feminine feature in Hindi-Urdu. This number neutralization disappears if the relevant context functions as a freestanding participle or if it functions as a nominal expression.

Here is a way to model these facts. We assume that number and gender head their own nodes with number higher than gender. This would yield a structure like the following for a participial structure.

(29) external structure of a participle



We further assume that head movement combines the verbal root with v and then with Asp, Gen, and Num. Within the context of a post-syntactic realizational theory of morphology like Distributed Morphology, we can

write down the following realizational rules for a language without number neutralization in the feminine.[4] Here we show the case for Punjabi.

(30) *Punjabi realizational rules:*

a. /-e/ ↔ [M.PL]
b. /-a:/ ↔ [M]
c. /-i:/ ↔ [F]
d. / ã:/ ↔ [PL]

Head movement in the syntax creates the following complex head, [[[[V v] Asp] Gen] Num]. Following the classical model of Distributed Morphology developed in Halle and Marantz (1993) and Halle and Marantz (1994), postsyntactic morphology realizes abstract syntactic heads. It does so by inserting one exponent into each syntactic head, a process called *vocabulary insertion.*. Vocabulary insertion is subject to Panini's Principle (the Elsewhere Principle). If more than one exponent satisfies this principle, the most specific exponent is chosen. Portmanteau morphemes, i.e., morphemes that simultaneously realize more than one syntactic head are triggered by *fusion* rules, which combine two syntactic heads into a single one. Applied to (30), the existence of the exponent *-e*, which simultaneously expresses [masculine] and [plural], motivates the fusion rule in (31):

(31) *Masculine plural fusion rule:*
. . .] M] PL] → . . .] [M PL]]

Fusion applies in this context – Masculine Plural – in all of the Indo-Aryan languages that we discuss here. The resulting structure is then realized by the rules in (30).

(32) *Punjabi participles*

a. participle with [M.PL] features:
input to realizational component after fusion (31): [[[[V v] Asp] [M PL]]
– there is a special form for [M.PL], and hence it must be used, giving us [V-v-Asp-**e**].
b. participle with [F.PL] features:
input to realizational component (no fusion): [[[[[V v] Asp] F] PL]
– [F] and [PL] are realized separately and in the order given by the structure, giving us [V-v-Asp-**i-ã:**].

The structure assumed has number located higher than gender. This together with the realizational rule in (30)d derives the generalization that in the languages without number neutralization, plural in the presence of feminine is always marked by a distinct exponent and that this exponent appears after the exponent of the feminine feature.

Under this account, Hindi-Urdu differs minimally from Punjabi and other languages where there is no number neutralization with respect to (30)d.

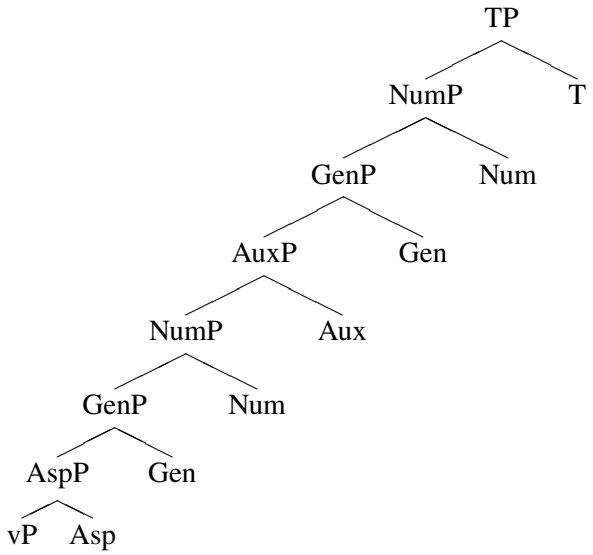
[4]Note that these rules make no reference to the [SG] feature. This requires further comment. One possibility is that there simply is no such feature in the syntax – under this conception, only plural DPs have a number specification. While this conception would work well for the data at hand, we will need to make reference to the [SG] feature while handling the paradigm for the present auxiliary and hence we will work with an architecture where the morphology does not have to spell out all syntactic features. It must spell out anything that it can but if there is no realizational rule for a feature, that feature can just go unrealized without any concomitant deviance.

(33) *Hindi-Urdu realizational rules:*

a. /-e/ ↔ [M.PL]
b. / ˜ / ↔ [PL / ___ [T]]
c. / ã:/ ↔ [PL / ___ [n]]
d. /-i:/ ↔ [F]
e. /-a:/ ↔ [M]

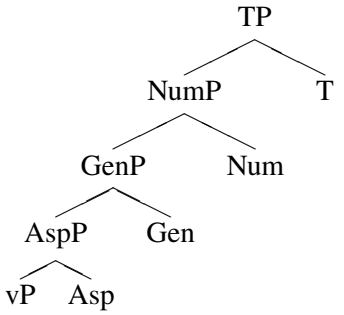
Crucially, in Punjabi, the [PL] on its own is always realized by *-ã:*. In Hindi-Urdu, the realization of this feature is context-sensitive. In the context of T, it is realized as a nasalization and in the context of an *n* head, it is realized as *-ã:*. In the absence of such heads, it simply lacks a realization. Number neutralization is in this treatment encoded implicitly – the plural feature by itself has no realization in Hindi-Urdu, unless it is in the context of T or n. We assume a structural characterization of the notion of context - the context of T is the head of the complement of T. The case of participles is shown below. The head of the NumP associated with the AspP is not in the immediate context of T, while the head of of the NumP associated with the AuxP is. Consequently a PL feature on the lower Num head (the Num head of the AspP) will not be realized while a PL feature on the higher Num head (the Num head of the AuxP) will be.

(34) participle plus auxiliary:



The other environments where we find number neutralization – infinitives, postpositions, untensed auxiliaries, adjectives and modifiers of adjectives – are also not sisters of TP and hence a PL feature there is not in the immediate context of T. We are also able to explain why number neutralization goes away when a participle becomes freestanding. It is plausible that in these cases, the freestanding participle is in fact in the immediate context of T as shown in the following structure.

(35) freestanding participle:



Finally (33)e handles the case of nominals where [PL] is realized by *-ã:*.

5 The role of Person and a revised generalization

The analysis proposed in the previous section works well but it runs into a confound when we look beyond agreement with the 3rd person. In all the examples considered so far, the agreement trigger has had third person features. We have not looked at cases where the agreement trigger has first or second person features. This might seem to be an innocent omission as in general participial/adjectival agreement tends to not involve person features (cf. Baker 2011). So the expectation would be that the person feature of the agreement trigger would not influence participial/adjectival agreement. However, it turns out that person does influence the agreement on freestanding participles. We find that freestanding participles with plural feminine 1st person subjects pattern with plural feminine 3rd person subjects in lacking number neutralization.

(36) *ham/ve laṛkiyã: mehnat nahĩ: kar-tĩ:/*kar-ti:*
we/they girls hardwork Neg do-HAB.F.PL/do-HAB.F
'We girls/those girls don't work hard.'

(37) *ham/ve laṛkiyã: mehnat nahĩ: kar rahĩ:/*rahi:*
we/they girls hardwork Neg do Prog.HAB.F.PL/Prog.HAB.F
'We girls/those girls aren't working hard.'

But plural feminine 2nd person subjects display number neutralization.

(38) *tum laṛkiyã: mehnat nahĩ: kar-ti:/*kar-tĩ:*
you girls hardwork Neg do-HAB.F/do-HAB.F.PL
'You girls don't work hard.'

(39) *tum laṛkiyã: mehnat nahĩ: kar rahi:/*rahĩ:*
you girls hardwork Neg do Prog.HAB.F/Prog.HAB.F.PL
'You girls aren't working hard.'

Now recall that freestanding habitual participles can actually appear in a number of syntactico-semantic contexts. Exemplified above is the case where negation allows for a freestanding habitual participle with present reference. Next we consider cases where the freestanding habitual participle is allowed by counterfactuals and the narrative past habitual.

(40) Counterfactual

a. *ka:sh tum laṛkiyã: mehnat kar-tĩ:/*kar-ti:*
'wish' you girls hardwork do-HAB.F.PL/do-HAB.F
'I wish you girls worked hard.'

Narrative Past Habitual

b. *un dinõ tum laṛkiyã: khuub mehnat kar-tĩ:/*kar-ti: . . .*
those days you girls lot hardwork do-HAB.F.PL/do-HAB.F
'In those days, you girls worked very hard. . .'

Here we find that plural must be expressed. The contrast between (38)/(39) on the one hand, where freestanding participles display number neutralization and (40), where they don't initially seems quite puzzling as at least on the surface it looks as if we have one and the same object behaving differently with respect to number neutralization. This contrast is also the reason why we cannot sustain the analysis proposed in the previous section. The analysis derives the generalization it is based on, namely that there is no number neutralization with freestanding participles. But as (38)/(39) show us, this generalization is wrong. So what is the correct generalization? Here is the distribution of number neutralization across the environments that we have examine so far.

(41) number neutralization across environments
(all agreements triggers have Feminine and Plural features)

	1/3 PERSON	2 PERSON
All Non-Freestanding Participles	Yes	Yes
Freestanding Present Habituals	No	**Yes**
Freestanding Narrative Past Habituals	No	No
Freestanding Counterfactuals	No	No

We believe that the correct generalization surfaces once we think of the covert ways in which the three superficially identical freestanding habitual participles differ, discussed in §3.1. The first kind, where the freestanding participle is licensed by negation, is always interpreted with present tense reference (see (21) and (22)). The narrative past habitual has, as the name suggests, past reference (see (27)). The case of the counterfactual (see (25) and (26)) is less clear but following the crosslinguistic generalizations discussed in Iatridou (2000), it is plausible that there is a past component in the makeup of the counterfactual. Therefore let us assume that the first kind of freestanding participle involves a covert present tense auxiliary while the other two involve a covert past tense auxiliary.

Next let us examine the paradigms of the present tense and the past tense auxiliaries. The present tense auxiliary only agrees in person and number while the past tense auxiliary only agrees in number and gender.

(42) the present tense auxiliary *hɛ*
(involved by hypothesis in the makeup of the freestanding participles licensed by negation)

	SG	PL
1	hũ	**hɛ̃**
2	hɛ	**ho**
3	hɛ	**hɛ̃**

(43) the past tense auxiliary *tha:*
(involved by hypothesis in the makeup of the freestanding habitual licensed by counterfactuals and the narrative past habitual)

	SG	PL
M	tha:	the
F	thi:	**thĩ:**

Focusing on the bold faced cells in these tables, we can extract the forms of the auxiliaries that would correspond to various potential number neutralization configurations. To test number neutralization, we will keep the gender as feminine and the number as plural. This means we will only manipulate person and the covert makeup of the freestanding participle in question.

(44) the form of the auxiliary that could appear with negated habituals vs. narrative habitual pasts

	NEGATED HABITUAL	NARRATIVE PAST
1F.PL	hɛ̃	thĩ:
2F.PL	**ho**	thĩ:
3F.PL	hɛ̃	thĩ:

Note that all the cells in the above table have nasalization except the boldfaced cell that corresponds to the 2FPl subject of a negated habitual/progressive. So the final generalization can be stated as follows:

(45) *Realization of the Plural Feature:*
if the tensed auxiliary that could appear with a particular freestanding participle has nasalization (see (44)), then the freestanding participle will too.

The new generalization makes reference to 'the tensed auxiliary that could appear with a particular freestanding participle'. How is this to be implemented? Let us explore the possibility that freestanding participles have a covert tensed auxiliary associated with them. Postpositions, participial reduced relatives, adjectives, and modifiers of adjectives are clearly not associated with a tensed auxiliary. Participles and the progressive auxiliary that appear with an overt tensed auxiliary are transparently associated with a tensed auxiliary, but the generalization only applies to covert auxiliaries.

This is an unusual generalization as it makes reference to a very particular fact about the form of a covert element, namely whether it has nasalization or not, to determine the shape of the freestanding participle. How may we represent this generalization? A simple generalization along the lines of the analysis in the previous section will not suffice. In that analysis, a plural associated with the participle received a realization in the context of T. But in this case, it is not quite the properties of the participle and the T head that determine whether we get number neutralization or not. The determining factor seems to be the actual form of the relevant auxiliaries.

6 A Morphological Analysis

The generalization concerning the realization of the plural feature laid out in (45) can be derived if we take the morphological makeup of the auxiliaries seriously. The idea is that the plural forms with nasalization are morphologically more complex than the forms without nasalization. In these plural forms, the plural feature

is realized by a distinct exponent as opposed to the other forms where a single exponent realizes multiple features.

Let us use the past tense auxiliary, the paradigm for which is repeated below, to illustrate this proposal concerning morphological complexity. The past auxiliary only inflects for number and gender.

(46) the past tense auxiliary *tha:*

	SG	PL
M	tha:	the
F	thi:	**thĩ:**

The interesting contrast is between the masculine plural and the feminine plural. The feminine plural involves one designated exponent for feminine (*-i:*) and one for plural (namely, nasalization). The masculine plural, on the other hand, employs a single exponent (*-e*) to express number and gender. The special behavior of masculine singular follows immediately from the fusion rule in (31). The feminine plural is thus morphologically complex in a way that the masculine plural is not and we take this complexity to be structurally represented. The structures created by successive head movement, which form the input to vocabulary insertion are given in (47). (47)b is the result of fusion (31).

(47) a. masculine singular: $[_T\ [_{Num}\ [_{Gen}$ Aux M] SG] T]
b. masculine plural: $[_T\ [_{Aux}$ Aux [M PL]] T]
c. feminine singular: $[_T\ [_{Num}\ [_{Gen}$ Aux F] SG] T]
d. feminine plural: $[_T\ [_{Num}\ [_{Gen}$ Aux F] PL] T]

Next let us consider the participle where ordinarily we get number neutralization of the plural in the context of the feminine. We will assume that despite number neutralization, a participle with feminine plural features has a complex representation that consists of [F] and [PL]. That is, agreement in all phi-features is syntactically represented. It is just a fact about Hindi-Urdu that [PL] on its own has a zero realization.

We can now look at what happens with a freestanding participle with a covert past tense auxiliary. The interesting case here concerns feminine plural features and involves the following configuration:

(48) a. *feminine plural freestanding participle:*
. . . $[_{Num}\ [_{Gen}$ Part(iciple) F] PL] ~~$[_T\ [_{Num}\ [_{Gen}$ Aux F] PL] T]~~
b. *masculine singular freestanding participle:*
. . . $[_{Part}$ Part [M PL]] ~~$[_T\ [_{Aux}$ Aux [M PL]] T]~~
(~~strikethrough~~ indicates that the auxiliary is syntactically present but is not realized overtly.)

To complete the proposal, we need the following realizational rules.

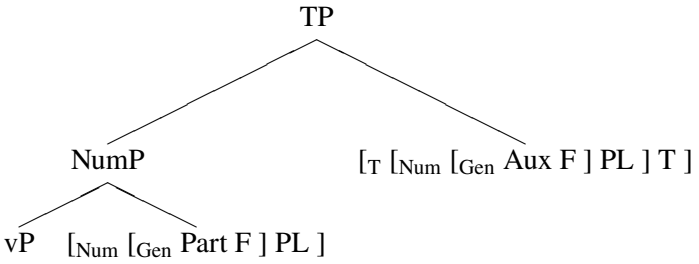
(49) *Hindi-Urdu realizational rules:*
a. /-e/ ↔ [M,PL]
b. /˜/ ↔ **PL / __** ~~**[$_T$ [$_{Num}$ [. . .] PL] T]**~~
c. /˜/ ↔ **[PL / [[__] T]]**
d. /-i:/ ↔ [F]
e. /-a:/ ↔ [M]

These realizational rules differ from the realizational rules from (33) primarily in the context that conditions the overt realization of the [PL] feature. Earlier we had this feature being realized anytime it was in the context of T. Now only T's with a [PL] specification count. (49)b states that a plural feature is realized by

nasalization if it is local to a plural feature that is immediately dominated by a node of type T and which is not itself realized. This rule triggers nasalization on participles if there is a covert auxiliary with feminine plural features (48a). Crucially, if the covert auxiliary contains masculine plural features, these features undergo the fusion rule (31) and as a result will not fulfill the context requirement of (49)b, as shown in (48b). The second nasalization rule in (49)c realizes a plural feature that is in a complex head with T, i.e., a plural feature on an auxiliary.

To illustrate, consider first a case of feminine plural with an overt auxiliary. The schematic structure (after head incorporation has taken place) is:

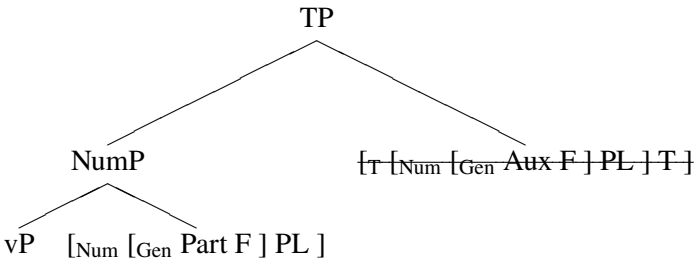
(50) participle plus past auxiliary: the FPL case



The [PL] feature under T is realized via nasalization by the rule in (49)e. The [PL] associated with the participle is in the context of a plural T but this is an overt T and hence the participial [PL] is not realized.

Next, consider a feminine plural case with a covert auxiliary:

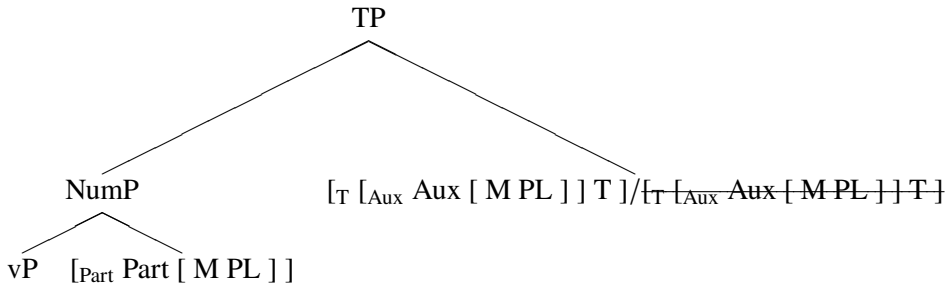
(51) freestanding participle with silent past auxiliary: the FPL case



Here the rule (49)b can apply and results in nasalization on the participle.

For completeness, let's also consider the cases of a participle and auxiliary, overt or covert, with [M,PL] features. As we have seen, fusion of [M] and [PL] applies in this case:

(52) freestanding participle with overt/silent past auxiliary: the MPL case



The features of the participle are realized completely independently of the features of T. Whether T is realized overtly or not, all the features of the participle are spelled out by the morpheme *-e* in (49)e. Because a single feature cannot be realized twice, no issue of realizing a freestanding [PL] feature bundle arises.

The empirical impact of the revised proposal becomes clearer once we look at the present tense auxiliary, which inflects for person and number but not for gender. The paradigm for it is repeated below.

(53) the present tense auxiliary *hɛ*

	SG	PL
1	hũ	**hɛ̃**
2	hɛ	**ho**
3	hɛ	**hɛ̃**

Note that the [2PL] involves the portmanteau morpheme *ho*, which simultaneously expresses 2nd person and plural number. Just like in the case of masculine plural, this portmenteau morpheme motivates the existence of the fusion rule in (54), which fuses a 2nd person feature on T and a plural feature into a single head.[5]

(54) *2nd person plural fusion rule:*
. . .] PL] 2] → . . .] [2 PL]]

The interesting cases for us involve the plural column. Fusion applies in the context of [2] and [PL] but not in the context of [1/3] and [PL]. Abstracting away from gender agreement, which is not expressed in the paradigm in (53), this gives us the following featural representations:

(55) *Representation of plural forms of the present tense auxiliary:*
a. 1st Plural: [$_{T}$ [$_{Num}$ Aux PL] 1]
b. 2nd Plural: [$_{T}$ Aux [PL 2]]
c. 3rd Plural: [$_{T}$ [$_{Num}$ Aux PL] 3]

In the 2nd plural, the person and number feature are fused and therefore both expressed by a portmanteau morpheme. This contrasts with the 1st and 3rd plural, where plurality is expressed by a designated element, i.e., nasalization.

We now look at a freestanding participle with a covert present tense auxiliary with a number of feature combinations. The fusion rule (31) applies in masculine plural configurations, and the fusion rule (54) applies in 2nd person plural cases. As a result, in the case of feminine 2nd plurals (56)b, fusion rule (54) applies to the covert auxiliary. In masculine 1/3 plural cases (56)c, fusion rule (31) applies to the participle. Finally, in masculine 2nd plural cases (56)d, both fusion rules apply.

(56) *Covert auxiliary is a present tense auxiliary:*
a. *feminine 1/3 plural freestanding participle:*
. . . [$_{Num}$ [$_{Gen}$ Part F] PL] ~~[$_{T}$ [$_{Num}$ Aux PL] 1/3]~~
b. *feminine 2 plural freestanding participle:*
. . . [$_{Num}$ [$_{Gen}$ Part F] PL] ~~[$_{T}$ Aux [PL 2]]~~
c. *masculine 1/3 plural freestanding participle:*
. . . [$_{Part}$ [M PL]] ~~[$_{T}$ [$_{Num}$ Aux PL] 1/3]~~
d. *masculine 2 plural freestanding participle:*
. . . [$_{Part}$ [M PL]] ~~[$_{T}$ Aux [PL 2]]~~

We now turn to the question of how the abstract syntactic structures in (56), which are created by head movement and fusion, are morphological realized. The cases where the agreement controller has masculine

[5]We would also need to address the [1SG] case. Following the logic of our proposal, fusion also applies in the context of [1] and [SG].

plural features ((56)c,d) are the easiest to handle. In these cases, fusion yields a [M,PL] feature bundle. By Panini's Principle (the Elsewhere Principle), the most specific rule – namely (49)a – always wins out over the less specific (49)b. As a result, only the realization of freestanding [PL] features is context-sensitive; the realization of [PL] features that have fused with another feature is not dependent on the context. Thus, no nasalization appears on the participle in the case of [M,PL].

When the agreement controller has feminine plural features, the [PL] feature on the participle and the [F] feature on the participle do not fuse. (49)a is therefore not applicable. Now the realization of the [PL] feature depends upon the syntactic context. If this [PL] feature finds itself in the context of a [PL] feature on a covert T, the contextual restriction of (49)b will be met and this [PL] feature will be realized via nasalization. Otherwise it will not be realized. The contextual restriction is met in (56)a, with a 1/3PL present auxiliary. In these auxiliaries, the [PL] feature on the auxiliary does not fuse with the [1/3] person feature and so there is a freestanding [PL] feature on T to condition the realization of the freestanding [PL] feature on the participle as nasalization. But this is not the case in (56)b, where we have a 2PL present auxiliary in which the [PL] feature fuses with the [2] person feature. Here is the final set of realizational rules, augmented to handle person. The rest of the system stays the same.

(57) *Hindi-Urdu realizational rules* (final version)

a. /-e/ ↔ [M,PL]
b. /˜/ ↔ PL / ___ ~~[$_T$ [$_{Num}$ [. . .] PL] T]~~
c. /˜/ ↔ [PL / [[___] T]]
d. /-i:/ ↔ [F]
e. /-a:/ ↔ [M]
f. /-o/ ↔ [2,PL]
g. /-ũ:/ ↔ [1,SG]
h. /-ɛ/ ↔ [PERSON]

In this analysis, the morphological distinctions that we have appealed to – namely whether [PL] on an auxiliary receives a distinct exponent or whether it is realized as part of a portmanteau – play a crucial role. Whether or not rule (57)b applies is determined by whether fusion of person and number by (54) takes place. This derives the curious generalizations in (41) and (45). Number is neutralized in the second person on freestanding present habitual participles because these involve a covert present tense auxiliary, whose overt forms in (42) reveal it to undergo fusion of [2] and [PL], hence bleeding the nasalization rule in (57)b. By contrast, the freestanding narrative past habitual participle and the freestanding counterfactual participle use the covert past tense auxiliary (43), which does not fuse [2] and [PL]. Rule (57)b can hence apply and insert nasalization onto the participle. As a result, the number distinction is morphologically preserved only in the latter case. In this way, we derive the fact that nasalization disappears on the participle if the covert auxiliary is present tense and if the agreement is 2nd person plural – the combination that does not induce fusion.

Note that that, as before, we have two distinct rules that introduce nasalization ((57)b and (57)c, respectively). A [PL] feature bundle under T is always realized as nasalization. And a [PL] feature in the immediate context of a silent T[PL] is also realized with nasalization. The restriction to a silent T[PL] is significant because otherwise we consistently get double nasalization i.e. nasalization on the auxiliary and nasalization on the participle. While this is attested in online usage, it seems degraded to our judgement. An example is provided in (58). While standardly there is no nasalization on the participle, for some speakers the participle can carry nasalization alongside the auxiliary:

(58) *Ram=ne ṭehniyã: ka:ṭ-i:/%-ĩ: thĩ:*
Ram=Erg branches.FPL cut-PFV.FSG/%-PFV.FPL be.PST.FPL
'Ram had cut the branches.'

We assume that while double nasalization is an option for some speakers, it is optional even for them. The system so far does not produce nasalization on the participle in (58). Modeling optional double nasalization would require the following optional realizational rule, which is similar to (57)b, but drops the covertness requirement imposed on the auxiliary.[6]

(59) *Optional rule for deriving double nasalization:*
/ ˜ / ↔ PL / ___ [$_{T}$ [$_{Num}$ [. . .] PL] T]

Like (57)b, the rule in (59) is conditioned only if no fusion of the plural feature as taken place.

7 A More Syntactic Analysis

The morphological analysis developed in the previous section is able to account for the data at hand but the analysis relies on access to how features are grouped together by the exponents that realize them in order to condition the realization of other features. For example, a [PL] feature on a participle is either overtly realized or not depending upon how the matrix present tense auxiliary groups together its person and number features. If, as in the case of the second person plural, the features are grouped together, participial [PL] goes unrealized. If no fusion takes place and the features are grouped separately as in 1st plural cases, then participial [PL] is realized. This treatment raises questions concerning where this grouping of features comes from. A reasonable answer is that the grouping happens at spellout as a result of competition guided by the Elsewhere Principle. But this raises a problem – if, as is standardly assumed, Spell Out proceeds cyclically up the tree (Bobaljik 2000), then at the point at which we spell out the participle, the tensed auxiliary has not been spelled out. Then it is not obvious where the difference between [[1] [PL]] and [[2 PL]] would come from. Therefore in this section, we consider an alternative treatment which does not need to make reference to such information.

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[6]Sakshi Bhatia has suggested to us that double nasalization might have an entirely different phonological source based on the phenomenon of pre-nasalization – a spread of nasalization from a nasalized auxiliary to a participle. Pre-nasalization would explain why some speakers accept sentences like the following.

i. %*uncle-ji: naha: rahẽ hɛ̃*
uncle-Hon bathe Prog.MPL.PL be.PRS.3PL
'Uncle is bathing.'

Here under our analysis, the progressive only has [M,PL] features which get fully spelled out *-e*. There is no [PL] feature left to realize. Consequently the double nasalization rule cannot be used to generate (i). Once we admit pre-nasalization as a source for double nasalization, it becomes an open empirical question whether the grammar also has (59). We leave the choice between these rules for future work which should also carefully delineate the availability of double nasalization. We find (i) and all other cases of double nasalization with the exception of perfects quite degraded. However informal surveys of online usage suggest that there is much variation here.

It should be noted that while a pre-nasalization account can be used to explain double nasalization, it is not obvious that we can appeal to pre-nasalization for handling freestanding participles. In particular cases where the possibility of nasalization depends upon the properties of the silent auxiliary would require a rather abstract notion of pre-nasalization. Such an account would also need to explain why otherwise optional and variable pre-nasalization in double nasalization contexts becomes obligatory with freestanding participles. We also see a clear empirical problem. While (i) is marginally acceptable for some, its freestanding counterpart in (ii) is completely unacceptable.

ii. **uncle-ji: nahĩ: naha: rahẽ*
uncle-Hon Neg bathe Prog.MPL.PL
'Uncle is not bathing.'

A pre-nasalization account that derives obligatory nasalization on a freestanding participle from the nasalization on a silent auxiliary should do the same in (ii), contrary to fact.

This alternative treatment follows the morphological treatment with the exception that the realization of [PL] is not conditioned on the internal grouping of features; instead we condition the realization of [PL] on syntactic features of the auxiliary. We replace the morphological rule in (60)a by the rule in (60)b – it should be noted that the [PL] in the conditioning context in (60)a refers to a morphological feature bundle, while the [–2,PL] in the conditioning context in (60)b refers to syntactic features.

(60) a. *Morphological Rule:*
/ ˜ / ↔ **PL** / ___ ~~[T [Num [. . .] PL] T]~~

b. *Syntactic Rule:*
/ ˜ / ↔ **PL** / ___ ~~[T [Num [. . .] PL] –2]~~

What the new rule in (60)b says is that [PL] is realized by nasalization in the immediate context of a silent T that has a plural feature and whose person is not 2nd person. Among the present tense auxiliaries with plural features, 1st person and 3rd person auxiliaries qualify while 2nd person auxiliaries do not. Past tense auxiliaries lack a person specification and so all plural past tense auxiliaries qualify. The resulting system makes the same predictions as the morphological system – the second person plural present tense auxiliary was the one environment that did not condition the realization of participial [PL]. However, it is not subject to the criticism we leveled at the morphological system. The system can be embedded in a standard cyclic spell out system.

However, we believe that as set up, this system is in fact less explanatory than the morphological system. By making direct reference to how the features are encoded, the morphological system is able to explain why the second person plural present tense auxiliary is special. In the new system, the fact that this auxiliary is special is merely encoded. It does not follow from anything. In principle, nothing would stop us from having a system with exactly the current exponents but where the special form was, say, the 1st person plural present tense auxiliary instead. It seems like by merely encoding the special form we are missing a generalization. Unfortunately at this point, we are unable to do better than these two attempts. Both attempts work. The first one is explanatory but there are questions about its implementation. The second one is easy to implement but it is not explanatory. We hope that future research will bring forth a system that is both explanatory and implementable within an existing spell out system.

8 Remaining Issues

8.1 Freestanding Past Participles

The first case of a freestanding participle that we looked at involved freestanding past participles. What is special about these in the context of Hindi-Urdu is that unlike the habitual participle and the progressive auxiliary, the past participle can stand on its own without any extra support, in a manner of speaking. The freestanding past participle is how the simple past tense is conveyed in Hindi-Urdu. In §3.1, we discussed how freestanding past participles need to be distinguished from the superficially similar past/passive participle. One clear way in which these differ is in the realization of the plural feature in the context of feminine. In the freestanding past participle, the plural feature is always realized as nasalization. This is shown in (61), repeated from (17) above. Plural is not expressed on the passive participle or on the past/passive participle used as a reduced relative, as shown in (62), repeated from (18).

(61) *Ram=ne ṭehniyã: ka:ṭ-ĩ:/*ka:ṭ-i:*
Ram=Erg branches.FPL cut-PFV.FPL/cut-PFV.FSG
'Ram cut the branches.'

(62) a. *ṭehniyã:* *kal* *ka:ṭ-i:/*ka:ṭ-ĩ:* *gayĩ:/gayi:*
branches.FPL yesterday cut-PFV.FSG/cut-PFV.FPL GO.PST.FPL/GO.PST.FSG
'The branches were cut yesterday.'

b. *[[kal* *kaṭ-i:/*kaṭ-ĩ:]* *ṭehniyã:]*
yesterday cut_{unacc}-PFV.FSG/cut_{unacc}-PFV.FPL branches.FPL
'the branches (that were) cut yesterday'

The situation of the past participle when used with an auxiliary is in between – realization of the plural feature in the context of feminine seems to be optional, falling under the rubric of 'double nasalization', illustrated in (58). In our proposal, [PL] can be realized as nasalization in one of two ways: it can be directly under T, or it can be in the local context of a silent T[PL] (or T[-2PL], depending upon which of the two analyses one adopts). For the habitual participle and the progressive auxiliary, we concluded that they were in the context of a tensed auxiliary, which is overt some times and silent in the freestanding cases. What is the situation for the freestanding past participle (61)?

Let us explore the option that the freestanding past participle involves a silent auxiliary. What would this auxiliary be? We could let it be the past auxiliary or the present auxiliary. The problem that arises then is that the past participle together with the past auxiliary and the past participle with the present auxiliary both have semantics that are distinct from the semantics of the simple past conveyed by the freestanding past participle. The semantics of the past participle together with the past auxiliary could be very roughly characterized as akin to the past perfect and the semantics of the past participle together with the present auxiliary could be very roughly characterized as akin to the present perfect. The remaining option then is the idea that the freestanding past participle moves to T. Nasalization would then be immediately follow, due to the rule in (57)c, which inserts nasalization if there is an unrealized plural feature in T. (61) then follows. Of course, this analysis will need to notate somewhere that past participle can move to T while the habitual participle and the progressive auxiliary cannot. The past tense semantics will follow from the aspectual semantics of the perfective aspect on the past participle.

8.2 The case of *tum*

We conclude this paper with a puzzle about the feature specification of the second person pronoun *tum*. Like English 'you', even though *tum* has singular reference, it triggers plural agreement. This is in contrast to *tu:*, which triggers singular agreement. *tum* is used for addresses that are social equals of the speaker while *tu:* for people are who are either intimate with or socially lower than the speaker. Unlicensed use of *tu:* can be perceived as rude.

(63) *tum* *na:c-te/na:c-e* *ho/the*
you dance-HAB.MPL/dance-PFV.MPL be.PRS.2PL/be.PST.MPL
'You_{equal} (male) dance/used to dance.'/'You_{equal} (male) have/had danced.'

(64) *tu:* *na:c-ta:/na:c-a:* *hɛ/tha:*
you.SG dance-HAB.MPL/dance-PFV.MSG be.PRS.2SG/be.PST.MSG
'$\text{You}_{familiar/inferior}$ (male) dance/used to dance.'/'$\text{You}_{familiar/inferior}$ (male) have/had danced.'

Based on these, it seem reasonable to treat *tu:* as having singular number and *tum* as having plural number for the purposes of agreement. The gender is contributed by the gender of the referent. So if *tum* is used for a female addressee, we would expect it to have [2FPL] features. This seems correct initially as the following cases show.

(65) *tum na:c-ti:/na:c-i: ho*
you dance-HAB.F/dance-PFV.F be-PRS.2PL
You$_{equal}$ (female) dance.'/'You$_{equal}$ (female) have danced.'

(66) *mɛ̃ ca:h-ta: hũ: [ki tum vahã: na:c-ti: hui: ja:-o]*
I want-HAB.MSG be.PRS.1PL that you there dance-HAB.F be.PFV.F go-SBJV.2PL
'I want that you go there dancing.'

The participle agrees with the feminine feature and the auxiliary in person and number, supporting the contention that this *tum* has [2FPL] features. However, the picture looks rather different in the following cases.

(67) *tum na:c-ti:/na:c-i: thi:/*thĩ:*
you dance-HAB.F/dance-PFV.F be.PST.F/be.PST.FPL
You$_{equal}$ (female) used to dance.'/'You$_{equal}$ (female) had danced.'

(68) *tum nahĩ: na:c-ti:/*na:c-tĩ:*
you Neg dance-HAB.F/dance-HAB.FPL
You$_{equal}$ (female) don't dance.'

Given that we believe that *tum* has [2FPL] features, these examples are puzzling. In (67), we would expect the past auxiliary to display plural agreement; instead we find singular agreement. And in (68), we have a freestanding participle and hence we would expect the PL feature to be realized via nasalization. But nasalization is not possible here. Curiously, plural agreement becomes obligatory if we add a plural NP to *tum* and thereby make it semantically plural.

(69) *tum laṛkiyã: na:c-ti:/na:c-i: thĩ:/*thi:*
you girls dance-HAB.F/dance-PFV.F be.PST.FPL/be.PST.F
You girls used to dance.'/'You girls had danced.'

We don't have an explanation for this puzzling state of affairs. There does seem to be the following peculiar generalization:

(70) a. *tum* with singular reference has [PL] features for agreement purposes if those PL features are realized as part of a feature bundle with other features such as [MPL] and [2PL] but not if those [PL] features would be realized by themselves i.e., by nasalization. In such a case, *tum* lacks [PL] features.
b. *tum* with plural reference has [PL] features across the board.

Perhaps the [PL] feature bundle obligatorily has plural semantics, which would be incompatible with *tum* having singular reference. But this would mean that the semantics of particular feature could vary depending upon how the feature is realized. A further problem with this line of thought is that the features of *tum* would have to be dependent on the elements it is agreeing with – when agreeing with elements where the agreement would result in a [MPL] or [2PL] feature bundle, *tum* must have [PL] features but when agreement would result in a [PL] feature bundle, *tum* is allowed to not have [PL] features.[7] This is all very peculiar. We leave a solution to the mysterious case of *tum* for future research.

[7]It might be instructive to look at singular *tum* with a feminine addressee together with a verb in the future. The Hindi-Urdu future is morphologically complex consisting of a subjunctive part that agrees in number and person and a participial part that agrees in number and gender. So we might expect that when a future agrees with a feminine singular reference *tum*, the subjunctive part will agree with [2F] and the participial part with either [FPL] or [F] depending upon the feature representation of *tum*.

i. *tum kab a:-o-gi:/*a:-o-gĩ:?*
you when come-Sbjv.2PL-Part.F/come-Sbjv.2PL-Part.FPL
'When will you come?'

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We find that only singular agreement is possible here leading to a paradoxical situation where one and the same *tum* needs to be [2PL] for the subjunctive part but singular for the participial part. But in fact, the participial component of the future seems to not realize the plural in the context of the feminine across the board. Consider the following case of a semantically plural *tum*. Even in this case, the participial component does not display nasalization.

ii. *tum laṛkiyã: kab a:-o-gi:/*a:-o-gĩ:?*
you girls when come-Sbjv.2PL-Part.F/come-Sbjv.2PL-Part.FPL
'When will you girls come?'

Hence there is no paradox with *tum* here. But the fact that the participial part displays number neutralization is puzzling if we assume that the whole future verb is under T. Given the system we have proposed, that would lead to realization of plural in a feminine context. A way to make sense of the facts is that while the subjunctive component of the future is under T, the participial component is outside the scope of T. Consequently a [PL] feature bundle does not receive any realization.

It is possible to find examples online where there is nasalization on the participial component of the future but such cases sound very degraded to our ear. Moreover these cases with nasalization on the participial component (e.g. *kar-ẽ-gĩ:* 'do-SBJV.2PL-PART.FPL') are outnumbered greatly by the cases without nasalization on the participial component (e.g. *kar-ẽ-gi:* 'do-SBJV.2PL-PART.FPL') . We will therefore not analyze cases like *kar-ẽ-gĩ:*.