Two Steps to Parasitic Agreement in Hindi-Urdu

Keywords: long-distance agreement, parasitic agreement, tier-based strictly local patterns

1. Overview Hindi-Urdu (HU) is famous for its verbal agreement system, which involves case-sensitivity, long-distance/cross-clausal agreement (LDA), and **parasitic agreement**, in which non-finite verbs (embedded or otherwise) agree if and only if the finite verb does. This last item is **difficult to motivate** under common Minimalist assumptions. If non-finite verbs bear unvalued ϕ-features which probe, then it should not matter whether or not some higher item also agrees. If they do not, then it is not clear why they should agree at all.

Here, I build on Bhatt's (2005) intuition that all verbs are valued together when the probe on finite T finds a goal. Two steps are needed: 1) finite T agrees with the closest visible DP, then 2) all verbs along this path agree. Each of these is a **tier-based strictly 2-local** (TSL-2) pattern, like many others in phonology and syntax (cf. Graf 2022b), and each on its own is unexceptional. This provides a **potential explanation** for the phenomenon: if language is capable of producing each pattern independently, we expect them to show up together at least occasionally.

2. Basic Data This data comes from Bhatt (2005). The finite verb/auxiliary agrees with the structurally highest nominative/unmarked DP in its domain, which may be the matrix subject (1), matrix object (2), or embedded object (3). Any participles/infinitives agree with the same DP. If there is no potential goal, default (MSG) agreement occurs (4).

(1) Subject agreement (unmarked subject/object)
Rahul *kitaab* *paṛh-taa* *thaa*
Rahul.M book.F read-HAB.MSG be.PST.MSG
'Rahul used to read (a/the) book.'

(2) Object agreement (ERG sbj. + unmarked obj.)
Rahul-ne *kitaab* *paṛh-ii* *thii*
Rahul-ERG book.F read-PFV.F be.PST.FSG
'Rahul had read the book.'

(3) LDA (ERG sbj. + unmarked embedded object)
Vivek-ne *[kitaab* *paṛh-nii]* *chaah-ii*
Vivek-ERG book.F read-INF.F want-PFV.FSG
'Vivek wanted to read the book.'

(4) Default agreement (ERG subject + ACC object)
Rahul-ne kitaab-ko paṛh-aa *thaa*
R-ERG book-ACC read-PFV.MSG be.PST.MSG
'Rahul had read the book.'

LDA appears to be optional in some sentences, but this is only apparent. Bhatt (2005) shows that restructured clauses require LDA, while other infinitives block it. Following Keine (2019), I assume the former to be *v*Ps, and the latter TPs, as in (5–6).

(5) *v*P allows LDA to cross
Ram-ne $[_{vP}$ *roṭii* *khaa-nii* $]$ *chaah-ii*
R-ERG bread.F eat-INF.F want-PFV.FSG
'Ram wanted to eat bread.'

(6) No LDA across TP
Ram-ne $[_{TP}$ *roṭii* *khaa-naa* $]$ *chaah-aa*
R-ERG bread.F eat-INF.M want-PFV.MSG
'Ram wanted to eat bread.'

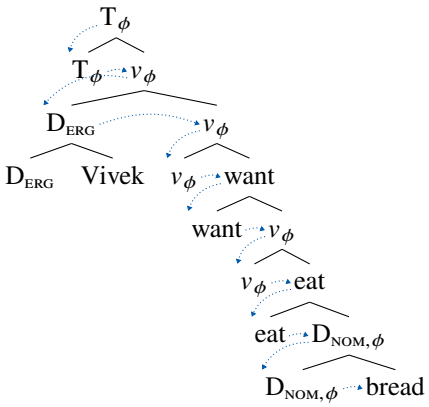
(5–6) also demonstrate parasitic agreement; finite agreement is impossible without infinitival agreement and vice versa (illicit examples omitted for brevity). Finally, if the matrix subject is nominative, LDA is blocked, but the matrix participle does agree. The basic generalization is therefore: every verb (finite or not) agrees iff it occurs along the **path** from finite T to its goal.

3. TSL-2 patterns A pattern is TSL if it can be described with strictly local constraints over a **tier** of salient elements, treating the rest as invisible. For TSL-2, each constraint may reference only two adjacent elements on the tier.

	Word	Tier
✓	sakasa	ss
✓	ʃakaʃa	ʃʃ
✗	sakaʃa	sʃ
✓	sataʃa	stʃ

Example. Suppose we have a language with sibilant harmony which is blocked by [t], similar to Slovenian. The tier consists of segments {s, ʃ, t}, which are the sibilants and the blocker. All other segments are invisible. The constraints on the tier are {*sʃ, *ʃs}. As a result, harmony is enforced except when [t] intervenes.

4. Constructing the tier Agreement proceeds in two steps, each with its own tier; here we focus on Step 2 (concord). We consider the string representing the *search path of the probe* on finite T. On the right is a bare phrase structure diagram for (3) at the relevant point in the derivation. A ϕ diacritic is added to items which agree successfully *in the present derivation*. Omitting the technical details, we follow the complement spine, adding each head *in the order first encountered* (the position of the maximal projection) producing:



$\mathbf{T_{FIN,\phi}} \cdot \boldsymbol{v_\phi} \cdot \mathrm{D_{ERG}} \cdot \mathrm{want} \cdot \boldsymbol{v_\phi} \cdot \mathrm{eat} \cdot \mathbf{D_{NOM,\phi}} \cdot \mathrm{bread}$

We construct the tier containing all items *which can bear the diacritic*, which are $\{\mathrm{T_{FIN}}, \mathrm{Aux}, v, \mathrm{D_{NOM}}\}$, plus any blockers, including $\mathrm{T_{INF}}$. (PRO is omitted, but would be invisible if present.) When agreement is successful, we have a chain of agreeing elements on the tier, starting with T and ending with D. When agreement fails, whether because there is no visible goal or because infinitive T intervenes, no elements in this chain bear the ϕ diacritic. This is summarized below.

Ex.	Configuration	Path (Tier elements highlighted)
1	Sbj. Agr.	$\mathbf{T_{FIN,\phi}} \cdot \mathbf{Aux_\phi} \cdot \boldsymbol{v_\phi} \cdot \mathbf{D_{NOM,\phi}} \cdot \mathrm{read} \cdot \mathbf{D_{NOM}} \cdot \mathrm{book}$
2	Obj. Agr.	$\mathbf{T_{FIN,\phi}} \cdot \mathbf{Aux_\phi} \cdot \boldsymbol{v_\phi} \cdot \mathrm{D_{ERG}} \cdot \mathrm{read} \cdot \mathbf{D_{NOM,\phi}} \cdot \mathrm{book}$
3	LDA	$\mathbf{T_{FIN,\phi}} \cdot \boldsymbol{v_\phi} \cdot \mathrm{D_{ERG}} \cdot \mathrm{want} \cdot \boldsymbol{v_\phi} \cdot \mathrm{read} \cdot \mathbf{D_{NOM,\phi}} \cdot \mathrm{book}$
4	Dflt. (No goal)	$\mathbf{T_{FIN}} \cdot \mathbf{Aux} \cdot \boldsymbol{v} \cdot \mathrm{D_{ERG}} \cdot \mathrm{read} \cdot \mathrm{D_{ACC}} \cdot \mathrm{book}$
6	Dflt. (Blocked)	$\mathbf{T_{FIN}} \cdot \boldsymbol{v} \cdot \mathrm{D_{ERG}} \cdot \mathrm{want} \cdot \mathbf{T_{INF}} \cdot \boldsymbol{v} \cdot \mathrm{eat} \cdot \mathbf{D_{NOM}} \cdot \mathrm{bread}$

5. The constraints As discussed above, agreement is all or nothing. We enforce this by banning mismatched pairs of (non-)agreeing elements within the chain from T to D:

$\{ {*}\mathrm{T_{FIN,\phi}} \cdot v, {*}\mathrm{T_{FIN}} \cdot v_\phi, {*} v_\phi \cdot v, {*} v \cdot v_\phi, {*} v_\phi \cdot \mathrm{D_{NOM}}, {*} v \cdot \mathrm{D_{NOM,\phi}}, {*} v_\phi \cdot \mathrm{T_{INF}}, {*}\mathrm{T_{INF}} \cdot v_\phi, \ldots \}.$

As a result, agreement in sentences like (6) is impossible, since $\mathrm{T_{INF}}$ projects yet never agrees. Next, to rule out agreement without a goal (a nonsensical version of (4)), we add ${*} v_\phi \cdot \ltimes$, where $\ltimes$ indicates end-of-string. Finally, to ensure that agreement takes place when possible in (1/2/3), we need a tier which contains just $\mathrm{T_{\pm FIN}}$ and $\mathrm{D_{NOM}}$. On this tier we ban ${*}\mathrm{T_{FIN}} \cdot \mathrm{D_{NOM}}$, where T fails to agree with a visible goal. This cannot be done on the existing tier, since all bigrams in, e.g., $\mathrm{T_{FIN}} \cdot \mathrm{Aux} \cdot v \cdot \mathrm{D_{NOM}}$ are licit. **To summarize**, the tier containing just $\{\mathrm{T_{\pm FIN}}, \mathrm{D_{NOM}}\}$ sets up the relation between T and its goal, and the tier which adds the verbs handles feature spreading.

① $\mathrm{T_{FIN,\phi}}$ $\mathrm{Aux_\phi}$ v_ϕ $\mathrm{D_{ERG}}$ V v_ϕ V $\mathrm{D_{NOM,\phi}}$ ② $\mathrm{T_{FIN,\phi}}$ $\mathrm{Aux_\phi}$ v_ϕ $\mathrm{D_{ERG}}$ V v_ϕ V $\mathrm{D_{NOM,\phi}}$

6. Typology, cross-domain parallels As discussed by Bhatt, HU has relatives in which infinitive agreement is not parasitic. In such languages, $\mathrm{T_{INF}} \cdot v_\phi$ is not banned; also, the two tiers can be collapsed. Similar variation can be observed in extraction morphology along a movement path (Graf 2022a). It is unclear to me to what degree phonological processes mirror parasitic agreement, but certain unbounded circumambient processes (Jardine 2016) might be comparable.

7. Conclusion Parasitic agreement is a natural outcome of the space of possibilities afforded by TSL-2 computations. Simple agreement involves AB pairs on a tier; bounded concord allows ACB, ACCB, ACCCB, etc. Putting the two together creates parasitic agreement. By analyzing linguistic patterns in this way, we gain insight into otherwise mysterious phenomena.

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