

DOM as case bleeding by cyclic default case

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Abstract In Hindi-Urdu, differential object marking (DOM) is parasitic on movement of the object: only objects that move out of their base position may bear DOM. In this paper, we develop an account of movement-related DOM in terms of case bleeding by cyclic default case. Against the background assumption that DOM corresponds to accusative case, we suggest that (i) default case is assigned cyclically at vP and (ii) default case corresponds to a case value (rather than the absence of case value). Based on these claims, we propose that in-situ objects receive cyclic default case, which bleeds subsequent assignment of any other case to this object, including (but not limited to) accusative case. Assignment of accusative case to the object is possible only if the object first escapes the domain of cyclic default-case assignment, deriving the movement–DOM interaction. Support for this analysis comes from what we call the *selective (in)accessibility* of in-situ objects: these objects are inaccessible to case assignment (accusative case, dative case, and genitive case), but they remain accessible to other syntactic dependencies (ϕ -agreement, triggering case on other DPs, and movement). A more general implication of the account is that heads may exhibit phase-like behavior in some respects (the triggering of cyclic operations) but not in others (PIC effects), suggesting that the two should be decoupled.

Keywords: differential object marking (DOM), accusative, dative, default case, phases, agreement, case, Hindi-Urdu

1 Introduction

Differential object marking (DOM) refers to apparently optional case marking of transitive objects, commonly conditioned by factors such as definiteness, specificity, or animacy. In the Hindi-Urdu example (1), the object *fuul* ‘flower’ may or may not be marked with the accusative-case marker *-ko*. If an object is marked with *-ko*, it typically receives a definite or specific interpretation; without *-ko* it typically receives an indefinite, nonspecific interpretation. These factors also interact with scrambling in ways we will not investigate here.¹

- (1) Mina-ne **fuul(-ko)** dekh-aa.
Mina-ERG flower(-ACC) see.PFV-M.SG
‘Mina saw a/the flower.’

In at least some languages with DOM, including Hindi-Urdu, there is clear evidence that DOM is related to movement of the object. As observed by [Bhatt & Anagnostopoulou \(1996\)](#) and [Bhatt \(2003, 2007, 2016\)](#), in-situ direct objects in ditransitive constructions may not bear *-ko* (2a) while direct objects moved to a higher position may (2b).

¹ The abbreviations used in the glosses follow the Leipzig glossing conventions. Transliteration and glossing have been modified from original sources for consistency.

- (2) a. Mina-ne Tina-ko **fuul**(*-ko) diy-aa.
 Mina-ERG Tina-DAT flower.M(*-ACC) give.PFV-M.SG
 ‘Mina gave Tina a flower.’
- b. Mina-ne **fuul-ko**₁ Tina-ko ____₁ diy-aa.
 Mina-ERG flower.M-ACC Tina-DAT give.PFV-M.SG
 ‘Mina gave Tina the flower.’

Other languages with movement-correlated DOM include Turkish (Keskin 2009:13) and Sakha (Baker & Vinokurova 2010:602).

An influential line of account to DOM patterns of this kind attributes this interaction between case marking and movement to the presence of a *locality boundary*, in particular Chomsky (2000, 2001)’s *Phase Impenetrability Condition* (PIC).² In a nutshell, these analyses assume that there is a phase boundary between the base position of the direct object and the assigner/trigger of accusative case. Objects that remain in-situ undergo Spellout and are therefore inaccessible or invisible to accusative-case assignment; only objects that move out of the locality domain remain accessible to accusative-case assignment (Baker & Vinokurova 2010, Baker 2015, 2024; also see Levin & Preminger 2015, and López 2012 for a locality account other than the PIC).

(3) *PIC account*

An in-situ object is inaccessible to accusative-case assignment because it has undergone cyclic Spellout.



The key property of a PIC account is thus that the DP is no longer part of the workspace when accusative case would be assigned. This approach to the problem makes the prediction that the DP should also be inaccessible to all other syntactic dependencies that apply after the point at which accusative-case assignment takes place. In other words, a PIC account predicts that spelled-out objects are *totally inaccessible*.

In this paper, we investigate the accessibility of in-situ objects in Hindi-Urdu to dependencies other than case assignment. We find that such objects are *selectively inaccessible*: they are inaccessible to accusative-case assignment, but they nonetheless remain accessible to (i) ϕ -agreement, (ii) the conditioning of case assignment to other DPs, and, depending on the analysis, (iii) movement. This holds even if these operations take place after accusative case would have been assigned. Thus, the inaccessibility of in-situ objects is limited to case assignment, not other dependencies.

To derive such selective inaccessibility, we develop an alternative approach to the interaction between accusative case and object movement. We propose that in-situ objects are inaccessible to accusative-case assignment as a result of *case bleeding by cyclic default case*. Our account is based on so-called “dependent case theory” (Marantz 1991, McFadden 2004, Bobaljik 2008, Baker & Vinokurova 2010, Preminger 2014, 2024, Baker 2014,

² A different line of approach is that the accusative-case assigner is not always present and instead inserted as a last resort when demanded by the licensing needs of an object (e.g., Kalin 2014, Bhatia & Bhatt 2023). These accounts then derive the connection to DO movement in (2) by assuming that accusative-assignment triggers object shift. In the interest of space, we cannot discuss this approach in detail here, but we note that it requires transderivational optimization (fn. 13) and that it does not seem to straightforwardly extend to the similar distribution of genitive case in Hindi (section 6.2, in particular (81)).

2015, 2024, Levin & Preminger 2015, Baker & Bobaljik 2017, Levin 2017, Yuan 2020, Poole 2022). In such models, case may be assigned in a variety of ways, listed in (4).³

(4) *Disjunctive case hierarchy*

- a. HEAD CASE
assigned to a DP under c-command by a functional or lexical head
- b. DEPENDENT CASE
assigned to a DP in the presence of another DP under c-command within the same local domain
- c. DEFAULT CASE
assigned to a DP when no other case-assignment mechanism is available, or absence of case value

Within this general framework, we propose an account of Hindi-Urdu DOM based on the two claims in (5):

- (5) a. Default-case assignment involves valuation of a case feature, not the absence of a value.
- b. Default-case assignment applies cyclically within narrow syntax.

(5a) is in line with Marantz (1991)’s original dependent-case proposal, which treats default case as a case value that is assigned (also see Baker 2015 and Branan 2022). It contrasts with other recent work that treats default case as simply the absence of a case value on a nominal (e.g. Preminger 2014, 2024, Levin & Preminger 2015, Kornfilt & Preminger 2015, McFadden 2018, Poole 2022). For many purposes, this distinction is not crucial—treating, e.g., nominative case as the realization of the absence of a case value or as the realization of a case value that is assigned in the absence of an existing case value is often not empirically significant—but it will be important for the account proposed here (also see fn. 24, Schütze 2001b, Baker 2015, Branan 2022, and others). (5a) embodies the view that default case corresponds to a case value, not the absence of one.

(5b) is based on much recent work that has argued that these case rules apply cyclically, typically within syntax (see Baker & Vinokurova 2010, Preminger 2014, 2024, Baker 2014, 2015, 2024, Levin 2017), as opposed to being postsyntactic and applying to the entire structure at once (cf. Marantz 1991). While this view is often primarily motivated by the application of dependent-case rules, (5b) expresses the claim that default case is similarly assigned cyclically within narrow syntax (also see Baker 2015 and Branan 2022 for default-case assignment within phasal Spellout domains).⁴

Against this background, we propose the cyclic default-case rule in (6).

³ Some remarks are in order. First, what we call “default” case is also commonly called “unmarked” case. We avoid the term “unmarked case” here because the term “unmarked” may also refer to the morphological form of a case (that is, not morphologically marked). The two notions are unrelated (for example, Levin 2017 treats Korean nominative case as unmarked case in the sense of the disjunctive case hierarchy, but it is not unmarked morphologically).

Second, Marantz (1991:24) actually distinguishes unmarked case and default case: while unmarked case is domain-specific, default case is not. This distinction is not relevant for our concerns here so we will set it aside.

Third, following Preminger (2024), we use the term “head case” instead of Marantz (1991)’s “lexically-governed case”.

⁴ Levin (2017) clearly assumes (5b), but is not entirely clear with respect to (5a). On the one hand, Levin (2017:453, 457) characterizes nominative case (in Korean) as amounting to being “caseless”; on the other hand, Levin (2017:458, 483) treats a DP as “receiv[ing]” nominative case, which might suggest some form of valuation.

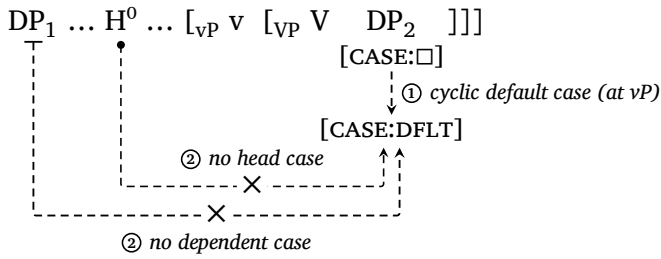
(6) *Cyclic default-case assignment*

If there is a caseless DP in the complement of *v*, assign default case to this DP once all other operations in *vP* have applied.

The core of our proposal is that (6) can lead to scenarios in which cyclic assignment of default case to a DP *bleeds* later assignment of any other cases to this DP, as schematized in (7). Here, an in-situ object DP remains caseless in *VP* (throughout this paper, we indicate unvalued case features as “[CASE:□]”), and it is then targeted by cyclic default-case assignment when *vP* is completed (①). This default-case assignment then bleeds subsequent assignment of any other case to the object (②), be it head case or dependent case.

(7) *Case-bleeding account*

An in-situ object is inaccessible to accusative-case assignment because it has previously received cyclic default case.



In (7), DP_2 is inaccessible to head-case assignment or dependent-case assignment. In crucial contrast to (3), however, this inaccessibility is not the result of a locality boundary, but instead due to bleeding by cyclic default-case assignment. Such bleeding is the direct result of (i) default-case assignment being cyclic so that it can globally precede assignment of other cases (in higher domains), (ii) default-case assignment being valuation of a case feature (not absence of a value), and (iii) a ban on case overwriting (DPs that have received case cannot subsequently receive another case).⁵ We then analyze the movement–DOM connection in (2) as the result of case bleeding that results from (5). Crucially, because our account does not invoke the PIC, the in-situ object remains accessible in the structure at large. This allows us to derive the selective-inaccessibility pattern we observe for in-situ objects.

Despite the fact that our account does not invoke the PIC (and, as we will show, in fact requires that *vP* does not induce a PIC effect), it nonetheless attributes a special status to *v*: the cyclic default-case rule (6) applies when *vP* is completed, and it targets elements in *v*’s complement. This is clearly reminiscent of standard phase theory, with the important distinction that the operation triggered is not the PIC but a case rule. This is reminiscent of what Baker (2015) calls *soft phases*. Because Baker (2015) does not invoke bleeding of other cases by default case, soft phases in his system result in languages *without* DOM. Our analysis can be seen as an extension of soft phases to default-case assignment, where they then produce a DOM pattern. More broadly, our analysis supports the view that the triggering of syntactic operations like case rules on the one hand and the triggering of PIC effects on the other do not necessarily coincide. We return to this point in section 7.

⁵ If (iii) is not operative in all languages, then (5) predicts a quite distinct pattern for such languages, which may be borne out by nominative case stacking in Korean as analyzed by Levin (2017). However, the grammatical status of such constructions, and whether they involve case stacking in the first place, are controversial (Schütze 2001a).

The paper is structured as follows: section 2 presents the core DOM facts in Hindi-Urdu and the PIC account of them. Sections 3–4 then demonstrate that in-situ objects are only selectively inaccessible, based on ϕ -agreement (section 3), and dative-case assignment (section 4). Section 5 then presents our own account in terms of bleeding among case rules. Section 6 discusses several issues emerging from our account, including issues of nominal licensing and an extension to genitive case. Section 7 concludes.

2 A constraint on case assignment in Hindi-Urdu

2.1 Distribution of DOM

Hindi-Urdu displays a case system with both split-ergativity and differential object marking (DOM). Our focus here will be the distribution of the DOM marker (-ko), and we will put ergative-case assignment aside for the most part (DOM and ergative case do not interact with each other). The DOM marker -ko only appears on transitive objects. It is typically optional on common-noun objects (8a), the choice being affected by definiteness, specificity, and animacy in complex ways (e.g., Butt 1993, Mohanan 1994, Butt & King 2004, Bhatt 2007, Mahajan 2017). On animate proper-name objects and animate pronominal objects, -ko is obligatory (8b). Anticipating our analysis, we will gloss the DOM marker -ko as “accusative” (Mohanan 1994, Butt & King 2004, Bhatt 2005, Mahajan 2017, Kidwai 2022, Baker 2024), but for now nothing hinges on this.⁶

- (8) a. Mina-ne **fuul(-ko)** dekh-aa.
 Mina-ERG flower(-ACC) see.PFV-M.SG
 ‘Mina saw a/the flower.’
 b. Mina-ne **Ram*(-ko)** dekh-aa.
 Mina-ERG Ram*(-ACC) see.PFV-M.SG
 ‘Mina saw Ram.’

⁶ While Hindi-Urdu has been argued to have (pseudo-)incorporation of objects (Mohanan 1995, Dayal 2011), this process does not provide a comprehensive account of the lack of -ko on certain objects. First, pseudo-incorporated objects do lack -ko, but they still control verb agreement, in the same way as regular bare objects. Pseudo-incorporated objects are therefore not simply “invisible” for syntactic processes. The question why they participate in verb agreement but not in case assignment is therefore as acute as for nonincorporated objects.

Second, not all objects that lack -ko are pseudo-incorporated. For one, Mohanan (1995) argues that (pseudo-)incorporation is banned in a range of environments, such as when the object and the verb are not adjacent to each other. However, the object may still lack -ko in such configurations:

- (i) kitaabẽ Anil beceg-aa.
 books Anil sell.FUT-M.SG
 ‘Anil will sell the books.’
 *‘Anil will do book-selling.’ (Mohanan 1995:85, (18b))

Additionally, Dayal (2011) argues that only NPs may undergo pseudo-incorporation in Hindi-Urdu while DPs may not and that overt quantifiers like *har* ‘every’ require a DP structure. Addition of *har* ‘every’ thus provides a means of blocking pseudo-incorporation, but it does not make -ko obligatory (Dayal 2011:127), and in the S IO DO structures to be discussed in the main text, the DO cannot bear -ko even if it is not pseudo-incorporated due to being a DP (ii):

- (ii) Ali-ne Ram-ko **har khat*(-ko)** dikhaay-aa.
 Ali-ERG Ram-DAT every letter*(-ACC) show.PFV-M.SG
 ‘Ali showed every letter to Ram.’

Thus, the distribution of -ko cannot be reduced to (pseudo-)incorporation.

- c. Mina-ne **mujh-ko**/***māĩ** dekh-aa.
 Mina-ERG I-ACC/*I see.PFV-M.SG
 ‘Mina saw me.’

Treating DOM *-ko* as accusative case is justified by the fact that it may only appear on objects of transitive verbs. In particular, it cannot appear on subjects of transitive verbs or on intransitive predicates, either unergative or unaccusative (9).⁷

- (9) a. **Ram(*-ko)** khat(-ko) paṛht-aa th-aa.
 Ram(*-ACC) letter(-ACC) read.IPFV-M.SG be.PST-M.SG
 ‘Ram used to read the/a letter.’
 b. **laṛkaa/*laṛke-ko** gir-aa.
 boy/*boy-ACC fall.PFV-M.SG
 ‘The/a boy fell.’
 c. **laṛkaa/*laṛke-ko** khãās-aa.
 boy/*boy-ACC cough.PFV-M.SG
 ‘The/a boy coughed.’

Thus, *-ko* is not simply a marker of specificity and/or animacy. Rather, its distribution is limited by grammatical function, in a way that mirrors accusative case in languages without DOM. We therefore follow the literature cited above in treating *-ko* as accusative case, albeit one that is not assigned to all objects.

As mentioned in section 1, there is clear evidence that the distribution of DOM in Hindi-Urdu is linked to movement of the object (Bhatt & Anagnostopoulou 1996, Bhatt 2003, 2007, 2016). Ditransitive constructions reveal that direct objects (DOs) that are in-situ cannot bear *-ko*; only DOs that are moved over the indirect object (IO) may do so. In (10), the DO *fuul* ‘flower’ may not bear *-ko* in the S–IO–DO order (10a), but it may do so in the S–DO–IO order (10b) and in the DO–S–IO order (10c). At the same time, while *-ko* is possible in (10b,c), it is not obligatory. Note that the IO also bears *-ko* (glossed as ‘dative’), but this *-ko* has a very different distribution from DOM *-ko* (in particular, it is never optional). We return to dative case in section 4.

- (10) a. Mina-ne Tina-ko **fuul(*-ko)** diy-aa.
 Mina-ERG Tina-DAT flower.M(*-ACC) give.PFV-M.SG
 ‘Mina gave Tina a/the flower.’
 b. Mina-ne **fuul(-ko)₁** Tina-ko ____₁ diy-aa.
 Mina-ERG flower.M(-ACC) Tina-DAT ____₁ give.PFV-M.SG
 ‘Mina gave Tina the flower.’
 c. **fuul(-ko)₁** Mina-ne Tina-ko ____₁ diy-aa.
 flower.M(-ACC) Mina-ERG Tina-DAT ____₁ give.PFV-M.SG
 ‘Mina gave Tina a/the flower.’

What (10) shows, then, is that while movement of the DO is necessary for accusative-case assignment, it does not make accusative case obligatory.

In line with this generalization, direct objects that require *-ko*, such as proper names or pronouns (recall (8b)), must precede the indirect object (11).

⁷ The marker *-ko* may appear on the subject of certain experienter verbs, but in this case it realizes dative case, not DOM. See Davison (2004a,b) as well as section 4.1.

- (11) a. *Mina-ne Tina-ko Ram(-ko) bec-aa.
 Mina-ERG Tina-DAT Ram(-ACC) sell.PFV-M.SG
 ‘Mina sold Ram to Tina.’
- b. Mina-ne Ram*(-ko)₁ Tina-ko ____₁ bec-aa.
 Mina-ERG Ram*(-ACC) Tina-DAT sell.PFV-M.SG
 ‘Mina sold Ram to Tina.’
- c. Ram*(-ko)₁ Mina-ne Tina-ko ____₁ bec-aa.
 Ram*(-ACC) Mina-ERG Tina-DAT sold.PFV-M.SG
 ‘Mina sold Ram to Tina.’

Given that Hindi-Urdu is a scrambling language, we will treat the movement of the DO in (10) and (11) as a kind of scrambling (following [Bhatt & Anagnostopoulou 1996](#), [Bhatt 2016](#), [Poole & Keine 2024](#) and others), but this is primarily a terminological choice.

Interactions between scrambling and DOM of the kind in (10)/(11) provide clear evidence that DOM in Hindi-Urdu is parasitic on movement of the DO, with unshifted objects being ineligible for DOM assignment. On the view adopted here that DOM is accusative case, the generalization is that DOs that remain in their base position cannot receive accusative case. The question is why this should be the case.⁸

2.2 PIC account

A recent line of approach to DOM patterns of the kind observed in Hindi-Urdu is in terms of phasal locality restrictions (that is, the PIC), in combination with vP phases. [Baker & Vinokurova \(2010\)](#) and [Baker \(2015\)](#) attribute an analogous ban on accusative case marking of in-situ objects in Sakha to phase-based locality (also see [Levin & Preminger 2015](#)), and [Baker \(2024\)](#) proposes a phase-based account for Hindi-Urdu in particular. Assuming with them (non-crucially) a dependent-case treatment of accusative case as in (12) but simplifying somewhat the specifics of their implementations, the guiding idea is that phase impenetrability renders material inside v’s complement, including the in-situ object, inaccessible (or invisible) to operations triggered outside of vP. This prevents accusative-case assignment to in-situ objects, as schematized in (13), and thereby rules out DOM on such objects.⁹

⁸ [Baker & Vinokurova \(2010\)](#) also use adverbs to diagnose object movement in Sakha, but due to the more flexible syntax of adverbs this is not possible in Hindi-Urdu ([Baker 2024:24](#), [Agarwal 2026:32](#)).

Additional evidence for a link between DOM and object movement in Hindi-Urdu comes from asymmetric DOM marking in coordinated objects. [Kalin & Weisser \(2019:667\)](#) observe that Hindi-Urdu does not permit such asymmetric DOM marking.

(i) ???/*vo shikaarii [sher-ko aur hiran] maar deg-aa.
 that hunter tiger-ACC and deer kill give.FUT-M.SG
 ‘The hunter will kill the tiger and a deer.’ ([Kalin & Weisser 2019:667](#), (14))

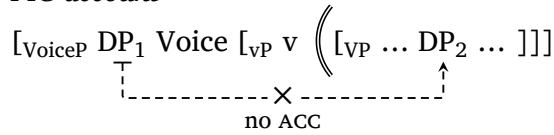
This observation follows if DOM requires movement in Hindi-Urdu: asymmetric DOM marking is then ruled out by the Coordinate Structure Constraint ([Baker 2024](#)). We note that Hindi-Urdu permits coordination of elements that do not match in definiteness if the case is the same on both conjuncts (see (ii)), supporting the conclusion that it is the case asymmetry that causes the ungrammaticality in (i).

(ii) [merii billii aur koi-na-koi anjaan jaanwar] roz laṛt-e hāī.
 my cat and some-not-some unknown animal(s) every.day fight.IPFV-M.PL be.3PL
 ‘My cat and some unknown animal(s) or other fight every day.’

⁹ (13) draws a distinction between Voice and v in (13) to establish a phase boundary between an in-situ object and the external argument DP and Voice. See [Pylkkänen \(2008\)](#), [Harley \(2013\)](#), and others for distinguishing between Voice and v.

(12) *Dependent accusative-case rule*

If, in VoiceP, a caseless DP₁ c-commands another caseless DP₂, assign [CASE:ACC] to DP₂.

(13) *PIC account*

The PIC account offers an elegant and principled explanation of the facts that (i) in-situ objects may not bear *-ko*, and (ii) scrambled objects may bear *-ko*.¹⁰

The key component of the PIC account is that the in-situ object is rendered inaccessible to syntactic operations as the result of it having undergone Spellout. This predicts that such objects should be inaccessible not just to accusative-case assignment, but to all subsequent syntactic operations. In sections 3 and 4, we argue that this is not the case. Instead, in-situ objects are selectively inaccessible *only* to case assignment to them, not other operations, as previewed in (14).

(14) *Selective inaccessibility of in-situ objects*

- a. In-situ objects are inaccessible to case assignment.
- b. In-situ objects remain accessible to ϕ -agreement (section 3) and conditioning case on other DPs (section 4).

The generalization in (14) then forms the basis of our account in section 5 in terms of cyclic default-case assignment and case bleeding.

3 Selective inaccessibility 1: Verb agreement vs. accusative-case assignment

In simple clauses in Hindi-Urdu, the main verb plus auxiliaries (if any) agree according to the algorithm in (15); see Mahajan (1989, 1990), Mohanan (1994), and Bhatt (2005), among others.

- (15) a. If the subject does not bear a case marker, the verb agrees with the subject.
- b. Otherwise, if the object does not bear a case marker, the verb agrees with the object.
- c. Otherwise, the verb bears 3rd person masculine singular default agreement.

This algorithm is illustrated in (16)–(18). Hindi-Urdu shows case discrimination in its agreement system in that overtly case-marked DPs may never control agreement. In (16),

While (13) assumes that accusative case is a dependent case, a PIC account is equally compatible with the more traditional view that accusative case is assigned under c-command by a functional head such as agent-introducing Voice/v (e.g. Chomsky 2000, 2001, Legate 2008). On such an account as well, the question arises why in-situ objects cannot receive accusative case given that they are c-commanded by the subject DP and Voice/v and a PIC account would offer an answer.

¹⁰ We note that on a PIC account additional assumptions are necessary to make *-ko* optional on scrambled objects such as (10). In particular, if the DO is scrambled above the subject, it must have moved through every phase edge along the way, which invariably puts it in the same phase as the external argument and Voice at some point. If locality was the only constraint on accusative-case assignment, we would then expect *-ko* to be obligatory on scrambled objects, contrary to fact.

both the subject and object are not overtly case-marked, leading to agreement with the subject *laṛkii* ‘girl’. In (17), the ergative-marked subject *laṛke-ne* ‘boy-ERG’ cannot control agreement but the object *sitaare* ‘stars’ can, resulting in object agreement. In (18), both the subject *laṛkii-ne* ‘girl-ERG’ and the object *sitaarō-ko* ‘stars-ACC’ are overtly case-marked and hence unable to control agreement, leading to default agreement.

- (16) *laṛkii* *sitaare/sitaarō-ko* *dekheg-ii/*-e/*-aa.* *subject agreement*
 girl.F.SG star.M.PL/star.M.PL-ACC see.FUT-F.SG/*-M.PL/*-M.SG
 ‘The girl will see (the) stars.’
- (17) *laṛkii-ne* *sitaare* *dekh-e/*-ii/*-aa.* *object agreement*
 girl.F.SG-ERG star.M.PL see.PFV-M.PL/*-F.SG/*-M.SG
 ‘The girl saw stars.’
- (18) *laṛkii-ne* *sitaarō-ko* *dekh-aa/*-ii/*-e.* *default agreement*
 girl.F.PL-ERG star.M.PL-ACC see.PFV-M.SG/*-F.SG/*-M.PL
 ‘The girl saw the stars.’

We follow the recent literature in assuming that verb agreement in Hindi-Urdu is established under Agree triggered by a probe on T (Bhatt 2005, Keine 2020b, Keine & Dash 2022, Bhatia & Bhatt 2023). This probe is case-discriminating (Bobaljik 2008) and cannot agree with overtly case-marked DPs such as ergative or accusative DPs. Thus, assignment of ergative or accusative case to a DP bleeds ϕ -Agree with this DP, which shows that ϕ -probing must take place *after* assignment of ergative and accusative case:

- (19) ϕ -probing takes place after ergative and accusative case have been assigned.

Locating the ϕ -probe on T derives the fact that both subjects and objects may in principle control agreement, but the subject takes precedence (16).

Agreement with *ko*-less objects takes place even if the object is demonstrably VP-internal (20). Here, the DO *tasviir* ‘picture’ remains in a low position following the IO *Ram-ko* ‘Ram-DAT’, and correspondingly it cannot bear *-ko*. Importantly, the DO obligatorily controls verb agreement.

- (20) *laṛkiyō-ne* *Ram-ko* *tasviir(*-ko)* *dikhaay-ii/*-aa.*
 girls-ERG Ram-DAT picture.F.SG(*-ACC) show.PFV-F.SG/*-M.SG
 ‘The girls showed Ram a picture.’

These facts demonstrate the selective inaccessibility of in-situ objects: the in-situ object in (20) is inaccessible for accusative-case assignment, but it remains accessible to verb agreement even though verb agreement is established after accusative-case assignment (19).

- (21) *Selective inaccessibility: Accusative-case assignment vs. ϕ -agreement*
 In-situ objects are selectively inaccessible to accusative-case assignment, but not to ϕ -agreement even though ϕ -agreement is established after accusative case (as accusative bleeds ϕ -agreement).

(21) presents conflicting requirements for a PIC account. If the in-situ object is inaccessible to accusative-case assignment as a result of being spelled-out it should also be

inaccessible to subsequent φ -agreement.¹¹ Because the PIC induces a binary split between accessible and inaccessible material, it does readily lend itself to an account of the selective-inaccessibility pattern in (21).

4 Selective inaccessibility 2: Accusative-case assignment vs. dative-case conditioning

A second instance of the selective inaccessibility of in-situ objects revolves is based on dative-case assignment. To preview, we present evidence for a dependent-case analysis of dative case in Hindi-Urdu, independently proposed by Baker (2024) (also see Baker & Vinokurova 2010 and Baker 2015 for other languages). On this analysis, dative case is assigned to a DP if this DP is caseless and c-commands another DP within vP, as stated in (22).

(22) *Dependent dative-case rule*

If, in the complement of v, a caseless DP₁ c-commands another DP₂, assign [CASE:DAT] to DP₁.

We then show that the lower DP referenced in (22)—i.e., DP₂—may be an object that is unavailable for accusative-case assignment. We conclude that while in-situ objects may not receive accusative case, they may nonetheless trigger dependent-case assignment to other DPs. The inaccessibility of in-situ objects for accusative case is thus again selective—they are nonetheless accessible to trigger the dative-case rule (22).

4.1 Basic distribution of dative case

We begin by laying out the distribution of dative case in Hindi-Urdu as a motivation for the dependent-case rule in (22). Dative case in Hindi-Urdu primarily appears on indirect objects of ditransitive verbs (23) and on experiencer subjects (24).

- (23) Mina-ne Tina*(-ko) kitaab d-ii.
 Mina-ERG Tina*(-DAT) book.F give.PFV-F.SG
 ‘Mina gave Tina a/the book.’

¹¹ As a reviewer notes, one potential way of avoiding this problem for vP phases might be to appeal to indirect agreement (Legate 2005). For example, Bjorkman & Zeijlstra (2019:547) propose that T does not agree directly with an object in Hindi-Urdu, but that the agreement is mediated via v: v agrees with the DO, and T then agrees with v if the subject bears ergative case. Bjorkman & Zeijlstra (2019) furthermore note that the agreement on v is realized on the main verb; the agreement on T is realized on an auxiliary if one exists. This account correctly derives object agreement in (17) and (20). What is less clear is how this account handles transitive clauses with non-ergative subjects. Here, the main verb (and auxiliary, if any) agree with the unmarked subject, see (16) and (i).

- (i) laṛkii kutte dekht-ii/*-e th-ii.
 girl.F.SG dog.M.PL see.IPFV-F.SG/*-M.PL be.PST-F.SG
 ‘The girl used to see dogs.’

Bjorkman & Zeijlstra (2019)’s account correctly derives that T agrees with the subject, but as far as we can tell, v would still agree with the object. The result would be that the main verb agrees with the object in (16) and (i), even if the auxiliary agrees with the subject. As shown, this is ungrammatical. The general challenge for indirect-agreement accounts of this kind is that v would have to agree with the object only if T subsequently agrees with v. If T does not agree with v, then v must agree with the subject instead of the object. It is not clear how this behavior can be derived as it seems to require significant lookahead. Of course, this problem does not arise if T agrees with the object directly.

- (24) a. **Mona*(-ko)** bukhaar hai.
 Mona*(-DAT) fever.M be.3SG
 ‘Mona has a fever.’
 b. **Mona*(-ko)** Sima dikh-ii.
 Mona*(-DAT) Sima.F appear.PFV-F.SG
 ‘Mona saw Sima.’ (*lit.* ‘Sima appeared to Mona.’)

Dative case is marked with *-ko* and is thus syncretic with accusative case. The distribution of the two cases clearly differs, however, indicating that dative case and accusative case are syntactically distinct. First, while accusative case alternates with null case (as discussed in section 2), dative case never does. Dative case *-ko* is obligatory on all DPs, even inanimate and nonspecific ones. For example, dative case *-ko* is obligatory on the IO *fuul* ‘flower’ in (25), but accusative case *-ko* is optional if *fuul* is a DO (see (8a)).

- (25) Anu-ne **fuul*(-ko)** paanii diy-aa.
 Anu-ERG flower*(-DAT) water give.PFV-M.SG
 ‘Anu gave the flower water.’

Second, accusative and dative case behave differently under passivization. Accusative case disappears in passives, as shown in (26). In the active clause in (26a), the internal argument *Ram-ko* must bear accusative case. In the passivized counterpart in (26b), the internal argument is null-marked, the case associated with subjects.¹²

- (26) a. Sita-ne **Ram*(-ko)** bulaay-aa.
 Sita-ERG Ram*(-ACC) call.PFV-M.SG
 ‘Sita called Ram.’
 b. **Ram** bulaay-aa gay-aa.
 Ram call.PFV-M.SG PASS-M.SG
 ‘Ram was called.’

By contrast, dative case never disappears in passives. In (27), the indirect objects *fuul-ko* and *Ram-ko* must retain *-ko* under passivization.

- (27) a. **fuul*(-ko)** paanii diy-aa gay-aa.
 flower*(-DAT) water.M give.PFV-M.SG PASS-M.SG
 ‘The flower was given water.’
 b. **Ram*(-ko)** khat diy-aa gay-aa.
 Ram*(-DAT) letter.M give.PFV-M.SG PASS-M.SG
 ‘Ram was given a/the letter.’

¹² One additional layer of complexity is that in passives, *-ko* is still possible, as in (i):

- (i) Ram-ko bulaay-aa gaay-aa.
 Ram-ACC call.PFV-M.SG PASS-M.SG
 ‘Ram was called.’

Kidwai (2022) and Baker (2024) propose that such constructions contain an external argument *pro*, whose presence licenses accusative case (also see Baker & Vinokurova 2010). On this account, (i) is not a genuine passive construction, unlike (26b). This is compatible with our account here; what is crucial for us is that accusative *-ko* which is obligatory in active clauses such as (26a) may disappear in passives (26b), whereas dative case *-ko* may not (27).

Third, one overarching generalization about the distribution of accusative case is that it requires the presence of a higher DP (e.g., it can appear on internal arguments of transitive verbs but not of unaccusative verbs, see (9b)). This is clearly not the case for dative case, which can appear on the subject of experiencer verbs (24). Conversely, we will show that dative case requires the presence of a lower DP, which is clearly not the case for accusative case (8).

For these reasons, we follow the common view in the literature on Hindi-Urdu that accusative case and dative case are homophonous but syntactically distinct (e.g., Mohanan 1994, Butt & King 2004, Davison 2004a,b, Baker 2024).¹³

4.2 Dative as a dependent case: Evidence from the permissive construction

Based on the evidence so far, there are in principle two viable approaches to dative-case assignment in Hindi-Urdu. One is to assume that dative case is assigned by a functional head (e.g., Appl, see Kalin 2014). The alternative is to treat dative case as a high dependent case in a low clausal domain (Baker & Vinokurova 2010, Baker 2015, 2024), as in (22). For the two configurations that show dative case in Hindi-Urdu discussed so far, both analyses are successful: a functional-head account may postulate an Appl head that occurs with both ditransitive and experiencer predicates that assigns dative case (Kalin 2014). A dependent-case analysis may appeal to the fact that both ditransitive and experiencer predicates involve two DPs below *v*, which triggers assignment of dative case to the higher DP (see Davison 2004a,b for relevant evidence for this structure for experiencer predicates).

In this section, we present evidence in favor of a dependent-case account of dative case, based on the so-called *permissive construction* (Butt 1993, 1995, Bhatt 2005, Butt 2014, Davison 2014, Keine & Dash 2022). In this construction, the matrix verb *denaa* ‘let’ embeds a nonfinite clause, as illustrated in (28).

- (28) mãã-ne [*baccõ*(-ko)* kitaabẽ paṛh-ne] d-ĩ.
 mother-ERG child*(-DAT) books.F read-INF let.PFV-F.PL
 ‘Mother let (the) children read (the) books.’ (based on Davison 2014:138, (1))

Two properties of the permissive construction are crucial: First, if the embedded clause is transitive, the embedded external argument (e.g., *baccõ-ko* ‘children’ in (28)) bears dative case (Butt 1993, 1995, 2014, Davison 2014, Keine & Dash 2022). Second, the permissive may involve an ECM structure (Davison 2014, Keine & Dash 2022). Against this background, we argue that the emergence of dative case in (28) favors a dependent-case analysis of dative case. Sections 4.2.1–4.2.2 discuss and motivate both properties in turn.

¹³ Notably, Kalin (2014:170–184) proposes an account that treats *-ko* uniformly—all instances of *-ko* are assigned by Appl (also see Bhatia & Bhatt 2023). Appl is obligatorily present in ditransitives and obligatorily assigns this case to the IO. For monotransitives, the presence of Appl depends on whether the object is in need of licensing. If the object is specific and/or animate, it requires licensing, and Appl must be projected and assign case to this object. If the object is inanimate and/or nonspecific, it does not require licensing, and projection of Appl is blocked, leading to absence of *-ko*. This account requires transderivational optimization (projection of Appl is blocked unless it is required to license a DP) and it seems at odds with fundamental differences between the distribution of accusative and dative *-ko*. In particular, while accusative *-ko* may appear only in the presence of a higher DP, dative *-ko* does not require the presence of a higher DP (as seen in particular in passives (27) as well as dative–nominative experiencer verbs (24)).

4.2.1 Dative case in the permissive construction

As noted in section 4.1, accusative case and dative case differ in their distribution. First, accusative *-ko* alternates with null case if the DP is inanimate and/or nonspecific, whereas dative *-ko* is always obligatory. In the permissive construction, *-ko* is obligatory on the external argument of a transitive embedded verb even if this DP is inanimate and/or nonspecific (29). Thus, this *-ko* never alternates with null case, indicating that it is dative case.

- (29) Anu-ne [**aag*(-ko)** fasal jalaa-ne] d-ii.
 Anu-ERG fire*(-DAT) crops.F burn-INF let.PFV-F.SG
 ‘Anu let (the) fire burn down (the) crops.’ (based on Keine & Dash 2022:687n6)

Second, we saw that accusative case *-ko* may disappear under passivization whereas dative *-ko* may not (see (26) and (27)). In the permissive construction, *-ko* on the embedded external argument of a transitive verb has to remain under passivization (30).

- (30) **aag*(-ko)** fasal jalaa-ne d-ii gay-ii.
 fire*(-DAT) crops.F burn-INF let.PFV-F.SG PASS-F.SG
 ‘(The) fire was allowed to burn down (the) crops.’

Both generalizations diagnose that this *-ko* is dative case rather than accusative case.

4.2.2 Structure of permissive construction

In a careful study of the structure of the permissive construction, Davison (2014) argues that this construction is syntactically ambiguous between an object control structure and an ECM structure, schematized in (31).

- (31) a. *Control structure:*
 α let β_1 [PRO₁ VP]
 $\rightarrow$ “ α permitted β to VP”
 b. *ECM structure:*
 α let [β VP]
 $\rightarrow$ “ α didn’t prevent an event from happening”

As indicated in (31), Davison (2014) argues that the two structures differ semantically. The control structure requires granting of permission, while the ECM structure is compatible with simple non-interference (“not preventing X from happening”). Many instances of the permissive construction are therefore ambiguous in this way, but as Davison (2014) notes, real-world plausibility can be used to create a bias for one structure or the other. Examples that bias towards (31b) are given in (32) and (33). These sentences do not require a pragmatically odd interpretation in which Anu grants permission to the fire, or in which the doctor does not grant permission to the patient to get a fever, respectively. Rather, these examples are naturally interpreted as (31b): Anu did not do anything to stop the fire, and the doctor did not let it come to pass that the patient got a fever.

- (32) Anu-ne [**aag*(-ko)** fasal jalaa-ne] d-ii. [= (29)]
 Anu-ERG fire*(-DAT) crops.F burn-INF let.PFV-F.SG
 ‘Anu let (the) fire burn down (the) crops.’

- (33) *ḍaakṭar-ne* [*mariiz*(-ko)* *bukhaar aa-ne*] *nahī̃ diy-aa*.
 doctor-ERG patient*(-DAT) fever.M come-INF not let.PFV-M.SG
 ‘The doctor didn’t allow the patient get a fever.’ [‘The doctor did everything they could to make sure the patient did not get a fever.’]
 (based on Davison 2014:151, (36a))

(32) and (33) thus support the view that the permissive allows an ECM structure.

In addition to the semantic difference between the two structures (31), Davison (2014) also provides a syntactic argument for the existence of an ECM structure. The argument is based on a general constraint on PRO in Hindi-Urdu, discussed in Davison (2008, 2010): dative subjects may not be PRO (34).

- (34) *Dative restriction* (Davison 2008:34)
 In contexts of obligatory control, the embedded verb may not assign its (null) subject dative case.

To illustrate, Hindi-Urdu has a number of verbs that take a dative subject, such as *mil* ‘get’ in (35). See Davison (2004a,b), Poole (2015), and Bhatia & Poole (2016) for discussion and evidence that the dative DP is, or can be, the subject.¹⁴

- (35) *Anu-ko inaam mil-aa*
 Anu-DAT award get.PFV-M.SG
 ‘Anu got the award.’

Davison (2008, 2010) shows that such verbs may not appear in control configurations in which the dative DP is PRO:

- (36) **Anu-ne* [PRO *inaam mil-naa*] *caah-aa*.
 Anu-ERG PRO.DAT award get-INF want.PFV-M.SG
 ‘Anu wanted to get the award.’

The source of this restriction does not need to concern us here. Crucially, Davison (2008) shows that the restriction does not arise with all infinitival configurations but instead is specific to control structures. Raising predicates, for example, permit dative-subject predicates under them, and so do ECM constructions (37).

- (37) *Aman-ne* [*Anu-ko inaam milt-e* *hue*] *dekh-aa*.
 Aman-ERG Anu-DAT award get.IPFV-OBL be.OBL see.PFV-M.SG
 ‘Aman saw Anu get the award.’

It is therefore not simply the case that dative-subject constructions cannot occur in nonfinite clauses; rather, it is specifically dative PRO that is ruled out.

Davison (2014) then uses the restriction in (34) to syntactically differentiate control structures from non-control structures in Hindi-Urdu. Returning to the permissive, Davison (2014) shows that dative-subject verbs are allowed in the infinitival clause. This is exemplified in (38).

¹⁴ Perhaps most strikingly, the dative DP can bind subject-oriented reflexives.

Of course, this argument only shows that an ECM structure is a *possible* structure for the permissive construction, not that this is the only structure. And indeed Davison (2014) argues that the permissive construction is ambiguous between an ECM structure and a control structure. For our concerns here, all that is necessary is that the permissive allows an ECM structure as one possible parse. Given that the string in (38) requires dative case on the embedded external argument, dative case must be obligatory on every possible parse of this string, including an ECM parse. We thus conclude that even on an ECM parse of the permissive construction, dative case on the external argument of a transitive embedded clause is obligatory.

4.2.3 Dative-case assignment in the permissive construction

Against the background of these conclusions, let us reconsider the example in (39), repeated from (29) above. Given real-world knowledge, this example favors an ECM construal, and the embedded external argument *aag-ko* ‘fire-DAT’ bears dative case, as evidenced by the fact that (i) *-ko* is obligatory (unlike accusative) and (ii) it is retained under passivization (see (30)).

- (39) Anu-ne [**aag*(-ko)** fasal jalaa-ne] d-ii. [= (29)]
 Anu-ERG fire*(-DAT) crops.F burn-INF let.PFV-F.SG
 ‘Anu let (the) fire burn down (the) crops.’

We now consider the mechanics by which dative case is assigned to *aag-ko* in (39). The first option is a functional-head account, according to which dative case is assigned by some functional head in (39). The second option is that dative case is assigned by the dependent-case rule (22). In what follows, we argue for the latter type of account.

Because a functional-head account dative case is assigned by some functional head in the structure of (39), the question arises on this account what the identity of this head is. This head must be located either in the embedded clause or in the matrix clause. We can immediately dismiss the possibility that this head is inside the embedded clause because dative case on the subject is not licensed if this clause is not embedded:¹⁵

- (40) **aag(*-ko)** fasal jalaat-ii hai.
 fire(*-DAT) crops.F burn.IPFV-F.SG be.3SG
 ‘The fire burns down (the) crops.’

This entails that the dative on *aag-ko* ‘fire-DAT’ in (39) cannot stem from the embedded predicate.

¹⁵ The string in (40) with *-ko* is grammatical on a semantically-anomalous parse where *aag-ko* ‘fire’ is the (scrambled) object and *fasal* ‘crops’ is the subject (“The fire, the crops burned.”), but this is of course irrelevant for our concerns here. In this case, *-ko* is a regular accusative case marker.

Moreover, there is evidence that the dative in (39) is also not assigned by the matrix predicate *de* ‘let’. The reason is that the highest DP of the embedded clause is not always assigned dative case. While dative case is obligatory on the external argument of an embedded transitive predicate, as in (39), it is not assigned to the sole argument of an embedded unergative or unaccusative predicate, as shown in (41a,b), respectively.¹⁶

- (41) a. Anu-ne [TV chal-ne] d-ii.
 Anu-ERG TV.F move-INF let.PFV-F.SG
 ‘Anu let the TV run.’ (i.e. ‘Anu didn’t turn off the TV.’)
 b. Anu-ne [per kaṭ-ne] diy-aa.
 Anu-ERG tree.M cut_{unacc}-INF let.PFV-M.SG
 ‘Anu let the tree be cut.’

In this respect, the permissive construction in Hindi-Urdu clearly differs from ECM in English, which involves accusative-case assignment to an embedded DP regardless of the valency of the embedded predicate. If the dative in (39) was assigned by the embedding verb *de* ‘let’ (or by some other head in the matrix clause), it should appear on the highest DP of the embedded clause regardless of whether this clause is transitive or intransitive.

We conclude, therefore, that the dative case in the permissive construction is not plausibly assigned by a functional head in the embedded clause or by a functional head in the matrix clause given that either option would predict dative case in more configurations than it actually appears in. This in turn means that there is no plausible functional head that dative case in the permissive construction could be attributed to. It is therefore difficult to see how a functional-head account could derive the distribution of dative case in this construction in a principled manner.

Let us now consider the dependent-case account of dative case in Hindi-Urdu. The relevant dependent-case rule, based on similar rules in Baker (2015, 2024) and Baker & Vinokurova (2010), is repeated from (22) in (42).¹⁷

¹⁶ See Bhatt & Embick (2017) for unaccusativity diagnostics for Hindi-Urdu. In (41), *-ko* is possible on *TV* and *per* ‘tree’ in (41), and it behaves like accusative/DOM. In particular, it correlates with specificity, and it is not retained under passivization (i):

- (i) a. TV chal-ne d-ii gay-ii.
 TV.F move-INF let.PFV-F.SG PASS-F.SG
 ‘The TV was allowed to keep running.’
 b. per kaṭ-ne diy-aa gay-aa.
 tree.M cut_{unacc}-INF let.PFV-M.SG PASS-M.SG
 ‘The tree was allowed to be cut.’

Moreover, there are predicates whose argument cannot be *ko*-marked at all:

- (ii) bhagwaan-ne zalzala/*zalzale-ko ho-ne diy-aa.
 God-ERG earthquake.M/*earthquake.M-ACC be-INF let.PFV-M.SG
 ‘God let the earthquake happen.’

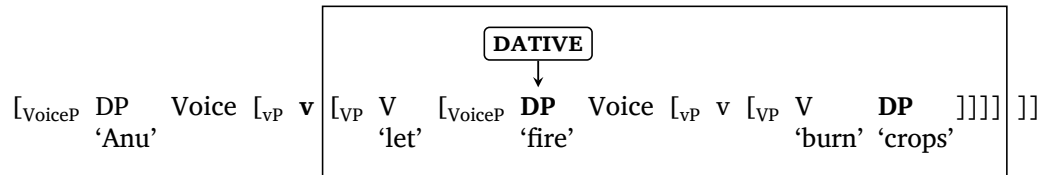
¹⁷ A reviewer asks whether [DAT] is a theoretical primitive in (42) or whether dative corresponds more to a general “dependent case” feature. Potentially relevant here is the fact that both accusative case and dative case in Hindi-Urdu are morphologically identical (*-ko*). In principle, *-ko* could be analyzed as the uniform realization of a [DEP] feature that is assigned by the two rules in (i):

- (42) *Dependent dative-case rule* [= (22)]
 If, in the complement of *v*, a caseless DP_1 c-commands another DP_2 , assign [CASE:DAT] to DP_1 .

As we now show, the rule in (42) yields the desired distribution of dative case, and it derives both (i) the dependence of dative case on embedding (i.e., (39) vs. (40)) and (ii) the dependence on the embedded predicate being transitive (i.e., (39) vs. (41)). First, the dative rule applies in permissive constructions with a transitive embedded clause, as shown in (44) for the example in (43). The embedded object *fasal* ‘crops’ is DP_2 in (42), and the complement of the matrix *v* constitutes the domain in which (42) applies. To aid readability, we provide head-initial bracket structures here and throughout.

- (43) Anu-ne [**aag*(-ko)** fasal jalaa-ne] d-ii. [= (29)]
 Anu-ERG fire*(-DAT) crops.F burn-INF let.PFV-F.SG
 ‘Anu let (the) fire burn down (the) crops.’

- (44) *Permissive construction with transitive embedded clause (43): Dative rule triggered*



By contrast, if the embedded clause is intransitive, the dative rule is not triggered given the lack of a DP_2 , as shown in (46).

- (45) Anu-ne [**TV** chal-ne] d-ii. [= (41a)]
 Anu-ERG TV.F move-INF let.PFV-F.SG
 ‘Anu let the TV run.’ (i.e. ‘Anu didn’t turn off the TV.’)

- (46) *Intransitive embedded clause (45): Dative rule not triggered (no lower DP)*

[VoiceP DP Voice [_{VP} *v* [_{VP} V [VoiceP DP Voice [_{VP} *v* [_{VP} V]]]]]]
 ‘Anu’ ‘let’ ‘TV’ ‘run’

The dative rule is likewise not triggered on external arguments in unembedded clauses given the lack of enclosing *vP*, as shown in (48).

- (i) a. *Dependent accusative-case rule* (generalized)
 If, in VoiceP a caseless DP_1 c-commands another caseless DP_2 , assign [CASE:DEP] case to DP_2 .
 b. *Dependent dative-case rule* (generalized)
 If, in the complement of *v*, a caseless DP_1 c-commands another DP_2 , assign [CASE:DEP] to DP_1 .

The rules in (i) have the advantage that *-ko* can be treated uniformly as the realization of [CASE:DEP] (rather than as the syncretic realization of both [CASE:ACC] and [CASE:DAT]). The disadvantage is that assignment of [CASE:DEP] must be treated as nonuniform (the result of either (i.a) or (i.b)). Thus, the case rules in (i) do not actually avoid a nonuniform treatment; they shift the nonuniformity from the morphology to the syntax. The choice between these two possibilities does not affect our argument and analysis so we will leave it open here. See also fn. 22.

- (47) **aag**(*-ko) fasal jalaat-ii hai. [= (40)]
 fire(*-DAT) crops.F burn.IPFV-F.SG be.3SG
 ‘The fire burns down (the) crops.’

- (48) *Unembedded transitive clause (47): Dative rule not triggered (no enclosing vP)*

[_{VoiceP} **DP** Voice [_{vP} v [_{vP} V DP]]]
 ‘fire’ ‘burn’ ‘crops’

The dependent dative-case rule in (42) thus resolves the problem that arises for a functional-head account of dative case in Hindi-Urdu. Dative case is assigned only if both conditions are met (two DPs within a complement to v), and failure of either condition bleeds dative-case assignment. This correctly derives the distribution of dative case in the permissive construction.¹⁸

Note that the dative rule (42) does not require the triggering DP (i.e., the lower DP) to be caseless. This will play a role in some of the derivations in section 5.4, and it is independently motivated by the permissive construction: the dative rule is triggered even if the embedded object bears a nonstructural case:

- (49) Anu-ne [duudh*(-ko) paanii-mē mil-ne] diy-aa.
 Anu-ERG milk*(-DAT) water-LOC mix-INF let.PFV-M.SG
 ‘Anu let the milk mix with the water.’

In this regard, the dative rule differs from the accusative rule (12), where the triggering DP must be caseless. This is in line with existing dependent-case formulations for accusative case (e.g., Baker 2015:48), and it is required here to prevent scrambled DOs from conditioning accusative case on a subject. See Baker (2015:194–196) for an independent proposal that dependent-case rules may be parameterized as to whether they require the triggering DP to be caseless or not.

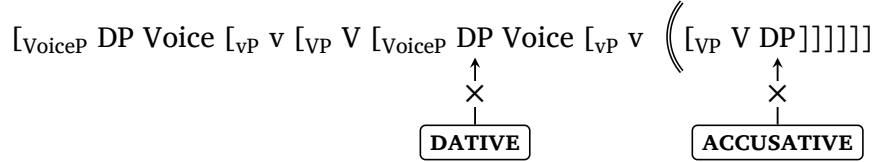
4.2.4 Dative assignment vs. accusative assignment in the permissive construction

Against the background of the dative rule in (42), we now turn to the relationship between dative-case assignment and accusative-case assignment. Recall that on a PIC account of accusative-case assignment, an in-situ object is spelled out as part of the vP phase before the external argument is merged, and therefore it is not assigned accusative case. This makes a strong prediction for the permissive construction: (50) gives the structure of the permissive construction with a transitive embedded clause whose object remains in-situ. The object is spelled out as part of the *embedded* vP phase and the PIC blocks accusative-case assignment to it. But because the embedded object is of course still inaccessible by the time the *matrix* vP is assembled (the point at which the dative rule could apply), the in-situ object should be inaccessible due to the PIC. The consequence is that the dative

¹⁸ While not central to our account, it seems possible to attribute all instances of dative case in Hindi-Urdu to the dependent-case rule in (22). As mentioned in section 4.1, dative case also appears on IOs of ditransitive verbs and on subjects of certain experiencer verbs. On standard assumptions about the structure of ditransitives (e.g., Pykkänen 2008), the IO is the higher of two DPs below v, and (22) thus correctly assigns them dative case. This holds irrespective of whether the ditransitive construction is passivized or not, deriving the fact that dative case does not disappear under passivization (27). For experiencer-verb constructions such as (24), we follow Davison (2004a,b), who argues that these involve an applicative constructions, with both DPs again generated below v. (22) thus correctly assigns dative case to the higher DP. Finally, Agarwal (2024) proposes an account for dative case in causative constructions in terms of dependent case.

rule should *not* apply in (50)—having been spelled out, the in-situ object should not be able to trigger the dative-case rule.¹⁹

(50) *Prediction of PIC account: Spellout of in-situ object should prevent dative-case rule*



The PIC account thus predicts that in the permissive construction, whenever the embedded object does not receive accusative case due to the PIC, it also should not be able to trigger dative case on a higher DP. We have already seen that this is incorrect. Dative-case assignment is obligatory even if the object does not receive accusative case:

- (51) Anu-ne [**aag*(-ko)** fasal jalaa-ne] d-ii. [= (29)]
 Anu-ERG fire*(-DAT) crops.F burn-INF let.PFV-F.SG
 ‘Anu let (the) fire burn down (the) crops.’

The fact that dative case is obligatory in the string in (51) means that it must be obligatory in every parse possible for this string, including one where the object stays in-situ. Thus, while in-situ objects are inaccessible to accusative-case assignment to them, they can nonetheless trigger a later application of dative-case assignment to another DP. What we see, then, is another instance of selective inaccessibility:

- (52) *Selective inaccessibility: Accusative-case assignment vs. dative-case conditioning*
 In-situ objects are selectively inaccessible to accusative-case assignment, but they can nonetheless condition subsequent dative-case assignment to another DP.

In-situ objects are again selectively inaccessible only to accusative-case assignment, but not to other operations.

5 Proposal: Case bleeding and cyclic default-case assignment

Sections 3–4 have shown that in-situ objects are selectively inaccessible, as summarized in (53). They cannot receive accusative case, but they are accessible for ϕ -agreement and can condition the dative-case rule.

¹⁹ In principle, the dative-case rule could also be triggered by the presence of a lower transitive VP (rather than by the presence of a lower object DP). Note that in order to derive dative case in (49), it would then have to be assumed that the locative DP is a direct object (so that the VP qualifies as transitive). This may or may not be the case, and it is an assumption that the dative rule in (42) does not need to make. Even if this reformulation is viable, it does not affect the gist of our argument. In order for a transitivity-based formulation of the dative rule to apply correctly, the rule must be sensitive to whether the embedded V takes an object (that is, whether it is transitive)—either by inspecting whether the embedded VP contains a DP or by checking the subcategorization information on this V. In both cases, the rule needs to be sensitive to information properly contained within the embedded v’s complement, hence information that we should not be available if v is a phase and the PIC holds. One might circumvent this problem by including on the embedded v a diacritic about whether the VP it selected contains an object or not. This is successful on a technical level, but not independently supported and motivated solely to circumvent the locality effect of vP phases. We suggest that if there is no such locality effect, then the problem does not arise to begin with. We thank two reviewers for helpful comments on this issue.

(53) *Selective inaccessibility of in-situ objects*

- a. In-situ objects are inaccessible to accusative-case assignment.
- b. In-situ objects remain accessible to ϕ -agreement and conditioning dative case on other DPs even if these processes take place after accusative assignment would have.

As we saw, an approach that treats in-situ objects as simply inaccessible to syntactic operations works well if only accusative-case assignment is considered (53a), but it is challenged by the fact that such objects nonetheless remain active and accessible for other operations (53b). We will therefore not pursue a PIC account here, and instead attribute (53) to *cyclic default-case assignment* plus concomitant *case bleeding*: In-situ objects are assigned default case, which bleeds subsequent assignment of accusative case, but not other syntactic dependencies.²⁰

5.1 Objects and default case

We begin by providing evidence that null-marked objects bear default case in the sense of the disjunctive case hierarchy in (4). That is, null-marked objects bear neither dependent case nor head case.

First, it is clear that the case of such objects is not lexical as it is not tied to specific verbs. This indicates that the case is not a head case in the sense of (4b). Second, while we have observed this null case on objects of transitive verbs, its distribution does not in fact require the presence of another DP. The distribution of null-marked arguments of unaccusative verbs in nonfinite clauses is parallel to that of null-marked objects of transitive verbs. Because demonstrating this parallelism is somewhat involved, we will defer discussion of unaccusatives to section 6.2 (see in particular (81) and (88)); for now, we simply note that the distribution of the relevant null case is not limited to transitive objects. This case therefore cannot be a dependent case.

Another argument for treating null-marked objects as bearing default case comes from verb agreement. Bobaljik (2008), building on Moravcsik (1974, 1978), argues that the case types in the disjunctive case hierarchy (4) define an accessibility hierarchy for ϕ -agreement, given in (54). Also see Preminger (2014, to appear).²¹

(54) *Revised Moravcsik Hierarchy* (based on Bobaljik 2008:303)

- a. Default case > Dependent case > Head case
- b. For any language and $X > Y$ in the hierarchy, if Y is accessible to verb agreement, then X is accessible to verb agreement as well.

Thus, individual languages have specific cutoff points on (54) that define which case types are accessible to verb agreement such that if one case type is accessible, all case

²⁰ An alternative approach, one that aims to rethink the effects of phasal Spellout, is explored in Agarwal (2026).

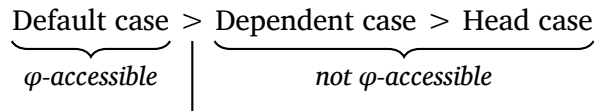
²¹ Bobaljik (2008) treats the cases in (54) as m(orphological)-case. However, as noted in Preminger (2024), it is clearly not the case morphology that determines accessibility for ϕ -agreement. For example, in Icelandic only DPs with default case (=nominative) may control ϕ -agreement. As Preminger (2024) notes, a dative DP whose morphological form happens to be syncretic with the nominative form still cannot control agreement:

(i) Rut líkuðu/??líkaði þessir sokkar. Icelandic
 Rut.DAT[=NOM] like.PL/??like.SG these socks.NOM
 ‘Rut likes these socks.’ (Preminger 2024:77, (4))

It is clear, therefore, that (54) must operate on syntactic case features, not their morphological realization.

types to the left are accessible as well. As Bobaljik (2008:308–310) discusses, only default case (in his terminology unmarked case) is accessible to verb agreement in Hindi-Urdu. Other cases, such as accusative and dative (which we analyze as dependent cases here) or ergative (which may be analyzed as either a dependent case or a head case) are not accessible to verb agreement (see section 2). Thus, the Hindi-Urdu-specific cutoff point for verb agreement is as in (55).²²

(55) *Agreement accessibility in Hindi-Urdu* (Bobaljik 2008:310)



As we saw in section 3, null-marked objects can control verb agreement (see (17) and (20)). By (55), this entails that they bear default case rather than dependent case or head case.²³

We therefore treat null-marked objects as bearing default case, broadly construed. As noted in section 1, default case may be interpreted as the assignment of a default case value or alternatively as simply the absence of case. In the sections that follow, we will show that the Hindi-Urdu DOM facts follow if (i) the default case on null-marked objects is an assigned default case (rather than the absence of a case value) and (ii) assignment of this default case is cyclic.

5.2 Case bleeding

Our core proposal is the default-case rule in (56). We use the term “default case” in the sense of Marantz (1991): a case that is assigned to caseless DPs in a given domain once all other relevant operations have taken place (see section 1):

(56) *Cyclic default-case assignment*

If there is a caseless DP in the complement of *v*, assign default case to this DP once all other operations in *vP* have applied.

²² The three case classes in (55) are defined by their mode of assignment: head case is assigned by a functional head; dependent case is assigned in the presence of another DP; and default case is either the absence of a case value or an elsewhere case assigned to DPs in a domain that are caseless. A reviewer raises the question how the nature of a specific case with respect to these case classes is represented for agreement. For example, if a φ -probe finds a DP with [CASE:DAT] (see fn. 17), how does it determine the location of that case on the scale in (55)? For Hindi-Urdu, the answer is fairly straightforward, at least for objects (see fn. 23): any DP with a case other than [CASE:DFLT] is ineligible for φ -agreement. The question is more challenging for languages like Nepali, which sets the cutoff point between dependent case and head case (Bobaljik 2008: 309–311). This is an interesting problem, particularly the Nepali case, but one that arises for any account that incorporates (54). We do not have a general solution to offer.

²³ Though we note an important complication: null-marked case on finite subjects. Null-marked subjects may control verb agreement (e.g., (16)) but it is not at all clear that they bear the same syntactic case as null-marked objects. First, within our account in this section, default case is assigned in the complement of *v* (see the case rule in (56)), which would not affect external arguments. Second, there are systematic restrictions on objects with default case—they cannot be animate and specific, which may be attributed to a licensing condition (see Bhatia & Bhatt 2023 and also section 6.1)—and these restrictions do not hold of null-marked subjects. For null-marked subjects, we see two analytical options. One is that they receive case from finite *T* (Bhatt 2007, Bhatia & Bhatt 2023). Notably, this would make them bear a head case, which would pose an interesting question for Bobaljik (2008)’s agreement entailment. Alternatively, they could bear a second default case, assigned within a finite TP. We cannot investigate the distribution of the case of null-marked subjects here, but we note that the latter approach not only has the advantage of reconciling subjects with (55), it also fits quite well with our proposal that default case is assigned cyclically. Also see fn. 37.

Two properties of (56) are crucial, as discussed in section 1: First, default case is an assigned case; in other words, default case does not represent the absence of a case value.²⁴ Second, default case is not assigned postsyntactically or at the end of the derivation; instead, (56) applies cyclically at certain points in the the derivation, viz. in the complement of *v* after all other operations within *vP* have applied. The fact that (56) applies after all operations within *vP* gives it an elsewhere character: (56) assigns default case to every DP within the complement of *v* that has not otherwise received a case.²⁵

A central component of our account is that default-case assignment by *v* is *not* accompanied by cyclic Spellout. There is no PIC effect, and the complement of *v* remains accessible to subsequent operations. We return to the relationship between (56) and phases in section 7.

Cyclic default-case assignment bleeds the assignment of accusative case. The accusative-case rule is repeated in (57). For the sake of concreteness, we assume that VoiceP projects above *vP* and introduces the external argument. While we assume a dependent-case characterization of accusative case in Hindi-Urdu, our account of DOM is equally compatible with an approach where accusative case is assigned by a head under Agree (see fn. 9).

- (57) *Dependent accusative-case rule* [= (12)]
 If, in VoiceP, a caseless DP₁ c-commands another caseless DP₂, assign [CASE:ACC] to DP₂.

The rule in (57) requires that DP₂ be caseless—that is, accusative case is only assigned to DPs that do not already bear case. The requirement that a DP to which case is assigned must not already have a valued case feature is standard.²⁶ As a result of this caselessness requirement, (57) is bled by prior assignment of default case.

²⁴ A reviewer asks how treating default/unmarked case as an actual case value (as opposed to the absence of a value), in combination with a ban on case overwriting may handle the generalization that only default/unmarked case can be apparently overwritten by other cases. For example, in Icelandic, nominative subjects appear in accusative case in ECM constructions, but dative subjects retain their dative case (Zaenen et al. 1985:448–449). While such differences may be taken to show that default/unmarked case is the absence of a case value, such an account is not available given our claims here. Instead, we attribute such apparent instances of case overwriting as reflecting the fact that a DP can avoid default-case assignment by undergoing movement. As stated in (56), cyclic default-case assignment in Hindi-Urdu applies to the complement of *v* after all other operations within *vP* have taken place. Thus, a DP originally within *v*'s complement may escape default-case assignment by moving to [Spec,*vP*]. It then remains caseless and accessible to subsequent case assignment. This derivation does not involve case overwriting. This derives the generalization that only default case may be apparently overwritten by other cases: a DP may escape default-case assignment by undergoing movement, leading to the impression of case overwriting. Other case rules are triggered as soon as their structural description is met, and DPs may therefore not escape them by undergoing movement.

²⁵ Default-case assignment is thus cyclic in the sense that it applies to subportions of the syntactic structure as they are assembled. As a reviewer notes, (56) is also countercyclic in the sense that the domain in which default case is assigned (the complement of *v*) is a proper subpart of the domain in which the rule is triggered (*vP*). Despite the terminological contrast, these two properties are not, as far as we can see, in conflict with each other.

²⁶ The ban on assigning case to a DP that already bears case is also needed empirically. For example, in the German example (i), the moving DP *den Hunden* 'the dogs' receives dative case in the embedded clause. This case cannot be overridden by subsequent accusative-case assignment in the matrix clause.

- (i) {Den Hunden₁ / *die Hunde₁ } glaubt Petra [_{CP} sollte man ____₁ weniger
 the dogs.DAT the dogs.ACC believes Petra.NOM should one.NOM less
 Futter geben].
 fodder.ACC give
 'The dogs, Petra believes one should give less fodder to.'

The last case rule relevant for our account is the dependent dative-case rule developed in section 4 and repeated in (58).

- (58) *Dependent dative-case rule* [= (22)]
 If, in the complement of *v*, a caseless DP_1 c-commands another DP_2 , assign [CASE:DAT] to DP_1 .

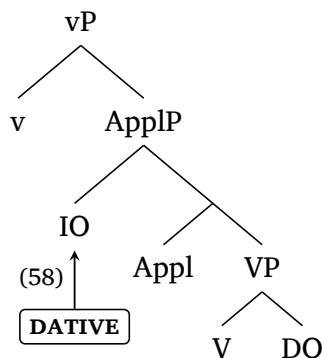
Finally, we assume that lower copies created by scrambling may trigger dependent-case rules. This assumption will become relevant in a derivation of a permissive construction in which the embedded object undergoes scrambling (74).

We now apply these case rules to the core ditransitive facts.²⁷ We saw in section 2 that in-situ objects cannot bear accusative case and that scrambled object may, but need not, bear accusative case. The relevant examples are repeated in (59).

- (59) a. Mina-ne Tina-ko **fuul**(*-ko) diy-aa. [= (10)]
 Mina-ERG Tina-DAT flower(*-ACC) give.PFV-M.SG
 ‘Mina gave Tina a/the flower.’
 b. Mina-ne **fuul**(-ko)₁ Tina-ko ____₁ diy-aa.
 Mina-ERG flower(-ACC) Tina-DAT give.PFV-M.SG
 ‘Mina gave Tina the flower.’
 c. **fuul**(-ko)₁ Mina-ne Tina-ko ____₁ diy-aa.
 flower(-ACC) Mina-ERG Tina-DAT give.PFV-M.SG
 ‘Mina gave Tina the flower.’

In all relevant configurations, the structural description of the dative-case rule (58) is met as soon as *v* merges with ApplP, leading to dative-case assignment to the IO. First, the structural description of the accusative rule (57) is not met at this point because the external-argument DP and Voice have not been merged yet. Second, the default-case rule in (56) does not apply because it applies as the final operation within *v*P. Dative-case assignment to the IO bleeds subsequent assignment of any other case to the IO given the ban on case overwriting. This means that we can ignore the IO for subsequent case computations.

- (60) *Dative case assigned to IO by (58) upon Merge of v*



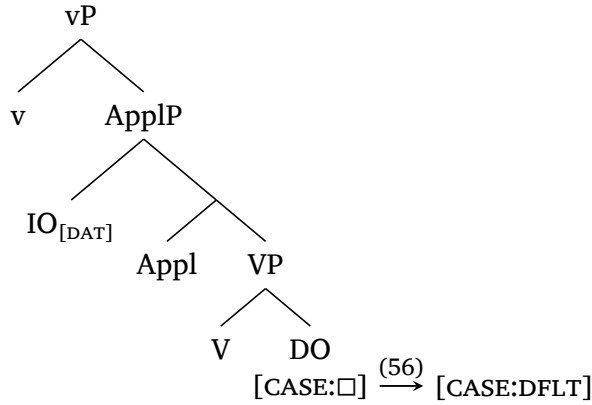
²⁷ We put aside ergative assignment in what follows. In Hindi-Urdu, ergative case is tied to finiteness and perfective aspect, which suggests that ergative case is assigned within the TP region (i.e., outside of VoiceP) and therefore after accusative and dative case have been assigned. See Bjorkman (2018), Baker (2024), and Agarwal (2026) for recent analyses of ergative case in Hindi-Urdu.

At this point, there are several continuations of (60), which result in different surface configurations. We consider each in turn.

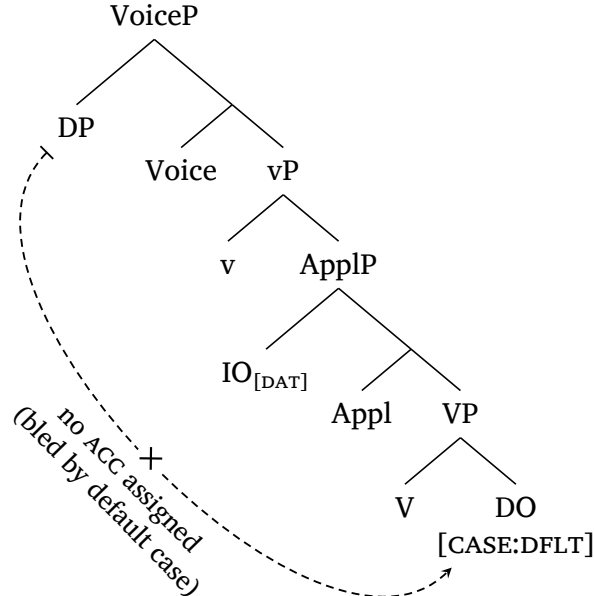
Continuation 1 of (60): No object scrambling. We first consider a continuation of (60) in which the DO does not undergo scrambling, shown in (61). In this case, given that the external argument is introduced in [Spec, VoiceP], all operations within vP have applied once dative case has been assigned in (60), and the default-case rule (56) applies, assigning default case to the DO. When Voice and the external argument are merged, accusative case is not assigned because accusative case is only assigned to caseless DPs (see (57)). In the resulting structure, the DO linearly follows the IO, and the DO cannot bear *-ko*. This derives (59a).

(61) *In-situ object*: [S IO DO-Ø V]

a. vP stage: default case assigned



b. VoiceP stage: Accusative assignment bled by default case

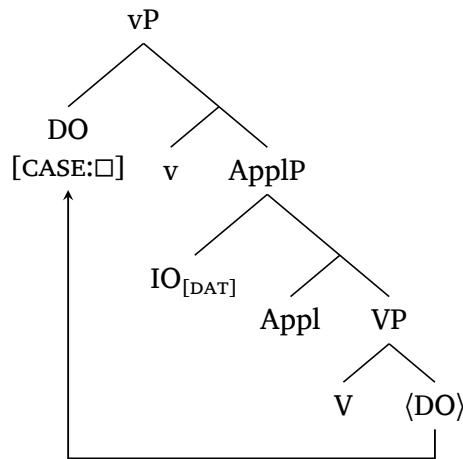


Continuation 2 of (60): Object scrambles to [Spec, vP]. Second, we consider derivations in which the object undergoes scrambling to [Spec, vP], as in (62). The structure upon Merge of v and dative-case assignment to the IO is (60), as before. After dative case has been assigned to the IO, the DO undergoes scrambling to [Spec, vP]. This scrambling

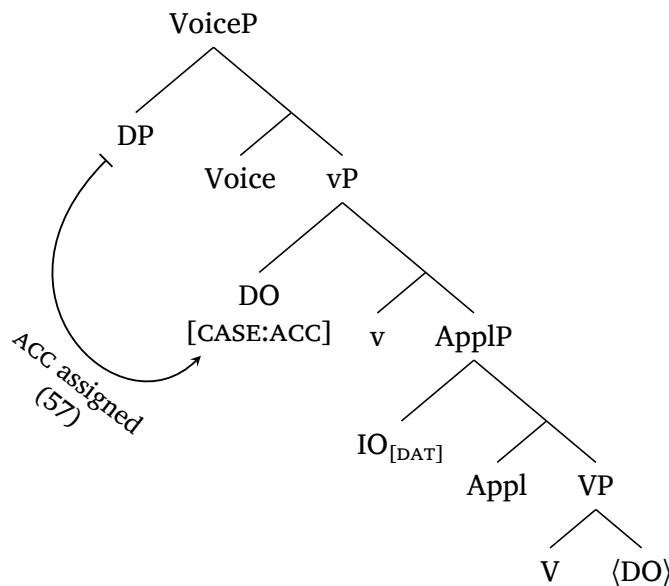
takes place prior to the application of the default-case rule (56) given that (56) applies only after all other operations within vP have taken place. Because (56) applies to the complement of v, it does not affect the scrambled DO, which remains caseless (for the case status of the lower copy of the DO, see fn. 33). Subsequent Merge of the external argument creates a VoiceP and leads to accusative case on the DO by (57).²⁸

(62) *DO scrambling to [Spec,vP]: [S DO-ko IO V]*

a. vP stage: default-case assignment bled by DO scrambling



b. VoiceP stage: Accusative assigned to DO



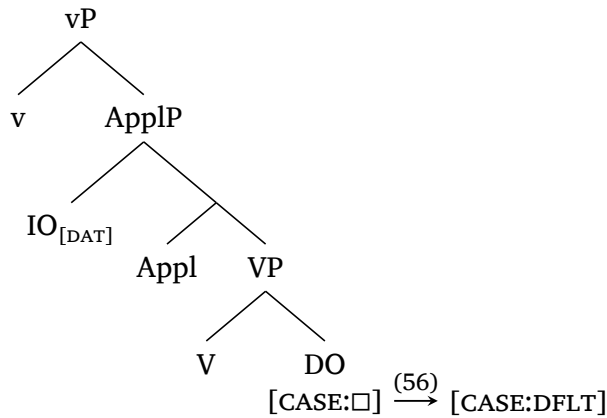
Continuation 3 of (60): Object scrambles to [Spec,VoiceP]. Finally, we consider a derivation in which the DO undergoes scrambling to [Spec,VoiceP], shown in (63). Here the DO is still in its base position upon completion of vP and hence targeted by default-case

²⁸ Because, as shown in (62b), Merge of the external argument creates a VoiceP, accusative-case assignment is triggered immediately upon Merge of the external argument, even if the DO were to subsequently move to an outer [Spec,VoiceP]. Such movement would therefore not affect the case assignment in (62).

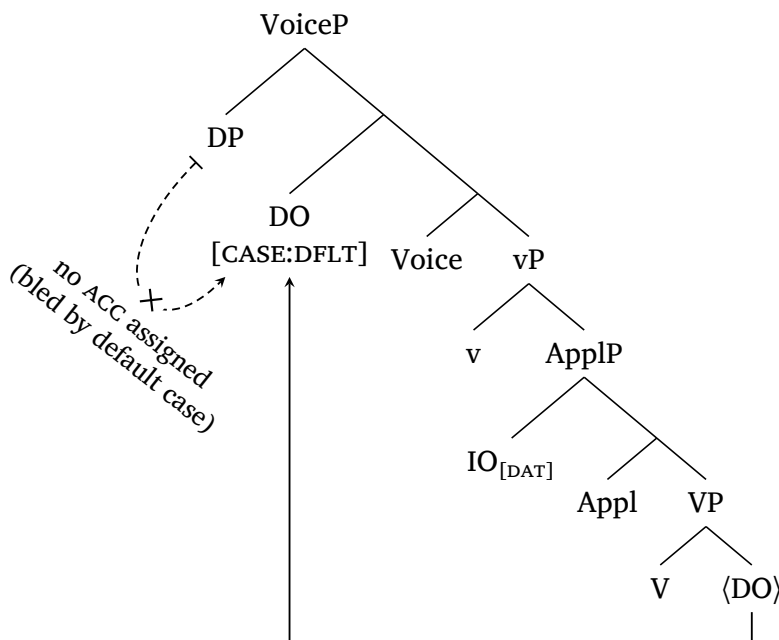
assignment. The DO then undergoes scrambling just below the external argument. Having already been assigned default case, the DO does not receive accusative case.²⁹

(63) *DO scrambling to [Spec, VoiceP]: [S DO-Ø IO V]*

a. vP: default case assigned



b. VoiceP: DO scrambling; accusative assignment bled by default case



Taken together, these derivations derive that (i) scrambled objects may or may not bear *-ko*, depending on whether they move after the default-case rule applies or before and (ii) in-situ objects may not bear *-ko* because they are invariably in the domain of the cyclic default-case rule and so cannot escape receiving default case. This derives the one-way entailment in (59)—scrambling enables *-ko*, but does not make it obligatory.³⁰

²⁹ Alternatively, the DO could scramble above the external argument, followed by movement of the external argument to a subject position (Davison 2004a,b) to derive the “S DO IO V” surface order.

³⁰ One potential additional derivation involves scrambling of the DO to an outer [Spec, ApplP]. If an inner specifier of a head can trigger dependent-case assignment to an outer specifier of the same head, then we expect the DO to receive dative case in this derivation (dative case on the IO would still be triggered by the lower copy of the DO). Whether this is problematic is not clear. Optional dative on the DO would be effectively indistinguishable from DOM so permitting this derivation would not generate any unwanted strings.

The account also derives the optionality of accusative case on objects in monotransitives, such as (8a). In this case as well, case assignment interacts with scrambling in the same way, but given the lack of an overt intervener in monotransitives this scrambling is string-vacuous, leading to apparent optionality in accusative-case assignment.

5.3 Verb agreement

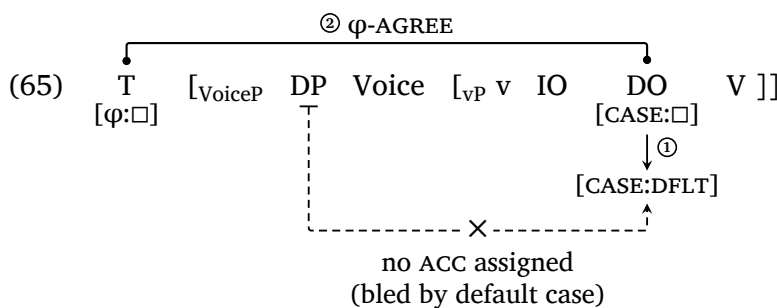
Because the account in the previous section is based on bleeding among case rules, not syntactic domains being opaque (that is, the PIC), it derives that in-situ object are still accessible for other syntactic operations. As discussed in section 3, verbs in Hindi-Urdu agree with the highest DP that is not overtly case-marked. If the subject bears ergative case, the verb agrees with the direct object if it does not bear accusative case *-ko*:

- (64) *laṛkiyō-ne Ram-ko tasviir dikhaay-ii/*-aa.* [= (20)]
 girls-ERG Ram-DAT picture.F.SG show.PFV-F.SG/*-M.SG
 ‘The girls showed Ram a picture.’

The DO *tasviir* ‘picture’ in (64) appears in its base position following the IO and it correspondingly cannot bear accusative case *-ko*. Nonetheless, it obligatorily controls verb agreement.

As mentioned in section 3, current accounts of Hindi-Urdu agreement locate the probe that underlies verb agreement above the base position of the external argument, specifically on T (Bhatt 2005, Keine 2020b, Keine & Dash 2022, Bhatia & Bhatt 2023), a view that we adopt here as well. This immediately derives that the verb preferentially agrees with the subject if possible.

The derivation for (64) is shown in (65). Assignment of default case to the in-situ DO in VP bleeds assignment of accusative case to the DO, as before. Default-case assignment does not, however, bleed φ -agreement with the DO (see section 5.1). T thus agrees with the in-situ DO.



Crucial to this account is that there is no PIC boundary between T and the in-situ object. The selective inaccessibility of in-situ DOs, repeated in (66), thus follows from (i) the absence of a PIC boundary in the vP region and (ii) case bleeding by cyclic default-case assignment.

- (66) *Selective inaccessibility: Accusative-case assignment vs. φ -agreement* [= (21)]
 In-situ objects are selectively inaccessible to accusative-case assignment, but not to φ -agreement even though φ -agreement is established after accusative case (as accusative bleeds φ -agreement).

5.4 Dative case vs. accusative case in the permissive construction

The case-bleeding account also accommodates the dative-case facts discussed in section 4. The key generalization reached there is repeated in (67).

- (67) *Selective inaccessibility: Accusative-case assignment vs. dative-case conditioning* [= (52)]
In-situ objects are selectively inaccessible to accusative-case assignment, but they can nonetheless condition subsequent dative-case assignment to another DP.

The motivation for (67) comes from the permissive construction:

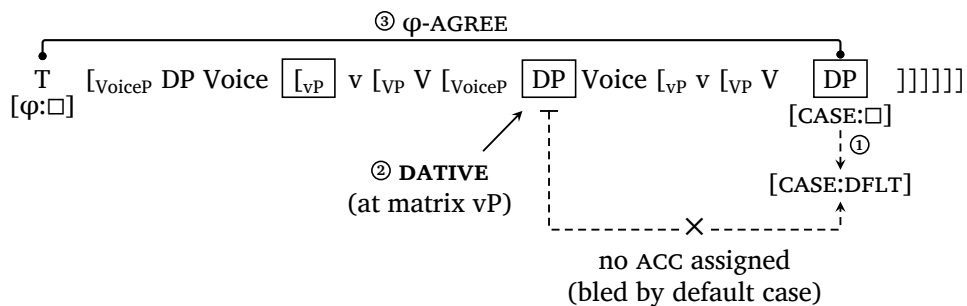
- (68) Anu-ne [**aag*(-ko)** fasal jalaa-ne] d-ii. [= (29)]
Anu-ERG fire*(-DAT) crops.F burn-INF let.PFV-F.SG
'Anu (let) the fire burn down (the) crops.'

Here, the embedded external argument *aag-ko* 'fire-DAT' must bear dative case even if the embedded object *fasal* 'crops' remains in-situ and therefore does not bear accusative case. In addition, *fasal* controls verb agreement.

We argued in section 4 that the dative case on *aag-ko* in (68) is conditioned, in part, by the embedded object and that this dative case is assigned when the matrix vP is built. We note also that (68) also instantiates (66) because the matrix verb *dii* 'let' agrees with the embedded object *fasal* 'crops'.

The case-bleeding account derives this case distribution as shown in (69). The in-situ embedded DO *fasal* 'crops' receives default case in the embedded vP (①), which bleeds subsequent assignment of accusative case in VoiceP. Because no PIC effect is at stake, *fasal* remains accessible in the structure as a whole. When the matrix vP is assembled, the context for the dative rule (58) is met, and the embedded external argument *aag* 'fire' is assigned dative case (②). Furthermore, the agreement between the matrix verb and *fasal* follows (③): given the lack of a phase boundary, the ϕ -probe on matrix T finds the embedded object and agrees with it.

- (69) *Permissive construction with in-situ object*

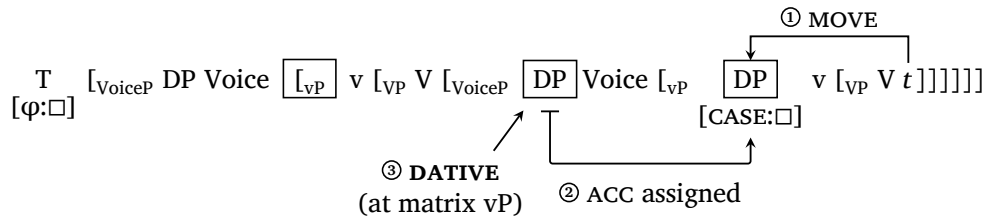


The absence of a PIC effect at the embedded vP or VoiceP is again crucial. In order to trigger the dative-case rule (58), the matrix vP, the embedded external argument *aag*, and the embedded object *fasal* must all be simultaneously accessible. This requires that *fasal* is still accessible at this point. The case-bleeding account derives that *fasal* nevertheless does

not receive accusative case due to earlier assignment of default case. But *fasal* remains accessible to condition other syntactic operations, such as (58) and verb agreement.³¹

Of course, as shown in (70), it is also possible for *fasal* to undergo scrambling to [Spec,vP] (①), thereby avoiding default-case assignment. In this derivation, *fasal* then receives accusative case in the embedded VoiceP (②). The application of the dative rule is not affected (③).

(70) *Permissive construction with shifted object*



This account makes a prediction about word order. Recall that in ditransitives, accusative case on the DO requires it to precede the IO (10). We attributed this to DO movement to [Spec,vP] that is necessary in order for it to avoid default-case assignment. In (70), the embedded DO likewise undergoes movement to [Spec,vP], but because the dative DP is the external argument of the embedded clause, this movement does not place the DO to the left of the external argument. This analysis predicts, therefore, that *-ko* on the DO does *not* require it to precede the dative DP in the permissive construction, in contrast to what we saw for ditransitive constructions. As (71) shows, this prediction is borne out—*fasal* may bear *-ko* without having to precede *aag-ko*.

- (71) Anu-ne [aag-ko **fasal-ko** jalaa-ne] diy-aa.
 Anu-ERG fire-DAT crops.F-ACC burn-INF let.PFV-M.SG
 ‘Anu let (the) fire burn down the crops.’

In addition to the word order in (71), it is also possible for the DO to precede the embedded agent, and in this case the DO may in principle either bear *-ko* or be bare (72).

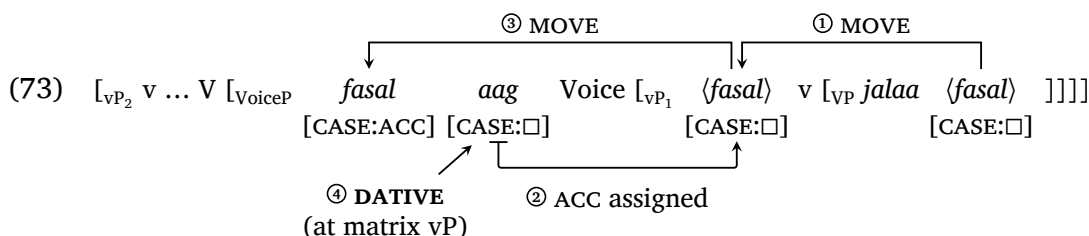
- (72) a. Anu-ne [**fasal-ko**₁ aag-ko ____₁ jalaa-ne] diy-aa.
 Anu-ERG crops.F-ACC fire-DAT burn-INF let.PFV-M.SG
 ‘Anu let (the) fire burn down the crops.’
 b. Anu-ne [**fasal**₁ aag-ko ____₁ jalaa-ne] dii.
 Anu-ERG crops.F fire-DAT burn-INF let.PFV-F.SG
 ‘Anu let (the) fire burn down the crops.’

To derive (72), it must be ensured that (i) the agent receives dative case even if the DO undergoes scrambling, and (ii) DO scrambling may, but need not, feed accusative-case assignment. In our account, the context for the dative-case rule is not created until matrix *v* is merged. If DO scrambling in (72) takes place within the embedded clause, it necessarily precedes the dative-case rule yet it evidently does not affect dative-case assignment to

³¹ Crucial for the derivation in (69) is that the dative-case rule (58) does not require the lower DP to be caseless (if it did, dative-case assignment to the higher DP would be bled by default-case assignment to the lower DP in (69)). See (49) for independent justification.

the embedded agent.³² This is an instance of counterbleeding. We attribute it to the assumption, mentioned earlier, that scrambling, like all movement, leaves a copy in the launching site (Chomsky 1995). While this copy ultimately goes unpronounced at PF, it is nonetheless a syntactic object that conditions syntactic operations just like other syntactic objects. The dative rule (58) is triggered by the presence of a lower DP, and so barring an extra stipulation, DPs that are lower copies are expected to trigger it just like DPs that are not lower copies. As a result, even if scrambling of *fasal* in (72) precedes the dative-case rule, it does not bleed dative-case assignment to *aag-ko*. More generally, because under the copy theory movement is monotonic (it does not modify existing structure), it follows that movement of a DP does not prevent it from triggering a case rule.³³

Second, assignment of accusative case to *fasal* ‘crops’ must be possible, but not obligatory, in (72). (73) and (74) depict two relevant derivations. In (73), *fasal* moves to the embedded [Spec,vP] and thereby escapes default-case assignment (①), feeding accusative-case assignment (②). It then moves above *aag* (③). As before, the presence of the lower copy of *fasal* triggers dative-case assignment to *aag* at matrix vP (④). This derivation produces (72a).

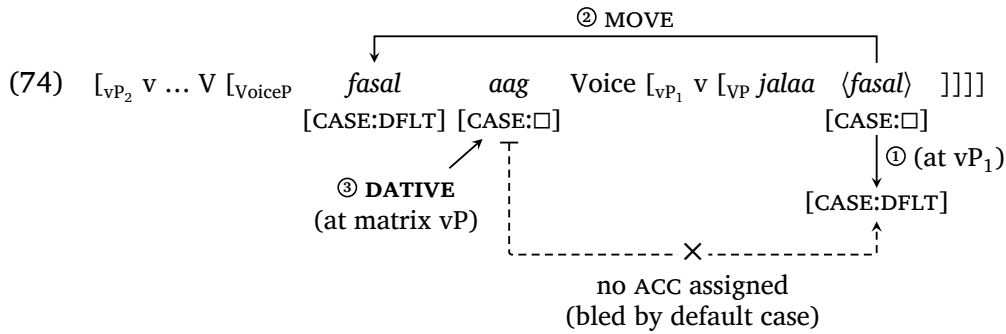


By contrast, in (74) *fasal* remains in its base position within vP and is thus assigned default case (①). It subsequently moves above the embedded subject (②). The presence of the lower copy of *fasal* then triggers dative-case assignment to *aag* ‘fire’ at matrix vP (③). This derivation produces (72b).

³² The strings in (72) are of course also compatible with a parse in which the DO scrambling leaves the embedded clause. But such a derivation is less problematic as far as the interaction with the dative-case rule is concerned, so we will put it aside here.

³³ Incorporating lower copies into the case calculus raises interesting further questions, which we can only briefly comment on here. First, a lower copy of a DP must not trigger a case rule on a higher copy of that DP. In other words, a lower copy of a moved DP may not act as a case trigger for a higher copy of the same DP. This must be ensured in any dependent-case theory and can be achieved by incorporating distinctness into the dependent-case rules—in (58), DP_1 and DP_2 must be distinct (not copies of the same DP).

Second, it raises the question whether lower copies can also be *targets* of case rules. This question arises particularly clearly in the context of default-case assignment. For example, if a DO moves out of VP prior to assignment of default case, the higher copy is caseless, but does the lower copy receive default case? We do not have clear evidence to answer this question one way or the other. If it does receive default case, then the two copies must not share a case feature: default-case assignment to the lower copy must leave unaffected the case of the higher copy. This does not seem unreasonable if they are indeed merely copies of each other (as opposed to a single, multidominated element): the two copies are identical at the time when they are created, but not hyperlinked, and so subsequent modification of one does not also modify the other. This does, however, make the statement of distinctness appealed to in the previous paragraph more complicated. Alternatively, it could be that lower copies are active as case *triggers* but not as case *targets*. This would seem to require a stipulation, however.



In (74), dative-case assignment to the higher copy of *fasal* is blocked because this copy already bears default case. This derivation therefore demonstrates that case bleeding does not just exist between default case and accusative case. Default case may also bleed dative-case assignment. It is again crucial that default case is assigned cyclically: *fasal* remains in situ at vP and receives default case. Subsequent movement is possible but does not alter that DP's case (to either accusative or dative). In section 6.2, we extend case bleeding to genitive case.

5.5 Section summary

On the account proposed here, cyclic default case bleeds accusative assignment (deriving movement-based DOM) but also dative case. While default case bleeds other cases, the DP remains accessible in the structure at large and may trigger dative-case assignment to another DP and control ϕ -agreement. This derives the selective inaccessibility of in-situ objects:

- (75) *Selective inaccessibility of in-situ objects*
- In-situ objects are inaccessible to case assignment.
 - In-situ objects remain accessible to ϕ -agreement and conditioning case on other DPs.

Because case assignment to a DO bleeds subsequent case assignment of another case to that DO but not other operations, it follows that only case assignment to a DO is susceptible to bleeding in this way. The operational split we observe is thus not a coincidence.

6 Extensions and further issues

In this section, we discuss two consequences of the case-bleeding account: (i) objects that require *-ko* and issues of nominal licensing (section 6.1) and (ii) an extension of our account to analogous facts with genitive case in unaccusative predicates (section 6.2).

6.1 Objects with obligatory accusative case

The account developed in section 5 derives the fact that in simple transitive clauses objects may in principle bear *-ko* (accusative case) or be unmarked (default case). This derives (76a). However, as noted in section 1, on some objects (including animate proper names and pronouns), *-ko* is obligatory (76b).

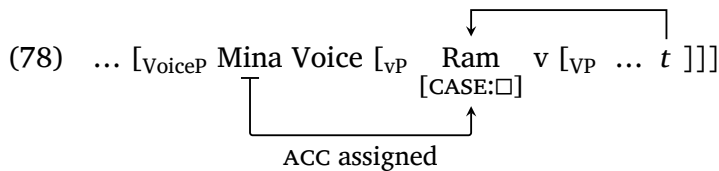
- (76) a. Mina-ne **fuul(-ko)** dekh-aa.
 Mina-ERG flower(-ACC) see.PFV-M.SG
 ‘Mina saw a/the flower.’
 b. Mina-ne **Ram*(-ko)** dekh-aa.
 Mina-ERG Ram*(-ACC) see.PFV-M.SG
 ‘Mina saw Ram.’

If *Ram* stays in-situ in (76b), it receives default case. Such a derivation must therefore lead to ungrammaticality.

We see two possible accounts of why some objects require *-ko*. The first approach, based on Diesing (1992, 1997) and Diesing & Jelinek (1995) (see, e.g., Baker & Vinokurova 2010 and Baker 2015, 2024) is that these objects are required to move to [Spec,vP].

- (77) Animate proper-name and pronominal objects/internal arguments must move to [Spec,vP].

As a result of (77), such objects invariably escape default-case assignment and thus receive accusative case.



This account correctly derives that such DOs must precede IOs in ditransitive constructions:

- (79) a. *Mina-ne Tina-ko **Ram(-ko)** bec-aa. [= (11a,b)]
 Mina-ERG Tina-DAT Ram(-ACC) sell.PFV-M.SG
 ‘Mina sold Ram to Tina.’
 b. Mina-ne **Ram*(-ko)₁** Tina-ko ____₁ bec-aa.
 Mina-ERG Ram*(-ACC) Tina-DAT sell.PFV-M.SG
 ‘Mina sold Ram to Tina.’

This approach produces the correct results for the configurations we consider here but might not generalize to certain other configurations (see Bhatia & Bhatt 2023:15–19).

An alternative approach invokes licensing through case. Kalin (2014, 2018) proposes that nominals differ in their licensing needs (also see Van Urk 2020 and Bhatia & Bhatt 2023). We might therefore stipulate that default case is not sufficient to license certain nominals (either all DPs or specifically objects/internal arguments):

- (80) Animate proper-name and pronominal objects/internal arguments require a non-default case.

The intuition underlying (80) is that some nominals require licensing through either head case or dependent case. Marantz (1991:24) notes that if default case is available, then, all else being equal, the classical Case Filter (Chomsky 1981) is never violated. (80) can be seen as a way of retaining the Case Filter within a framework that permits default-case assignment because default case does not satisfy the case requirement imposed by (80).

As a result of (80), if an animate proper-name or pronominal object remains in situ, it invariably receives default case, which bleeds subsequent assignment of accusative case. In this structure, the object does not bear *-ko*, but the structure is ungrammatical because it violates (80). The only converging derivation is one in which the object undergoes scrambling to [Spec,vP], followed by assignment of accusative case, as in (78).

Both approaches in (77) and (80) are compatible with our case-bleeding account. They both amount to a requirement that certain objects move to [Spec,vP]. (77) states this requirement directly; (80) derives it from case-licensing needs.

6.2 Extension to gerunds and genitive case

The central ingredient of the account in section 5 is a bleeding relationship between default case and accusative case. In this section, we show that the account additionally sheds light on some curious restrictions in the distribution of genitive case in Hindi-Urdu. While genitive case also marks possessors inside a DP, we focus here on genitive case in nonfinite clauses in subject position.³⁴ Such clauses permit the highest DP to bear genitive case, which we assume is assigned by nominal structure present in such clauses (for the sake of concreteness, by a D head); in other words, these clauses are gerunds (Bhatt 2005, Keine 2020b).

Our starting point is Bhatt (2007)'s observation that external arguments of transitive verbs must bear genitive case (81a) in gerunds, but arguments of unaccusative verbs do not need to if they are common nouns (81b).

- (81) a. [caṭṭaan*(-kaa) gaarīi kucal-naa] ajiib baat hai.
 rock*(-GEN) car crush-INF strange thing be.3SG
 ‘A/the rock’s crushing the car is a strange thing.’
 b. [caṭṭaan(-kaa) gir-naa] ajiib baat hai.
 rock(-GEN) fall-INF strange thing be.3SG
 ‘A/the rock’s falling is a strange thing.’ (based on Bhatt 2007:13n1)

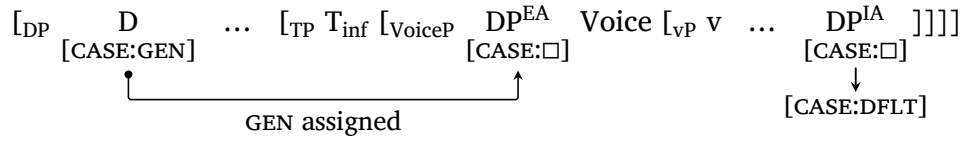
Because the relevant DP *caṭṭaan* ‘rock’ is the same in (81a,b), it is clear that the distribution of genitive case cannot be attributed to properties of this DP.

We can understand the contrast in (81a,b) as another effect of cyclic default-case assignment.³⁵ The structure for (81a) is given in (82). The in-situ internal argument (IA) *gaarīi* ‘car’ receives default case upon completion of vP. The external argument (EA) *caṭṭaan* ‘rock’ then receives genitive case when the higher nominal structure present in gerunds is merged.

³⁴ In object position, this kind of clause is usually degraded and, for some speakers, ungrammatical (Keine 2020b:38–39).

³⁵ A related account is proposed by Bhatt (2007), who also suggests that null-marked DOs and null-marked unaccusative subjects of nonfinite clauses receive the same case. In contrast to our account, Bhatt (2007) treats this case as a head case (assigned by v_{unacc}) instead of default case (we note that this conflicts the accessibility of these unmarked DPs for verb agreement given the Revised Moravcsik Hierarchy (54)). Furthermore, the relationship between this case and DOM does not seem to be one of bleeding. Rather, assignment of DOM is treated as genuinely optional (Bhatt 2007:14). It is not clear that this account extends to the distribution of genitive case discussed here because assignment of genitive case is not generally optional (81a) so some other way of blocking it in (81b), such as bleeding, is still required.

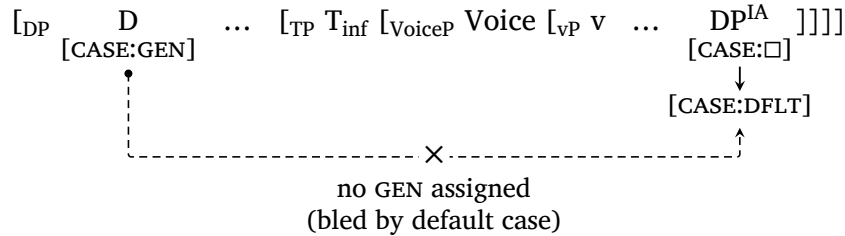
(82) *Structure for (81a): Genitive invariably assigned to external argument*



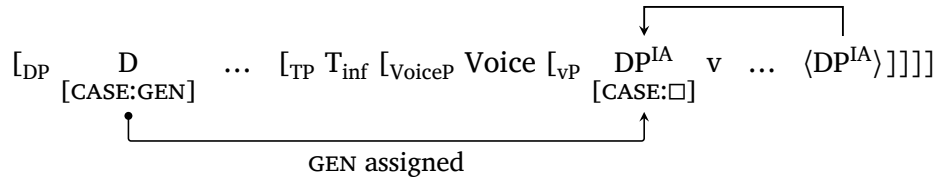
Genitive case on *caṭṭaan* is obligatory in (82) because it could not have been bled by prior case assignment as no other case-assignment mechanism is available to a DP in [Spec,VoiceP] in a nonfinite clause.

By contrast, in the unaccusative structure in (81b), *caṭṭaan* originates within VP and is hence c-commanded by *v*. If *caṭṭaan* remains in-situ and receives default case, subsequent genitive-case assignment is bled (83).³⁶ If *caṭṭaan* moves to [Spec,vP] prior to default-case assignment, it then receives genitive case (84).

(83) *Structure for (81b) without genitive: Genitive bled by default-case assignment to IA*



(84) *Structure for (81b) with genitive: Default case bled by scrambling of IA, genitive invariably assigned*



The two derivations in (83) and (84) are analogous to the derivations in section 5, except that the case that is bled by default-case assignment is not accusative, but genitive. Note also that in (83) default case is assigned to an internal argument that is *not* the lower of two DPs. This is, of course, in line with this not being default case rather than dependent case.

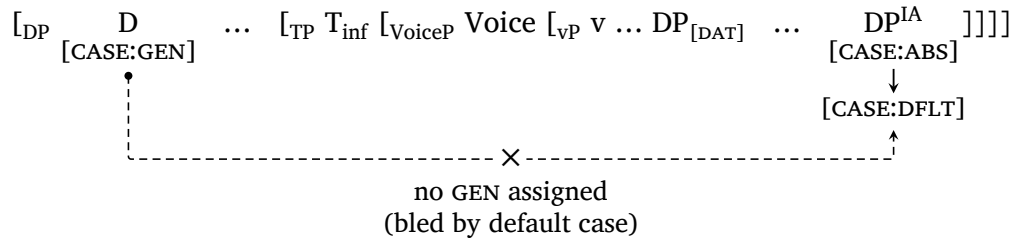
This account of the distribution of genitive case makes an immediate prediction: because (i) genitive case on internal arguments is possible only if not bled by prior default-case assignment and (ii) in-situ objects invariably receive default case, the account predicts that in-situ objects cannot bear genitive case whereas shifted objects may, but do not have to, bear genitive case. This prediction is borne out. In (85), the nonfinite clause contains a passivized ditransitive structure. As we saw in section 2, ditransitive structures allow us to diagnose whether the DO has left its base position. In the baseline IO–DO order (85a), genitive case is impossible on the DO. By contrast, in the DO–IO order (85b), where the DO has undergone scrambling, genitive case is permitted.

³⁶ Note that in (83) default case is assigned to the sole argument of an unaccusative verb. This is of course in line with our account that zero case on objects is not a dependent case but default case. As such, it is not dependent on the presence of a higher DP.

- (85) a. [fuul-ko **paanii*(-kaa)** diyaa jaa-naa] acchii baat hai.
 flower-DAT water(*-GEN) give PASS-INF good thing be.3SG
 ‘The water being given to the flower is a good thing.’
- b. [**paanii(-kaa)**₁ fuul-ko ____₁ diyaa jaa-naa] acchii baat hai.
 water(-GEN) flower-DAT give PASS-INF good thing be.3SG
 ‘The water being given to the flower is a good thing.’

The pattern in (85) is analogous to the relationship between scrambling and accusative case, and our analysis is therefore analogous as well. In the IO-DO order (85a), the DO is in its base position and thus invariably receives default case (86). This bleeds subsequent assignment of genitive case; the version of (85a) with genitive case therefore cannot be derived.

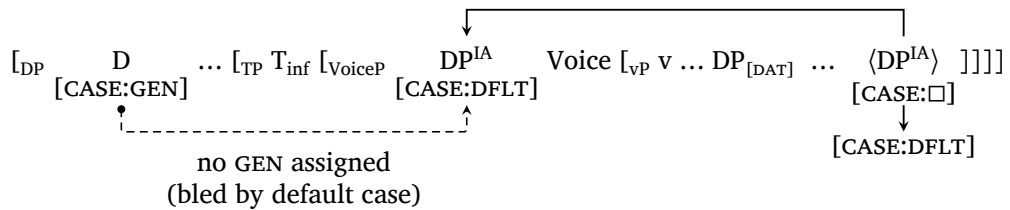
(86) *Structure for (85a)*



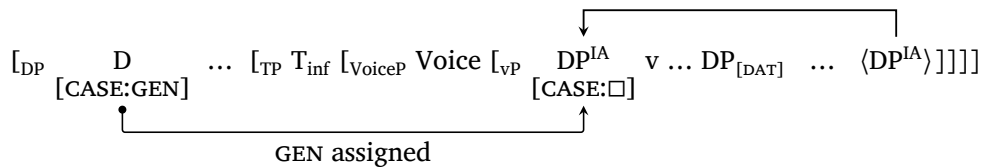
With scrambling (85b), two derivations are possible: if the DO receives default case before scrambling (that is, if scrambling targets [Spec,VoiceP]), genitive case is still bled (87a). By contrast, if scrambling targets [Spec,v_P] and thus applies before default-case assignment, the DO does not receive default case, paving the way for genitive-case assignment (87b).

(87) *Structures for (85b)*

a. *Default case assigned before scrambling*



b. *Scrambling bleeds default-case assignment*



Finally, DPs that require *-ko* in object position (i.e., animate proper names and pronouns) also require genitive case if they are the sole argument of an unaccusative verb in a gerund.³⁷

³⁷ There is no analogous restriction in a finite clause:

- (88) [Anu*(-kaa) gir-naa] ajiib baat hai.
 Anu*(-GEN) fall-INF strange thing be.3SG
 ‘Anu’s falling is a strange thing.’

In this case, the DP *Anu* must move to [Spec,vP] (either as a direct result of (77) or as an indirect result of (80)) and therefore does not receive default case. It is then invariably assigned genitive case.

By contrast, if argument of an unaccusative verb in a nonfinite clause is a DP that is not subject to (77)/(80), the account predicts that it may remain in situ and receive default case. This is indeed the case as we already saw in (81b).

In sum, the cyclic default-case account developed in section 5 also sheds light on the distribution of genitive case in gerunds, extending the scope of the account beyond DOM.

7 Conclusion and outlook

In this paper, we argued for an account of Hindi-Urdu DOM that is based on a particular view of default-case assignment, repeated in (89).

- (89) a. Default-case assignment involves valuation of a case feature, not the absence of a value.
 b. Default-case assignment applies cyclically within narrow syntax.

Empirically, in-situ objects in Hindi-Urdu cannot bear accusative case whereas scrambled objects can. DOM patterns of this kind have been analyzed as a PIC effect, according to which in-situ objects are altogether inaccessible to all operations beyond a certain point in the derivation. We argued that while such a treatment works well if only case is considered, it fails to produce the right results once dependencies other than case assignment to the object are taken into consideration. While in-situ objects cannot be assigned case, they are nonetheless accessible to ϕ -agreement and to triggering a dependent-case rule on other DPs. We called this split the *selective inaccessibility* of in-situ objects. Because a PIC account blocks all dependencies with DPs in spelled-out phase complements, it does not produce selective inaccessibility.

Instead, we proposed a case-bleeding account that crucially relies on (89). On this account, in-situ objects invariably receive cyclic default case. Because this default case is assigned cyclically, it bleeds the subsequent assignment of accusative case due to a general prohibition against multiple case assignment in Hindi-Urdu. This account derives that in-situ objects are only inert for case assignment, not other dependencies: default-case assignment bleeds assignment of other cases to this object, but it does not render the object inaccessible to other dependencies, deriving the selective-inaccessibility pattern. The selective effects of default-case assignment are summarized in (90).

-
- (i) kaṭoraa/Raj/māī gir-aa.
 bowl/Raj/I fall.PFV-M.SG
 ‘A/the bowl/Raj/I fell.’

If in finite clauses finite T is available as a case assigner (Bhatt 2007, Bhatia & Bhatt 2023), the DP in (i) can move to [Spec,vP] and thereby escape default-case assignment, followed by assignment of case from finite T. Alternatively (see fn. 23) these subjects could be licensed by a second instance of default case within finite TP. The latter option might then favor (77) over (80).

(90) Cyclic default-case assignment to a DP

- a. bleeds:
 - (i) accusative-case assignment to this DP: (61), (63)
 - (ii) dative-case assignment to this DP: (74)
 - (iii) genitive-case assignment to this DP: (83), (87a)
- b. does not bleed:
 - (i) ϕ -agreement with this DP: (65), (69)
 - (ii) conditioning of dative-case assignment by this DP: (69), (70)
 - (iii) scrambling of the object out of vP: (63), (87a)

On this account, default case may bleed dependent case and head case (if genitive is analyzed as a head case), and it is such bleeding patterns that provide the clearest motivation for cyclic default-case assignment.

While the specific combination of claims in (89) has not, to our knowledge, been explored before (with the possible exception of [Levin 2017](#), see fn. 4), we note that [Baker \(2015\)](#) develops a related notion of cyclic default-case assignment for different empirical domains (also see [Branan 2022](#)). His account differs from ours with respect to (89b). In [Baker \(2015\)](#)'s account, default case is assigned as a last resort to caseless nominals in a phasal Spellout domain if this phasal Spellout renders these nominals inaccessible/invisible to all subsequent syntactic operations and case rules ([Baker 2015](#): 150–151). As a consequence, in this model, nominals with default case are predicted to be totally inaccessible and default case cannot interact with subsequent syntactic operations (in particular, there is no potential for case bleeding by default case).

Turning to the order of the case rules, in dependent-case theory default case is assigned last, after head case (lexical and inherent case) and dependent case (91):

(91) *Order of operations in dependent-case theory*

HEAD CASE → DEPENDENT CASE → DEFAULT CASE

If case rules applied globally, it would be impossible for default case to bleed any other case because default case would follow all other case-assignment mechanisms. But if case rules apply in cyclic domains, then default-case assignment in a lower domain may bleed dependent-case assignment and head-case assignment in a higher domain. Thus, we suggest that the ordering in (91) holds, but cyclically.

As mentioned at various points in this paper, in order for this account to deliver the attested dependencies in (90b), it is crucial that vP does *not* induce PIC effects. Apparent PIC effects on case assignment are instead analyzed as being due to default case. This conclusion has important implications for questions about phasehood. Clearly, vP and VoiceP are special in our account because they trigger the application of case rules: vP triggers the dependent dative rule (58) and the default-case rule (56), and VoiceP triggers the dependent accusative rule (57). Moreover, at least the vP-triggered rules exhibit a key characteristic of phases: both the dative-case rule and the default-case rule apply in the complement of v (i.e., what is called the *domain* of v in phase theory) though it is worth noting that this is not the case for the accusative rule, at least as formulated here. The idea that case rules are tied to phases is not new ([Baker & Vinokurova 2010](#), [Baker 2015](#)). While on our account vP and VoiceP bear several features characteristic of phases, they lack what is traditionally the core characteristic of phases: the triggering of locality (i.e., PIC) effects.

If our account is on the right track, it therefore indicates that a head's ability to trigger case assignment and its ability to induce PIC effects should be dissociated. While it has

sometimes been proposed that both of these properties are distinctive to phases (see [Citko 2014](#) for an overview), our results indicate that projections may have the former property while lacking the latter. This converges with what [Baker \(2015:149–152\)](#) calls *soft phases*, which trigger case rules but do not induce PIC effects. Because in [Baker \(2015\)](#)’s system default case is not assigned in soft phases, there is no case bleeding by cyclic default case of the kind we propose here. Instead, soft phases lead to obligatory accusative case on objects in his system, rather than to DOM. But the underlying dissociation of case from PIC effects is the same, and so our proposal may be seen as an extension of soft phases to default case.

The conclusion is also in line with the behavior of other heads. For example, T in English does not induce PIC effects but may trigger syntactic operations (subject raising, ϕ -agreement, case assignment).³⁸ And conceptually, separating a head’s ability to trigger syntactic operations and its effect on locality appears reasonable as well given that traditional phase theory ([Chomsky 2000, 2001](#)) does not actually formally unify the two; any correlation would have to be by fiat.

Once we recognize heads that may trigger syntactic operations without inducing PIC effects and thus delink the two, we can ask whether there are also heads that induce PIC effects without triggering syntactic operations. One clear candidate for a head with these properties is unaccusative *v*—it arguably does not trigger syntactic operations (it does not trigger case rules and does not introduce an argument), yet it has been argued to induce PIC effects ([Legate 2003, Sauerland 2003](#)). Another candidate is a CP that does not contain complementizer agreement or other syntactic operations triggered by C yet still induces PIC effects. Projections of this kind provide some indication that the two properties ought to be decoupled more generally.

The question then arises to what extent *vP* and Voice are “phases” in our account. We believe that this question is largely terminological in nature. If we take PIC effects to be the defining property of phases, then *vP* and VoiceP are not phases on our account (in Hindi-Urdu at least). By contrast, if we take the ability to trigger case rules as a defining characteristic of phases, then clearly they qualify as phases. [Baker \(2015, 2024\)](#) takes the latter stance: the core property of phases is that they trigger case rules. *Hard phases* additionally trigger a PIC effect; *soft phases* do not. As mentioned, from this perspective, *vP* and VoiceP are soft phases in our system. By contrast, much of the recent literature that has argued against *vP* phases takes PIC effects as the defining property of phases and argues against *vP* phases based on the absence of PIC effects ([Keine 2017, 2020a,b, Grano & Lasnik 2018, Mendes & Ranero 2021, Keine & Dash 2022](#)). From this perspective, *vP* and VoiceP are not phases in our system. In other words, our account claims that *vP/VoiceP* is a (soft) phase as far as triggering operations is concerned while at the same time not a phase as far as PIC effects are concerned, with apparent PIC effects associated with *vP/VoiceP* reanalyzed as the results of the cyclic application of default-case assignment. Replacing the binary phase/nonphase distinction with two orthogonal distinctions (triggering of case rules and triggering of PIC effects) provides a natural place for a *v* head with the properties we have argued for.

³⁸ Analyses in which all operations are triggered by phase heads must then assume that the ability to trigger subject movement, ϕ -agreement, and case assignment originates on the phase head C and is transferred to T (so-called *feature inheritance*, see [Chomsky 2007, 2008](#)). See, e.g., [Broekhuis \(2016\)](#) for critical discussion.

Abbreviations

ACC = accusative, DAT = dative, ERG = ergative, F = feminine, FUT = future, GEN = genitive, INF = infinitive, IPFV = imperfective, LOC = locative, M = masculine, NOM = nominative, OBL = oblique, PASS = passive, PFV = perfective, PL = plural, PST = past, SG = singular

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Competing interests

The authors have no competing interests to declare.

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