# Chapter 1

# Reciprocals and Passives in Ndebele

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This paper examines reciprocal constructions in Zimbabwean Ndebele, marked by the suffix *-an*. We argue that these reciprocals are verbal, not pronominal, and that *-an* functions as a valency-reducing verbal extension. Adopting and extending Bruening's (2004; 2006) analysis, we propose that *-an* is the exponent of a special type of reciprocal agentive Voice, ($\text{Voice}_{\text{Rec}}$), which introduces the Agent in its specifier and relates it reciprocally with a lower argument. We further argue that this head bears an obligatory DP-licensing feature $[*\text{D}*]_{\text{OL}}$, giving rise to the requirement that reciprocal constructions must always contain a DP argument. We end with a crosslinguistic connection between $\text{Voice}_{\text{Rec}}$ and passives in certain languages.

## 1 Introduction

Two types of reciprocals can be found across languages: pronominal and verbal ones (Nishigauchi 1992; Mchombo 1993; Bruening 2004; Siloni 2008; Tatsumi 2017; a.o.). Pronominal reciprocals involve an anaphor, such as *each other* in English (1). In contrast, verbal reciprocals encode reciprocity through valency-reducing verbal morphology e.g., the morpheme *-aw* in Japanese (2).

(1) They helped *each other*.

(2) [John-to Mary]-ga home-at-ta. *Japanese*
John-and Mary-NOM praise-REC-PST
'John and Mary praised each other.' (Tatsumi 2017: 536)

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In this paper, we examine the syntactic properties of reciprocals in Zimbabwean Ndebele (S44). As illustrated in (3), these constructions involve a special reciprocal extension, the suffix *-an*.[1]

(3) Abantwana ba-ya-nced-an-a.
2.child 2.SBJ-PRS-help-REC-FV
'The children are helping each other.'

In Section 2, we demonstrate that Ndebele reciprocals are indeed verbal: there is no evidence for an overt or covert reciprocal DP equivalent to *each other*. We argue that reciprocals in Ndebele involve valency reduction as they amount to using a thematically transitive predicate in an intransitive frame (or ditransitive predicates in a mono-transitive frame). In Section 3, we follow Bruening's (2004, 2006) analysis of verbal reciprocals and suggest that Ndebele reciprocals include a reciprocal agentive Voice ( $\text{Voice}_{\text{Rec}}$), which i) selects for an unsaturated VP of type <e,<st>> and ii) merges a DP in its specifier. This allows us to capture the observation that reciprocity relations in Ndebele can hold only between the Agent and a missing argument introduced by the head immediately below Voice (e.g., V or Appl). In Section 4, we investigate the interaction between passives and reciprocals, observing that the two can co-occur only with thematically ditransitive predicates. We characterize this as a transitivity restriction on reciprocals in Ndebele, akin to the transitivity restriction of passives found in many languages, including English. In Section 5, we implement this restriction as obligatory DP licensing. More concretely, $\text{Voice}_{\text{Rec}}$ in Ndebele bears a [∗D∗] feature, which must be checked by a DP in order for the derivation to proceed. In Section 6, we suggest that this implementation can be extended to passives in languages like English, which, like Ndebele reciprocals, require at least one DP to be projected in their structure. Section 7 concludes.

## 2 Ndebele reciprocals are verbal

We provide arguments for treating Ndebele reciprocals as verbal. First, the reciprocal morpheme *-an* in Ndebele is part of the extended verb stem. (4) provides

[1] All data come from a single speaker to ensure a coherent system for analysis. While some inter-speaker variation exists – especially regarding the possible co-occurrence of the passive and reciprocal extensions – we do not combine judgments from different speakers in order to maintain internal consistency in the dataset. Tone is not marked in the examples, as it does not bear on the patterns and generalizations under discussion. All Ndebele data are given using standard orthography.

the verbal template in Ndebele. The subject agreement prefix precedes the tense prefix. The object agreement prefix follows the tense. Verbal extensions e.g., the causative or applicative, appear after the verbal root.[2]

(4) SBJ-TENSE-(OBJ)-verbal root-CAUS/APPL/**REC**/PASS-FINAL VOWEL

The REC morpheme *-an*[3] is a verbal extension that occurs after the verbal root like other extensions e.g., the causative *-is* or the applicative *-el* (Sibanda 2004; Khumalo 2007: 79; 2014). This is illustrated in (5).

(5) Abantwana ba-ya-zi-theng-is-el-an-a izimpahla.
2.child 2.SBJ-PRS-8.OBJ-buy-CAUS-APPL-REC-FV 8.clothes
'The children are selling the clothes to each other' (Khumalo 2014: 144)

Second, there is no reciprocal DP equivalent to *each other* in this construction. Instead, reciprocity is expressed through verbal morphology, the suffix *-an*, which exhibits the properties of a valency-reducing morpheme. One could hypothesize that these reciprocals do have a projected reciprocal DP anaphor in the structure, but this DP is null. This does not appear to be the case. Null pronouns in the language trigger object agreement – e.g., the null first person object in (6) must trigger object agreement (*ngi-*) for the intended meaning to arise. In contrast, object agreement cannot coreference the reciprocal argument in (7). Neither the object marker *ba-*, typically triggered by class 2 nouns like *abantu* 'people', nor the default marker *ku-* are possible.[4]

[2]While Ndebele extensions exhibit a strict order, REC can sometimes follow PASS, deviating from the template. As reported by Sibanda 2004: 66, this occurs when the semantic subject is locative or a semantically empty expletive (i). In this paper, we set locative subjects aside and focus on cases in which the order of extensions is strictly REC«PASS. We leave examples like (i) for further research.

(i) (Pandle) kw-a-sik-w-an-a / kw-a-sik-an-w-a.
outside 15SBJ/17SBJ-PST-stab-PASS-REC-FV 15SBJ/17SBJ-PST-stab-REC-PASS-FV
'(Outside) there was stabbing of each other.'

[3]Note that *-an* changes to *-en* in the context of the Recent Past final suffix.

(i) Abantu ba-nced-en-e.
2.person 2SBJ-help-REC-FV.RPST
'People helped each other.' (recent past)

(ii) Abantu b-a-nced-an-a.
2.person 2SBJ-DPST-help-REC-FV
'People helped each other.' (distant past)

[4]For similar facts in Chichewa see Mchombo 2004: 83.

(6) Abantwana ba-ya-**ngi**-nced-a *pro.*
2.child 2.SBJ-PRS-**1SG.OBJ**-help-FV
'The children are helping me.'

(7) Abantwana ba-ya-**(*ba/*ku)**-nced-an-a.
2.child 2.SBJ-PRS-**2.OBJ/15.OBJ**-help-REC-FV
'The children are helping each other.'

We take the contrast above to suggest that Ndebele reciprocals lack a null reciprocal anaphor and are instead intransitive constructions.

One might challenge this conclusion by treating the REC suffix itself as an object marker, but one that is exceptionally linearized to the right of the root. However, the REC suffix lacks other properties of object markers, as well. For example, object-marking in Ndebele is incompatible with in-situ subjects, as illustrated in (8). (The in-situ position is diagnosed by word order and default subject agreement – see Pietraszko 2023 for further discussion and analysis). The REC suffix, however, is not subject to this restriction (9).

(8) *Ku-ngi-nced-e abantwana.
15.SBJ-**1SG.OBJ**-help-FV.RPST 2.child
'The children helped me.'

(9) Ku-nced-en-e abantwana.
15.SBJ-help-REC-FV.RPST 2.child
'The children helped each other.'

Another reason to think that *-an* is not an object marker comes from the fact that it can co-occur with an object marker in the same verb as in (10) (Khumalo 2003). Here, the missing argument corresponding to *each other* is the indirect object, while the object marker co-varies with the direct object.

(10) Abantwana ba-ya-zi-theng-is-el-an-a izimpahla.
2.child 2.SBJ-PRS-8.OBJ-buy-CAUS-APPL-REC-FV 8.clothes
'The children are selling the clothes to each other' (Khumalo 2014: 144)

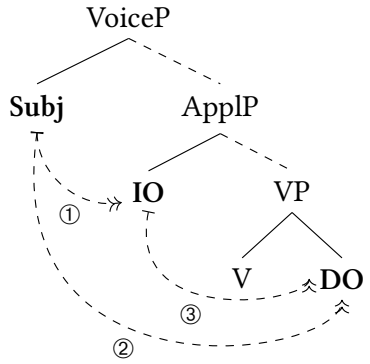
The co-occurrence of *-an* and an object marker in one verb is noteworthy because Ndebele does not allow multiple object markers in a single verb as in (11). This strongly suggests that *-an* is not an object marker.

(11) a. Ngi-yi-(*m)-ph-ile uSipho iyembe.
1sg.SBJ-9.OBJ-(*1.OBJ)-give-RPST.DSJ 1.Sipho 9.shirt
'I gave Sipho the shirt.'

b. Ngi-m-(*yi)-ph-ile iyembe uSipho.
1sg.SBJ-1.OBJ-(*9.OBJ)-give-RPST.DSJ 9.shirt 1.Sipho
'I gave Sipho the/a shirt.'

Another way in which Ndebele reciprocal constructions behave like verbal reciprocals is in showing restrictions on possible reciprocity relations (see e.g., Bruening 2006 for these restrictions in Japanese). Pronominal reciprocals allow a number of reciprocity relations among arguments. For instance, in a ditransitive construction in English, we observe three possible reciprocity relations, shown in (12). In relation ①, the Agent is interpreted reciprocally with the indirect object. In ②, the Agent is reciprocal with the direct object. Lastly, it is also possible for the indirect object to be reciprocal with the direct object, as in ③.

(12) ① **The contestants$_i$** showed *each other$_i$* pictures.
② **The contestants$_i$** showed the judge *each other$_i$*.
③ The judge showed **the contestants$_i$** *each other$_i$*.




Of the three options above, Ndebele allows only the first one, where the subject is reciprocal with the indirect object (13). The subject cannot be reciprocal with the direct object, which is lower in the structure than the indirect object. Furthermore, it is not possible for the indirect object to be reciprocal with the direct object.[5]

[5]To express a type of meaning where mothers revealed each other, our consultant uses an em-

(13) Abantwana b-a-mbul-el-an-a omama.
2.child 2.SBJ-DPST-reveal-APPL-REC-FV 2.mother
① '**Children** revealed mothers$_{DO}$ to *each other*$_{IO}$.'✓
② '**Children** revealed *each other*$_{DO}$ to mothers$_{IO}$'✗
③ 'Children revealed **mothers$_{DO}$** to *each other*$_{IO}$.'✗

The pattern in (13) suggests that Ndebele reciprocals are subject to two restrictions. First, the reciprocal relation must include the Agent. And second, the other participant of the reciprocal relation must be the argument *immediately* below the Agent. This argument is necessarily the indirect/applied object whenever one is present, as those are projected higher than direct objects. A direct object may be part of a reciprocal relation only when it is the closest DP to the Agent, as is the case in monotransitives (e.g. (3)). We will show in Section 3 how these generalizations follow from the analysis advocated here.

Lastly, languages with pronominal reciprocals have been reported to allow both sloppy and strict interpretation under ellipsis. This is possible in Greek examples like (14) with the reciprocal anaphor (Paparounas 2023).

(14) Greek (adapted from Paparounas 2023: 80)
... i ðikastes laðonun **o enas ton**
... the.NOM.PL judge.NOM.PL oil.3.PL the.NOM one.NOM the.ACC
**alo** pio sixna apo tus astinomikus.
other.ACC more often from the.PL police.officer.PL

*Sloppy:* ✓ '...the judges bribe each other more often than the policemen bribe each other.'
*Strict:* ✓ '... the judges bribe each other more often than the policemen bribe the judges.'

Ndebele reciprocals allow only a sloppy reading, which is a restriction typical of verbal reciprocals across various languages (Mchombo 1993; Bruening 2004; 2006; Keenan & Razafimamonjy 2004).

bedded causative construction shown in (i). In this instance, the DP *mothers* is the subject of the embedded clause introduced by the complementizer *ukuthi* rather than the object of the matrix clause.

(i) umfana w-a-yenz-a ukuthi omama ba-za-ambul-el-an-a.
1.boy 1.SBJ-DPST-do-FV COMP 2.mother 2.SBJ-FUT-reveal-CAUS-APPL-FV
'The boy made the mothers$_i$ reveal each other$_i$.'

(15) Abazingeli b-a-nced-an-a okwedlula abagoli.
2.hunter 2.SBJ-DPST-help-REC-FV that.which.is.beyond 2.fisherman
'Hunters helped each other more than fishermen.'
*Sloppy:* ✓ 'Hunters helped each other more than fishermen helped each other.'
*Strict:* ✗ 'Hunters helped each other more than fishermen helped hunters.'

To sum up, Ndebele reciprocal constructions behave like verbal reciprocals in a number of ways. They do not have a null reciprocal anaphor as demonstrated by the lack of object agreement. We have argued that *-an* itself is not an object marker because it is compatible with an *in-situ* subject, which cannot co-occur with canonical object markers. Furthermore, Ndebele does not allow multiple object markers on the same verb, but *-an* can co-occur with an object marker. Instead, *-an* patterns like a verbal extension. Specifically, it is a valency-reducing morpheme: when combined with a transitive predicate like 'help', it turns it into an intransitive predicate with one overt argument. Lastly, reciprocal relations in Ndebele are restricted, as is common to verbal reciprocals: the reciprocal relation can only hold between the Agent and the argument immediately below it.

## 3 Bruening's (2004, 2006) analysis of verbal reciprocals

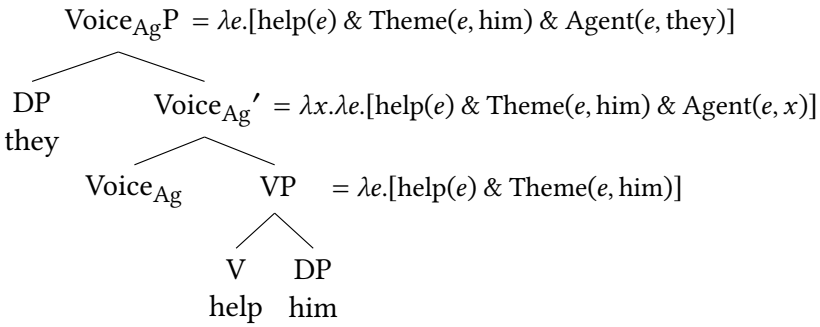
In this section, we summarize Bruening's (2004, 2006) analysis of verbal reciprocals and show how it accounts for Ndebele facts.

### 3.1 The reciprocal *-an* is the head of a reciprocal agentive Voice

Bruening (2004, 2006) proposes an analysis of verbal reciprocals that builds on the idea that external arguments are introduced by Voice (Kratzer 1996). In transitive constructions, Voice combines with a VP of type <s,t> via Event Identification and creates an argument position for the Agent. This position is then saturated by merging a DP in Spec,VoiceP. The denotation of agentive Voice is given in (16), while (17) illustrates a derivation of a transitive construction.

(16) $[\![\text{Voice}_{\text{Ag}}]\!] = \lambda x.\lambda e.[\text{Agent}(e, x)]$

(17) 'They helped him.'

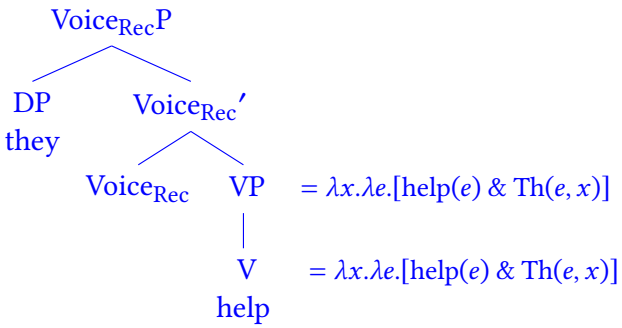



Bruening (2004; 2006) proposes that verbal reciprocals are formed with a different type of agentive Voice. Like $\text{Voice}_{\text{Ag}}$, $\text{Voice}_{\text{Rec}}$[6] introduces an Agent argument slot, which may then be saturated by merging a DP in Spec,VoiceP. However, the denotation of $\text{Voice}_{\text{Rec}}$ is different from that of $\text{Voice}_{\text{Ag}}$. As we see in (18), $\text{Voice}_{\text{Rec}}$ is a function that takes VP as an argument. The two therefore combine via Functional Application, rather than Event Identification. Moreover, $\text{Voice}_{\text{Rec}}$ combines with a VP of type <e,<s,t>>, i.e. a VP with an unsaturated internal argument. The truth conditions of $\text{Voice}_{\text{Rec}}$ define a reciprocity relation between the internal and the external argument (18). The external argument introduced by $\text{Voice}_{\text{Rec}}$ must have a cardinality of at least 2. This is necessary to ensure that the subject DP includes at least two members to engage in a reciprocal event. The denotation further divides the event into multiple sub-events, which differ from each other in which member of the subject DP is the Agent and which is the Theme of the subevent. An example derivation of a verbal reciprocal is given in (19).

(18) $[\![\text{Voice}_{\text{Rec}}]\!] = \lambda f_{\langle e,st\rangle}.\lambda z : |z| \geq 2.\lambda e.\,\big[\forall x \in z.\,\exists y, q \in z.\,\big(x \neq y \;\&\; x \neq q$
$\&\; \big(\exists e'\,[f(e', y) \;\&\; \text{Agent}(e', x) \;\&\; e' \leq e]$
$\&\; \exists e''\,[f(e'', x) \;\&\; \text{Agent}(e'', q) \;\&\; e'' \leq e]\big)\big)\big]$

(19) 'They helped each other'

[6] Our label $\text{Voice}_{\text{Rec}}$ corresponds to Bruening's RecipV.




$$[\![\text{Voice}'_{\text{Rec}}]\!] = \lambda z : |z| \geq 2.\lambda e.\,[\forall x \in z.\exists y, q \in z.(x \neq y \,\&\, x \neq q \,\&\, (\exists e'[\text{help}(e') \,\&\, \text{Th}(e', y) \,\&\, \text{Ag}(e', x) \,\&\, e' \leq e] \,\&\, \exists e''[\text{help}(e'') \,\&\, \text{Th}(e'', x) \,\&\, \text{Ag}(e'', q) \,\&\, e'' \leq e]))]$$

$$[\![\text{Voice}_{\text{Rec}}\text{P}]\!] = \lambda e.[\forall x \in \text{they}.\exists y, q \in \text{they}.(x \neq y \,\&\, x \neq q \,\&\, (\exists e'[\text{help}(e') \,\&\, \text{Th}(e', y) \,\&\, \text{Ag}(e', x) \,\&\, e' \leq e] \,\&\, \exists e''[\text{help}(e'') \,\&\, \text{Th}(e'', x) \,\&\, \text{Agent}(e'', q) \,\&\, e'' \leq e]))]$$

On this analysis, verbal reciprocals are syntactically unergative – only the external argument is projected.[7] Consequently, there is no binding relation to speak of in verbal reciprocals.

Finally, Bruening proposes that the reciprocal morpheme that appears on the verb in languages with verbal reciprocals is the realization of Voice$_{\text{Rec}}$. Accordingly, we treat the reciprocal suffix *-an* as the exponent of Voice$_{\text{Rec}}$ in our analysis of reciprocals in Ndebele, to which we now turn.

## 3.2 Deriving the core facts from Voice$_{\text{Rec}}$

In this section, we apply Bruening's analysis to reciprocals in Ndebele.

[7] Another analytical possibility is that the syntax of reciprocals is unaccusative – i.e., the overt DP is generated in the Theme position rather than the Agent position. We are not aware of such analyses for verbal reciprocals, but it is worth noting this possibility, especially given that similar proposals have been made in the literature on reflexives, where there is ongoing debate as to whether they have unaccusative or unergative syntax (see Siloni 2008 for an overview). An unaccusative analysis of reciprocals would not straightforwardly extend to reciprocals in ditransitives, where the reciprocal relation does not involve the verb's complement but rather the Agent and the indirect object (see example (13)). The reciprocal relation invariably involves the Agent, not the Theme, as predicted by the unergative analysis. A full investigation of this issue is left for future work.

We start by deriving the observation that the reciprocal *-an* cannot be added to intransitive predicates, unergative or unaccusative (20).[8]

(20) a. Abantu b-a-f-(*an)-a.
2.person 2.SBJ-DPST-die-REC-FV
'People died.'

b. Abantu b-a-gid-(*an)-a.
2.person 2.SBJ-DPST-dance-REC-FV
'People danced.'

The unaccusative VP in (20a) has a projected internal argument *abantu* 'people', which means that this VP is saturated (type <s,t>). Recall that $\text{Voice}_{\text{Rec}}$ requires an unsaturated VP of type <e,<st>>. Thus, the ungrammaticality of (20a) follows from Bruening's account, as it involves a type mismatch between $\text{Voice}_{\text{Rec}}$ and VP. (20b) receives a similar explanation: the unergative VP is also of type <s,t> (though, in this case, due to not having an internal role in the first place). For this reason, $\text{Voice}_{\text{Rec}}$ cannot take this VP as its argument.

Second, this analysis explains why there is no object agreement coreferencing the internal argument of reciprocal (see (7)). Under the analysis adopted here, the internal argument is not projected in the structure at all, and therefore there is no DP to control object agreement.

Third, recall that Ndebele reciprocals allow only a sloppy reading under ellipsis (see (15)). The strict–sloppy alternation in languages like English occurs due to different interpretations of a reciprocal DP, such as *each other*. Since no such DP is present in verbal reciprocals, we don't expect the alternation to arise. The reason why the sole interpretation available is sloppy identity is that $\text{Voice}_{\text{Rec}}$ defines the internal argument in terms of the external argument appearing in the same extended projection. The internal argument is interpreted as a member of the plural DP merged in the external position. For this reason, the internal ar-

[8] The reciprocal suffix can be used with verbs like *dance* when the applicative extension *-el* is also present, as in (i). In this case, the reciprocity relation holds between the Agent (projected in Spec,VoiceP) and the applied argument (semantically introduced by Appl, but not projected syntactically). Reciprocal Voice in this case combines with an unsaturated ApplP.

(i) Abantwana b-a-gid-el-an-a.
2.child 2.SBJ-DPST-dance-APPL-REC-FV
'The children danced for each other.'

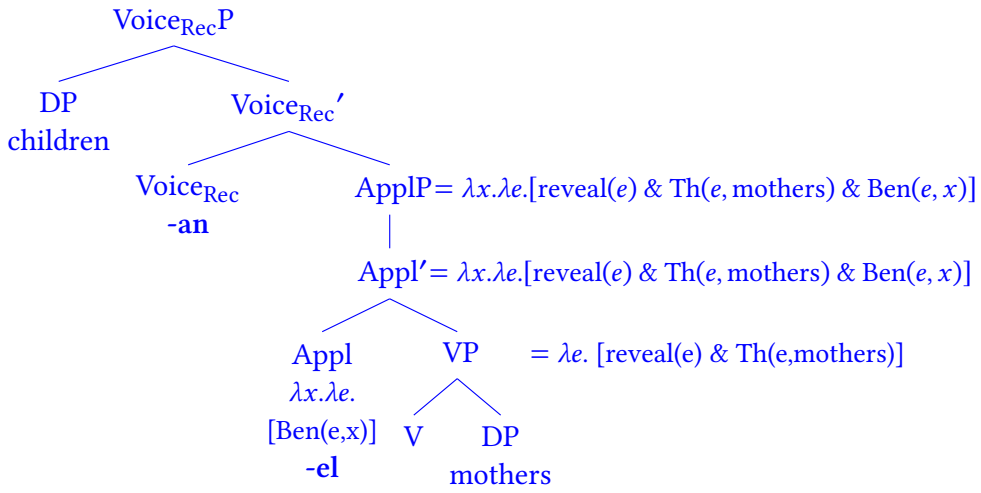
gument cannot be interpreted as referring to a DP in a different clause, as would be required for the strict reading.

Lastly, recall that the semantic arguments involved in a reciprocal relation in Ndebele must be the Agent and the highest internal argument. For instance, the reciprocal relation in (21), repeated from (13), must involve the Agent 'children' and the Benefactive argument. That is, only option ① is a possible interpretation of (21). Option ②, where the Agent is related with the Theme, is impossible. Option ③, which does not involve the Agent in the reciprocal relation, is similarly unavailable.

(21) Abantwana b-a-mbul-el-an-a omama.
2.child 2.SBJ-DPST-reveal-APPL-REC-FV 2.mother
① '**Children** revealed mothers$_{DO}$ to *each other*$_{IO}$.' ✓
② '**Children** revealed *each other*$_{DO}$ to mothers$_{IO}$' ✗
③ 'Children revealed **mothers$_{DO}$** to *each other*$_{IO}$.' ✗

Bruening's analysis derives interpretation ① as follows. First, the verb selects a DP that saturates its Theme argument. This saturated VP (type <s,t>) is then selected by Appl – a head that, much like regular agentive Voice, introduces a new semantic role (Benefactive) and combines with a saturated VP via Event Identification (see (22)). The Benefactive argument slot is, in the normal case, saturated by merging a DP in Spec,ApplP. However, this argument remains unprojected when Voice$_{Rec}$ is used (the same is true for the Theme in a reciprocal of a monotransitive verb, discussed above). Thus, the Benefactive argument remains unsaturated inside ApplP in (21), and the semantic type of ApplP is <e,<s,t>>, as required by Voice$_{Rec}$. The derivation proceeds as expected: Voice$_{Rec}$ combines with the unsaturated ApplP via Functional Application and semantically relates the Agent with the missing internal argument, as discussed above. The full derivation of (21) is given in (22).

(22)




$[\![\text{Voice}'_{\text{Rec}}]\!] = \lambda z : |z| \geq 2.\lambda e.\,[\forall x \in z.\exists y, q \in z.(x \neq y \;\&\; x \neq q$
$\&\; (\exists e'[\text{reveal}(e') \;\&\; \text{Th}(e', \text{mothers}) \;\&\; \text{Ben}(e', y) \;\&\; \text{Ag}(e', x) \;\&\; e' \leq e]$
$\&\; \exists e''[\text{reveal}(e'') \;\&\; \text{Th}(e'', \text{mothers}) \;\&\; \text{Ben}(e'', x) \;\&\; \text{Ag}(e'', q) \;\&\; e'' \leq e]))]$

$[\![\text{Voice}_{\text{Rec}}\text{P}]\!] = \lambda e.\,[\forall x \in \text{children}.\exists y, q \in \text{children}.(x \neq y \;\&\; x \neq q$
$\&\; (\exists e'[\text{reveal}(e') \;\&\; \text{Th}(e', \text{mothers}) \;\&\; \text{Ben}(e', y) \;\&\; \text{Ag}(e', x) \;\&\; e' \leq e]$
$\&\; \exists e''[\text{reveal}(e'') \;\&\; \text{Th}(e'', \text{mothers}) \;\&\; \text{Ben}(e'', x) \;\&\; \text{Ag}(e'', q) \;\&\; e'' \leq e]))]$

The reciprocal relation in ② is impossible because it would require the Theme to be not projected syntactically, leaving the VP of type <e,<s,t>>. While this is possible when VP combines directly with Voice$_{\text{Rec}}$ (as in (19)), here it leads to a type clash – as we saw in (22), Appl combines with saturated predicates (<s,t>). Finally, a reciprocal relation between the two objects, as in ③, cannot be established simply because neither of these arguments is the Agent, and reciprocity in Ndebele is tied to the Agent through the semantics of Voice$_{\text{Rec}}$.

To sum up, adopting Bruening's analysis of verbal reciprocals, we have proposed that Ndebele reciprocals are formed with Voice$_{\text{Rec}}$P – a type of agentive Voice that has a specifier and selects for an unsaturated XP (VP as in (19) or ApplP as in (21)), and creates a semantic reciprocity relation between the Agent and a missing argument.

## 4 Interactions between reciprocals and passives

In this section we investigate the co-occurrence of passive and reciprocal morphology. The two suffixes can independently attach to a verb:

(23) a. Umama u-nced–[w]-e ng-umntwana.
1.mother 1.SBJ-help-[PASS]-RPST by-1.child
'The mother was helped by a child.' *passive of transitive*

b. Abantwana ba-ya-nced-[an]-a.
2.child 2.SBJ-PRS-help-[REC]-FV
'The children are helping each other.' *reciprocal of transitive*

However, stacking them on a monotransitive verb leads to unacceptability:

(24) ??Kw-a-nced-[an]-[w]-a ng-abantwana.
15.SBJ-DPST-help-[REC]-[PASS]-FV by-2.child
'It was helped each other by the children.' *reciprocal + passive*

One possible hypothesis explaining (24) is that the passive and the reciprocal extensions realize the same functional head (e.g., Voice), and therefore only one of them can occur in a given sentence. This, however, predicts that REC and PASS should *never* co-occur, incorrectly ruling out (25). Since the two extensions can co-occur in ditransitives, they must realize separate functional heads (with PASS projected higher than REC, assuming the Mirror Principle (Baker 1985)).

(25) Izipho z-a-nik-[an]-[w]-a ng-abantwana. (c.f. (24))
10.gift 10.SBJ-DPST-give-[REC]-[PASS]-FV by-2.child
'The gifts were given to each other by children.' *reciprocal + passive*

Another way of explaining the ungrammaticality in (24) would be via a ban on passivizing intransitives. If the reciprocal detransitivizes the verb ('help$_{(Tr)}$' → 'help-each-other$_{(Intr)}$'), then the passive morpheme would be attaching to an intransitive verb here. However, Ndebele does allow passivization of intransitives (specifically unergatives), yielding impersonal passives (26).

(26) Kw-a-gid-[w]-a ng-abantwana.
15.SBJ-DPST-dance-[PASS]-FV by-2.child
'It was danced by the children.' *impersonal passive*

The impossibility of combining REC and PASS in monotransitives is therefore not directly related to valency reduction. In the next section, we show how our adaptation of Bruening's analysis derives that REC and PASS can co-occur only in ditransitives, while remaining compatible with the existence of impersonal passives in this language.

## 5 Deriving the ditransitive restriction on PASS+REC

We observed in the previous section that REC and PASS can co-occur only in ditransitive sentences in Ndebele. In this section, we propose that this restriction is syntactic in nature and relates to DP licensing. More specifically, we propose that Reciprocal Voice is an obligatory DP licensor, and consequently, requires a DP in its c-command domain. This requirement, in combination with passive syntax, yields the result that only ditransitive verbs permit the co-occurrence of REC and PASS.

### 5.1 Obligatory Licensing by $\text{Voice}_{\text{Rec}}$

We assume Bruening's (Bruening 2004; 2006) analysis of the syntax and semantics of verbal reciprocals, discussed in Section 3. Recall that this analysis correctly derives the core properties of Ndebele reciprocals discussed there. One property that does not follow straightforwardly from Bruening's account is the generalization that only ditransitives allow PASS and REC to co-occur in Ndebele. We propose that this is due to an additional property of Reciprocal Voice: this head bears a [∗D∗] feature, which must be checked by a DP. (We adopt the [∗F∗] notation from Müller (2010) for features triggering an Agree relation.) Crucially, [∗D∗] in $\text{Voice}_{\text{Rec}}$ cannot remain unchecked – a DP must be present in the domain of $\text{Voice}_{\text{Rec}}$ to check its [∗D∗] feature. In light of existing evidence that at least some probes (e.g., those involved in $\phi$-agreement) need not succeed in finding a goal (see Preminger 2014 and later work), one might expect that a failure to check [∗D∗] should be tolerated by the derivation. We propose, however, that DP licensing by $\text{Voice}_{\text{Rec}}$ is obligatory. We implement this by proposing that probes are lexically specified as either fallible or infallible, with fallible being the default type. We take infallible probes to be the marked case and represent them with a special diacritic – the subscript OL (for *Obligatory Licensing*). We define Obligatory Licensing as follows:

(27) *Obligatory Licensing*
A feature $F_{OL}$ must enter in an Agree relation with a matching category in order for the derivation to proceed.[9]

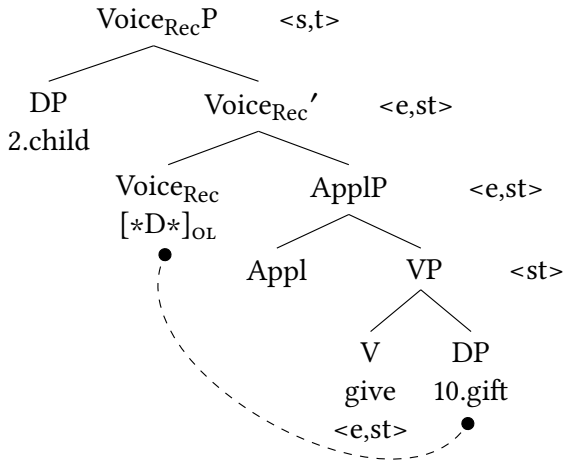
Our proposal is that Reciprocal Voice in Ndebele has $[*D*]_{OL}$, which requires a DP in the c-command domain of $Voice_{Rec}$.

Let us see how this proposal derives the core examples of reciprocal sentences in Ndebele, first without passive voice. In (28), the ditransitive verb *nika* 'give' has been reciprocalized. As a result, the Benefactive DP is not projected and is interpreted reciprocally with the Agent. The $[*D*]_{OL}$ feature on $Voice_{Rec}$ probes in its c-command domain as soon as it is merged and finds the direct object. This satisfies Obligatory Licensing, and the derivation can proceed.[10]

(28) Abantwana b-a-nik-an-a izipho.
2.child 2.SBJ-DPST-give-REC-FV 10.gift
'The children gave each other gifts.'

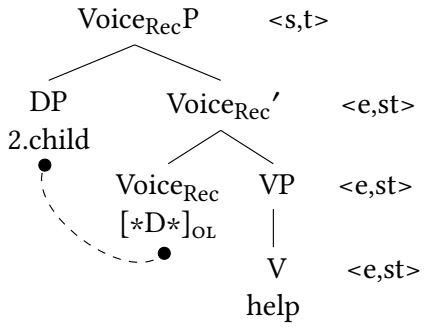
[9] When applied to D-checking, Obligatory Licensing resembles the Inverse Case Filter – a requirement that a head with the ability to license a DP (through case assignment), must do so (Bošković 1997). However, we prefer to stay agnostic as to whether the facts discussed here should be characterized as involving case licensing, given much controversy around case in Bantu languages, including Ndebele (see Pietraszko 2021 and references cited there). We also do not wish to commit to *all* DP licensing being obligatory, as the adoption of the Inverse Case Filter would do. For the time being, we speculate that both fallible and infallible DP licensing exist as a lexical property of licensing heads (with infallible probes marked with the OL diacritic, and fallible probes being the default.) One possible avenue to explore in the future is whether Obligatory Licensing can be generalized to both Inverse Case Filter effects (such as the facts at hand) and Case Filter effects, where it is the DP that appears to require licensing. This might be done by allowing the OL designation to be a property not just of probes (e.g. Voice) but also of goals (DPs). Finally, we leave open whether Obligatory Licensing is found outside of D-checking. One potential candidate is the Person Licensing Condition, found in analyses of the Person Case Constraint (i.a. Béjar & Rezac 2003), according to which 1st and 2nd person DPs must be licensed by Agree in certain contexts. The relevant parallel is that, although $\phi$-agreement has been shown to be fallible elsewhere, there appears to be specific contexts in which it is obligatory. This could be captured by generalizing OL beyond D-checking, allowing other features or relations to be lexically specified as infallible. Further discussion of potential extensions of Obligatory Licensing must be left for the future.

[10] Note that $[*D*]_{OL}$ is akin to a case licensing feature and is not a structure-building feature like [EPP] or, in Müller's notation, [·D·]. A structure-building feature must additionally be present on $Voice_{Rec}$ to trigger Merge of a DP in Spec,VoiceP. We do not represent this feature in our trees. As will become evident from the discussion of passives and reciprocals in the next section, the two features of $Voice_{Rec}$ need not co-occur – in passives, $Voice_{Rec}$ does not project a specifier but it still requires a DP to Agree with.




Turning now to monotransitives, recall that they have unergative syntax when combined with Voice$_{Rec}$. This means that there is no DP in the c-command domain of Voice$_{Rec}$ that could check its [∗D∗]$_{OL}$ feature. However, we assume cyclic Agree (Béjar & Rezac 2009), according to which a probe that fails the search of its c-command domain projects to the phrasal level, where it may probe again. In the case at hand, the [∗D∗]$_{OL}$ probe projects to Voice$_{Rec}$′, in which position it can be checked by the Agent DP under sisterhood. This derivation is illustrated with the verb *nceda* 'help' in (29).

(29) Abantwana ba-ya-nced-an-a.
2.child 2.SBJ-PRS-help-REC-FV
'The children are helping each other.'



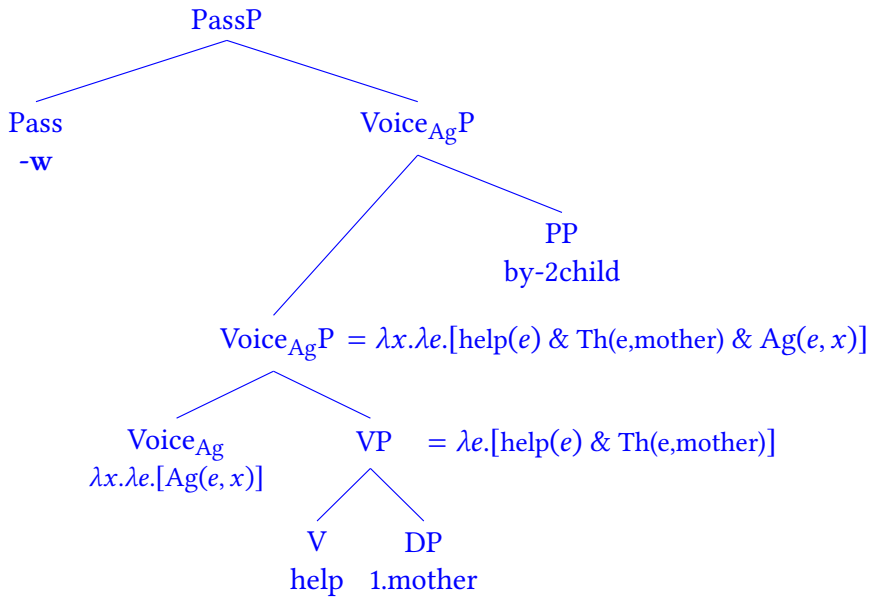

In sum, the [∗D∗]$_{OL}$ feature of Voice$_{Rec}$ is checked in both monotransitive and

ditransitive active structures. The next section considers passivized reciprocals, in which a contrast arises between monotransitives and ditransitives.

## 5.2 Combining reciprocals and passives

Building on previous work, we take passive voice to arise from two functional projections: an agentive VoiceP and a higher PassP, with the optional PP Agent being adjoined to VoiceP (Embick 2004; Bruening 2006; 2013; Schäfer 2017; Wurmbrand et al. 2021). We treat the passive suffix *-w* as the realization of Pass. An example derivation of a passive sentence is given in (30) below.

(30) Umama u-nced–w-e ng-abantwana.
1.mother 1.SBJ-help-PASS-RPST by-2.child
'The mother was helped by the children.'

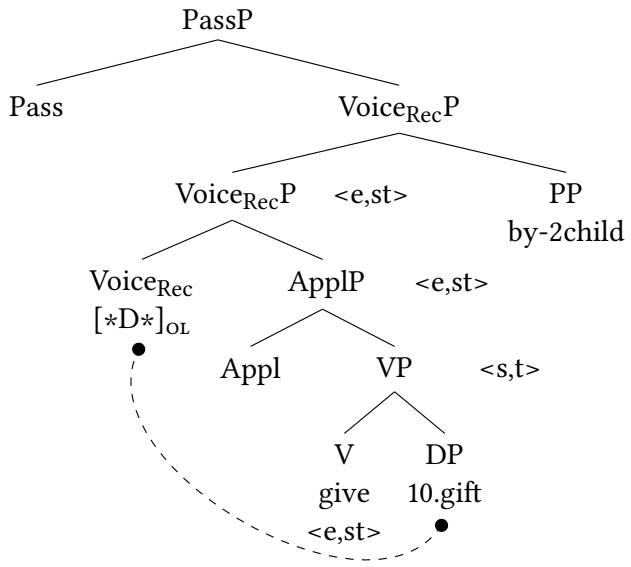



Recall from Section 3 that in an active sentence, the Agent variable introduced by Voice is saturated by the DP projected in Spec,VoiceP. In passives, VoiceP does not project a specifier, leaving the Agent argument unsaturated at the VoiceP level (type <e,st>). Instead, the Agent variable is saturated either via existential closure or by a PP adjoined to VoiceP.

With the analysis of passives in place, we move on to the co-occurrence of

passives and reciprocals, illustrated in (31). As discussed above, Reciprocal Voice is a type of agentive Voice – it projects a DP specifier in active voice but not in passives. The latter scenario is seen in the derivation of (31) below.

(31) Izipho z-a-nik-an-w-a ng-abantwana.
10.gift 10SBJ-DPST-give-REC-PASS-FV by-2.child
'The gifts were given to each other by the children.'

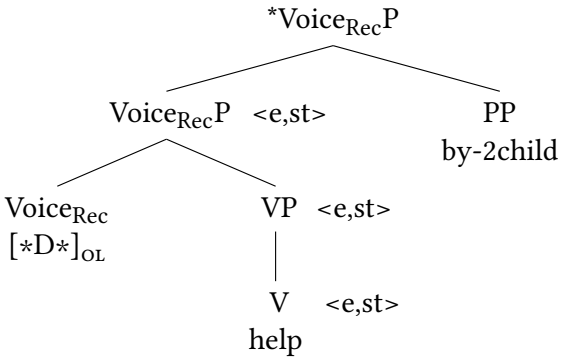



In (31), two thematic DPs are unprojected: the Benefactive (due to $\text{Voice}_{\text{Rec}}$) and the Agent (due to passivization). This combination effectively transforms an underlying ditransitive predicate into an intransitive structure when both $\text{Voice}_{\text{Rec}}$ and Pass are present. A necessary step in this derivation is the checking of $[*D*]_{\text{OL}}$ in $\text{Voice}_{\text{Rec}}$. This head probes its c-command domain and finds the Theme DP *izipho* 'gifts', which checks $[*D*]_{\text{OL}}$, allowing the derivation to proceed.

The picture changes when $\text{Voice}_{\text{Rec}}$ and Pass combine in the context of a monotransitive verb. As shown in (32), the Theme must be unprojected for the VP to compose with $\text{Voice}_{\text{Rec}}$. Because there is no other DP in the c-command domain of $\text{Voice}_{\text{Rec}}$, $[*D*]_{\text{OL}}$ cannot be checked by VP-internal material. While cyclic expansion of the probe would normally allow checking by the Agent DP in Spec,$\text{Voice}_{\text{Rec}}$, no such DP is projected in passives. The DP 'children' embedded in the *by*-phrase is not able to check this feature since, as we discuss below, DPs

embedded in PPs are not accessible to A-probes in the language. Consequently, $[*D*]_{OL}$ remains unchecked, and the derivation cannot proceed.

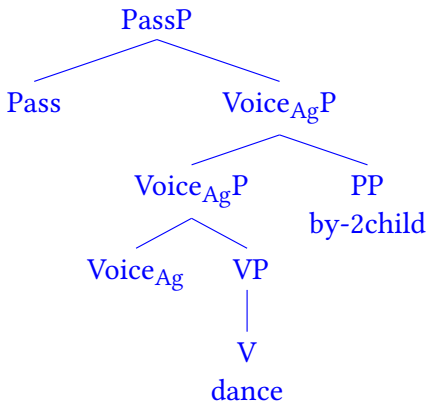
(32) ??Kw-a-nced-an-w-a ng-abantwana.
15.SBJ-DPST-help-REC-PASS-FV by-2.children
'It was helped each other by the children.'




Note that semantic type requirements are not the problem in (32): the VP is of type <e,st>, as required by Voice$_{Rec}$, and Voice$_{Rec}$P is likewise of type <e,st>, as is normally the case in passives (see e.g. (30)). On our analysis, then, the incompatibility of a passive and a reciprocal in this context is purely syntactic. Voice$_{Rec}$ requires a DP in its checking domain (i.e. within VoiceP), but neither the Theme nor the Agent DPs are projected. This derives the contrast between ditransitives and monotransitives when combining passive and reciprocal syntax. Only ditransitives have enough arguments to still be left with at least one DP after the double valency reduction caused by the co-occurrence of passive and reciprocal structure.

Finally, this analysis is compatible with the existence of impersonal passives in Ndebele, in which an unergative predicate is passivized, giving rise to a structure with no DP argument projected (33). This is allowed simply because these constructions do not involve Voice$_{Rec}$, and, by hypothesis, neither Voice$_{Ag}$ nor Pass have a D-checking requirement in Ndebele.

(33) Kw-a-gid-w-a ng-abantwana.
15.SBJ-DPST-dance-PASS-FV by-2.child
Lit. 'It was danced by the children.'




Thus, the problem in (32) is not that the language lacks passives of intransitives. The culprit is Voice$_{Rec}$, which is present in (32), but absent in (33).

One additional question, raised by a reviewer, is whether the transitivity restriction observed in reciprocals can be satisfied by low adjuncts, as those may contain a DP and are plausibly in the c-command domain of Voice$_{Rec}$. To the best of our knowledge, the answer is no. As we saw in (32), the DP contained in a *by*-phrase is unable to check [∗D∗]$_{OL}$. This is corroborated by other adjuncts, such as locative PPs. As we see in (34), adding such an adjunct to the problematic (32) does not improve the sentence.

(34) ??Kw-a-nced-an-w-a ng-abantwana e-khitsh-ini.
15.SBJ-DPST-help-REC-PASS-FV by-2.children LOC-kitchen-LOC
'It was helped each other by the children in the kitchen.'

This suggests that a DP inside a PP is not accessible to Voice$_{Rec}$. This fact is not surprising given that DPs contained in PPs are generally inaccessible to A-relations in Ndebele. For example, the language lacks pseudo-passives, i.e. movement of a DP to subject position out of a PP complement of the verb (35). This is impossible, regardless of what happens to the stranded preposition.

(35) *Ipheni i-bhal-w-a **(nga-(ye))** ng-umfana.
9.pen 9.SBJ-write-PASS-FV (with-(it.9)) by-1.boy
'The pen is written with by the boy.'

An interesting contrast is observed between DPs contained in a PP, and DPs with oblique case marking: only the latter type of oblique morphology allows the DP contained in it to check the [∗D∗] feature on $\text{Voice}_{\text{Rec}}$. We follow Halpert (2015) in distinguishing prepositions from oblique case prefixes. The latter replace the augment prefix on the noun, while prepositions attach on top of an augment. Halpert derives the complementarity of the augment and oblique case markers by proposing that they expone the same head in the nominal extended projection, namely K. Prepositions are of category P and they combine with an entire KP, explaining prepositions co-occur with an augment. Based on this diagnostic, the three oblique markers we saw above—*nga-* 'with' (35), *ng-* 'by', and the locative circumfix (34)—are prepositions. As an example of an oblique case prefix, Halpert (2015: 186) gives the prefix *ku-*, which introduces the recipient in a ditransitive construction. We find the same prefix in Ndebele (36). Passivization of this construction promotes the non-oblique theme to subject position (37). Interestingly, Pass and $\text{Voice}_{\text{Rec}}$ can co-occur here (38).

(36) Ng-a-thum-a u-bhudi wami **ku-mama**.
1SG.SBJ-DPST-send-FV 1-brother my 17-mother
'I sent my brother to mother.'

(37) U-bhudi wami w-a-thuny-w-a **ku-mama**.
1-brother my 1.SBJ-DPST-send-PASS-FV 17-mother
'My brother was sent to mother.'

(38) Kw-a-thuny-an-w-a **ku-mama** nga-bo.
15SBJ-DPST-send-REC-PASS-FV 17-mother by-them
Lit. 'There was sending of each other$_i$ to mother by them$_i$.'

The grammaticality of (38) shows that the oblique DP *ku-mama* is able to check the [∗D∗] feature on $\text{Voice}_{\text{Rec}}$. In this respect, *ku-mama* contrasts with *e-khitshi-ini* 'in the kitchen', which, as we saw in (34), cannot check the [∗D∗] feature on $\text{Voice}_{\text{Rec}}$. This contrast is expected on our account combined with Halpert's treatment of the oblique markers involved in the two sentences. The locative circumfix is a preposition, which renders its complement DP inaccessible to Voice. The prefix *ku-*, on the other hand, is an exponent of K, which means there is no PP layer embedding the DP 'mother' in (38). Assuming that KP is always part of the nominal projection, KPs are eligible targets of A-relations in the language, including [∗D∗] checking.

In this section, we proposed that $\text{Voice}_{\text{Rec}}$ is an obligatory DP licensor,

which restricts its ability to co-occur with Pass. The two categories can co-occur only when at least one DP argument is present in the structure to check the [∗D∗] feature on $\text{Voice}_{\text{Rec}}$. This is the case only with underlyingly ditransitive verbs, as demoting two arguments still leaves one DP in the syntax. In contrast, this is not possible with monotransitive verbs, where the demotion of both the Agent (through passivization) and the Theme (through reciprocalization) yields a structure with no argument DPs projected.

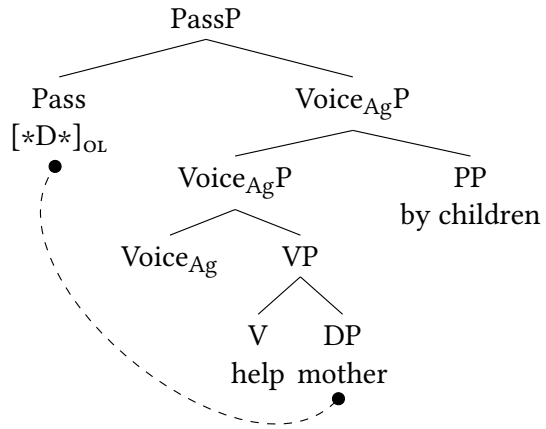
## 6 Transitivity Restriction as Obligatory DP Licensing

We have seen that reciprocal constructions in Ndebele require the presence of at least one DP. In this way, they contrast with passives, which can apply even to intransitive predicates in Ndebele, yielding structures with no DP arguments.

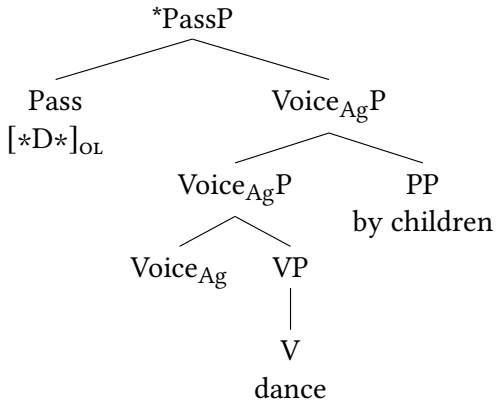
The transitivity restriction of reciprocals resembles the restriction exhibited by passives in many languages, including English. In such languages, passivization cannot apply to intransitive verbs, requiring at least one argument DP to be present in a passive structure. We suggest that this restriction can be derived by extending Obligatory Licensing, introduced here for $\text{Voice}_{\text{Rec}}$, to Pass in those languages. In languages lacking so-called impersonal passives (passives of unergatives), the Pass head bears $[*\text{D}*]_{\text{OL}}$. In the grammatical English passive in (39), this feature is checked by the Theme *mother*. A passive of an unergative, however, is impossible because there is no DP to check $[*\text{D}*]_{\text{OL}}$ (40).[11]

[11] While DPs can move out of PP complements in English (*The sofa$_i$ was sat on t$_i$.*), movement out of a *by*-phrase is not possible (*The children$_i$ were helped (mother) by t$_i$.*), suggesting that the PP in (40) is opaque to A-relations and thus cannot check $[*\text{D}*]_{\text{OL}}$.

(39) Mother was helped by children.




(40) *It was danced by children.




If both $\text{Voice}_{\text{Rec}}$ and Pass are possible bearers of $[*D*]_{OL}$ crosslinguistically, and each head can bear it independently of the other, we predict languages to vary in whether and where they show a transitivity restriction. Table 1 below shows how the locus of $[*D*]_{OL}$ determines the locus of transitivity restrictions in a language.

Whether a language has verbal reciprocals matters as well. Languages which lack them instantiate only the passive half of this typology. In this group, we have English, which shows the restriction in passives, and languages such

German, Dutch, Lithuanian, and many others, which do not (Perlmutter 1978; Perlmutter & Postal 1984; Šereikaitė 2022). This contrast is hypothesized to arise due to the presence or absence of $[*D*]_{OL}$ in Pass.

Table 1: Predicted transitivity restrictions in passives and reciprocals

| | $[*D*]_{OL}$ on Pass? | $[*D*]_{OL}$ on $Voice_{Rec}$? | Transitivity restriction: |
|---|---|---|---|
| English | ✓ | n/a | present in passives |
| German | ✗ | n/a | absent in passives |
| Ndebele | ✗ | ✓ | present in reciprocals but not passives |
| Lg X | ✓ | ✓ | present in both reciprocals and passives |
| Lg Y | ✓ | ✗ | present in passives but not reciprocals |
| Lg Z | ✗ | ✗ | absent in both reciprocals and passives |

In languages that do have verbal reciprocals in addition to passives, the two heads vary independently, yielding four types, shown in Table 1. Ndebele instantiates a case where only $Voice_{Rec}$ has $[*D*]_{OL}$. This implies a transitivity restriction in reciprocals (ruling out (32)), but not in passives (ruling in impersonal passives (33)). If both Pass and $Voice_{Rec}$ bear $[*D*]_{OL}$ (Lg X), their co-occurrence should be restricted to ditransitives, as in Ndebele, while passives of unergatives should also be illicit, unlike in Ndebele. If only Pass bears this feature (Lg Y), passives should require a DP (no impersonal passives), but reciprocals should not. This type, however, may be impossible to diagnose, because the construction needed to test for a transitivity restriction on reciprocals involves an impersonal passive, which is independently ruled out in this type of language by $[*D*]_{OL}$ in Pass. Finally, if neither head bears the feature, neither construction should show a transitivity restriction (Lg Z), allowing both impersonal passives and passive reciprocals of monotransitives such as (32). We leave these typological predictions for future work.

## 7 Conclusion

This paper argued that Ndebele reciprocals are verbal rather than pronominal: the reciprocal meaning is expressed by the verbal suffix *-an*, which patterns morphologically and syntactically like other verbal extensions, and we find no evidence for an overt or covert reciprocal DP. Like verbal reciprocals in other lan-

guages, Ndebele reciprocals are valency-reducing, display restricted patterns of reciprocity (necessarily involving the Agent and the argument immediately below it), and allow only a sloppy reading under ellipsis. These facts align closely with Bruening (2004; 2006)'s analysis, which we adopted here.

Building on this foundation, we proposed that $\text{Voice}_{\text{Rec}}$ in Ndebele bears an obligatory DP-licensing feature, $[*\text{D}*]_{\text{OL}}$. This property accounts for the distribution of reciprocals and for their restricted co-occurrence with passives: the two extensions can combine only in ditransitives, where a DP can satisfy the licensing requirement. In monotransitives, passivization removes the external argument and reciprocalization removes the internal argument, leaving no DP to check $[*\text{D}*]_{\text{OL}}$, resulting in ungrammaticality. This analysis allows us to draw a parallel between reciprocals in Ndebele and passives in languages such as English – both constructions require at least one DP to be present in the structure. We suggested that a unified account of both cases of transitivity restriction is via obligatory DP licensing by the relevant functional head.

## Abbreviations

Additional abbreviations: DPST - distant past, DSJ - disjoint, FV - final vowel, RPST - recent past.

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