According to the standard binding theory of Chomsky (1981), reflexives and reciprocals can be collapsed under the umbrella term anaphor. This predicts a uniformity in form and behaviour between these two phenomena. Data from Shona (Narrow Bantu) is presented showing that while the reflexive of that language has the syntactic and semantic character of a bound variable, the reciprocal works as a detransitivising operation on verbal predicates. Through this, a description of the syntactic and semantic forms of both the reflexive and the reciprocal is presented, including a model lambda calculus.

1 Introduction

In the first formulation of the standard binding theory (Chomsky, 1981), reflexive pronouns and reciprocal expressions are grouped together under the umbrella term anaphor. This grouping is based on English data such as that seen in (1) and (2):

(1) a. I showed Jack, himself, in the mirror.
    b. *I showed himself, Jack, in the mirror.

(2) a. I showed [Janet and Chrissy], each other, in the mirror.
    b. *I showed each other, [Janet and Chrissy], in the mirror.

As shown, both reflexives and reciprocals in English have the same felicity conditions: they require a c-commanding antecedent within their binding domain. In the ditransitive structures of (1) and (2), asymmetric c-command is well-documented, in that the indirect object c-commands the direct object, but not vice-versa. While there have been various refinements to the binding theory in the years since, this conflation of reflexives and reciprocals under the term anaphor has gone largely unchallenged.

Even in languages where there are no reflexive or reciprocal DPs, there is an expectation that these two phenomena will be expressed through similar morphosyntactic means. In the case of Halkomelem Salish, this is through a detransitivising affix on the verb (Gerds, 2000):

(3) a. k"es “burn”
    b. k"eseθət “burn self”
    c. k"estal “burn each other”

As shown, both the reflexive and the reciprocal in this language are derived through affixation to a verb root, yielding a form which is syntactically intransitive, but semantically transitive. These are markedly different from English, but the language itself remains internally consistent in its treatment of reflexives and reciprocals, so the grouping of these two phenomena still holds.

In this paper, I present data from Shona, a Bantu language of Zimbabwe, which shows that reflexives and reciprocals do not in fact form a universal natural class. The reflexive in Shona has the distribution of a DP, filling an argument position, whereas the reciprocal is a detransitiviser, eliminating an argument position from the syntax.

This paper will be structured as follows: Section 2 will present the basic data on the reflexive and...
reciprocal forms of Shona, along with a very basic description of the morphosyntax of the language. Section 3 will detail the arguments proving that the reflexive is not a detransitiviser, and the reciprocal is not an anaphor. Finally, in Section 4, a model lambda calculus for both the reflexive and reciprocal is presented. A brief conclusion and discussion of unanswered questions is presented in Section 5.

2 Reflexives, reciprocals, and verbal morphology

Reflexives in Shona are represented using the morpheme zvi, affixed immediately to the left of the verb root:

   SUBJ.1-REM,PST-REFL-burn-FV forest
   ‘Mufaro burned himself.’

   SUBJ.1ST.SG-REM,PST-REFL-cook-FV
   ‘I cooked myself.’

c. Ta-ka-zvi-nzw-a.
   SUBJ.1ST.PL-REM,PST-REFL-hear-FV
   ‘We heard ourselves.’

One striking feature of this abridged paradigm is that the reflexive here is invariable across φ-features. In the literature, the status of this morpheme is variable. In essence, the debate is over whether this morpheme is a detransitivising affix, or an object marker. Because there is no apparent inflection for φ-features of the antecedent, and because the language has a rich set of valence-altering verbal affixes, the temptation to classify zvi among this set of affixes is clear. Conversely, this position immediately to the left of the verb root is canonically the position for object markers in the language. To fully understand the implications of placing zvi among the set of object markers, the morphosyntactic character of these object markers must first be described.

Questions surrounding the nature of the object markers are not merely a puzzle for Shona; the issue remains a contentious one across the Bantu languages. In essence, the issue again breaks down into two camps: on the one side there are those who view these markers as purely an agreement phenomenon, and on the other are those who treat the object markers as some sort of clitic pronoun. As with the matter of the reflexive marker, there is no clear unanimous claim made in the Shona literature on this matter, though basic functions of the object markers are clear and uncontroversial. The following near-minimal pair from Fortune (1973) illustrates one function of the object markers in Shona:

(5) a. Ndi-no-tem-a huni.
   SUBJ.1ST-HAB-chop-FV firewood.NC10
   ‘I chop firewood.’

b. Ndi-no-dzi-tem-a huni.
   SUBJ.1ST-HAB-OBJ.10-chop-FV firewood.NC10
   ‘I chop firewood.’

As indicated, the object marker is not glossed as contributing any new meaning to the sentence. It does however show noun class agreement with huni. In the discussion of this example, Fortune describes the contribution of the object marker as being one of emphasis. In my own fieldwork, this claim of emphasis is often repeated, though also along with definiteness, which has been cited as a function of object markers in Swahili, along with topicality (Creissels, 2001). Similarly, Kunene (1975) notes for Zulu that object markers in that language are licensed only when the object being marked has been mentioned in previous discourse. Clearly, there is some connection between object marking and information structure.

The arguments for treating the object marker as a sort of pronominal element comes from data such as (6):
The domain to the right of the verb root in Shona (and Bantu languages generally) is reserved for verbal extensions which generally increase or decrease the valence of a given predicate:

(6) a. Shingi a-ka-bik-a mbudzi.
    Shingi SUBJ.1-REM.PST-cook-FV goat.CL9
    ‘Shingi cooked the goat.’

b. Shingi a-ka-yi-bik-a.
    Shingi SUBJ.1-REM.PST-OBJ.9-cook-FV
    ‘Shingi cooked it.’

Here, the same agreement for noun class is shown, but the object marker can completely replace the object DP. Because the object marker replaces the object DP, it has been historically treated as an object pronoun. This is not necessarily at odds with the data in (5), where the object marker and the DP object co-occur, as elitic-doubling is a well-documented phenomenon in European languages. However, agreement with a covert object marker is pervasive in pro-drop languages where verbal morphology is argued to show agreement with a φ-feature rich, but phonologically null pro. There is no reason this same analysis cannot be applied to (6b), treating the object marker yi as reflecting agreement with a class 9 pro. This is the line of analysis I will be assuming in this paper, treating object markers as an agreement phenomenon rather than pronominal elements.

While details surrounding the optionality of this agreement remain to be established, some preliminary assumptions as to the position and syntactic character of the object markers can be made. Taking seriously the Mirror Principle of Baker (1985), the position of the object marker in the morphology should give a clue as to its position in the syntactic clause structure. In this case, the object marker appears between the verb root and the tense marking. Given this position, the most reasonable placement for the object marker would be as a v head. However, Shona also has a voice morpheme which is a more likely candidate for the v head. Given that the passive can co-occur with object markers (Bliss and Storoshenko, 2008), object markers must occupy a distinct position in the syntax from the passive morpheme, making it impossible to place the object markers at v. One solution to this issue in existing literature is to posit an Agr phrase below the tense projection, providing a position for the object markers. It is this analysis which is adopted here, with a caveat again that more needs to be done on describing the exact nature of this phrase. Given its optional nature, object marking cannot be connected to any mechanism of obligatory movement (overt or covert) for the purpose of case checking. That being said, there is as yet no evidence to rule out the possibility that there is covert movement into a local checking relation. By whatever mechanism (Spec-Head Agreement after covert movement or a simpler Agree relation holding between the Agr head and a c-commanded DP), there is agreement for φ-features between this head and an argument DP. Where the object marker appears pronominal, this agreement could be with a φ-feature-rich pro. Coming back to the matter of zvi, the question is whether zvi is a morpheme which works on the valence of its predicate, or it is a marker of agreement along the lines of an object marker. Before answering this question, I will turn to a description of the Shona reciprocal.

Reciprocity in Shona is expressed using the morpheme an which, unlike the reflexive, appears to the right of the verb root:

(7) a. Ta-ka-nzw-an-a.
    SUBJ.1ST.PL-REM.PST-hear-RECIPE-FV
    ‘We heard each other.’

    dog.CL10 SUBJ.10-REM.PST-see-RECIPE-FV
    ‘The dogs saw each other.’

    Calisto ASSOC Shingi SUBJ.2-REM.PST-see-RECIPE-FV
    ‘Calisto and Shingi saw each other.’

Like the reflexive, there is no apparent alteration in the form of the reciprocal based on φ-features. The most striking distinction between the reflexive and the reciprocal is, of course, the positioning of the morphemes. The domain to the right of the verb root in Shona (and Bantu languages generally) is reserved for verbal extensions which generally increase or decrease the valence of a given predicate:
regardless of the information structure facts, the very fact that this construction is even work in (9), as similar constructions in Zulu (Kunene, 1975) are licensed in contrastive focus contexts. Regardless of the information structure facts, the very fact that this construction is even possible in Shona is sufficient for the argument that zvi is not a detransitiviser; if it were, then a direct object should be m:

(8) a. Shingi a-ka-bik-ir-a Mufaro mbudzi.
Shingi SUBJ.1-REM.PST-cook-APPL-FV Mufaro goat.9
‘Shingi cooked the goat for Mufaro.’

b. Shingi a-ka-pis-is-a Mufaro mbudzi.
Shingi SUBJ.1-REM.PST-burn-CAUS-FV Mufaro goat.9
‘Shingi caused Mufaro to burn the goat.’

c. Mu-riyo wa-ka-pis-w-a (na Shingi).
CL3-vegetables SUBJ.1-REM.PST-burn-PASS-FV by Shingi
‘Vegetables were burnt (by Shingi).’

The examples in (8) illustrate, respectively, the applicative, causative, and passive morphemes of Shona. The first two of these add an argument to the predicate, while the last one has the effect of demoting an argument. In this respect, an seems to be a natural member of the set of verbal extensions: it reduces the valence of the predicate by one, and it appears in the same morphosyntactic domain as other similar morphemes. Unlike zvi, where there are discrepancies in the literature, the treatment of an is much more uniform: it is standardly analysed as a valence-changing verbal extension.

As such, the question of maintaining a uniformity of analysis for the reflexive and reciprocal in Shona would seem to hinge upon ignoring the the fact that zvi is placed in the position of an object marker, and instead treating it as a verbal extension. This position is not unheard of in the wider Bantu literature, as Creissels (2002) makes a similar argument for a cognate reflexive in Tswana. Certainly, the data does bear some superficial similarity to what was seen in Halkomelem Salish, where both reflexives and reciprocals were expressed through a verbal affix which is insensitive to the φ-features of the “missing” argument. The evaluation of this hypothesis in the face of Shona data is presented in the next section.

3 Arguing the Status of zvi and an

A number of arguments can be brought to bear on the question of whether or not zvi is a valence-changing operator; this section will outline two of these, drawn from Storoshenko (in press). Firstly, there is the question of whether or not the object can still be expressed in the presence of the reflexive. As shown earlier, object DPs can still appear in the same sentence as an agreeing object marker. If zvi were an object marker, it should be expected that this duplication is still possible. Conversely, if zvi were a morpheme which rendered a predicate intransitive, such duplication should be impossible. With reflexives, however, such examples suffer from the separate issue of seeming redundant. Given that zvi would already be repeating the subject, having the full object also present would not only represent an additional repetition of the same referent, but it would also potentially be a Condition C violation, as the subject DP would c-command the object. Problems aside, such examples do not appear to be categorically ruled out:

(9) ? Shingi a-ka-zvi-bik-a Shingi.
Shingi SUBJ.1-REM.PST-REFL-cook-FV Shingi
‘Shingi cooked herself.’

As shown in (9), the sentence where Shingi appears as both the subject and object co-occurring with zvi is judged to be marked, but not categorically ungrammatical. In terms of mitigating the potential Condition C violation, one can again look to information structure. Even a well-studied language such as English is rife with apparent Condition C violations:

(10) John, hit John. (Not Tom, Dick, or Harry)

This focus construction mitigates the Condition C problem, and it is likely that something similar is at work in (9), as similar constructions in Zulu (Kunene, 1975) are licensed in contrastive focus contexts.
completely unacceptable in conjunction with zvi.

Another argument against the analysis of zvi as a de transitiviser is that it does not have the apparent universal characteristics of such morphemes found in other languages, described by Lidz (1996). One such characteristic is the use of what he calls “verbal reflexives”, essentially de transitivising morphemes, in de causative constructions where only a theme of a normally transitive verb is expressed. This can be illustrated using Lidz’ examples from Imbabura Quechua and Kannada:

(11) a. Imbabura Quechua
   pungu-kuna-ka paska-ri-rka.
   door-PL-TOP open-REFL-PST.3
   ‘The doors opened.’

   b. Kannada
   baagil-u mučč-i-koND-itu.
   door-NOM close-PP-REFL.PST-3.SM
   ‘The door closed.’

In Shona, the reflexive marker zvi does not emerge in similar constructions:

   CL.3-door SUBJ.3-REM.PST-close-FV
   ‘The door closed.’

   b. Whindo ra-ka-puts-ik-a.
   window.5 SUBJ.5-REM.PST-break-STAT-FV
   ‘The window broke.’

In the first sentence, there is no marking on the verb indicating that only one of the arguments is present; the equivalent transitive verb has exactly the same form. In the second case, the stative morpheme ik is added to the verb stem. Thus, while Shona appears to have multiple means of expressing this de causative function, the reflexive zvi does not appear among them. Testing these same constructions explicitly using the reflexive resulted in ungrammatical sentences. A second observation made by Lidz is that this kind of morphological reflexivity universally shows up on a transitive predicate where the object is possessed by the subject:

(13) a. Fula
   O hett-ike fedenndu.
   he cut-REFL.PERF finger
   ‘He cut his finger.’

   b. Kannada
   hari-yu tann-a angi-yannu hari-du-kolNDA.
   Hari-NOM self-GEN shirt-ACC tear-PP-REFL.PST-3.SM
   ‘Hari tore his shirt.’

Again, the evidence is that zvi does not have this function:

(14) a. Shingi a-ka-won-a ruoko wa Mufaro.
   Shingi SUBJ.1-REM.PST-see-FV hand POSS Mufaro
   ‘Shingi saw Mufaro’s hand.’

   b. Mufaro a-ka-won-a ruoko wa-ke.
   Mufaro SUBJ.1-REM.PST-see-FV hand POSS-he
   ‘Mufaro saw his hand.’

   c. *Mufaro a-ka-zvi-won-a ruoko wa-ke.
   Mufaro SUBJ.1-REM.PST-REFL-see-FV hand POSS-he
   ‘Mufaro saw his hand.’
The first sentence in (14) shows the basic structure for a possessed object. When the object is possessed by the subject, as in the second sentence, the reflexive does not emerge, and is shown to be ungrammatical in the third sentence. Even without the redundant indication of the possessor in the object noun phrase, sentences attempting to use the reflexive in this way are ungrammatical:

\[(15) \ast \text{nda-ka-zvi-won-a ruoko.} \]

\[\text{SUBJ.1ST.SG-REM.PST-REFL-see-FV hand} \]

‘I saw myself the hand.’

As shown in (15), even a simple first person sentence is not permissible in this form. Based upon these two tests, it appears that zvi does not conform to two universals for verbal reflexives put forth by Lidz. Taken in combination with the observation that objects appear to remain acceptable in reflexive sentences in Shona, it seems safe to conclude that zvi is not a detransitivizing morpheme. The logical conclusion then is that zvi is indeed a member of the set of object markers.

Turning now to the reciprocal an, a different result is obtained when a direct object is present along with the reciprocal morpheme:

\[(16) \ast \text{Ta-ka-won-an-a va-rume.} \]

\[\text{SUBJ.1ST.SG-REM.PST-see-RECIP-FV CL2-man} \]

Lit: “They saw each other the men”

Unlike the reflexive case, the judgement here is categorical; the object is not possible. However, Brauner (1995) notes the following example in conjunction with the reciprocal:

\[(17) \text{Zimbabwe i-no-ganhur-an-a ne Zambia.} \]

Zimbabwe \text{SUBJ.9-HAB-border-RECIP-FV with Zambia} ‘Zimbabwe borders on Zambia.’

Here, the reciprocal apparently has a singular subject, indicated by the class 9 agreement on the verb, and Zambia appears post verbally as what Brauner describes as possible object which has been conjoined, making it appear that there is some mechanism for the retention of the object, despite the observation in (16). However, this appears to be a form of split conjunction, as demonstrated by the following sentence pair, which are reported to be synonymous:

\[(18) \text{a. Imbwa ne mbudzi dza-ka-won-an-a.} \]

\[\text{dog-CL9 and goat-CL9 SUBJ.10-REM.PST-see-RECIP-FV} \]

‘The dog and the goat saw each other.’

\[\text{b. Imbwa ya-ka-won-an-a ne mbudzi.} \]

\[\text{dog.CL9 SUBJ.9-REM.PST-see-RECIP-FV and goat.CL9} \]

‘The dog and the goat saw each other.’

Here, it appears that the conjunction of imbwa and mbudzi is splittable, with the conjunction and second conjunct able to be postposed to the end of the sentence. What is more intriguing about this construction is that the subject agreement changes depending on whether the whole conjunction or just the first conjunct appears in the canonical subject position. Where the whole conjoined DP is present, the agreement is a class 10 plural, but when the conjoined DP has been split, the agreement is with the class 9 singular. Clearly, the postposed element in (17) and (18) is not a distinct object, but rather a displaced component of the subject DP. The exact nature of this displacement mechanism is not yet known, and will require further study, but that study is beyond the scope of the present paper. Important here is the fact that sentences such as (17) and (18) cannot be used to argue that a reciprocal sentence with an is somehow transitive.

Thus, both zvi and an behave as expected based upon their position: zvi is a pre-verbal object marker, though a unique one, and an is a post-verbal valence operator, acting as a detransitivising suffix. This then settles the question posed at the outset of this paper: Shona provides evidence for a language in
which reflexives and reciprocals do not form a syntactic natural class. In the next section of the paper, I go on to provide a more detailed semantic account of the function of these two morphemes.

4 The syntactic and semantic character of $zvi$ and $an$

As determined above, $zvi$ is a member of the set of object markers in Shona. As such, it is a reflection of an agreement between the Agr$_o$ head and some argument DP. In this case, $zvi$ must reflect agreement with some reflexive-like element in an internal argument position, and Agr$_o$. The analysis presented here will be that the element in the internal argument position of a reflexive sentence is not a pro, but rather a phonologically null bound variable. $Zvi$, then is the manifestation of agreement between the Agr$_o$ head and this bound variable.

However, the agreement observed here is not strictly between the Agro head and a bound variable, as demonstrated by (9), where $zvi$ occurs in conjunction with a full DP argument. Rather, what $zvi$ appears to indicate is the presence of a bound internal argument, be it either overt or covert. Crucial here is the observation that when the class one object marker $mu$ is used, it is obligatorily free, and cannot be used to refer to an object bound by a subject:

$latex (19) \text{ i-ye$_i$ a-ka-mu-bik-a Shingi$_{e/f}$ .} \text{ PRONOUN-3RD.SG SUBJ.1-REM.PST-OBJ.1-cook-FV Shingi} \text{ ‘She cooked Shingi.} \text{ ‘She cooked Shingi.} \text{ ‘She cooked Shingi.} \text{ ‘She cooked Shingi.}

Here, where a subject pronoun is in a position to bind the direct object, that binding is judged ungrammatical with the class 1 object marker, where the object marker agrees with a potentially bound object.

The mechanism for the variable binding is quite simple. It is independently argued in Bliss and Storoshenko (2008) that all subjects in Shona undergo an ‘A’ movement to the left clausal periphery. This movement creates the necessary operator-variable structure to bind a variable in the argument position, and final evaluation of the semantic form can be carried out along the lines of the Binder Index Evaluation Rule proposed in Büring (2005):

$latex (20) \boxed{\text{Shingi akazvibika] = Shingi, } \lambda x \lambda y .(y \text{ cooked } x) (x_i) (t_i) = \text{ Shingi } (t_i, \text{ cooked } x_i) = \text{ Shingi } \lambda x (x \text{ cooked } x) = \text{ Shingi cooked Shingi}}

In this manner, reflexive semantic forms are calculated, with $zvi$ being an indicator of the presence of a bound object, but not itself carrying any semantic meaning.

Turning to the reciprocal, a substantially different form will need to be proposed. Because $an$ operates on the valence of the predicate to which it is attached, its semantic form must be a function which takes a transitive predicate as input and outputs a predicate in which the predicate’s valence has been reduced by one place. The following form is proposed, again adapted from Büring (2005):

$latex (21) \boxed{\text{[an] = } \lambda P <e<e,t>. \lambda X. [\forall x \subseteq X [\forall y \subseteq X \wedge x \neq y [P(x)(y)]]]}$

This function takes a transitive predicate of type $<e<e,t>$, returning an intransitive predicate, taking a plural set as its argument (in the sense of the join-semilattice structure of Link (1983)). Subsets of the plural argument are mapped to the two argument positions of the original transitive predicate, with the caveat that equivalent subsets cannot appear in both positions. This function derives the observation that direct objects are incompatible with the reciprocal; given that $an$ requires a transitive predicate as input, this could only be the verb root itself, before combination with any potential internal arguments, as a complement of the verb root would combine semantically with the verb root before $an$, which is an operator outside of VP.

However, $an$ can interact with other verbal extensions in Shona. One of these is the applicative $ir$. As described in Bliss (in press), the reciprocal occupies an Appl head, which dominates the VP, and has a
specifier where the applied object (AppIO) appears. This applied object can have a number of different functions, as described by Bliss, but here I am concerned only with cases where the AppIO is a beneficiary, the default case. Again, hearkening back to the Mirror Principle, we can use morpheme order to determine the order in which the operators apply to a predicate:

(22) a. Calisto na Shingi va-ka-bik-ir-an-a ma-nhanga.
   Calisto and Shingi SUBJ.2-REM.PST-cook-APPL-RECIP-FV CL6-pumpkin
   “Calisto and Shingi cooked pumpkin for each other.”


As shown in (22), there is a fixed order for the combination of the reciprocal and the applicative in Shona. The applicative must precede the reciprocal, meaning that the applicative must compose with the predicate before the reciprocal. A very tentative semantic form for \( ir \) can be constructed, simply an operator which adds a beneficiary argument to a predicate:

\[
[ir] = \lambda P \lambda x. (P \text{ for } x)
\]

Given that the order of the combination of morphemes can be determined from the morphology, the calculation of the semantics is a simple matter:

\[
[\text{akabikirana manhanga}] = \lambda x \lambda y. (y \text{ cooked } x) (\text{pumpkin})
   = \lambda y. (y \text{ cooked pumpkin})
   = \lambda x \lambda y. (y \text{ cooked pumpkin for } x)
   = \lambda X. [\forall x \subseteq X \forall y \subseteq X \land x \neq y \forall y \text{ cooked pumpkin for } x]]
\]

As shown, the first combination is of the verb root with the internal argument. Then, the applicative is added, yielding a transitive predicate which can serve as the input for the reciprocal. This fixed order of operations predicts that where a reciprocal is combined with the applicative in this way, the reading can only be that the reciprocal relation holds between the subject and the AppIO, and not with the theme argument. This prediction is borne out in the judgement that sentences with the structure of (22a) are unambiguous, with the only reading being the one predicted: where the reciprocity is between the subject and AppIO. There is nothing in the present semantic formulation which would rule out a derivation where the reciprocal is applied to the a transitive predicate lacking an internal argument, and that predicate being subsequently modified with the applicative. In theory, this should derive the reading where reciprocity holds between the subject and internal argument, for the benefit of an AppIO which could be merged in the normal [Spec, AppIO] position. However, as shown in (22b), this derivation, which would be reflected by the different morpheme order is blocked by what must be a morphosyntactic rather than a semantic rule.

5 Conclusion

This paper began with the question of whether or not reflexives and reciprocals universally form a natural class, as expected under Condition A of the binding theory. It has been argued that Shona provides evidence that reflexives and reciprocals need not form a natural class, as the reflexives in this language can be captured under a binding analysis between DPs, while the reciprocal is a detransitivising operator on a verbal predicate. In developing this argument, a syntactic and semantic analysis of both the reflexive and reciprocal in Shona has been presented. However, in both cases, there are related issues, outside the scope of this paper, which remain unexplored. While it seems clear that the reflexive zvi is an object marker in Shona, more work needs to be done on determining the exact character of these object markers. In terms of the reciprocals, the examination of cases where the purported object of a reciprocal sentence is present has uncovered a structure in which elements of a conjoined noun phrase can apparently be discontinuous. Again, these issues are held over for future research.
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Dennis Ryan Storoshenko
dstorosh@sfu.ca