

Anaphoric Binding in Colloquial Sinhala

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1. Introduction

In this paper, I examine the properties of reflexive binding in Sinhala¹ (Indo-Aryan: Sri Lanka), in particular those related to the reflexive *taman*, the verbal reflexive, and the pronoun *eyaa*. Sinhala data illustrates that reflexive pronouns that are normally required to be coreferential with an argument in the local domain may be disjoint, and personal pronouns may be bound to an argument in the local domain that they are normally required to be disjoint from. Anaphoric binding relations are conditioned by a number of different factors, one of which is the verb, which may be marked for reflexivisation and may determine the binding domain of reflexives and pronouns which occur within its nucleus. The data also provides evidence that a single anaphor can have more than one binding domain. Therefore it is not possible to define a particular anaphor as ‘long distance’ or ‘clause-bound’. Further the relation between argument structure and reflexive binding is evident in the interaction between the verbal reflexive, the personal and reflexive pronouns.

In this paper, I do not intend to provide a formal description based on Functional Uncertainty, however, in section 3 I will discuss some problems associated with anaphoric binding equations based on Functional Uncertainty (Dalrymple 1993), with respect to Sinhala data. First, I will survey binding relations of the reflexive pronoun in simple clauses and multi-clause constructions (i.e those with finite or non-finite subordinate clauses or infinitive clauses).

2. Anaphoric Binding Patterns

There are two ways to express the reflexive in Sinhala: one involves the use of the reflexive pronoun *taman* ‘self’ (or the reciprocal *tamətaman* ‘each other’, the reduplicated form of *taman*) and, the other involves adding the verb *gannəwa* ‘take’ to the perfect participle form of the verb. They both can occur individually or together in the same clause, in which case the *gannəwa* verb conditions the binding domain of *taman*.

The Sinhala has a pronominal system consisting of a large number of pronouns with distinct forms for humans, animals and inanimate objects. Among them, the most commonly used ones include: *mamə* ‘I’, *api* ‘we’, *eyaa* ‘he/she’, *eka* ‘it’ (non-human/derogatory) and *ekə* ‘it’ (inanimate). In this paper, I will restrict the discussion to the interaction between the reflexive verb and *taman* and the reflexive verb and the pronoun *eyaa*.

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¹ All the conclusions reached in this paper are based on colloquial Sinhala and the assumptions made here with regard to reflexives of colloquial Sinhala may, therefore, be quite different from that of literary Sinhala. This study represents judgements of 16 native Sinhala speakers who were asked to comment on coreference relations of arguments in sentences. While not all the sentences were tested for judgments on coreferentiality with all 16 informants, most of the sentences represent judgements of about 10-12 informants. All the data in this paper is from this study, unless otherwise stated.

- The following abbreviations are used:

ACC: accusative case; ANIM: animate; DAT: dative case; INAN: inanimate; INDEF: indefinite; INF: infinitive; INST: instrumental/ablative case; GEN: genitive/locative; NEG: negative; NOM: nominative case; PL: plural; PP: perfect participle; PRES: present; PST: past; SG: singular

Animate and inanimate nouns, and inanimate pronouns are unmarked for both nominative and accusative case, while animate pronouns and proper names are marked with *-wə* for accusative.

2.1 Reflexive *taman*

Taman ‘self’ is the reflexive pronoun in Sinhala (Gair et al 1989, Gunasekara 1891, Inman 1994).^{2,3} *Taman* inflects for case, just like any other noun/pronoun (see Figure 1).

Figure 1: Case Inflections for Nouns/Pronouns

Case	Reflexive	Reciprocal	1SG ‘I’	‘child’
Nominative	<i>taman-∅</i>	<i>tamətaman-∅</i>	<i>mamə-∅/maŋ-∅</i>	<i>laməya-∅</i>
Accusative	<i>taman-wə</i>	<i>tamətaman-wə</i>	<i>maawə</i>	<i>laməya-wə</i>
Dative	<i>taman-tə</i>	<i>tamətaman-tə</i>	<i>matə</i>	<i>laməya-tə</i>
Instru./Ablative	<i>taman-gen</i>	<i>tamətaman-gen</i>	<i>magen</i>	<i>laməya-gen</i>
Genitive	<i>taman-ge</i>	<i>tamətaman-ge</i>	<i>mage</i>	<i>lamayə-ge</i>

Reflexive pronouns can be used as arguments (for examples see section 2.2) and possessors: see (1). *Taman* is inherently 3rd person but unspecified for number and gender. Therefore it cannot be coreferential with the first and second person pronouns (see (2.a)). In (2.b), *taman* is not acceptable, since the antecedent is a first person pronoun.

- (1) *Nimal₁ Siri-wə₂ taman-ge_{1,*2} gedərə-di dækka.*
 Nimal Siri-ACC self-GEN house-at see.PST
 ‘Nimal₁ saw Siri₂ at his_{1,*2} house.’ (Inman 1994:51)

- (2) a. *laməya₁/minissu₂/ohu₃/əya₄/*api₅ taman-ge_{1,2,3,4,*5} --*
 child/man.PL/3SG.MASC/3SG.FEM/*1PL self-GEN --
 -- *wədak balaa_gatta, nam hondai.*
 -- work.INDEF look.PP_take.PST, if good

‘It is better if the child₁/men₂/he₃/she₄/*we₅ minded self’s_{1,2,3,4,*5} business.’

- b. *api ape/*taman-ge wədak balaa_gatta, nam hondai.*
 1PL 1PL.GEN/*self-GEN work.INDEF look.PP_take.PST, if good
 ‘It is better if we minded our own/*self’s business.’

2.2 Reflexive Verb *gannəwa*

When the verb *gannəwa* ‘take’ is suffixed to the perfect participle form (PP) of a verb the result is a sentence with a reflexive meaning (Gair 1970:123, Gunasekara 1891:180, Reynolds 1980:185). In other words, the perfect participle of the verb suffixed with *gannəwa* has grammaticalised as a

² According to Gunasekara (1891:173), *taman* is plural and singular form is *tama*. However, he points out that regardless of its singular inflection, *tama* is used as plural and vice versa. *Tamun*, as given in Gair et al (1989:98), is assumed to be in free variation with *taman*, and the both forms are same in meaning and their distribution.

³ It is worth noting that in spoken Sinhala, *taman* is not as frequently used as it is in literary Sinhala. This example from ‘Lankadiipa’ newspaper illustrates the occurrence of *taman* in literary Sinhala:

mee pilibandəwə puwathpath dənwiim paləkiriimətə tamaa katəyutu_kərənə bawə D. Kīya.
 this about newspaper advertisement.PL publish-INF self work-on.PRE that D. say.PST
 ‘D said that self is working on advertising on newspapers about this (matter).’

reflexive auxiliary (Herring 1989:179). Henceforth, these verbs will be referred to as ‘reflexive verbs’.⁴ This type of reflexive is very common both in literary and colloquial Sinhala: see sentence (3-4).

(3) *amma kaemak hadaa_gannəwa.*
mother meal.INDEF make.PP_take.PRE
‘The mother is making herself a meal.’

(4) *lamayi gaha_gatta.*
children strike.PP_take.PST
‘Children fought/ Children hit one another.’

Reflexive *taman* may appear as an argument or in a non-argument position in a clause subcategorised by a reflexive verb. Sentence (5), which is similar to (3-4), contains a reflexive verb and the reflexive *taman*, which is redundant and not obligatory as can be seen in (3-4). Even without an overt reflexive pronoun, the sentence has the same meaning as it does when *taman* is present. In fact, sentences without an overt reflexive pronoun are preferred over those with its presence in casual conversations. In (5) the reflexive verb can not have another object which is not coreferential with the antecedent. It is because of this that the meaning ‘*Siri hurt Gune*’ is not available in (5).

(5) *Sriya (taman-wə)/*Gune-wə tuwaalə_karə_gatta.*
Sriya (self-ACC)/*Gune-ACC injury_make.PP_take.PST
‘Sriya hurt herself/*Gune.’

Further, note that *taman* is highly disfavoured in argument positions of simple sentences which do not have reflexive verbs. Compare the following sentence with (5):

(6) *Sriya Gune-wə/*taman-wə tuwaalə_kəla.*
Sriya Gune-ACC/*self-ACC injury_make.PST
‘Sriya hurt Gune/*herself.’

Sentence (6) does not have *gannəwa* affixed to its verb and therefore does not have a reflexive sense. Note that the verb being non-reflexive, the sentence is not acceptable with the reflexive pronoun *taman-wə*.

What seems to happen is that the reflexive verb enforces the coreferential effect between its subject and an NP which occur within its nucleus. Therefore there must be an NP that can be coreferential with the subject. On the other hand, with non-reflexive verbs, *taman* not being coindexed with the subject, becomes highly disfavoured or unacceptable in simple sentences like (6). However, as in sentence (1) *taman* as a possessor is acceptable in simple sentences without a reflexive verb. I will

⁴ It is also to be noted that combinations of *gannəwa* with verbs/verbal bases have other meanings and functions. This is an example from Paolillo (1989) quoted in Herring (1989:179) for compound continuative construction:

Meyaage bandinə wayəwə den pahu wee_genə_enəwa.
his/her marry-AdjP age now past become_take.PP_come.PRE
‘Her marrying age is now passing by.’

As Reynolds (1980:185) points out, some sentences with *gannəwa* can have the meaning of “managed to” as in the following sentence.

ohu dumriyətət pənə_gatta.
3SG train-DAT jump.PP_take.PST
‘He managed to jump onto the train’.

discuss this issue in detail in section 2.5, and will show that *taman* which appears as an argument of a non-reflexive verb cannot bind with its subject and is required to be bound by a long distance antecedent. It is because of this reason that *taman-wə* is not acceptable in (6). In the following section, I will discuss the long distance binding and the interaction between *taman* and the reflexive verb in multi-clause constructions.

2.3 Long Distance Binding

The binding domain of the reflexive pronoun depends on: a) whether the verb is reflexive, b) the type of clause where the reflexive pronoun appears, ie. a simple or multi-clause construction, and c) the person of the potential antecedent.

When *taman* occurs in a sentence with a reflexive verb, the reflexive is always bound in the Minimal Complete Nucleus (MCN), the domain containing the reflexive, the antecedent and the reflexive verb (for instance see (7.a) and (8.a)). However, when the reflexive *taman* appears in a subordinate clause containing a non-reflexive verb, it is coreferential with the highest argument of the matrix clause which may or may not contain a reflexive verb: see (7.b) and (8.b).

(7) a. *Piyal₁ kiwwa [Sriya₂ taman-wə*_{1,2} tuwaalə_kəṛə_gatta] kiyəla.*
 Piyal say.PST [Sriya self-ACC injury_make.PP_take.PST] that
 ‘Piyal₁ said that Sriya₂ hurt herself₂/him*_{1,*3}.’

b. *Piyal₁ kiwwa [Sriya₂ taman-wə_{1,*2} tuwaalə_kəṛə] kiyəla.*
 Piyal say.PST [Sriya self-ACC injury_make.PST] that
 ‘Piyal₁ said that Sriya hurt him₁ /*herself.’

(8) a. *Daya₁ Piyal-tə₂ [taman-ge₁ kaarekə hodə_gannə-tə] (kiyəla) kiwwa.*
 Daya Piyal-DAT self-GEN car.DEF wash.PP.take-INF (that) tell.PST
 ‘Daya₁ told Piyal₂ to wash his₂ /*her₁ car.’

b. *Daya₁ Piyal-tə₂ [taman-ge₂ kaarekə hodənnə-tə] (kiyəla) kiwwa.*
 Daya Piyal-DAT self-GEN car.DEF wash-INF (that) tell.PST
 ‘Daya₁ told Piyal₂ to wash her₁ /*his₂ car.’

The embedded clause of (7.a) is parallel to sentence (5). The reflexive is bound within the embedded clause which is the domain containing the reflexive pronoun, the antecedent and the reflexive verb. Now compare the embedded clause of (7.b) and the sentence (6) which is not acceptable with *taman*. *Taman* can occur in the embedded clause in (7.b) without a reflexive verb. Further, as shown by coindexation, *taman* is coreferential with the highest argument in the matrix clause, but not with that of the lower clause. In (6), since the non-reflexive verb does not coindex its reflexive pronoun with the antecedent *Sriya*, they can not be coreferential, and therefore the sentence is ungrammatical because of the reflexive not having an antecedent to be bound by. Similarly, in the case of (7.b), the absence of a reflexive verb results in non-coreference between *taman* and the subject in the minimal domain, hence *taman* is disjoint from the lower subject *Sriya* and corefers with the higher subject *Piyal*. Thus, the evidence shows that *taman* requires the presence of a reflexive verb if it is to be bound in the minimal domain or else it must find a long distance antecedent. Sentence (8), which has an infinitival phrase, also illustrates this fact.

Now let's consider sentences with more than one embedded clause. *Taman* in such subordinate clauses corefers with the subject in the highest matrix clause, unless there is a reflexive verb in the clause in which *taman* appears. (9.a) has two subordinate clauses and the reflexive *taman* appears in the lowest clause, yet it binds with the subject in the highest clause. In (9.b), the reflexive appears in a relative clause.

- (9) a. *Gune*₁ *hituwa*, [*Wiməle*₂ *laməya-tə*₃ *kiwwa* *kiyəla* --
 Gune think.PST, [Wimale child-DAT say.PST that --
 -- [*Siri*₄ *taman-wə*₁ *wiwecəne-kəlaa*]] *kiyəla*.
 -- [Siri self-ACC criticise_do.PST]] that

'Gune₁ thought that [Wimale₂ told the child₃ that [Siri₄ criticised him₁]].'

- b. *John*₁ *kiwwa* [*Wiməle*₂ *dannəwa* *kiyəla* [[Ø *taman-tə*₁ --
 John say.PST [Wimale know.PRE that [/ self-DAT --
 -- *gahapu*]³ *miniha*₃ *taman-ge*₃ *wədə* *kəṛə-gattə*]²]¹ *bawə*.
 --hit.PP / man self-GEN work do.PP_take.PST]] that.

'John₁ said that [Wimale₂ knows that [the man₃ / who hit self₁]¹ did his₃ own work]²]³.'

Note that clause "2" (superscript following the bracket in 9.b) contains a reflexive verb, therefore, *taman-ge* 'self's' corefers with *miniha* 'man'. The reflexive *taman-tə* in clause "3" cannot bind with its null subject in the minimal domain, as the non-reflexive verb *gahapu* 'hit.PP' does not allow a such coreference between its reflexive and the subject. Therefore, the reflexive pronoun has to find a long distance antecedent. Even though the clause "2" contains a reflexive verb, the reflexive *taman-tə* (in clause "3") is disjoint from *miniha* 'man' and corefers with *John*, the matrix subject. The reason for disjointedness between *taman-tə* and the clause "2" subject, *miniha* is that the reflexive is not an argument of the reflexive verb in clause "2", hence the reflexive verb has no effect on the reflexive pronoun. Further this example indicates that a reflexive pronoun in a lower clause can pass through higher clauses not being blocked by reflexive verbs in such clauses, to be bound with the highest subject, and the reflexive verb only indicates coindexation between its subject argument and the reflexive pronoun which too should be a co-argument of the same verb.⁵

The reflexive pronoun cannot bind with the 1st and 2nd person pronouns as its antecedent, as mentioned in section (2.1): (see sentence (2.a-b), for example). However, some informants find 2nd person pronouns marginally acceptable. As shown earlier, the reflexive in (10.a) binds with the matrix subject. Now consider (10.b), in which the 1st person pronoun in the matrix subject position cannot be the antecedent. Therefore, *taman* is disjoint from the matrix subject and corefers with the lower subject, as there is no other binder available for it. This does not in any case indicate that an object can be a potential antecedent for *taman*. *Siri*, the matrix object in this case controls the XCOMP subject position, hence it is a potential antecedent. This is further evident in sentence (c), which is

⁵ See Mandarin (Chief 1996), where the presence of a reflexive verb in an intermediate clause blocks the reflexive being bound by a higher subject.

ungrammatical, since it has no antecedent for *taman*. If an object could be a potential antecedent, we would expect *taman* to corefer with *Siri-tə*. Note that (c) does not have a discourse antecedent.

- (10) a. *Wiməle₁ Siri-tə₂ kiwwa [∅₂ taman_{1,*2,*3} gænə John-tə₃ kiyannə] kiyəla.*
 Wimale Siri-DAT say.PST [self about John-DAT say.INF] that
 ‘Wimale₁ told Siri₂ [∅₂ to tell John₃ about self_{1,*2,*3}].’
- b. *api₁ Siri-tə₂ kiwwa [∅₂ taman*_{1,2,*3} gænə John-tə₃ kiyannə] kiyəla.*
 1PL Siri-DAT say.PST [self about John-DAT say.INF] that
 ‘We₁ told Siri₂ [∅₂ to tell John₃ about self*_{1,2,*3}].’
- c.* *api₁ Siri-tə₂ taman*_{1,*2} gænə kiwwa.*
 1PL Siri-DAT self about say.PST
 ≠ ‘We told Siri about himself.’
 ≠ ‘We told Siri about ourselves.’

Sentence (10.b) does not indicate any inconsistency in binding relations of reflexive *taman*, as it does not bind with *any* subject (or any argument), when a matrix subject (or a lower subject) is not available. Although there are three arguments in (11), non of them can be an antecedent for *taman-tə*. The matrix subject is not a binder in this case, as it is a first person pronoun. The lower subject, *Siri-tə*, too, cannot be an antecedent for the reflexive (unlike in (10.b)), since the coreference between an argument and the subject is acceptable when they occur within the nucleus of a reflexive verb. In other words, the reflexive verb has to license coindexation between its subject and an argument. In the case of (10.b), there was no need for a reflexive verb, since the binding involved between the subject and a non-argument.

- (11) **api₁ Siri-tə₂ kiwwa [∅₂ taman-tə*_{1,*2,*3} John₃ gænə kiyannə] kiyəla.*
 1PL Siri-DAT say.PST [self.DAT John about say.INF] that
 *‘We₁ told Siri₂ [∅₂ to tell self*_{1,*2,*3} about John₃].’

To sum up, with the presence of a reflexive verb, the reflexive should bind with the subject of the reflexive verb, otherwise, if in multi-clause construction with the absence of a reflexive verb, *taman* should bind with the highest matrix subject. Only if the highest matrix subject is a first or second person pronoun, the reflexive binds with the next lower subject. It is to be noted that *taman* cannot have a discourse antecedent (see section 2.4). Its binding relations are not based on logophoric principles and can, therefore, be accounted for by syntactic constraints alone.

2.4 Logophoricity and *Taman*

We discussed sentences containing matrix verbs of saying and thinking, etc. in which *taman*'s antecedent is the one whose views, feelings etc. are reported in subordinate clauses. As Clements (1975) discusses, in some languages logophoric pronouns are used to refer to antecedents “..whose speech, thoughts or feelings are reported or reflected...” (p. 141). Thus, when a long distance pronoun binds with a noun functioning as the source of reported discourse, it is said to be in a logophoric relationship with the antecedent. The source of communication is only one of a number of semantic factors distinguishing logophoric binding from reflexive binding. Following sentences illustrate that *taman* is not a logophor although it shares some logophoric properties.

Long distance reflexive binding is a productive construction and not restricted to matrix clauses involving verbs such as *say*, *think*, *feel*, *blame* etc. Any type of verbs appear in matrix clauses and subordinate clauses, and the subject of the matrix clause, regardless of its semantics/logophoric properties becomes the antecedent of *taman*. Sentence (12) illustrates this:

- (12) *guruwəɾəya₁ taman-tə*_{1,2} danduwam_kəɬə nɪsaa, laməya₂ iskoole-tə giye naene.*
 teacher self-DAT punishment_do.PP since, child school-DAT go.PST NEG
 ‘The child₁ did not go the school, since the teacher₂ punished self_{1,*2}.’

Logophors can sometimes bind with a discourse antecedent, as Clements points out. However this is not possible with *taman*. Consider (13), in which the context is given in such a way that one would expect *taman* to be bound with an argument in the previous sentence. However, *taman* cannot corefer with *laməya*, but the personal pronoun *eyaa* ‘she/he’ can be coreferential with *laməya* ‘child’ (or with a discourse antecedent). Note also that the reflexive cannot be coreferential with *amma* ‘mother’, because ‘the giver’ and ‘the givee’ of ‘give’ cannot be the same. Hence the second sentence is ungrammatical, since the reflexive pronoun does not have a binder in the same sentence.

- (13) *laməya₁ badəginii kiyəla amma-tə₂ kiwwa. *Amma₂ eyaa-tə_{1,3}/taman-tə*_{1,*2} --*
 child hungry that mother-DAT say.PST. mother 3SG-DAT/self-DAT --
 -- *kaemak hadəla_dunna.*
 -- meal.INDEF make.PP_give.PST

‘The child₁ told the mother₂ that (he₁) was hungry. The mother₂ prepared a meal and gave it to him_{1,3}/self_{*1,*2}.’

Thus, long distance binding relations of *taman* in non-reflexive clauses are not based on logophoric principles.

2.5 Reflexives in Simple Clauses and Arguments vs. Non-Arguments

It was mentioned in section (2.2) that *taman* cannot appear in simple sentences without a reflexive verb, and the sentence (6) was given as evidence for this. (Here I use the term ‘simple sentence’ to refer to those without embedded clauses). However, some forms of the reflexive pronoun can appear in sentences without the presence of a reflexive verb: for instance, the possessive form *taman-ge* ‘self’s’ as in (1). Although informants’ judgements on the acceptability of reflexive *taman* in sentences with non-reflexive verbs are somewhat variable, some interesting observations about the occurrences of the reflexive pronoun in simple sentences have been made. There appear to be restrictions on reflexive pronouns in simple sentences with non-reflexive verbs, and on nouns and personal pronouns which occur as arguments of a reflexive verb. In other words, acceptability or unacceptability of a given simple sentence depends on two factors: (a) presence of absence of a reflexive verb, and (b) whether the reflexive pronoun is an argument or a non-argument. Below I will present a number of sentences to illustrate that reflexives in non-argument positions (ie. possessives and complements of postpositional phrases) are acceptable when occurring with non-reflexive verbs (see (1)), while reflexives in argument positions are strongly disfavoured or unacceptable with non-reflexive verbs: see (6). Sentence (14) presents the same evidence:

- (14) a. *Wiməle₁ Siri-tə taman₁ gænə kiwwa/*kiyaa_gatta.*
 Wimale Siri-DAT self about say.PST/*say.PP_take.PST
 ‘Wimale₁ told Siri about himself₁.’
- b. *Wiməle taman-tə Siri gænə kiyaa_gatta/*kiwwa.*
 Wimale self-DAT Siri about say.PP_take.PST/*say.PST
 ‘Wimale talked to himself about Siri.’

The reflexive verb in (14.a) is not acceptable with the reflexive pronoun, since *taman* appears in a non-argument position. However, the sentence is acceptable with the non-reflexive verb and *taman* in the PP corefers with *Wiməle*. On the other hand, when *taman* appears in the object position (14.b), the verb must be reflexive. In a non-argument position of a reflexive verb, any binding or non-binding NP, including *taman* as possessors and complements of PPs, can occur, as there are no restrictions from the reflexive verb. This is shown in (15). The reflexive occurs as the complements of PPs with a non-reflexive verb in (15.a), while in the same position a proper noun is allowed under a reflexive verb in (b). ((b) would have the same meaning without the reflexive verb, although with it (b) implies that *the child*, *the chair* and *Siri* were all close to each other).

- (15) a. *laməya₁ taman₁ langin putuwə tibba.*
 child self near.INST chair.Ø.DEF keep.PST
 ‘The child₁ kept the chair close to him_{1/*2}.’
- b. *laməya Siri langin putuwə tiyaa_gatta.*
 child Siri near.INST chair.DEF keep.PST_take.PST
 ‘The child kept the chair close to Siri.’

The acceptability of (15.b) may be due to lexical properties of verbs, as not all verbs behave similarly. It is observed that those verbal stems (ie. *tibba* ‘keep.PST’ in (15)) that allow *taman* in a sentence under a non-reflexive verb also allow non-binding nouns in the same position under a reflexive verb. On the basis of examples considered so far, we observed that the reflexive verb constrains the binding domain of the reflexive and enforces some restrictions as to what can occur within its nucleus. Further, reflexive possessors and reflexive complements of postpositions are less restricted in terms of their distribution as they can freely appear as non-arguments as well as arguments in a sentence regardless of the presence or the absence of a reflexive verb.

2.6 Pronoun *eyaa*

Reflexive verbs constrain not only the binding domain of *taman* but also what can be the antecedent of a pronoun.⁶ A pronoun can be coreferential with the subject in a minimal binding nucleus if a reflexive verb is present (16.b). In fact, *taman* is rarely used in such sentences and instead pronouns are used in the place of *taman* to give reflexive meaning. The pronoun *eya* ‘she/he’ cannot be coreferential with any argument in (16a). However, in (16.b) the presence of a reflexive verb licenses the pronoun to be coreferential with the subject. A non-pronominal like *Piyal* in the same position must be disjoint in reference (16.b). Thus, reflexive verbs treat pronouns as though they are anaphors.

⁶ See Chief (1996) for a discussion of similar binding relations in Mandarin pronouns conditioned by reflexive verbs.

- (16)a. *laməya₁ eyaa-wə^{*1,2} / Piyal-wə tuwaalə_kəla.*
 child 3SG-ACC / Piyal-ACC injury_make.PST
 ‘The child₁ injured him₂/her₂ /Piyal/*himself/*herself’.
- b. *laməya₁ eyaa-wə_{1,*2} / *Piyal-wə tuwəalə_kəṛə_gatta.*
 child 3SG-ACC / Piyal-ACC injury_make.PP_take.PST
 ‘The child₁ injured himself₁/herself₁ / *Piyal’.
- (17) a. *lamayi₁ eegollan₁ / *minissu₂ atəre salli bedaa_gatta.*
 children 3PL / * man.PL among money divide.PP_take.PST
 ‘Children₁ shared the money among themselves₁ / *men₂’
- b. *lamayi₁ eegollan^{*1,2} / minissu atəre salli beduwa.*
 children 3PL / man. PL among money divide.PST
 ‘Children₁ distributed the money among them^{*1,2} / men.’

The coreferentiality between *eegollan* (plural of *eyaa*) and the antecedent is clearly shown by the ungrammaticality in the sentence when *eegollan* is replaced by a non-coreferential NP like *minissu* ‘men’ (17.a). When *gatta* does not appear in the verb, the pronouns must be free (17.b).

2.7 Summary

If *taman* appears in a clause containing a reflexive verb, it should bind with the local subject. Otherwise *taman* must corefer with a long distance antecedent. Personal pronouns, too, cannot be free within the local domain and should bind with the local subject when occurring with a reflexive verb. The antecedent of *taman* is always the subject. When the highest subject is a 1st or 2nd person pronoun, the next lower subject appears to antecede the anaphor in multi-clause constructions. In simple clauses, if the subject is a 1st or 2nd person pronoun the sentence simply becomes unacceptable. It is to be noted that the difference between personal pronouns and *taman* is that *taman* should have a binder (ie. a long distance or local antecedent) within the same sentence, while pronouns need not have a binder within the same sentence. Unlike *taman*, they can be free in a sentence unless they occur within the nucleus of a reflexive verb. Further we observed reflexive possessives and complements of postpositions behave differently from those reflexives in argument positions of a sentence. *Taman* in an argument position is restricted and generally acceptable with the presence of a reflexive verb, whereas possessors and postpositional complements are less restricted and may appear with non-reflexive verbs.

3. Towards A Solution

Pronouns and the reflexive are not in complementary distribution. Sinhala anaphora does not obey the binding principles of Government and Binding Theory (Chomsky 1981) since pronouns may bind locally as well non-locally (contrary to Principle B) and reflexives can bind non-locally as well locally (contrary to Principle A). In what follows we will discuss some problems posed by the unusual characteristics of *taman* for a description based on *Inside-Out Functional Uncertainty* (Dalrymple 1993). At the end, it should be clear that the description of Sinhala data calls for an alternative framework like Optimality Theory (Prince & Smolensky 1993).

3.1 Inside-Out Functional Uncertainty

'Functional Uncertainty' (FU) can be used to express the relationship between an anaphor and its antecedent in F-structure, one of two levels of syntactic representation in Lexical Functional Grammar. The concept, called "Outside-In FU", was first introduced by Kaplan et al (1987) for analysis of topicalisation. For example, for (18)

(18) '*Mary, John claimed that [Bill telephoned yesterday]*'_{COMP} (Kaplan et al p. 5)

the *Outside-In FU* equation is $(\uparrow\text{TOPIC}) = (\uparrow\text{COMP OBJ})$. Here the $(\uparrow\text{TOPIC})$, *Mary* is identified with more embedded $(\uparrow\text{COMP OBJ})$, the object of the complement, hence the name '*Outside-in*' *FU*. Dalrymple proposes '*Inside-Out FU*', a slight variation of *Outside-In FU*, for stating the relation between an anaphor and an antecedent within the F-structure. The above *Outside-In FU* equation can be stated with *Inside-Out FU*, as $((\text{COMP OBJ } \uparrow) \text{TOPIC})$. Now let's look at a sentence with a reflexive: '*Sriya hurt herself*'. The simplified F-structure for this sentence is given in (19):

(19) F-structure for '*Sriya hurt herself*':

$$\left[\begin{array}{l} \text{PRED 'hurt' } <(\uparrow\text{SUBJ}) (\uparrow\text{OBJ})> \\ \text{SUBJ} \quad [\text{PRED 'Sriya'}] \\ \text{OBJ} \quad [\text{PRED 'self'}] \end{array} \right]$$

(20) $((\text{OBJ } \uparrow) \text{SUBJ})_{\sigma} = \uparrow_{\sigma}$

(21) $((\text{DomainPath } \uparrow) \text{AntecedentPath})_{\sigma} = \text{the antecedent}_{\sigma}$

The binding equation relating to this sentence is given in (20), which is based on more general anaphoric binding equation (21). The anaphoric binding equation tells us what the anaphor is, what the antecedent is, and the path linking the anaphor and the antecedent. The up arrow " \uparrow " following the DomainPath is the anaphor. DomainPath is the path leading to the anaphor, which is given relative to the antecedent. For example in (20), OBJ is the path and the " \uparrow " following it is the OBJ's value, the anaphor (referring to '*self*' here). The AntecedentPath is SUBJ, which is '*Sriya*'. The constraint equation " $_{\sigma}$ " indicates that the anaphor and the antecedent have the same semantic content.

3.2 Analysis of Sinhala Anaphoric Binding

Binding patterns of Sinhala personal and reflexive pronouns are given in Figure (2) below:

Figure 2: Binding Patterns of taman and eyaa

With non-reflexive verbs	With reflexive verbs	
disjoint from coarguments	bound with the subject in MCN	Pronoun <i>eyaa</i>
bound with the most distant 3rd person subject	bound with the subject in MCN	Reflexive <i>taman</i>

It is not possible to propose a single domain for the pronoun and the reflexive as local or long distance, since they have more than one binding domain depending on the presence or absence of a reflexive verb. If a reflexive verb is present, which may be in finite or non-finite form, both types of pronouns bind with the subject in the minimal complete nucleus (MCN): the domain containing the predicate, the subject and other arguments. If a reflexive verb is not present in the clause in which *taman* occurs, the reflexive should bind with the highest subject in the sentence. If the highest subject is a 1st person or 2nd person pronoun, then the reflexive binds with the next lower subject. Subordinate clauses may have non-finite (ie. infinitives) or finite verbs (i.e Ss separated by the complementiser *kiyala* ‘that’). Pronouns are free in the local domain with the absence of a reflexive verb. As it seems rather complicated to have anaphors with more than one binding domain for each one, we can simplify binding domains as in (22).

- (22) a. Reflexive *taman* should bind with the highest 3rd person subject in the same sentence, which may contain subordinate clauses with or without finite verbs.
- b. Anaphor (ie. reflexive and personal pronouns) should bind in the MCN, only if the predicate is marked with *gannəwa*.
- c. Pronouns are free unless they occur in the MCN with a predicate marked with *gannəwa*.

Sinhala anaphor poses a number of problems for a solution based on FU. Dalrymple assumes that each anaphoric element has an anaphoric binding equation lexically attached to it defining its binding domain. However, when an anaphor shares more than one binding domain and these domains of the anaphor are conditioned by different factors, it is hard to propose a precise binding equation to be attached to an anaphor. Further, in multi-clause constructions, the highest subject is not necessarily the best antecedent for *taman*, but the one that is furthest away from the anaphor and the one that agrees with it in person. We will need to employ very complex FU equations to account for this type of long distance binding.

3.3 Reflexive Verb and Anaphoric Binding Equations

I assume that the reference to reflexive binding is encoded in the lexical entry of each reflexive verb since it indicates the coreferentiality between its subject and an anaphor which occurs within its nucleus. Therefore our binding equations must refer to the reflexive verb. We need two sets of binding equations for *taman*: the first one for the reflexive binding in a nucleus containing a reflexive verb, and the second one for reflexive binding in multi-clause constructions in which *taman* appears in a nucleus of a non-reflexive verb. The first set of binding equations involving a reflexive nucleus (see 23) refers to MCN.

- (23) a. $[\text{((DomainPath GF } \uparrow) \text{ AntecedentPath)}_{\sigma} = \uparrow_{\sigma}$
 b. $\neg(\rightarrow \text{SUBJ})$
 c. $\uparrow_{\text{REFL}} =_{\text{c}} +]$

“ \uparrow ” following the GF in the binding equation is the anaphor. With “ $\neg(\rightarrow \text{SUBJ})$ ” (in 23.b) the DomainPath cannot pass through a f-structure containing a SUBJ: for instance, an anaphor, whether or not it is an argument, should bind with the first subject in its DomainPath. In other words, it should

bind within the minimal complete binding nucleus: see sentence (7.a). According to the constraint equation in (23.c) this binding condition is applicable only if the verb is reflexive. I assume that the verb is lexically specified as to whether it is reflexive or not.

Now consider a sentence like (9.a), which does not have a reflexive verb and in which *taman* corefers with the highest subject. For these types of sentences without reflexive verbs, we need to employ the second set of binding constraints. These binding equations should contain the constraint equation ($\uparrow_{\text{REFL}} =_c -$), so that our binding equations will only apply to sentences with non-reflexive verbs (compare with (23.c)). The binding relation in (9.a) is constrained by Dalrymple's conditions: *Coargument Disjointness Condition* (p.131-134) which imposes disjointness in reference from coarguments in the same nucleus; *Root S Condition* (p.136) which says that any argument in the sentence can antecede the anaphor, and *Subject Condition* (p.137-8), according to which only subjects can be antecedents. When these three conditions are jointly applied, they allow the reflexive to be bound to any subject in a higher S. With the *Root S Condition*, an anaphor can appear at an indefinite distance from its antecedent, as it does not specify a particular antecedent to be bound with. The nature of this condition predicts ambiguity in sentences such as (9.a) which has a number of clauses embedded in it. However, (9.a) is not ambiguous and the antecedent is *Gune* who is being criticised. To account for binding relations of *taman* in multi-clause constructions (like 9), it is possible to use *Subject Condition*, *Root S Condition* and another new condition that we can call "*Non-Highest Subject Non-Coreference Condition*" (Dalrymple, p.c.), which rules out any non-highest subject being coreferential with *taman*. While the combination of these three conditions can account for certain long distance binding relations (like (9.a)), they fail to account for sentences like (10.b), in which the lower subject becomes the antecedent, since the highest subject is a first person pronoun. This poses a serious problem for our binding conditions.

Let's assume that we modify our binding conditions in a such way that would rule out the highest subject being the antecedent if it is a 1st or 2nd person pronoun.⁷ However, when we apply our modified long distance binding conditions to a sentence like (10.b), still it will not generate the correct output. The reason is that *Subject Condition*, *Root S Condition* and *Non-Highest Subject Non-Coreference Condition* jointly rule out all the arguments except the highest subject being the antecedent. What we added to the binding conditions to prevent any 1st or 2nd person pronoun being an antecedent, does not allow the 1st person pronoun in (10.b) to be the antecedent. Therefore, by not having an antecedent that obeys all the conditions, the sentence may be treated as ungrammatical. Therefore our binding conditions must have the flexibility to select the next lower subject as the antecedent, when the highest subject is not the optimal one.

As a theoretical alternative, Optimality Theory (OT) appears to be worth considering with regard to the Sinhala anaphoric binding. This does not mean that the anaphoric binding system based on FU is wrong or cannot describe the binding relations of *taman* in Sinhala. The main problem that we considered previously is that *taman* has a number of different binding domains depending on various conditions. Three such domains were identified: 1) the subject in the minimal complete nucleus (MCN) if the verb is reflexive; 2) the highest subject in multi-clause constructions; and 3) the next available lower subject if the highest subject is not available in a multi-clause construction. The pronoun *eyaa* is subject to two binding domains: the subject in a MCN with a reflexive verb, and disjointness from co-arguments. We can list these domain and antecedency requirements as conditions on binding relations,

⁷ This might be done by adding a statement like $\neg((\uparrow_{\text{SUBJ}} = 1) \wedge (\uparrow_{\text{SUBJ}} = 2))$ to binding equations.

as in (24) where the leftmost conditions are the overriding ones. The hierarchy of conditions given here is not intended to serve as a set of constraints of anaphoric binding based on OT, but rather as an illustration of how competing binding conditions of Sinhala anaphor can be explained in terms of the spirit of OT.

(24) Hierarchy of Domain/Antecedency Requirements of *taman* and *eyaa*

Reflexive <i>taman</i>	(A) Disjointness from non-3rd person nominals	>	(B) Coreference with SUBJ in MCN (in nucleus of a reflexive verb)	>	(C) Coreference with SUBJ which is furthest away from <i>taman</i>
Pronoun <i>eyaa</i>	(i) Disjointness from non-3rd person nominals	>	(ii) Coreference with SUBJ in MCN (in nucleus of a reflexive verb)	>	(iii) Disjointness from coarguments

The above-given hierarchy of conditions shows a cline less to more violable (or, alternatively, from more to less strict). In (10.b) repeated below as (25), for instance, the coreference between *api* ‘we’ and *taman* would violate person agreement (24A), and (24B) is not applicable for this sentence. Thus, at the expense of violating the lower condition (C), *taman* binds with the lower subject. In a simple sentence with a reflexive verb and a first person subject, as given in (2.b) repeated as (26), *taman* cannot bind with the subject although it would satisfy both (B) and (C). Such coreference will result in the sentence being unacceptable, simply because the anaphor does not agree with the subject in person. Thus, it indicates that condition (A) should rank higher than (B).

(25) *api*₁ *Siri-tə*₂ [\emptyset ₂ *taman*_{*1,2,*3} *gəənə* *John-tə*₃ *kiyannə*] *kiyəla* *kiwwa*.
 1PL Siri-DAT [self about John-DAT say.INF] that say.PST
 ‘We₁ told Siri₂ [\emptyset ₂ to tell John₃ about self_{*1,2,*3}].’

(26) *api* *ape/*taman-ge* *wədək* *balaa_gatta*, *nam* *hondai*.
 1PL 1PL.GEN/*self-GEN work.INDEF look.PP_take.PST, if good
 ‘It is better if we minded our own/*self’s business.’

Pronouns are normally free within the MCN (Condition (iii) in (24)). Their binding relations are conditioned by the reflexive verb, when they occur within the nucleus of a reflexive verb. Therefore Condition (ii) should rank higher than the more general Condition (iii). Like *taman*, *eyaa* being a third person pronoun cannot corefer with a non-third person noun. Consider (27a-b):

(27)a. *Daya*₁ *eyaa-ge*_{1,*2} *kaarekə* *hodə-gatta*.
 Daya 3SG-GEN car.DEF wash.PP-take.PST
 ‘Daya₁ washed his_{1,*2} car.’

b. *mamə*₁ *eyaa-ge*₂ *kaarekə* *hodə-gatta*.
 1SG 3SG-GEN car.DEF wash.PP-take.PST
 ‘I washed his car.’

The reflexive verb in (27.a) requires *eyaa* to be bound with the subject. However, this is not possible in (b) as the pronoun cannot agree with the non-third person nominal. Unlike the reflexive *taman*, the pronoun *eyaa* need not have a binder in the same sentence. Therefore, (27.b) becomes acceptable indicating that the person agreement between the antecedent and the anaphor is more important than those restrictions imposed by reflexive verbs. I assume that an approach based on OT would be more suitable for explaining complex binding relations of Sinhala anaphors. Ideally, we would expect that in an OT-based account, there would be a set of universal constraints of anaphoric binding relations to provide the flexibility needed for language specific variations.

4. Conclusion

Data from Sinhala illustrates that an anaphor is subject to a combination of different binding conditions. The binding domain of an anaphor varies depending on the interaction of these binding conditions. The reflexive and personal pronouns are not in complementary distribution. The anaphoric elements discussed here cannot be characterised as either ‘clause-bound’ or ‘long distance’, since an anaphor can have a variable binding domain. Thus, the domain of reflexivisation is not a defining feature of a given anaphoric element.

We observed that verbs morphologically marked for reflexivisation put constraints on coreference between anaphor and antecedent. I assume that the reflexive verb brings further insight into the interaction between the representation of argument structure, lexical semantics and morpho-syntax, and therefore requires a thorough investigation. Finally, as we very briefly showed Sinhala anaphoric binding relations may be better described in terms of Optimality Theory, which allows for the violation of certain binding conditions through constraint interaction.

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