

## Anaphoric R-Expressions as Bound Variables<sup>1</sup>

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### 0. The Problem

San Lucas Quiavini Zapotec (SLQZ), an Otomanguean language of southern Mexico, regularly allows apparent Principle B and C violations.<sup>2</sup> R-expressions may bind identical R-expressions (1-2) and pronouns may locally bind identical pronouns (3):

- (1) R-yu'lààa'z Gye'eihlly Gye'eihlly  
hab-like Mike Mike  
"Mike likes himself."
- (2) R-cààa'z bxuuhahz ch-ia bxuuhahz  
hab-want priest irr-go priest  
"The priest wants to go."
- (3) R-yu'lààa'z-ëng la'anng  
hab-like-3s.prox 3s.prox  
"He/she likes himself/herself."

Thai also allows apparent Principle C violations:

- (4) John koonnat John  
John shaved John  
"John shaved himself." [Thai]

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<sup>2</sup> This pattern was described in detail in Munro 1994. Some of the grammaticality judgments reported in this earlier work differ from those found here.

- (5) Aajarn kit waa puak rau chççp aajarn  
 teacher think that all we like teacher  
 “The teacher<sub>i</sub> thinks we like him<sub>i</sub>.” [Thai]

### 1. Proposal

This paper will show that Principles B and C do indeed hold in SLQZ and Thai. I will argue that putatively “bound” R-expressions are not, in fact, true R-expressions, but bound variables spelled out as copies of their antecedents. Likewise, “locally bound” pronouns are bound copies of their antecedents.

This is consistent with the view that reflexive predicates represent functions mapping a single argument to both argument positions (Reinhart and Reuland 1993):

- (6)  $\lambda x (P..x...x..)$

Under Reinhart and Reuland’s assumptions, reflexivity is realized in one of two ways: either a predicate is lexically specified as reflexive, or it needs to be ‘reflexive-marked’ by a reflexive morpheme. SLQZ lacks an independent series of reflexive pronouns; thus it uses bound copies to reflexive-mark predicates.

### 2. An Earlier Proposal

The Thai pattern was noted by Lasnik (1986). He concluded that Principle C is subject to parametric variation: Principle C holds in languages such as English, but not in languages such as Thai. This theory has been invoked to account for the binding facts of Quiégolani Zapotec (related to, but mutually unintelligible from, SLQZ) (Black 1994).

### 3. Testing the Hypothesis

The idea that Principle C is absent in languages such as Thai and SLQZ forces several predictions about the behavior of these languages. The following sections examine these predictions, and show that Principle C does indeed hold in Thai and SLQZ. Thus, an alternate account must be made for their binding patterns.

#### 3.1. Prediction 1: All R-expressions Should Be Bindable

If Principle C did not hold in some languages, then these languages should allow R-expressions to be bound in any context. However, the contexts in which R-expressions may appear to be bound in Thai and SLQZ are extremely limited.

Lasnik notes that in Thai, R-expressions cannot be bound by pronouns (7). The same constraint holds in Quiégolani Zapotec (8) (Black 1994) and SLQZ (9):

- (7) \*Khaw chççp John  
 he likes John  
 “He<sub>i</sub> likes John<sub>i</sub>.” [Thai: Lasnik 1986, p.154]

*Anaphoric R-Expressions*

- (8) \*Per n-an-t men pa go r-zak Merse  
 but s-know-neg 3s what thing h-have Mercedes  
 “But she<sub>i</sub> didn’t know what Mercedes<sub>i</sub> had.”  
 [Quiégolani Zapotec: Black 1994, p. 98]
- (9) \*B-gwi’ih-ëng lohoh Gye’eihlly  
 perf-look-3s.prox at Mike  
 “He<sub>i</sub> looked at Mike<sub>i</sub>.”

Lasnik attributes this constraint to a referential hierarchy on binding: less referential elements may not bind more referential ones. Thus, R-expressions may be bound by R-expressions, but not by pronouns.

However, constraints on bound R-expressions are stricter than Lasnik suggests. In Thai and SLQZ, R-expressions cannot be bound by different (equally referential) R-expressions (10-11); pronouns can be locally bound neither by R-expressions (12) nor pronouns differing in formality or proximity features (13). The same constraints hold for Thai (14):

- (10) R-yu’làaa’z Gye’eihlly me’s  
 hab-like Mike teacher  
 “Mike<sub>i</sub> likes the teacher<sub>j/\*i</sub>.”
- (11) R-yu’làaa’z me’s Gye’eihlly  
 hab-like teacher Mike  
 “The teacher<sub>i</sub> likes Mike<sub>j/\*i</sub>.”
- (12) R-yu’làaa’z Gye’eihlly la’anng  
 hab-like Mike 3s.prox  
 “Mike likes him/\*himself.”
- (13) R-yu’làaa’z -ih la’anng  
 Hab-like-3s.prox 3s.dist.  
 “He/she<sub>i</sub> likes him/her<sub>j/\*i</sub>.”
- (14) \*John koonnuat aajarn  
 John shave teacher  
 “John<sub>i</sub> shaved the teacher<sub>\*i</sub>.” [Thai]

Thus, apparent binding of R-expressions and local binding of pronouns appear to be subject to the following constraint:

- *The Identical Antecedent Requirement*: The only R-expressions that can be bound, and pronouns that can be locally bound, are exact copies of their antecedents.

This requirement calls into question the idea that Principle C may be freely disobeyed in languages such as Thai and SLQZ.

### 3.2. Prediction 2: Thai and SLQZ Should Not Show Crossover Effects

If Principle C were absent in Thai and SLQZ, then *wh*-traces are predicted to be subject to A-binding, and these languages should not show crossover effects.

Both languages, however, show both strong and weak crossover effects. In (15) and (16), the *wh*-trace cannot be coindexed with any *c*-commanding arguments:

- (15) Q: Tu r-ralloh la'anng r-yu'làaa'z (t) Li'eb (t)  
 Who hab-think 3s.prox hab-like Felipe  
 "Who does he think Felipe likes? /Who does he think likes Felipe?"

A: Lia Paamm-zhi'  
 Ms. Pam-maybe  
 "Maybe Pam."

- (16) \*Khray<sub>i</sub> thii khaw<sub>i</sub> khit t<sub>i</sub> waa Nit rak t<sub>i</sub>  
 who COMP he think COMP Nit love  
 "Who<sub>i</sub> does he<sub>i</sub> think Nit loves?" [Thai: Ruangjaroon 2001]

Because SLQZ has basic VSO word order and no subject agreement on verbs with non-pronominal subjects, argument *wh*-questions are often ambiguous between subject and object readings. (This is seen in the two possible interpretations of (15)). (17), however, shows a weak crossover effect: the possessed nominal *x:nàaanni*, 'his/her mother', can only be interpreted as the object (not the subject) of the sentence:

- (17) Tu r-yu'làaa'z t x:-nnàaan-ni' \*t  
 who hab-like gen-mother-refl.poss  
 "Who like his/her own mother/\*Who does his/her own mother like?"

Thai also shows weak crossover effects. In (18), 'who' must be disjunct from 'his':

- (18) MQ khong kao chççp kray  
 Mother his<sub>i</sub> like who<sub>j</sub>  
 "Who<sub>j</sub> does his<sub>i</sub> mother like?" [Thai]

These data show that *wh*-traces cannot be A-bound in Thai and SLQZ, which is unexpected if these languages lacked Principle C.

### 3.3. Prediction 3: Bound DPs Should Be Fully Referential

If Principle C were absent in Thai and SLQZ, then fully referential DPs should be able to be bound, and should have the same referential force as other R-expressions.

This, however, proves not to be the case. “Bound” R-expressions in Thai and SLQZ do not receive strict readings in VP deletion contexts, as do typical R-expressions. Rather, they allow only sloppy (bound variable) readings:

- (19) B-gwi’ih Gye’eiully lohoh Gye’eiully zē’cy cahgza’ Li’eb  
perf-look Mike at Mike likewise Felipe  
“Mike looked at himself, and Felipe did too.”  
(\*Felipe looked at Mike/ Felipe looked at himself)

- (20) John koonnuat khong John lae Peter ko muankan  
John shave of John and Peter the same  
“John shaved himself, and Peter did too.”  
(\*Peter shaved John/ Peter also shaved himself) [Thai]

Thus, bound copies in SLQZ and Thai do not have the referential force of normal R-expressions. Rather, they behave like bound variables.

## 4. Bound Copies as Bound Variables: The Solution, Revisited

The presence of Principle C effects and the bound variable readings of apparently bound R-expressions support the proposal that they are not truly referential, but are bound variables spelled out as copies of their antecedents. Likewise, “locally bound” pronouns are also bound copies. This accounts for the general constraint against bound R-expressions and locally bound pronouns, as well as the presence of crossover effects. The copy status of these apparently bound expressions also accounts for the Identical Antecedent Requirement.

## 5. Semantic Consequences

This proposal also predicts another binding constraint in languages such as SLQZ and Thai. If bound copies are bound variables, then they should be, in type-theoretical terms, elements of type  $e$ . Thus, only DPs of type  $e$  should be able to appear as bound copies.

This prediction is borne out. Referential DPs and pronouns, which are elements of type  $e$ , may appear as bound copies, but quantified phrases, elements of type  $\langle\langle e, t \rangle, t \rangle$ , cannot be bound copies<sup>3</sup>:

- (21) \*B-guhty cho’nn ra bxuuhahz cho’nn ra bxuuhahz  
perf-kill three pl. priest three pl. priest  
“Three priests killed themselves.”

<sup>3</sup> I assume that in these contexts, both names and definite DPs are elements of type  $e$ , consistent with Partee’s (1986) claim that natural languages allow definite descriptions to be either type  $e$  or type  $\langle\langle e, t \rangle, t \rangle$ .

- (21) \*B-guhty cho'nn ra bxuuhahz cho'nn ra bxuuhahz  
 perf-kill three pl. priest three pl. priest  
 "Three priests killed themselves."
- (22) ??R-a txup tson wnaa r-ka txup tson wnaa gyus  
 Hab-go two three woman hab-buy two three woman pot  
 "A few women went to buy a pot."  
 [Quiégolani Zapotec: Black 1994, p. 103]
- (23) \*Thuk khon konnuad thuk khon  
 every one shave every one  
 "Everyone shaved himself." [Thai]

### 5.1. QPs and Bound Copies

Bound QP copies cannot appear—at least not with a reflexive reading—because they would cause a semantic type clash. Recall that reflexive predicates are assumed to be functions mapping a single argument to both argument positions:

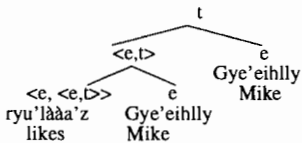
- (24)  $\lambda x (P..x...x..)$

Thus, a reflexive predicate such as "kill oneself" is a function that takes an entity to form a second function, which takes the same entity to form a proposition:

- (25)  $[[\text{kill oneself}]] := [\lambda x \in D_e. \lambda x \in D_e. x \text{ kill } x]$

According to this representation, then, bound copies must be of type *e*. Thus, a simple reflexive expression such as (1), gets the representation in (26):

- (26)  $[[\text{Mike likes himself}]] := [\lambda x \in D_e. \lambda x \in D_e. x \text{ likes } x] (\text{Mike}) = 1$

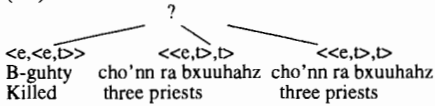


If the reflexive argument is a QP, however, a type clash occurs. Consider the ungrammatical example (21), repeated below:

- (27) \*B-guhty cho'nn ra bxuuhahz cho'nn ra bxuuhahz  
 perf-kill three pl. priest three pl. priest  
 "Three priests killed themselves."

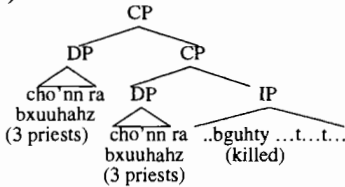
From (28), we see that the QPs cannot combine compositionally with the predicate, which only selects entities as arguments:

(28)

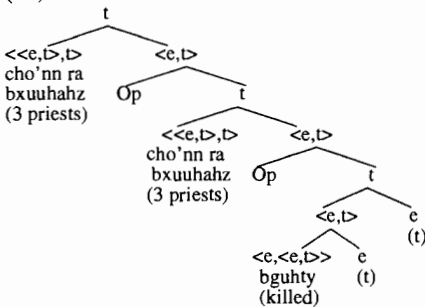


One means of making this structure licit is to type-shift the copies by raising them at LF, leaving traces of type *e* to combine with the predicate. The following syntactic and semantic structures will result:

(29)



(30)



The LF structure in (30), however, does not denote the intended reflexive reading: since each of the traces is bound by a different QP, the sentence can only mean that three priests killed three other priests.

## 5.2. Reflexivization of QPs

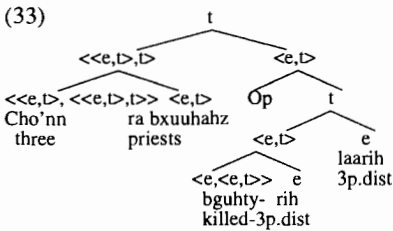
SLQZ uses a different pattern to reflexivize QPs: the QP is base-generated as a preverbal topic, and the actual subject of the reflexive predicate is realized as a distal pronoun<sup>4</sup>. The reflexive object is a bound copy of the subject pronoun:

- (31) Cho'nn ra bxuuhahz b-guhty-rih la'arih  
 Three pl priest perf-kill-3p.dist 3p. dist  
 "Three priests killed themselves."

<sup>4</sup> See Munro (to appear) for the uses of proximate and distal forms in narrative.

- (32) Yra'ta' ra bxuuhahz b-guhty-rih la'arih  
 Every pl priest perf-kill-3p.dist 3p. dist  
 "Every priest killed himself."

In this construction, reflexive arguments are realized as pronominal variables (thus, elements of type *e*), with the QP base-generated in an A' (operator-like) position. (33) shows the semantic representation of (31):



Here, a single QP takes scope over both pronominal, giving a reflexive reading.

To sum up, the failure of quantified arguments to appear as bound copies is due to the bound variable status of bound copies: variables are elements of type *e*, and only elements of type *e* may appear as bound copies.<sup>5</sup>

## 6. SLQZ Bound Copies as Long-Distance Anaphora

SLQZ also allows non-locally-bound copies, which also behave as bound variables. This section will propose that non-locally-bound copies are long-distance anaphora, and share syntactic and semantic features attested in long-distance anaphora crosslinguistically.

### 6.1. Bound Copies as Nominative Anaphors

Bound copies can be subjects of embedded clauses. (SLQZ has no infinitival clauses; all verbs are marked with tense/aspect markers.) Embedded subject copies are also interpreted as bound variables:

- (34) R-càaa'z Gye'eihlly g-ahcnèe Gye'eihlly Lia Paamm zë'cy cahgza' Li'eb  
 hab-want Mike irr-help Mike fem. Pam likewise Felipe  
 "Mike wants to help Pam, and so does Felipe."  
 (Felipe also wants to help Pam /\*Felipe also wants Mike to help Pam)

### 6.2. Embedded Object Copies

Bound copies can also be objects of embedded clauses:

<sup>5</sup> Bare nouns in SLQZ may be interpreted as singular or plural, definite or indefinite, depending on context. I will assume that bare nouns are DPs with silent heads, and these DPs are treated as entities.



*Anaphoric R-Expressions*

- (35) R-ralloh Gye'eihlly r-yu'làaa'z Lia Paamm Gye'eihlly  
Hab-think Mike hab-like fem. Pam Mike  
"Mike<sub>i</sub> thinks Pam likes him<sub>i</sub>."

Object bound copies in embedded clauses can get apparently referential readings:

- (36) R-ralloh Gye'eihlly r-yu'l àaa'z-ënn Gye'eihlly  
Hab-think Mike hab-like-1p Mike  
"Mike<sub>i</sub> thinks we likes him<sub>i</sub>

chiru' zë'cy cahgza' Li'eb  
also likewise Felipe  
and so does Felipe."

(Felipe thinks we like Mike/Felipe thinks we like him (Felipe) )

This, however, is not necessarily evidence against the anaphoric status of the bound copy. Thráinsson (1993) notes that the Icelandic long-distance anaphor *sig* allows only a sloppy reading in VP-deletion contexts when bound locally, but allows both strict and sloppy readings when its antecedent binds it across a clause:

- (37) Jón rakaDi sig og Péter gerDi DaD líka  
John shaved self and Peter did so too  
(Peter shaved himself (Peter)/ \*Peter shaved John)
- (38) Jón sagDi [aD Dú hefDir svikiD sig] og Péter gerDi DaD líka  
John<sub>i</sub> said that you had betrayed self<sub>i</sub> and Peter did so too  
(Peter said that you betrayed John / Peter<sub>i</sub> said that you betrayed him<sub>i</sub> )

This shows that SLQZ bound copies show the same interpretive behavior as local and long-distance anaphors crosslinguistically.

### 6.3. Bound Copies in Adjunct Clauses

Bound copies may also appear in adjunct clauses, where they also get bound variable readings:

- (39) Zi'cygaa' nih cay-uhny Gye'eihlly zèèiny b-ii'lly-ga' Gye'eihlly  
While that prog-do Mike work perf-sing-also Mike  
"While Mike worked, he sang."

This is unexpected given that no c-command relation holds between the copy and its antecedent. However, the relation between the copy and its antecedent is not unattested: Huang and Tang (1993) note that Chinese long-distance anaphors may appear in adjunct clauses with antecedents in main clauses:

- (40) Ta zhidao [[suiran Lisi piping-le zijì]  
 He know though Lisi criticise-ASP self  
 “He<sub>i</sub> knows that although Lisi<sub>j</sub> criticized self<sub>i/j</sub>”

dajia haishi hen xihuan ta  
 all still very like him  
 we still like him.” [Chinese: Huang and Tang 1993, p. 279]

Bound copies in adjunct clauses, like other copies, get bound variable readings and are subject to the Identical Antecedent requirement:

- (41) Zi’cygaa’ nih cay-uhny Gye’eihlly zèèiny b-ii’lly-ga’ Gye’eihlly  
 While that prog-do Mike work perf-sing-also Mike  
 “While Mike was working, he sang

zè’cy cahgza’ Li’eb  
 likewise Felipe  
 and so did Felipe.”  
 (\*Felipe sang while Mike worked/Felipe sang while he (Felipe) worked)

- (42) Zi’cygaa’ nih cay-uhny Gye’eihlly zèèiny b-ii’lly-ga’-ng  
 While that prog-do Mike work perf-sing-also-3s.prox  
 “While Mike was working, he/she (someone else) sang.”

This supports the idea that adjunct bound copies are semantically dependent on their antecedents, and are not merely instances of accidental coreference.

#### 6.4. Non-Local Copies Are Not Logophors

It has been claimed that the non-bound anaphora cross-linguistically are logophors: pronominal elements representing one whose speech, thoughts, or perceptions are being reported. An example of this is the use of *myself* in (43):

- (43) As for myself, I like sugar in my coffee.

Long-distance anaphora have also been claimed to be logophors (Reinhart and Reuland 1993, Huang and Liu 2001). Under these accounts, the distribution of long-distance anaphora is constrained primarily by semantic and pragmatic factors, rather than purely structural ones.

However, non-locally bound copies in SLQZ can appear in contexts in which their use is not logophoric. Such contexts are noted by Dubinsky and Hamilton (1998), who argue that epithets can only be c-commanded by their antecedents in anti-logophoric environments:

### *Anaphoric R-Expressions*

(44) \*Felipe<sub>i</sub> is afraid his teacher failed the poor guy<sub>i</sub>.

(45) Felipe<sub>i</sub> ran over the man who tried to help the poor guy<sub>i</sub>.

Example (44) is ungrammatical because *the poor guy* is c-commanded in a logophoric context: Felipe's feelings are being described. (45), on the other hand, is grammatical because the context in which the epithet appears is anti-logophoric: it says nothing about Felipe's state of mind during the action.

If non-locally-bound copies in SLQZ were logophors, they would be ruled out in contexts similar to that in (45). However, this prediction is not borne out: (46) shows that non-locally-bound copies can occur in anti-logophoric contexts:

(46) B-tàa'az Gye'eihlly bèe'cw nih b-da'uhgya'ah Gye'eihlly  
perf-hit Mike dog REL perf- bite Mike  
"Mike hit the dog that bit him."

Here, the copy is licit even though (46), like (45), does not describe the perspective of the subject or its copy. Hence, it cannot be the case that bound copies are logophors.

### **7. Conclusion**

This paper has shown that the apparently bound R-expressions and locally bound pronouns that appear in SLQZ and Thai do not represent Principles B or C violations. Rather, these elements are semantically and syntactically bound variables that are spelled out as copies of their antecedents. In SLQZ, which lacks a morphologically distinct series of anaphors, bound copies serve as both local and long-distance anaphora.

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