The Structure of Nominals and Binding in Child Thai

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1. Introduction

(1) The Binding Principles (BP):
   a. Principle A: An anaphor must be bound within its binding domain.
   b. Principle B: A pronoun must be free within its binding domain.
   c. Principle C: An R-expression must be free everywhere.

(2) BP are thought to be:
   a. Innate
   b. Universal
   c. Acquired very early (perhaps at the earliest testable stages).

(3) Exceptions to BP, in particular Principle C:
   - Thai (Lasnik, 1989), San Lucas Quiavini Zapotec (Lee, 2003), amongst others.

Research Question: What do children in these languages do?
- initially exhibit evidence of Principle C, only to lose it as they develop?
- initially show no evidence of Principle C, in contrast to children acquiring other lgs?

Overview of the talk:

2. Binding in Thai
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   2.2 Larson (2005; Lee, 2003): φP and DP
   2.3 Adult grammaticality judgement tasks
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2. Binding in Thai

2.1 The traditional picture

Lasnik (1989; 1991) reports that Principle C in Thai is violable, as shown in (4).

(4) a. Noi khít waa Noi câ chaná b. Nid chɔɔp nãngs̄́y thîi khun hâî (kâb) Nid
    Noi think COMP Noi will win  Nid like book COMP 2ndS give (to)  Nid
    “Noi thinks that she will win” “Nid likes the book that you gave her”

Problem: if Principle C is not universal, then it raises the possibility that it is not part of UG. (Note: universality ≠ innateness).

(5) The Exact Copy Condition: Hoonchamlong (1991) points out that Principle C is violable only when the two nominals in question are exact copies of each other.

(6) Lasnik’s (1989; 1991) essentially re-states Principle C in terms of the Referential Hierarchy: something less referential (e.g., a pronoun) cannot bind something equally or more referential than it, but Principle D states that a nominal may bind something that is equally referential (but not more referential).

(7) *Khaw kft waa Noi já cha-ná
    She think COMP Noi will win
    “She (Noi) thinks that Noi will win”

Parametric variation: Principle C occurs in some languages (e.g., English), Principle D in others (Thai).

So Thai is not an exception to the Binding Theory, retaining the possibility that it is innate, universal, and acquired very early.

2.2 φ-Phrases and Determiner-Phrases (Larson, 2005)

Dechaine & Wiltschko (2002) propose a 3-way distinction in pronouns:

Table 1. Deschaine & Wiltschko’s nominal proform typology

<table>
<thead>
<tr>
<th></th>
<th>Pro-DP</th>
<th>Pro-φP</th>
<th>Pro-NP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal syntax</td>
<td>D syntax</td>
<td>Neither D nor N syntax</td>
<td>N syntax</td>
</tr>
<tr>
<td>Distribution</td>
<td>Argument</td>
<td>Argument or predicate</td>
<td>Predicate</td>
</tr>
<tr>
<td>Semantics</td>
<td>Definite</td>
<td>--</td>
<td>Constant</td>
</tr>
<tr>
<td>Binding status</td>
<td>R-expression</td>
<td>Variable</td>
<td>--</td>
</tr>
</tbody>
</table>

(8) a. ![Diagram](url)  b. ![Diagram](url)  c. ![Diagram](url)

Binding Properties: Principle C  Principle B  n/a
D&W argue for this typology of pronouns, but claim that this 3-way distinction also applies to other nominal types (p.439). Larson (2005) applies this idea to nominals in Thai. Larson’s proposal:

- In (4), the antecedent is generated as a full DP, with all the referential, semantic and binding properties of a DP.
- The bound R-expression, however, is not a full DP, but a φP.
- This φP receives its features from the antecedent, hence the Exact Copy Condition.
- The φP may be spelled out in one of two ways:
  1. either φ may be spelled out, in which case a classic pronoun occurs, or
  2. everything below the φ head (including N) may be spelled out, in which case a full R-expression occurs.

Prediction: bound pronouns and bound R-expressions should be in free variation:

(9) aacaanı̱ khi̱t wàa kǎw / aacaanı̱ cà chaná
Teacher think say 3sing-male/teacher will win
“The teacher, thinks that he will win.”

This analysis only applies when the bound R-expression is unmodified by any D-like element (e.g., demonstrative or classifier). But when modified by classifiers/demonstratives, a D-layer is projected, and the bound expression cannot be a φP.

Predictions: bound R-expressions modified by classifiers/demonstratives should be *.

Predictions:

(a) Unmodified R-expressions may be bound (4, 10).
(b) Modified R-expressions may NOT be bound (11).
(c) Unmodified bound R-expressions should behave like variables → subject to Principle B (12).

(10) aacaanı̱ khi̱t wàa aacaanı̱ cà chaná
teacher think COMP teacher will win
“The teacher, thinks he will win”

(11) * aacaan chalāat khon ūn̄̆ nī̱̆̆ khít wàa aacaan chalāat khon ūn̄̆ nī̱̆̆ cà chaná
teacher smart CL fat think COMP teacher smart CL fat will win
“The fat, smart teacher, thinks he, will win”

(12)*Sakı̱ tii kǎw / Sakı̱
Sak hit 3SM/Sak
“Sak hit himself”

**Summary:**

<table>
<thead>
<tr>
<th>Nominal Type</th>
<th>Description</th>
<th>Principle B</th>
<th>Principle C</th>
</tr>
</thead>
<tbody>
<tr>
<td>φP</td>
<td>Unmodified</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>DP</td>
<td>Modified by classifier or demonstrative</td>
<td>✗</td>
<td>✓</td>
</tr>
</tbody>
</table>
2.3 Adult Grammaticality Judgement task
We tested Larson’s claim with 20 native speakers of Thai, using a grammaticality judgement task. Participants were provided with a context and asked to rate sentences on a scale of 1-5 on how well they matched the given context.

- 2 conditions: φP condition and DP condition.

Sample context: (translated from Thai):
Two cute pigs, a big one and a small one, get hungry and go to the kitchen to snack on some fruit. The big cute pig decides to eat the banana and the small cute pig decides to eat the orange. The big cute pig then starts watching tv while eating the banana, and the small cute pig goes back to reading her book while eating the orange.

Summary: Small cute pig eats orange while reading.
Big cute pig eats banana while watching tv.

(13) φP Test Item: [pig] ate the orange while [pig] was reading.
Coreference reading: the same pig ate the orange while it read → true
Disjoint reading: one pig ate the orange, the other did the reading → false

(14) DP Test Item: [Cute CL pig] ate the orange while [Cute CL pig] was reading.
Coreference reading: the same pig ate the orange while it read → true
Disjoint reading: one pig ate the orange, the other did the reading → false

Table 2. Predictions and results for adult Thai speakers

<table>
<thead>
<tr>
<th></th>
<th>Expected response</th>
<th>Actual response (mean, 1=reject, 5=accept)</th>
</tr>
</thead>
<tbody>
<tr>
<td>φP Condition</td>
<td>Accept</td>
<td>3.78</td>
</tr>
<tr>
<td>DP Condition</td>
<td>Reject</td>
<td>2.15</td>
</tr>
</tbody>
</table>

Conclusion: Adults reject a bound coreferential reading of an R-expression when that R-expression is a full DP, but accept the bound coreferential reading when that R-expression is unmodified (i.e., φP). This provides empirical support to Larson’s theory.

2.4 Hypotheses for Thai children

Hypothesis 1. The BP are NOT an innate part of UG. Prediction: Thai children may violate all of the BP at early stages, only to learn that Principle C applies to DPs.

Hypothesis 2: The BP ARE part of UG, but children have not learned that φPs and DPs behave differently in Thai. Prediction: Thai children will adhere to Principle C for all nominal types.

Hypothesis 3: The BP ARE a part of UG, and children have learned the structure of nominals in Thai. Prediction: Thai children should behave just like Thai adults (reject coreference with DPs but accept coreference with φPs).
Table 3: Summary of three hypotheses and predictions for child Thai

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>øP Condition</th>
<th>DP Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (No Principle C anywhere)</td>
<td>Accept</td>
<td>Accept</td>
</tr>
<tr>
<td>2 (Principle C across the boards)</td>
<td>Reject</td>
<td>Reject</td>
</tr>
<tr>
<td>3 (Adult-like)</td>
<td>Accept</td>
<td>Reject</td>
</tr>
</tbody>
</table>

3. Experiments
3.1 Experiment 1: øPs versus DPs

Objective: To test whether children adhere to Principle C when the R-expression is a øP or a DP

Method: Truth value judgment task (TVJT)

Participants: 15 children in a kindergarten affiliated with Kasetsart University, Bangkok, 5 aged 3;0-3;11, 5 aged 4;0-4;11, and 5 aged 5;0-5;11

Materials: Each child was tested with 8 stories, each accompanied by a puppet’s statement. The statements included 2 critical øP items, 2 critical DP items, and 4 fillers.

Design: Two lists were created; each contained the same stories and statements but they were presented in different orders. Half of the puppet’s statements matched the context and the other half didn’t, yielding a 2 (øP /DP) x 2 (match/mismatch) design.

Procedure: The children were individually presented with each of the stories acted out using toy characters. The puppet then made a statement about the story. The children were asked whether what the puppet said was right or wrong.
Sample story and test items:

This is a story about two cute piggies: the big cute pig and the small cute pig, see? One day both pigs are at home – the big cute pig is watching TV and the small cute pig is reading a book. The big cute pig feels hungry, and looks around for some food. She sees two bananas and an orange on the table. She grabs the orange, but just before she eats it, the small cute pig says “Hey! That’s my orange, and I’d like to eat it now.” The big cute pig says “Well, I was about to eat the orange, but I guess it’s yours, so I will eat the banana.” So the big cute pig gives the small cute pig the orange, and takes a banana for herself. She then starts watching TV while eating her banana and the small cute pig starts eating the orange while reading her book.

<table>
<thead>
<tr>
<th>Final scene:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Small cute pig eating an orange while reading.</td>
</tr>
<tr>
<td>- Big cute pig eating a banana while watching TV.</td>
</tr>
</tbody>
</table>

Puppet: Ok, this story was about two pigs who were hungry. Hmm, let’s see

(15) a. Pig\textsubscript{i} ate the orange while pig\textsubscript{i} read the book. \hspace{1cm} \textphiP Condition
b. Cute CL pig\textsubscript{i} ate the orange while cute CL pig\textsubscript{i} read the book \hspace{1cm} \textDP Condition

### 3.2 Results

<table>
<thead>
<tr>
<th>Coreference in adult Thai:</th>
<th>\textphiP Condition</th>
<th>\textDP Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammatical</td>
<td>90% (9/10)</td>
<td>90% (9/10)</td>
</tr>
<tr>
<td>Ungrammatical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 year olds (n=5)</td>
<td>90% (9/10)</td>
<td>90% (9/10)</td>
</tr>
<tr>
<td>4 year olds (n=5)</td>
<td>90% (9/10)</td>
<td>80% (8/10)</td>
</tr>
<tr>
<td>5 year olds (n=5)</td>
<td>90% (9/10)</td>
<td>90% (9/10)</td>
</tr>
</tbody>
</table>

⇒ Children accept coreference in both the \textphiP condition as well as the DP condition.

Two possible interpretations of this result:

Interpretation 1: Principle C is not an innate principle of language (Hypothesis 1).
Interpretation 2: Thai children treat all nominals, at least at this stage of development, as \textphiPs (Hypothesis 2).
We tested interpretation 2 in a second experiment.

3.3 Experiment 2: Are all R-expressions φPs in child Thai?
Objective: To test whether the R-expression in child Thai behaves like φPs, i.e., subject to Principle B.
Method, participants, design and procedure were the same as in experiment 1.
Materials: Each child was tested with 8 stories, each followed by a puppet’s statement (2 monoclause test items and 6 fillers).
Sample story and test item:
This is a story about a big cute bear, a small cute bear, and a nice pink pig. One day, the big cute bear and the small cute bear are playing in the backyard, and the nice pink pig is watching TV inside. After a while, the bears get bitten by mosquitoes, and they start to feel itchy, so they run inside. The big cute bear scratches his arms and legs, but his back is very itchy, and he can’t reach it. He asks the small cute bear to scratch his back for him, but because he is so small, he can’t reach it. So the big cute bear asks the nice pink pig to scratch his back for him (and he does). The small cute bear scratches his own arms and legs, and because he can reach his back, he scratches his own back too.
Puppet: This is a story about two bears and a pig. The bears are playing in the backyard, until they get bitten by mosquitoes. I know what happens,

(16) hei scratches small cute CL beari’s back.

3.4 Results
Table 5: Children’s acceptance of coreference in monoclause

<table>
<thead>
<tr>
<th>Monoclause condition</th>
<th>Coreference in adult Thai</th>
<th>Ungrammatical</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 years old (n=5)</td>
<td>60% (6/10)</td>
<td></td>
</tr>
<tr>
<td>4 years old (n=5)</td>
<td>90% (9/10)</td>
<td></td>
</tr>
<tr>
<td>5 years old (n=5)</td>
<td>0% (0/10)</td>
<td></td>
</tr>
</tbody>
</table>

→ R-expressions in early Thai are treated as φPs, and thus subject to Principle B. The ungrammaticality of local binding emerges late in Thai children, consistent with the Delay of Principle B Effect (DPB).

4. Discussion and Conclusion
In this paper we provided empirical evidence that adults in fact allow a bound reading of an R-expression when that R-expression is unmodified by a D-like element (e.g., classifier, demonstrative).

- Modified R-expressions are full DPs and therefore subject to Principle C
- R-expressions without demonstratives/classifiers are structurally smaller constituents (φPs). They behave as pronouns and are subject to Principle B.
The idea that bare R-expressions are pronouns is a plausible one from many perspectives, including the typology proposed by DW, as well as the fact that the pronominal system in Thai is very articulated and complex. This complexity suggests that pronominal-like forms that spell out $\phi$-features should not be unexpected.

We also find that:

- Unlike adults, children treat all R-expressions as $\phi$Ps, including those with overt demonstratives or classifiers.
- R-expressions in child Thai behave like pronouns both in terms of where they trigger binding violations (only within local domains) and also in terms of their development (the DPB effect).
- The apparent violations of Principle C in Thai are not in fact violations of a universal principle of grammar, but rather the correct application of Principle B to a misanalysis of nominals in the language.

Further research is required (and planned) in order to address several remaining questions:

1. Do unmodified R-expressions behave like variables in other respects? E.g., do they receive a sloppy identity reading in VP-deletion contexts?
2. At what age do Thai children attain adult-like competence in the distinction between $\phi$Ps and DPs with respect to binding?
3. Could length effects be a possible factor?
4. Do pronominal antecedents trigger stronger violations than referential antecedents? That is, does Principle D hold in adult and child Thai?

References