*ABA syncretism patterns in pronominal morphology

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A thesis submitted to University College London in partial fulfilment of the requirements of the degree of

DOCTOR OF PHILOSOPHY
Page intentionally bears this sentence alone.
I, Hannah Jane Middleton, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Hannah Jane Middleton

March 2020
Why leave a page intentionally blank when you could leave a rhetorical question instead?
When you are a Bear of Very Little Brain, and you Think of Things, you find sometimes that a Thing which seemed very Thingish inside you is quite different when it gets out into the open and has other people looking at it.

A. A. Milne
Abstract

Syncretism patterns in strong free-standing pronominal forms (specifically anaphors, diaphors, and pronouns) show that they share an underlying functional structure. Based on a new typology of 80 languages, I argue for a hierarchical structure such that diaphors contain pronouns, and anaphors contain diaphors. Each layer of the structure introduces a functional head which places an additional restriction on the antecedent of the pronominal form. The proposed structure derives the fact that of five logically possible patterns of syncretism, only four are attested.

I argue further that morphological variation in the realisation of Strict and Sloppy interpretations of anaphors and diaphors can be captured if the features \( A \) and \( D \) are optionally allowed to drop in the interpretation of alternatives (Sauerland 2013), and that morphological variation in the exponence of anaphors, diaphors and pronouns in languages such as Peranakan Javanese of Semarang can be captured if the notion of Optional Impoverishment is adopted from Nevins & Parrott 2010.

Finally, I consider two analyses of pseudo-ABA patterns of syncretism, and argue that only the simple analysis is compatible with the broader analysis of the morphology and morphological behaviour of pronominal forms that I propose in this thesis. In the simple analysis, \( A \) and \( D \) are not cyclic nodes, and the pronominal tree spells out when it merges with \( K(ase) \) (or some higher node). Pseudo-ABA patterns arise when a spanned exponent for \([A [D]]\) and an exponent for \( P \) together spell out more of the pronominal structure than any other combination of exponents. The alternative analysis, in which \( A \) and \( D \) are cyclic nodes, is incompatible with the analysis of variable exponence found in pronominal forms.
Impact Statement

In this thesis, I investigate the morphology of pronominal forms such as *him, her, himself* and *herself*. The sentence *Only Diana thinks that Charles loves her* is ambiguous; it is true if Diana thinks that Charles loves Diana, and Camilla thinks Charles doesn’t love Camilla, and Elizabeth thinks Charles doesn’t love Elizabeth, and it is also true if Diana thinks that Charles loves Anne, but Camilla and Elizabeth think he doesn’t.

The sentence *Diana thinks that only Charles loves himself* is true if Diana thinks that Charles loves Charles, William doesn’t love William, and Harry doesn’t love Harry. Due to the ambiguity of the first sentence, English represents an AAB pattern of morphology (*her-her-himself*). There are five logically possible patterns, but I only found four of them in my survey of 80 languages (AAA, AAB, ABB and ABC); the ABA pattern was unattested. In this thesis, I propose a theory that explains why the ABA pattern doesn’t exist.

Apart from a detailed analysis of the morphology of pronominal forms (which contributes firstly to the field’s understanding of the theory of Distributed Morphology, and secondly to the field’s understanding of binding theory), this thesis highlights the importance of careful elicitation of linguistic data. All of the pronominal forms investigated in this thesis had the potential to be ambiguous, and it was necessary to develop a set of ten stories (with accompanying pictures) that disambiguated the target interpretations of the pronominals precisely. The data elicitation materials used for the cross-linguistic survey of pronominals in this thesis thus serve as a model for future research on the possible interpretations of pronominal forms.

The data elicitation method adopted in this thesis could further be of benefit to non-academics who are engaged in the preservation or documentation of endangered and understudied languages. One considerable difficulty in investigating pronominal forms is that grammarians rarely (and never systematically) explore the specific ambiguities highlighted here when analysing the nature of a given language’s pronominal forms. Consequently, grammars are invariably incomplete in their descriptions of pronominal forms. If the data elicitation methods used in this thesis were adopted by those who are working to preserve or document endangered and understudied languages, the descriptions of pronominal forms in grammars would significantly improve in detail and accuracy. This would contribute to a richer understanding, not only of endangered or understudied languages, but of pronominal forms in all languages.

I have published a paper on the problem and solution of disambiguating the target interpretations of sentences for language informants in *The Quarterly*, the official publication of the Psychology Postgraduate Affairs Group (Middleton 2018). I have written up the analysis of pronominal forms presented in Chapter 2 of this thesis in a paper which is currently under review at a journal of linguistics. I am in the process of writing up the analysis of pseudo-ABA patterns of morphology in a paper, with the intention of submitting it to a journal specialising in morphology articles.
Acknowledgements

10th April 1995

“Baby hens are called chicks,” said my mother.

“Well,” I replied, “chicks reminds me of lots of chicks, chick reminds me of one.”

This thesis started out life as a mock paper written when I was an undergraduate on my year abroad. I had challenged myself to understand what a logophor was, a problem that has plagued me (and inadvertently, my family) to this day. My mock paper was developed further under the supervision of Klaus Abels, who decided that in the face of the dire alternatives I presented him with, it should be the topic of my undergraduate dissertation. At the end of the year I presented it to Ad Neeleman as a possible topic for a PhD, admitting at the end of the meeting, “I’m not sure Klaus was that impressed, though. I don’t think he thought that this idea was particularly good,” to which Ad replied, “It doesn’t matter what Klaus thinks, it only matters whether or not it’s *right*.” I haven’t paid Klaus’s advice the smallest bit of attention since.

Ad, thank you for everything you’ve taught me, and for all your support over the last four years. Klaus, thank you likewise. Choosing you as supervisors were two of the best decisions I have ever made. Thank you as well to Yasu Sudo, my secondary supervisor, and to Andrew Nevins, Hans van de Koot and Kriszta Szendrői, for whom I was a teaching assistant. I learnt a lot working under your supervision. I am also grateful to Richard Jardine for rescuing my PhD application from the abyss that is UCL’s application system, so that it wasn’t lost forever. And thank you to Tom McFadden and the Leibniz-Zentrum Allgemeine Sprachwissenschaft (ZAS) for hosting me in the final year of my PhD.

This thesis would have been impossible but for the hundred and fourteen people who gave me data from their native languages. Their names are given with the data they provided, all of which can be found in Appendices A and D. Thank you to all of them. I am also grateful to John Middleton and Sigwan Thivierge, who collected Madurese and Ojibwe data on my behalf. Thank you to Savio Meyase, Ratih Oktarini, and Anthea, Maureen and Arthur Middleton, who asked their native speaker friends for Marathi, Sundanese and Irish data respectively for me.

Several people spent time extensively discussing their native language with me, and providing me with additional valuable data; thank you to Cate Canonica (Italian), Gísli Rúnar Harðarson (Icelandic), Jim McCloskey (Irish), Yasu Sudo (Japanese), Sandhya Sundaresan (Tamil), and Jianguo Xiong (Mandarin Chinese). Similarly, thank you to everyone who has found time for meetings to discuss my work with me, especially to Daniel Harbour for discussing features and functional heads with me, Luisa Martí for helping me grapple with semantics, Benjamin Bruening for tenaciously pointing out problems with my early analysis of Strict and Sloppy readings, Jonathan Bobaljik and Heather Newell for improving my analysis of pseudo-ABA patterns, and Martina Wiltschko for discussing orthogonal analyses of pronominal forms with me. John Middleton and Stan Zompi gave me detailed comments on the final draft of this thesis; thank you both.
Thank you to all my fellow PhD student and teaching assistant friends for all the laughs, jokes, trips for post-Upgrade pancakes, cheeky Nandos, drinks and dinners that are so essential to sanely completing a PhD, especially to Yara AlShaalan, Cate Canonica, Patrick Elliot, Faidra Faitaki, Jiri Kaspar, Alina Konradt, Mike Mourounas, Hanbyul Song, Elena Titova, Greg Williamson, Yan Zhang and Ruoying Zhao at UCL, Lujain Alkhazy, Pietro Baggio and Margaret Ruoan Wang at QMUL, and Fenna Bergsema, Remo Nitschke, Luise Schwarzer and Stan Zompi, internationally.

Thank you to Saiid Omar and Lee (supporters of Chelsea), Fuad, Sharika, and Muhsin Abubakar (supporter of Arsenal) for the many conversations we have had over the years (mostly Chandler House gossip and football results) at reception, and for all the help you’ve given me with various problems like singing radiators on the first floor.

Finally, my family. Mum, Dad, Susie and John: Logophors matter. They really do.

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Abbreviations

\(\pi\) Person

\# Number

♀♂ Gender

1 1\textsuperscript{st} person

2 2\textsuperscript{nd} person

3 3\textsuperscript{rd} person

I Class 1 marker

II Class 2 marker

III Class 3 marker

IV etc.

ABS Absolutive

ACC Accusative

ACT Active

AGR Agreement marker

AGT Agentive marker

ART Article

ASP Aspect

C Complementiser

CAUSE Causative

CL Clitic

CONJ Conjunctive marker

CONT Continuous

COP Copula

DAT Dative

DECL Declarative

DEF Definite

DET Determiner

DIR Direct marker

DO Direct object

EMPH Emphatic

EP’TTH Epenthetic

ERG Ergative

FEM Feminine

FOC Focus marker

FUT Future

FV Final vowel

GEN Genitive

HAB Habitual

IMPF Imperfect

IND Indicative

INDEF Indefinite

INV Inverse marker

IPFV Imperfective

ITER Iterative

K Case

LOC Locative

MASC Masculine

N Nominaliser

N-FIN Non-finite

NEG Negative

NEUT Neutral

NOM Nominative

OBL Oblique

OM Object marker

PART Particle

PAST Past

PERSP Perspective

PFV Perfective

PL Plural

POSS Possessive

PRED Predicative marker

PREP Preposition

PRES Present

PROG Progressive

PRON Pronoun

PTCP Participle

REFL Reflexive

REL Relativiser

REL.PRON Relative pronoun

SG Singular

SM Subject marker

SUBJ Subjunctive

THM Thematic marker

V Verbaliser

WIT.PAST Witnessed past
Chapter 1

Introduction

This thesis investigates syncretism patterns in free-standing pronominal forms, using them as a diagnostic for identifying their internal structure. Investigations into pronominal forms have featured significantly in the literature ever since Reinhart 1976 and Chomsky 1981 first proposed what has come to be known as Canonical Binding Theory. Canonical Binding Theory was developed further in Chomsky 1982, where it was proposed that anaphors, pronouns and R-expressions are not syntactic primitives, but complex entities composed of features. The features Chomsky suggested were [±anaphor] and [±pronoun], the motivation behind them being to explain the shared properties of NPs. Thus, pronouns bore the features [−anaphor +pronoun] and R-expressions bore the features [−anaphor −pronoun], and consequently the shared property of pronouns and R-expressions was attributable to their common feature [−anaphor]: neither must be bound in its governing category.

Unusually for a featural analysis, these features are not supported by morphology. In fact, just by looking at English, it’s clear that the morphology supports a very different set of underlying features. For example, in Chomsky’s analysis, the features anaphors and pronouns are composed of bear opposing values: [+anaphor −pronoun] and [−anaphor +pronoun] respectively. Since it is assumed in the Minimalist (Chomsky 1993; 1995) and Distributed Morphology (Halle & Marantz 1993) frameworks that feature bundles that have no valued features in common receive different exponents, this predicts that anaphors and pronouns will share no morphology at all. However, the anaphor himself is composed of the pronoun him plus the morpheme self, suggesting that the anaphor bears all the features of the pronoun, plus at least one more.

English is not alone in presenting data that is morphologically inconsistent with Chomsky’s features. For example, the Niger-Congo language Fanti has the anaphor neho and the pronoun ne, while Xining Mandarin’s (Sino-Tibetan) anaphor is jia ziji and its pronoun is jia. The fact that the morphology of these three linguistically diverse languages is incompatible with Chomsky’s featural analysis should immediately prompt us to look
Continuing in this spirit, now consider the Fanti data in (1). Suppose Diana has just
returned home, and her butler reports the following: Charles is very happy with himself
today, because he planted two large vegetable plots. William, however, is very cross with
himself, because he did badly in his exam at school. Harry is also very cross with himself;
he forgot his rugby kit that morning and couldn’t play in the match after school. On
hearing this, Diana probably thinks that at this particular moment in time, only Charles
loves himself. The pronominal form that can be used to describe this scenario is neho.

The pronominal form ne is more flexible; it describes either a scenario in which Diana
thinks Charles loves Diana, Camilla doesn’t think Charles loves Camilla, and Elizabeth
doesn’t think Charles loves Elizabeth, or a scenario in which Diana thinks Charles loves
Anne, and Camilla and Elizabeth think he doesn’t.

(1)  *(Only) Diana thinks that (only) Charles loves himself / her* in Fanti

a. Diana djwin de Charles nktin do neho
Diana think that Charles only love NEHO
→ Diana λx (x thinks that only Charles λy (y loves y))

b. Diana nktin e na o djwin de Charles do ne
Diana only 3SG T think that Charles love NE
→ Only Diana λx (x thinks that Charles λy (y loves x))

c. Diana nktin e na o djwin de Charles do ne
Diana only 3SG T think that Charles love NE
→ Only Diana λx (x thinks that Charles λy (y loves z))

These interpretations contrast with those available in Xining Mandarin. In Xining Mandarin,
the pronominal form jia ziji can be used both when Diana thinks that Charles loves
Charles, William doesn’t love William, and Harry doesn’t love Harry, and when Diana
thinks Charles loves Diana, Camilla doesn’t think Charles loves Camilla, and Elizabeth
doesn’t think Charles loves Elizabeth. The third scenario — where Diana thinks Charles
loves Anne, and Camilla and Elizabeth think he doesn’t — is described with the pronominal
form jia (2).
(2) (Only) Diana thinks that (only) Charles loves himself / her in Xining Mandarin\(^1\)

a. Diana simo zhe sa Charles sa zhi ba jia ziji nei zhei fo
Diana thinks ZHE SA Charles SA only BA JIA ZIJI loves ZHEI that
→ Diana λx (x thinks that only Charles λy (y loves y))

b. Diana simo zhe sa zhi Charles sa ba jia ziji nei zhei fo
Diana thinks ZHE SA only Charles SA BA JIA ZIJI loves ZHEI that
→ Only Diana λx (x thinks that Charles λy (y loves x))

c. Diana simo zhe sa zhi Charles sa ba jia nei zhei fo
Diana thinks ZHE SA only Charles SA BA JIA loves ZHEI that
→ Only Diana λx (x thinks that Charles λy (y loves z))

In both languages we find a syncretism: the Fanti pronominal \(nt\) is available for the free pronoun reading and the non-locally bound variable reading (1b,c), to the exclusion of the locally bound variable reading (1a), while the Xining Mandarin pronominal \(jia ziji\) is available for both the bound variable readings (2a,b), to the exclusion of the free pronoun reading (2c). What is of interest here is that these syncretisms don’t match up.

Following a long line of scholars (e.g. Jakobson 1962; Halle & Marantz 1993; Harley 2008; Caha 2009; Bobaljik 2012), I take the syncretism of two items to indicate that they share a common underlying feature. The analysis in this thesis is presented in the tradition compatible with Distributed Morphology and Minimalism. In these frameworks, feature bundles constitute the terminal nodes of syntactic trees, and after the syntax has finished doing its syntaxy jobs, the final tree is fed to the articulatory and conceptual interfaces, where the feature bundles receive their phonological forms and semantic meaning.

In order for syncretism to occur, certain morphemes must have at least one feature in common. Suppose Pronoun A realises the features \([P Q R]\), while Pronoun B realises \([Q R S]\). Syncretism will occur if there is no exponent that realises \([P Q R]\) or \([Q R S]\), but only one for the features \([Q R]\). This exponent is thus the maximally specified exponent for both pronouns (the Maximal Subset Principle, Kiparsky 1973; Halle & Marantz 1993), and syncretism will occur. The Fanti data suggests that non-locally bound pronominals and free pronouns share a feature in common, while the Xining Mandarin data indicates the same for both locally and non-locally bound pronominals. The core questions this thesis sets out to answer then, are these: what is the distribution of features that underlie free-standing pronominal forms, and how do they combine?

Accounting for the behaviour of anaphors and pronouns has been the primary object

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\(^1\)The words zhe, sa, ba and zhei are all particles, whose exact identity does not matter here.
of binding theories since the groundbreaking work of Reinhart 1976 and Chomsky 1981. Accounting for the behaviour of long-distance bound variables (diaphors) within the same theory became important later, though logophors (perspectival diaphors) were documented at around the same time, in Hagège 1974. Another layer of complexity emerged with the examination of Strict and Sloppy readings, which were brought to public attention by Partee 1989. One considerable difficulty in investigating all of these pronominal distinctions is that grammarians rarely (and never systematically) explore these specific semantic distinctions when analysing the nature of a given language’s pronominal forms. Consequently, a substantial part of the present research comprises a typological study of pronominal forms in relation to their interpretations at LF. This study has covered 80 languages to date, representing a total of 12 language families and one isolate. The data gathered for this study can be found in Appendix A, and the data elicitation materials can be found in Appendix B.

Before I outline the structure of the thesis, let me say a word or two about the scope of my investigation. The present study uses morphology as a window into pronominal structures. An exhaustive analysis would study both pronominal forms in all their guises (1st, 2nd and 3rd person; strong, weak and clitic; etc), and pronominal forms alongside all their morphological relatives (reciprocals, inchoatives, applicatives, etc). But one cannot do justice to an exhaustive analysis of pronominal forms in a single thesis. For this reason, I investigate the subdomain of strong 3rd person free-standing pronominal forms.

I restrict my analysis to 3rd person pronominals for two reasons. Firstly, they are able to be bound (crucial for the analysis of anaphors and diaphors) in more syntactic configurations than the 1st and 2nd person pronominals, making diagnostic tests easier to construct. Secondly, 3rd person pronominals show the richest morphological variation, making them more morphologically informative than 1st and 2nd person pronominals.

Strong free-standing pronominal forms likewise demonstrate the richest morphological variation, again making them maximally morphologically informative. Strong free-standing pronominals, such as herself or her, function as full arguments in the syntax (roughly, they

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2 See also Sag 1976 and Williams 1977, which discuss Strict and Sloppy readings in VP ellipsis.

3 A quick glance at the data in Appendix A reveals that I too, am culpable on this point, notably with respect to Strict readings of locally-bound variables.

4 I have been asked about the typological diversity of my language sample. Since there is no clear way to determine how to select a linguistically diverse group of languages to make up one’s sample, I accepted data from every language offered to me. This resulted in my language sample being Indo-European heavy, with the Austronesian and Niger-Congo language families also well-represented. If one was to follow Bobaljik’s (2012:§2.3.2) method of reducing languages to cognate sets, then we will only remove two languages from my sample (Frisian and Afrikaans), leaving my language sample 78-strong. Bobaljik takes two cognate sets to be distinct if (and only if) they differ in at least one of their component roots, though they need not differ in all (Bobaljik 12012:42).
can bear stress, focus, and emphasis, and can appear in coordinated DPs). They contrast with morphologically smaller pronominals, such as weak pronominal forms, clitics, or the subject and object markers of languages like Swahili, which must be attached to or incorporated into the verbal structure (Cardinaletti & Starke 1996; 1999; Déchaine & Wiltschko 2002; 2017). Weak pronominal forms, including clitics or subject and object markers, fall outside the scope of the present study.5

Following in the same vein, an analysis of reduced anaphors also falls outside the scope of this thesis. Reduced anaphors surface when they are the object of a grooming verb, such as wash or shave, or the object of an inherently reflexive verb, such as behave (English) or schamen ‘to be ashamed of oneself’ (Dutch). When an anaphor is the object of a non-grooming verb, the full anaphor is used, but when it is the object of a grooming or inherently reflexive verb, it can be completely silent, as happens in English (3a), or reduced, as happens in Dutch (3b).

(3) Reduced anaphors with grooming verbs in English and Dutch

a. Diana thinks that only Charles washed (himself).
b. Diana denkt dat alleen Karl zich(zelf) waste.
c. Charles washed only *(himself).
d. Karl waste alleen zich*(zelf).
e. The boys washed *(themselves) and each other.
f. De jongens wasten zich*(zelf) en elkaar.

Reduced anaphors are not strong free-standing pronominals, as they cannot be stressed (3c,d), and cannot be coordinated (3e,f). They therefore fall outside the scope of the present study, and instead, I refer the reader to Reuland 2011, which presents the most detailed analysis of reduced anaphors that I am aware of.

The present study also excludes an analysis of elements that are morphologically related to, but syntactically distinct from reflexive pronominals. Déchaine & Wiltschko

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In this thesis, I argue that pronominal forms are structurally complex, such that diaphors contain pronouns, and anaphors contain diaphors. These structures are orthogonal to the structures argued for by Cardinaletti & Starke 1996, 1999 and Déchaine & Wiltschko 2002, 2017. This is demonstrable with Italian data for Cardinaletti & Starke’s structures, and raises the question of how the structures I propose interact with the structures proposed by Cardinaletti & Starke 1996, 1999 and Déchaine & Wiltschko 2002, 2017. I address this issue in Appendix C.
(2017:65) observe that the smaller pronominal forms they investigate can additionally function as middles, inchoatives, applicatives, and imperative subjects (in the case of the pronominals Déchaine & Wiltschko call ϕPs), agreement markers and evaluative markers (ClassPs), medio-reflexives and inchoatives (nP), and numeral classifiers and applicatives (NPs). Strong free-standing pronominal forms do not show syncretism with these elements, and so an analysis of them also falls outside the scope of the present study.

Another type of DP that will not be investigated here is reciprocals. Reciprocals are frequently included in analyses of anaphors because their antecedents are subject to the same constraints of locality that anaphors’ antecedents are. Reciprocals are set aside for three reasons. Firstly, they are not morphologically related to the strong free-standing pronominal forms that concern us here, and since the primary object of this thesis is to use morphology as a window into pronominal structures, they are not of immediate interest. Secondly, in this thesis I argue that anaphors have counterparts that take long-distance antecedents (diaphors), and counterparts that refer to sentence-external entities (pronouns). In contrast, reciprocals can only take local antecedents; there are no known long-distance reciprocals, or reciprocals with sentence-external antecedents. As will become clearer as the arguments in this thesis develop, this means that reciprocals will not exhibit the morphological patterns that are investigated here. Thirdly, the semantics of reciprocals is fundamentally different from the semantics of pronominal forms, which means that the semantic content of the features unique to reciprocals is fundamentally different from the semantic content of the features that underlie pronominal forms.

Finally, I also set aside what are known as exempt anaphors, and for an analysis of these refer the reader to Charnavel 2019. Exempt anaphors are anaphors whose antecedent is non-local (4), and is the perspectival or empathetic locus of the clause containing the exempt anaphor (Charnavel 2019).

(4) Examples of exempt anaphors

a. John_said to Mary that nobody would doubt that physicists like himself were a godsend. (Kuno 1987)

b. The picture of herself on the front page of The Times made Mary’s claims seem somewhat ridiculous. (Pollard & Sag 1992)

c. Alice expected the King to invite the Rabbit and herself for a drink. (Reuland & Winter 2009)

Exempt anaphors are morphologically identical to anaphors with a local antecedent (plain anaphors in Charnavel 2019), and have been reported to exist for a linguistically diverse set of languages (for example, himself in English (e.g. Pollard & Sag 1992), lui-même
and *son propre* in French (e.g. Charnavel & Sportiche 2016), *sig* in Icelandic (e.g. Maling 1984), *ziji* in Mandarin (e.g. Huang & Liu 2001), *zibun* in Japanese (e.g. Kuroda 1973), *kendisin* in Turkish, and *öz* in Uyghur (Major & Özkan 2018)). Charnavel 2019 argues convincingly that the differences between plain and exempt anaphors can be reduced to their binder. She argues that plain anaphors are bound by a local overt DP, while exempt anaphors are bound by a silent logophoric pronoun introduced by a syntactically represented logophoric operator, which is in turn bound by the overt non-local antecedent. Since exempt anaphors are morphologically identical to plain anaphors⁶ and their exceptional behaviour can be accounted for by positing a silent logophoric pronoun introduced by a syntactically represented logophoric operator, I do not investigate them further here.

The thesis is structured as follows. In Chapter 2, I present the main contribution to the field of linguistics that this thesis makes. In §2.2 I present the data. In §2.3 I discuss the possible feature permutations that could account for the attested and unattested patterns of syncretism, and identify the only permutation that is compatible with morphologically transparent pronominal forms. I then identify the pronominal tree structure to which the features belong, and discuss the semantic content of the features that underlie pronominal structures. In §2.4 I propose an extension of Sauerland’s 2013 weak presuppositional analysis of anaphors that allows for a uniform analysis of Strict and Sloppy readings of anaphors and diaphors. In §2.5 I address an apparent complication for the analysis presented; variable exponence. In §2.6 I conclude.

In Chapter 3, I investigate the cyclic/non-cyclic status of the A and D nodes in the pronominal tree. The investigation was precipitated by the need to account for pseudo-ABA patterns of syncretism found in three of the languages in my sample; Babanki (Niger-Congo), Malayalam (Dravidian), and Yoruba (Niger-Congo). In §3.2, I present the simple analysis of the pseudo-ABA patterns of syncretism. In §3.3 I consider how the analysis would look if A and D were cyclic nodes, and show how Bobaljik’s 2012 analysis can account for the data. Finally, in §3.4, I close the chapter by demonstrating that the probabilistic impoverishment analysis of variable exponence from §2.5 is only compatible with a theory in which A and D are *not* cyclic nodes. I conclude in §3.5.

I summarise the contribution this thesis makes to the field of linguistics, and speculate on future directions for research in Chapter 4.

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⁶In her conclusion, Charnavel does mention Dutch, whose plain anaphor *zichzelf* is morphologically distinct from its exempt anaphor *hemselves*, but speculates that the difference is due to a feature [±log] that does not affect the pronominal structure proposed in this thesis. If this speculation can be empirically supported, the morphologically indistinct anaphors such as English *himself* can be explained straightforwardly by appealing to underspecification.
Chapter 2

*ABA syncretism patterns in pronominal morphology

2.1 Introduction

This chapter is concerned with the mismatched syncretisms found in Fanti and Xining Mandarin, introduced in Chapter 1. These languages illustrate two possible patterns of syncretism; another three are logically possible. In §2.2 I show that of the five logically possible syncretism patterns between three pronominal forms, only four are attested. First I present the data illustrating the attested patterns of syncretism, and then I show the complete paradigm of attested and unattested syncretism patterns.

In §2.3 I discuss which feature permutations will generate the attested patterns of syncretism, without allowing the unattested. I begin with the monopartition, and work through to the tripartition. Four permutations meet the requirements exactly; I then show that only one of the four is also compatible with the transparent morphology of the languages in my sample. I propose that the features that underlie pronominal forms belong to the terminal nodes of a pronominal tree, and discuss their semantic content.

In §2.4 I introduce a problem posed by Strict and Sloppy readings of anaphors and diaphors, and show how it can be accounted for by adopting and extending Sauerland’s 2013 weak presuppositional analysis of anaphors. In §2.5 I examine the variable exponente found in Peranakan Javanese of Semarang. I show that the Distributed Morphology framework already has a tool to deal with the data found in this language, namely Probablistic Impoverishment (Nevins & Parrott 2010). I conclude in §2.6.

2.2 Cross-linguistic patterns of syncretism

We saw from the Fanti and Xining Mandarin data (repeated in (5) and (6)) that there are three different kinds of pronominal; a locally bound variable, a non-locally bound variable, and a free pronoun.
(5) (Only) Diana thinks that (only) Charles loves himself / her in Fanti

a. Diana djwin de Charles nkoṭin do neho
   Diana think that Charles only love NEHO
   → Diana λx (x thinks that only Charles λy (y loves y))

b. Diana nkoṭin e na o djwin de Charles do ne
   Diana only 3SG T think that Charles love NE
   → Only Diana λx (x thinks that Charles λy (y loves x))

c. Diana nkoṭin e na o djwin de Charles do ne
   Diana only 3SG T think that Charles love NE
   → Only Diana λx (x thinks that Charles λy (y loves z))

(6) (Only) Diana thinks that (only) Charles loves himself / her in Xining Mandarin

a. Diana simo zhe sa Charles sa zhi ba jia ziji nei zhei fo
   Diana thinks ZHE SA Charles SA only BA JIA ZIJI loves ZHEI that
   → Diana λx (x thinks that only Charles λy (y loves y))

b. Diana simo zhe sa zhi Charles sa ba jia zi jī nei zhei fo
   Diana thinks ZHE SA only Charles SA BA JIA ZIJI loves ZHEI that
   → Only Diana λx (x thinks that Charles λy (y loves x))

c. Diana simo zhe sa zhi Charles sa ba jia nei zhei fo
   Diana thinks ZHE SA only Charles SA BA JIA loves ZHEI that
   → Only Diana λx (x thinks that Charles λy (y loves z))

I know of no language that makes any further morphological distinctions in its pronominal forms,1 and so proceed with these three logical functions. For the sake of perspicuity, these are the three labels for the pronominal forms that correspond to the three LFs: anaphor, diaphor, and pronoun, (7).

(7) The pronominal terminology used in this thesis

<table>
<thead>
<tr>
<th>Pronominal</th>
<th>Logical Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAPHOR</td>
<td>Diana λx (x thinks only Charles λy (y loves y))</td>
</tr>
<tr>
<td>DIAPHOR</td>
<td>Only Diana λx (x thinks Charles λy (y loves x))</td>
</tr>
<tr>
<td>PRONOUN</td>
<td>Only Diana λx (x thinks Charles λy (y loves z))</td>
</tr>
</tbody>
</table>

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1Kiparsky 2002 proposes five pronominal distinctions (whose antecedents are locally-bound, finite-bound, reflexive, referentially dependent, and referentially independent), but as I know of no language where the morphology transparently and uniquely marks five distinctions, I haven’t investigated this possibility here. See §2.4 for discussion of Strict and Sloppy readings of anaphors and diaphors.
Informally, an anaphor is a bound variable (i.e. it has a Sloppy reading) that takes a local c-commanding antecedent; a diaphor is a bound variable that takes a non-local antecedent, in whose scope it sits; and a pronoun is a free variable, and all else being equal it can take any discourse antecedent it likes. The term *anaphor* for locally-bound variables is well-established, being derived from the Ancient Greek *aná* ‘up’ and *phérō* ‘I carry’. Continuing with Ancient Greek, *diaphor* is a neologism, formed from *diá*, ‘at variance’ and *phérō*. This ensures that the term *diaphor* is consistent with the rest of the *phor* family: *anaphor, cataphor, endophor, exophor, logophor*.

Data was elicited in the following manner: The informant was told the story that disambiguates local binding (in which a person P is told about three people, X, Y and Z, such that X loves X, Y doesn’t love Y, and Z doesn’t love Z), and then asked to translate the corresponding sentence (*P thinks that only X loves x-self*) into their native language so that the translation is true for the story. This was then repeated for the stories and target sentences of the diaphor and pronoun. Stories and target sentences of the Strict readings of the anaphor and diaphor were added to my elicitation materials later, and immediately followed their Sloppy counterparts in elicitation: Sloppy anaphor > Strict anaphor > Sloppy diaphor > Strict diaphor > pronoun.

Reading from the bottom of (7) up (for reasons that will become clear later on), Fanti represents an AAB pattern of syncretism. This pattern is found in many different languages and language families, such as Balinese (Austronesian), Thai (Tai-Kadai), and Finnish (Uralic) (8).

(8) *Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him* in Finnish

a. Kengu uskoo, että vain Nasu rakastaa itseään
   Kanga believes that only Piglet loves *ITSEÄN*
   → *Kanga λx (x thinks that only Piglet λy (y loves y))*

b. Vain Nasu uskoo, että Kengu rakastaa hääntä
   only Piglet believes that Kanga loves *HANTA*
   → *Only Piglet λx (x thinks that Kanga λy (y loves x))*
   → *Only Piglet λx (x thinks that Kanga λy (y loves z))*

Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him in Finnish

Xining Mandarin, on the other hand, represents an ABB pattern of syncretism. As with

---

2In designing these sentences, it became apparent that it was better to use the history-neutral, race-neutral and (largely) culture-neutral characters from the Winnie-the-Pooh stories, rather than the British royals. The only hiccup came with languages that have a set of pronominals specifically for humans; this problem was surmounted by asking informants to pretend that Kanga and friends were human. Because the Winnie-the-Pooh stories are male-heavy in characters (Kanga is female and everyone else is male), it was simpler to present informants with stories where in the first Kanga was thinking, while for the latter two Piglet was thinking.
the AAB pattern, the ABB pattern can be found across the globe, in languages such as Japanese (Japonic), the Dravidian language Tamil, and Turkish (Turkic) (9).

(9) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him in Turkish

a. Kanga sadece Piglet-in kendisin-i sev-diği-in-i
   Kanga.NOM only Piglet-GEN KENDISIN-ACC love-C-POSS-ACC
düş-iin-iyor
   think-PROG-3SG
→ Kanga λx (x thinks that only Piglet λy (y loves y))

a’. Sadece Piglet Kanga-nin kendisin-i sev-diği-in-i
   only Piglet.NOM Kanga-GEN KENDISIN-ACC love-C-POSS-ACC
düş-iin-iyor
   think-PROG-3SG
→ Only Piglet λx (x thinks that Kanga λy (y loves x))

b. Sadece Piglet Kanga-nin on-u sev-diği-in-i düş-iin-iyor
   only Piglet.NOM Kanga-GEN ON-ACC love-C-POSS-ACC think-PROG-3SG
→ Only Piglet λx (x thinks that Kanga λy (y loves z))

There are also languages that distinguish three pronominal forms, resulting in an ABC pattern. I represent this pattern with Basque (language isolate) (10); it can also be seen in languages such as Ewe (Niger-Congo) and Icelandic (Germanic).

(10) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him in Basque

a. Kanga-k uste du bakarrik Piglet-ek maite du-ela bere buru-a
   Kanga-ERG think have only Piglet-ERG love have-that BERE BURU-DET
→ Kanga λx (x thinks only Piglet λy (y loves y))

b. Bakarrik Piglet-ek uste du Kanga-k maite du-ela bera
   only Piglet-ERG think have Kanga-ERG love have-that BERA
→ Only Piglet λx (x thinks Kanga λy (y loves x))

c. Bakarrik Piglet-ek uste du Kanga-k maite du-ela hura
   only Piglet-ERG think have Kanga-ERG love have-that HURA
→ Only Piglet λx (x thinks Kanga λy (y loves z))

Then there is the case of total syncretism: AAA. This is common in languages from Polynesia, for example Tongan and Bislama, but can also be found in Africa with Kinyarwanda (Niger-Congo), and is represented here by the Kartvelian language Georgian, (11).
(11) *Kanga/ only Piglet thinks that only Piglet / Kanga loves himself / him* in Georgian

a. k’anga pikrobs rom mxolod piglet’s uq’vars igi

   Kanga thinks that only Piglet loves IGI

   \[ \rightarrow \text{ Kanga } \lambda x (x \text{ thinks only Piglet } \lambda y (y \text{ loves } y)) \]

a’. mxolod piglet’i pikrobs rom k’angas uq’vars igi

   only Piglet thinks that Kanga loves IGI

   \[ \rightarrow \text{ Only Piglet } \lambda x (x \text{ thinks Kanga } \lambda y (y \text{ loves } x)) \]

   \[ \rightarrow \text{ Only Piglet } \lambda x (x \text{ thinks Kanga } \lambda y (y \text{ loves } z)) \]

There is one pattern of syncretism which is unattested: the ABA pattern. This pattern is completely absent from the 80 languages in my survey. This means that of the five logically possible patterns of syncretism that could be found in pronominal forms, four are attested, but the ABA pattern is not (12).

(12) *Four attested patterns of syncretism and one unattested*

\[
\begin{array}{cccc}
\text{AAA} & \text{AAB} & \text{ABB} & \text{ABC} & \text{*ABA} \\
\end{array}
\]

2.3 A Morphological Analysis

2.3.1 Permutations of Primitives

With four syncretism patterns attested and one unattested, the task now is to try to determine which permutations of primitives will derive all and only the attested patterns.\(^3\) In anticipation of the analysis in §2.3.3, I’m going to call these abstract primitives P, D and A. In the first pattern illustrated in (12), AAA, the three pronominals show complete syncretism. If we take syncretism to indicate that two pronominals share an underlying feature, we can conclude that there is some primitive, P,\(^4\) that is common to all three pronominal forms (13a). Taking the next two patterns illustrated in (12) – AAB and ABB – we see a bipartition in the system. Since each cell must have a unique set of primitives, and assuming we want to be conservative and use the minimal number of primitives to do this, we need two primitives, P and D, which can combine in four possible ways (13b).

---

\(^3\)For an abstract discussion of this problem, see Bobaljik & Sauerland 2018.

\(^4\)P is, and will remain, non-binary.
The monopartition (a); logically possible permutations for a bipartition (b)

The first two permutations show a cumulative pattern, so that one set of primitives is a proper subset of the other, while in the latter two permutations each half of the bipartition receives separate primitives. However, the latter permutations don’t preserve the possibility of total syncretism, which we require to account for AAA pronominal systems. This rules out the second two permutations in (13b), and we are left with only two permutations for a bipartition in the pronominal paradigm.

Now let’s consider the fourth pattern of syncretism illustrated in (12). This exhibits a tripartition. For this we minimally need three primitives; P, D and A. Following the argument for preserving the possibility of total syncretism above, we know that at least one primitive, P, must be shared by all three cells. If we generate the tripartition with primitive accumulation, six permutations are possible (14), while if we generate the tripartition allowing the primitives D and A to bundle separately, six more permutations are possible (15).

Cumulative primitives: logically possible permutations for a tripartition

Separate primitives: logically possible permutations for a tripartition

Recall that we were able to rule out two of the four logically possible permutations for a bipartition because they did not preserve the possibility of total syncretism. The
twelve permutations for a tripartition in (14) and (15) can be reduced to four via a similar requirement. It is important that our theory captures the fact that none of the syncretisms illustrated in (12) are non-adjacent. At present, eight of the permutations in (14) and (15) allow for non-adjacent syncretisms.

In (14), only the first two permutations disallow non-adjacent syncretisms. The second two permutations would produce non-adjacent syncretisms if there was one exponent realising the primitives \([PDA]\) and another realising only \([P]\). The final two permutations would produce non-adjacent syncretisms if one exponent realised \([PD]\) and the other \([P]\). Hence, these four permutations must be ruled out. In (15), only the first two permutations disallow non-adjacent syncretisms. The third and last permutations would produce non-adjacent syncretisms in the case where one exponent realised \([PA]\) and the other \([P]\), and the fourth and penultimate permutations would do the same with an exponent realising \([PD]\) and another for \([P]\). Hence, these four permutations can also be ruled out. It is impossible to generate an ABA syncretism pattern for the first two permutations in (14) or the first two permutations in (15), as there is no pair of exponents for any of the four permutations that will result in a permutation’s edge cells being realised by one exponent and the middle cell being realised by the other.

It is worth pausing for a moment to observe that these facts lead to four rules about the permutations of primitives that will disallow non-adjacent syncretisms. Firstly, one primitive \(X\), must underlie all forms, to account for cases of total syncretism. Secondly, for any permutation of primitives such that another primitive \(Y\), is the property of an edge cell, but is also the property of another cell non-adjacent to the first, non-adjacent syncretisms are allowed where there is one exponent realising the primitives \([XY]\) and another realising \([X]\). This is illustrated in (16a). Hence, our second rule must be that no primitive can be the property of non-adjacent cells.\(^5\) We also need to consider cases where one primitive belongs to a middle cell but not an edge one (16b). With the same two exponents, a non-adjacent syncretism will arise. Hence, our third rule must be that any primitive appearing in a middle cell must also appear in an edge cell.

(16) *Primitive permutations allowing non-adjacent syncretisms*

<table>
<thead>
<tr>
<th>a. (XY)</th>
<th>b. (X)</th>
<th>c. (XY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(X)</td>
<td>(XY)</td>
<td>(XY)</td>
</tr>
<tr>
<td>(XYZ)</td>
<td>(XZ)</td>
<td>(XZ)</td>
</tr>
</tbody>
</table>

Finally, the fourth rule must dictate that the primitives cannot stack up in a ‘mountain’-

\(^{5}\) I tacitly assumed this rule when I arranged the three logical functions in (7).
formation. There is one permutation of primitives that abides by the first three rules but allows an ABA syncretism. This permutation has two primitives, \( Y \) and \( Z \), which build up from opposing edges and overlap in the middle cell, creating a mountain-formation of primitives (16c). This arrangement of features overgenerates, allowing an ABA syncretism (with exponents for [X Y Z] and [X]), whereas the absence of \( Y \) and \( Z \) in the middle slot allows all and only the *ABA syncretism patterns. A mountain-formation of primitives should only be posited when there is clear morphological evidence to support it, as Caha 2017 argues for Locative-Allative-Dative Case syncretisms.\(^6\)

(17) *Four rules underlying the primitive permutations for *ABA syncretisms*

a. One primitive must underlie all forms.

b. No primitive can be the property of non-adjacent slots.

c. Any primitive in a middle cell must also appear in an edge one.

d. The primitives must not stack up in a mountain-formation.

Returning to the syncretism patterns at hand, we now have four permutations of primitives that allow for the four attested patterns of syncretism in (12), without allowing for the unattested fifth.

(18) *Actually possible primitive permutations for a tripartition*

<table>
<thead>
<tr>
<th>a. P D A</th>
<th>b. P</th>
<th>c. P D</th>
<th>d. P A</th>
</tr>
</thead>
<tbody>
<tr>
<td>P D</td>
<td>P</td>
<td>P D</td>
<td>P A</td>
</tr>
<tr>
<td>P</td>
<td>P D</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>P D A</td>
<td>P D</td>
<td>P D A</td>
<td>P A</td>
</tr>
</tbody>
</table>

All four of these permutations allow for the syncretisms in (12); the required exponents are given in each cell of (19) to illustrate this for (18a), and the required exponents are given in each cell of (20) to show this for (18c) (invert these for (18b) and (18d) respectively).

(19) *Illustration the cumulative permutations allow all the patterns in (12)*

\[^6\]Caha 2017 argues that the Locative and Allative Cases share a feature, and that the Allative and Dative Cases share a feature. This results in a mountain-formation of features which does not allow an ABA syncretism; the Locative and Dative Cases cannot be realised by one exponent while the Allative Case is realised by another. Such an analysis must be ruled out in the pronominal domain because it excludes the possibility of complete syncretism between the three pronominals.
Illustration the separate permutations allow all the patterns in (12)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>[P]</td>
<td>[P D]</td>
<td>[P]</td>
<td>[P D]</td>
</tr>
<tr>
<td></td>
<td>[P]</td>
<td></td>
<td>[P]</td>
</tr>
<tr>
<td></td>
<td>[P A]</td>
<td></td>
<td>[P A]</td>
</tr>
</tbody>
</table>

2.3.2 Transparent Morphology

In order to decide between the four primitive permutations in (18), we need to look for languages in which the morphology transparently reflects the structure of pronominal forms. English is one such language, since *himself* is clearly composed of two morphemes; the pronoun *him* and *self*. Since *himself* is exclusively used as an anaphor, we can rule out (18b) from contention, because in this permutation the anaphor realises only one primitive, which by hypothesis is incompatible with *himself*’s two morphemes. The languages in my sample provide robust support for ruling out the primitive permutation in (18b): the anaphors of Romanian (Romance), Igbo (Niger-Congo), Māori (Austronesian) and Nagamese (a north-east Indian creole), for example, are transparently made up of a SELF-morpheme and the syncretic morpheme for diaphors and pronouns (21).

The transparent morphology of five AAB languages

<table>
<thead>
<tr>
<th>himself</th>
<th>el însuși</th>
<th>onwe ya</th>
<th>ia anô</th>
<th>tai nijor</th>
</tr>
</thead>
<tbody>
<tr>
<td>him</td>
<td>el</td>
<td>ya</td>
<td>ia</td>
<td>tai</td>
</tr>
</tbody>
</table>

English Romanian Igbo Māori Nagamese

The primitive permutations in (18a,c,d), however, are all able to derive these pronominal systems. To decide between them we must turn to other languages. In my dataset the richest transparent morphological forms are confined to AAB languages, so I will turn to the Peranakan Javanese of Semarang (Austronesian, henceforth PJS), as reported by Cole et al 2007; 2015.

PJS has three pronominal forms: *awake dheen dhewe*, *awake dheen*, and *dheen*. The anaphor in PJS is *awake dheen dhewe*; it can only take a local, c-commanding antecedent. We know it’s a variable because it receives a Sloppy reading in VP ellipsis² (22).

---

²Klaus Abels and Benjamin Bruening (pc) point out that strictly speaking, these examples illustrate stripping, but as the binding literature traditionally uses the term *VP ellipsis*, I will stick with this term here too.
The anaphor of PJS (Cole et al 2015:143; 2007:25)

a. Alii ngomong nek aku pikir [Tonoj ketok awake dheen dhewei/j/k
Ali say C 1SG think [Tono see AWAKE DHEEN DHEWE
nggon kaca] in mirror

Ali said that I thought that Tono saw himself in the mirror.

b. [Gurue Tonoj]j ketok awake dheen dhewei/j/k nggon kaca
[teacher Tono] see AWAKE DHEEN DHEWE in mirror

Tono’s teacher saw himself in the mirror.

c. Tono ketok awake dheen dhewe nggon kaca, Siti yaya.
Tono see AWAKE DHEEN DHEWE in mirror Siti also
→ Tono λx (x saw x in the mirror) and Siti λy (y saw y in the mirror)
→ *Tono λx (x saw z in the mirror) and Siti λy (y saw z in the mirror)

Cole et al report that awake dheen can refer to either a local antecedent, a long distance antecedent, or a discourse antecedent (2007:32). This is illustrated in (23), with a local c-commanding antecedent, xj, a non-local antecedent, xi, and a discourse antecedent, xk. VP ellipsis shows that awake dheen is ambiguous between a bound variable interpretation (since it can take a Sloppy reading), and a fixed referent reading (since it can take a Strict reading). I will return to Strict and Sloppy readings in §2.4; they don’t concern us here.

The diaphor of PJS (Cole et al 2015:143; 2007:26)

a. Alii ngomong nek aku pikir [Tonoj ketok awake dheen [j/k nggon kaca]
Ali say C 1SG think [Tono see AWAKE DHEEN in mirror]

Ali said that I thought that Tono saw himself / him in the mirror.

b. [Gurue Tonoj]j ketok awake dheen [j/k nggon kaca
[teacher Tono] see AWAKE DHEEN in mirror

Tono’s teacher saw himself / him in the mirror.

c. Tono ngomong nek Bowo ketok awake dheen nggon kaca, Siti yaya.
Tono say C Bowo see AWAKE DHEEN in mirror Siti also
→ Tono λx (x said Bowo saw x) and Siti λy (y said Bowo saw y)
→ Tono λx (x said Bowo saw z) and Siti λy (y said Bowo saw z), z = Tono

The final pronominal form in PJS is dheen. Dheen behaves much like the pronoun in English; it is also ambiguous between the diaphoric and free pronoun readings, and in VP ellipsis can have both Sloppy and Strict readings (24).

a. Aliₕ ngomong nek aku pikir [Tonoₗ ketok dheenₗ/*ₗ/k nggon kaca]  
    Ali say C 1SG think [Tono see DHEEN in mirror]  
    Ali said that I thought that Tono saw him / her in the mirror.

b. [Gurue Tonoₗ]ₗ ketok dheenₗ/*ₗ/k nggon kaca  
    [teacher Tono] see DHEEN in mirror  
    Tono’s teacher saw him / her in the mirror.

c. Tono ngomong nek Bowo ketok dheen nggon kaca, Siti yaya.  
    Tono say C Bowo see DHEEN in mirror Siti also  
    → Tono λₓ (x said Bowo saw x) and Siti λᵧ (y said Bowo saw y)  
    → Tono λₓ (x said Bowo saw z) and Siti λᵧ (y said Bowo saw z)

Let’s start with awake dheen dhewe: it’s the most morphologically complex pronominal form, and also the most semantically restricted. In fact, it can operate only as an anaphor. Awake dheen, by contrast, is one morpheme poorer, and thus by hypothesis, must realise a proper subset of the primitives realised by awake dheen dhewe. This means we can temporarily ignore the fact that awake dheen can operate as an anaphor (since some additional mechanism must be permitting this, see §2.5), and focus only on the fact that it can operate as a diaphor. Finally we have dheen; this is more simplex still, comprising of only awake dheen’s second morpheme. This indicates that it realises a proper subset of the primitives awake dheen realises, and as it is the only pronominal form that can take any discourse antecedent, it must be PJS’s pronoun. In summary then, awake dheen dhewe is PJS’s anaphor, awake dheen is PJS’s diaphor, and dheen is PJS’s pronoun. Thus, the pronominal paradigm of PJS is given in (25a).

(25) The pronominal paradigm of PJS

<table>
<thead>
<tr>
<th>a. awake dheen dhewe</th>
<th>b. P D A</th>
<th>c. Exponents</th>
</tr>
</thead>
<tbody>
<tr>
<td>awake dheen</td>
<td>A ↔ dhewe</td>
<td></td>
</tr>
<tr>
<td>dheen</td>
<td>P ↔ awake</td>
<td>P ↔ dheen</td>
</tr>
</tbody>
</table>
top-heavy cumulative one in (18a) (repeated here as (25b)), with the exponents given in
(25c).

2.3.3 The structure and semantics of pronominal forms

We must now ask what forces the primitives to stack up in the top-heavy cumulative pattern.
The answer I propose is simple: A, D and P are functional heads that each belong to the
terminal node of a layered tree, such that P is on the lowest node, D on the one above it, and
A at the top (26a). Each node on the tree necessarily contains all the nodes below it, à la
Bobaljik’s Containment Hypothesis (2012); A and D thus form the extended projection of P
(Grimshaw 2005). Hence, the diaphor necessarily contains the pronoun, and the anaphor
necessarily contains the diaphor. While the tree is strictly hierarchical, I assume that
the branching is flexible, allowing for both left- and right-branching structures (Abels &
néeleman 2012). These assumptions immediately allow us to draw the pronominal tree
for the PJS anaphor (26b).

(26) Tree structure for pronominal forms (a); explicit for the PJS anaphor (b)

We can now see how the attested and unattested syncretism patterns illustrated in §2.2 are
accounted for. The tree in (26a) ensures that P will be a property of every pronominal,
thus accounting for AAA patterns of syncretism; as each functional head is added to the
structure, it automatically becomes a feature of all larger structures. This tree structure
also explains why we don’t find any cases of ABA syncretism in pronominal systems; if
an exponent X expones [P], and an exponent Y expones [D [P]], then by the Maximal
Subset Principle the exponent X will never ‘beat’ Y to be inserted for the anaphor, and
hence, ABA patterns cannot occur.

The restrictions on the antecedents of the pronominals are introduced to the structure by
the functional heads. In this thesis, I have given the functional head P as a presupposition

8This structure is thus a more fine-grained version of Reuland’s 2011 and 2017 analyses of anaphors such
as himself; the pronoun him is embedded within a larger structure.
9I assume that exponents can be inserted at non-terminal nodes; see Neeleman & Szendrói 2007;
Radkevich 2010.
that constrains the interpretation of the pronominal, while D and A are syntactic functions which are semantically empty. The pronominal tree complete with semantic denotations is given in (27).

\[
\begin{align*}
\mathbb{P} & = w_i \in D_e \\
[A] & = \lambda z . z \\
[D] & = \lambda y . y \\
[\varphi] & = \lambda x : \pi(x) \wedge \#(x) \wedge \varphi(x) . x
\end{align*}
\]

The feature P is straightforward. Following Heim & Kratzer 1998, I assume P is a variable of type \( <e> \). P is associated with \( \varphi \)-features; these are given as a function of type \( <e,e> \) that combines directly with P, and they add the presuppositions that the entity identified by P has \( \varphi \)-features that match the pronoun’s. It is a standard assumption that \( \varphi \)-features introduce presuppositions that constrain the interpretation of pronominals (e.g. Cooper 1983; Dowty & Jacobson 1989; Heim & Kratzer 1998; Büring 2005; Heim 2005; 2007; Kratzer 2009; Sudo 2012).\(^{10}\)

While this thesis does not investigate the decomposition of P and \( \varphi \)-features, I have placed the \( \varphi \)-features as a function above P to capture the nature of their semantics. However, this arrangement also has a morphological reflex. There is evidence that \( \varphi \)-features really can be separate from P.\(^{11}\) For example, in the Slavic languages there is a clear pronominal root on, which is followed by portmanteau morphemes that indicate gender and Case (e.g. Russian 3SG.NOM: MASC on; FEM on-a; NEUT on-o). Similarly, the pronouns of Ainu, a language isolate spoken in Japan and Russia, include Number morphemes; -ani marks the singular, while -oka marks the plural (Shibatani 1990).\(^{12}\)

\(^{10}\)This is not considered to be the true semantic story, however (Kratzer 2009). Since I am no semanticist, I leave this problem to the experts.

\(^{11}\)I’m grateful to Jonathan Bobaljik (pc) for telling me about these cases.

\(^{12}\)I assume that some kind of DP-internal concord explains cases in which \( \varphi \)-features are realised multiple times within a pronominal form, as is arguably the case with Number in English (*him-self* SG; *them-selves* PL). It should be noted, however, that the *they-them-their* triplet is losing its plural specification in English.
The feature D is a functional head that takes the pronominal denoted by \([\phi \ [P]]\) and binds it to a c-commanding antecedent at LF. D is a semantically empty syntactic function, which I model on the function Self from Neeleman & van de Koot 2002. Neeleman & van de Koot represent grammatical dependencies as functions that enter the tree with their dependent (thereby satisfying Inclusiveness, Chomsky 1995), and then percolate (or climb) the tree until they are satisfied by particular features which they must immediately c-command (thereby satisfying Accessibility, Chomsky 1995). For example, predicates introduce argument functions (theta roles), which percolate the tree until they immediately c-command arguments.

In the present case, D is a function that percolates the tree at LF until it meets an unsatisfied theta role. The function D is essentially parasitic on theta roles (similar ideas have been suggested before, for instance in Williams 1980, Reinhart & Reuland 1993 and Neeleman & van de Koot 2002); it attaches to an unsatisfied theta role and they percolate the tree until they are satisfied by an argument together. D does not have to attach to the first unsatisfied theta role it meets; it can attach to any unsatisfied theta role, ensuring that the binding relationship between the diaphor and its antecedent can be non-local.

It is crucial that D percolates the tree at LF and not in the syntax before Spell Out, because the important constraint that D introduces is scope. In the Heim & Kratzer 1998 system, all pronominals are variables, and hence theoretically capable of being bound. Since this overgenerates, Heim & Kratzer assume that antecedents must c-command the variables they bind at LF in order for the variable binding relationship to hold (1998:241). In other words, bound variables must fall within the scope of their antecedent.

The claim that binding occurs under scope may be contested in favour of an analysis in which binding occurs under c-command in the syntax proper. In contrast to theories that analyse \(\phi\)-Agreement as mediating the binding relationship (e.g. Kratzer 2009; Reuland 2011; 2017 (for simplex anaphors); Rooryck & Vanden Wyngaerd 2011; Wurmbrand 2017), there are alternative theories of binding that posit some feature similar to D. For example, Adger & Ramchand 2005 propose I\(\phi\) and Safir 2014 proposes D-bound. Both theories assume that the feature must be c-commanded by its antecedent in the syntax proper for the binding relationship to obtain. Indeed, since Reinhart 1983, the overwhelming majority of linguists have believed c-command to be the crucial relation between the variable and its antecedent, a claim which has been comprehensively challenged by Barker 2012 (see also Higginbotham 1980; May 1985; Moulton & Han 2018), who shows that variable

(as in the sentence Go home to your spouse and ask them if they would like to come to our party), but the double plurality remains in the my+*self; our+*selves pair.

\(^{13}\)If all pronominals were capable of being bound, the pronoun he in the following pair of sentences should be able to take a bound variable reading, which it can’t: I don’t think anybody here is interested in [every boy]’s work. He, should not be invited.
binding occurs under scope. The critical cases are ‘almost c-command’ sentences, such as the famous Every farmer who owns a donkey, beats it. If c-command in the syntax proper is the crucial relationship between a variable and its antecedent, there should be no language which can morphologically distinguish bound variable interpretations of almost c-command sentences from free pronoun interpretations; these should uniformly be given with the exponents for P.

It’s quite difficult to construct almost c-command sentences which test this prediction, primarily due to additional language-specific constraints imposed on the exponents for diaphors (see below). For example, Mandarin’s zǐjǐ is subject-orientated, so it is impossible to construct an almost c-command sentence which will test the prediction. Icelandic’s sig appears to be likewise constrained, ruling Icelandic out as a possible tester too. Fortunately, Japanese’s zibun isn’t subject to such a restriction. Consider the data in (28).

(28) Japanese ‘almost c-command’ sentences

a. [dono otokonoko-no heya]-ni-mo [zibun-no syasin]-ga aru [which boy-GEN room]-in-MO [ZIBUN-GEN picture]-NOM exist
  → In every boy λx (x’s room) there’s a picture of x.

b. [dono otokonoko-no heya]-ni-mo [kare-no syasin]-ga aru [which boy-GEN room]-in-MO [KARE-GEN picture]-NOM exist
  → In every boy λx (x’s room) there’s a picture of y.

c. [hotondo-no otokonoko-no heya]-ni [zibun-ga tukutta mono]-ga aru [most-GEN boy-GEN room]-in [ZIBUN-NOM made thing]-NOM exist
  → In most boys’ λx (x’s rooms) there’s something x made.

d. [hotondo-no otokonoko-no heya]-ni [kare-ga tukutta mono]-ga aru [most-GEN boy-GEN room]-in [KARE-NOM made thing]-NOM exist
  → In most boys’ λx (x’s rooms) there’s something y made.

In these examples, the bound variable zibun is not c-commanded by its antecedent. Instead, the variable appears only in its antecedent’s scope. When the pronominal is not bound, the exponent kare ([P,MASC]) appears. One cannot resort to positing PRO as the possessor (and therefore variable binder) of picture of himself for (28a) to rescue this data (as suggested in Chomsky 1986), because the pattern can also be seen in (28c,d) and it’s not clear where one could posit PRO in the phrase something he made. This data thus backs up Barker’s claim that variable binding occurs under scope, not c-command, and supports this analysis of D.14

14Some experimental studies investigating the role of syntax in the interpretation of bound variables,
Finally we have the feature $A$. $A$ is associated with local c-command; it takes the variable $[D \varphi [P]]$ and introduces a locality restriction on its antecedent. Roughly, its antecedent can be no further away from the anaphor than the nearest c-commanding subject. Like $D$, $A$ is a semantically empty syntactic function, which percolates the tree at LF until it finds an unsatisfied theta role, and they are satisfied by an argument together. However, unlike $D$, $A$ must attach to the first theta role it meets; this ensures that the anaphor’s antecedent will be local.$^{15}$

Like $D$, $A$ percolates the tree at LF. However, the notion of local c-command is fundamentally syntactic in nature, since it must be satisfied in the syntax proper. This idea is not new: all theories in which some form of Agreement mediates the binding relationship propose a syntactic account for the restrictions on anaphors, and some non-Agreement analyses also offer syntactic explanations, such as the feature $\text{VAR}$ in Hicks 2006; 2009, the feature $\text{DEP}$ in Sundaresan 2013, or the function $\text{Self}$ in Neeleman & van de Koot 2002.

In the present proposal, this is derived by the percolation $D$ being dependant on the percolation of $A$. When $D$ is immediately c-commanded by $A$, as is the case when the pronominal is an anaphor, $D$ must attach to $A$; they then attach themselves to the same theta role and all three are satisfied by one argument together. Limiting the percolation of $D$ to the percolation of $A$ ensures that the anaphor’s antecedent c-commands it in the syntax proper as well as at LF because the locality restriction on $A$ prevents the anaphor from having an QR’d antecedent at LF (29).

(29) Anaphors cannot take non-c-commanding antecedents

a. *[Every farmer who owns a donkey] beats itself.
b. [Every farmer who owns a donkey] beats it.
c. [Every farmer who owns a donkey] beats himself.

It is notable that there is nothing in the semantics of $A$ that dictates that it must merge above $D$; this is simply stipulated as a fact rendered transparent by the morphological patterns found in the languages of my survey. However, Klaus Abels (pc) observed that this might not be true; while the data in (30) suggests that $A$ merges above $D$ (since the anaphors transparently contain the morphology of the diaphors), the data in (31) suggests that $A$

---

$such$ as Kush et al 2015 and Cunnings et al 2015, have used c-command as the relevant syntactic notion. However, they typically make this assumption out of convenience, making it clear in their papers that they are aware of Barker’s 2012 claims and deliberately design their experiments to avoid sentences that involve variable binding under scope alone. For experimental work that examines the role of scope and c-command in variable binding and confirms Barker’s 2012 claim, see Moulton & Han 2018.

$^{15}$As shown by Neeleman & van de Koot 2002, this also captures the ambiguous interpretation of anaphors in ditransitive sentence, such as William, showed Harry, himself in The Mirror; $A$ meets both the predicate’s unsatisfied theta roles at the same time, allowing himself to mean either William or Harry.
could merge directly with P.

(30)  *The transparent morphology of three ABC languages*

<table>
<thead>
<tr>
<th>Icelandic</th>
<th>Malay</th>
<th>Telugu</th>
</tr>
</thead>
<tbody>
<tr>
<td>sjálfan</td>
<td>dirinya</td>
<td>tananu</td>
</tr>
<tr>
<td>sig</td>
<td>diri</td>
<td>tananu</td>
</tr>
<tr>
<td>hana</td>
<td>dia</td>
<td>atanini</td>
</tr>
</tbody>
</table>

(Germanic) (Austronesian) (Dravidian)

(31)  *The transparent morphology of four AAB languages*

<table>
<thead>
<tr>
<th>English</th>
<th>Armenian</th>
<th>Fanti</th>
<th>Tenyidie</th>
</tr>
</thead>
<tbody>
<tr>
<td>himself</td>
<td>inqn iren</td>
<td>nh⁴ho</td>
<td>puo thie puo</td>
</tr>
<tr>
<td>him</td>
<td>iren</td>
<td>n⁴</td>
<td>puo</td>
</tr>
</tbody>
</table>

(Germanic) (Indo-European) (Niger-Congo) (Sino-Tibetan)

There are two reasons to believe that A always merges above [D [P]]. Firstly, no one has ever reported a pronominal form that must take a local antecedent but cannot be a bound variable, and since bound variablehood is a restriction introduced by the feature D, A must merge above D. Secondly, if A can merge directly above P, we expect the anaphors in English, Armenian, Fanti and Tenyidie to be able to have a locally c-commanding antecedent, but without needing to be in its scope. Consider the sentence in (32), which has two possible readings.

(32)  *Some young lady seems likely to dance with every senator.*  (Barss 1986)

\[ \exists > \forall \rightarrow \text{There’s one lady; it seems likely she’ll dance with all the senators.} \]

\[ \forall > \exists \rightarrow \text{For each senator there’s a lady who seems likely to dance with him.} \]

It can be demonstrated that the wide scope reading of the universal (\( \forall > \exists \)) in examples like (32) cannot be due to long-distance quantifier raising (see Neeleman & Payne 2019 and references therein). Rather, the second reading in (32) can only be accessed if *some young lady* is interpreted in its base position, with *every* taking scope over the whole of the embedded clause (33).

(33)  \( \forall > \exists \) interpretation

\[ [\text{Some young lady}]_i \text{ seems likely } [t_i \text{ to dance with every senator}]. \]
By this reasoning, the scope domain of some young lady is also the embedded clause. But if we insert an anaphor as the object of the matrix verb, only one interpretation is available (34).\footnote{This argument has been presented before, for example in Aoun 1982; Fox 1999; Lebeaux 1994; 2009.}

(34) Barss 1986 example with an anaphor

Some young lady seems to herself likely to dance with every senator.

\[ \exists > \forall \rightarrow \text{There’s one lady; it seems to her likely that she will dance with all the senators.} \]

\[ \forall > \exists \rightarrow \text{For each senator there is a lady for whom it seems likely that she will dance with him.} \]

On an account in which anaphors simply need to be within the local c-command domain of their antecedent, this is unexpected. However, if anaphors need to be both within the local c-command domain of their antecedent, and within its scope domain, this data is expected. Hence, we can see that anaphors realise both A and D; the English anaphor cannot simply be A merged above P.

Before I close this section, one thing must be said about the exponents for the pronominal forms. The exponents of the pronominal forms can be restricted by more than just the features A, D and P. For example, Icelandic’s sig spells out [D [P]], but is additionally restricted to subjunctive (SUBJ) and non-finite clauses (N-FIN) (Maling 1984; Hellan 1986; Sigurðsson 1990). Similar facts can be found for Danish (Anderson 1986; Hellan 1986; Thráinsson 1990), Norwegian (Hellan 1986), Russian (Progovac 1992), Dutch (Koster 1985; 1987), and Italian (Giorgi 1984). I propose that these constraints are features in the spirit of Safir’s [+F] features (2014), which further restrict the Spell Out of the respective exponents (35).

(35) Additional constraints on pronominal exponents

\[
\begin{align*}
[D [P]], \text{SUBJ, N-FIN, Subj } & \leftrightarrow \text{sig Icelandic} \\
[D [P]], \text{Subj } & \leftrightarrow \text{zìjī Mandarin} \\
[P], \text{PERSP } & \leftrightarrow \text{ta(a)n Tamil}
\end{align*}
\]

Pronominal forms can also be subject or object oriented (Subj); sig and Standard Mandarin’s zìjī are subject-orientated; Mapun’s nuwa (Frajzyngier 1985), Gokana’s -èè (Hyman & Comrie 1981), Yoruba’s òun (Adesola 2006), and Ewe’s yè (Clements 1975) are all able to take objects as antecedents. Another constraint is perspective (PERSP); Tamil’s ta(a)n (Sundaresan 2013) and Ewe’s yè (Clements 1975) are obligatorily read de se. Since each of these restrictions is language-specific, I must leave for further research the question
of whether these are (a) restrictions on the pronominal features I propose, (b) restrictions introduced by an independent set of features, or (c) restrictions imposed by something else altogether (such as semantic operators).

2.4 In defence of presuppositions

In this section, I introduce a problem posed by Strict and Sloppy readings of anaphors and diaphors, and show how it can be accounted for by adopting and extending Sauerland’s 2013 weak presuppositional analysis of anaphors.

The present study was triggered by the following data from Icelandic and Ewe (Niger-Congo), which was juxtaposed in Culy 1994.

(36) *Only Diana believes that Charles loves her* in Icelandic (Sells 1987:467)

a. Aðeins Díana telur að Karl elski sig
   only Diana believes that Charles loves SIG
   \[ \rightarrow \text{Only Diana } \lambda x (x \text{ believes Charles } \lambda y (y \text{ loves } x)) \]

b. Aðeins Díana telur að Karl elski hana
   only Diana believes that Charles loves HANA
   \[ \rightarrow \text{Only Diana } \lambda x (x \text{ believes Charles } \lambda y (y \text{ loves } z)), z = \text{Diana} \]
   \[ \rightarrow \text{Only Diana } \lambda x (x \text{ believes Charles } \lambda y (y \text{ loves } z)), z \neq \text{Diana} \]

(37) *Only Kofi ♂ believes that Ama ♀ loves him* in Ewe (Culy 1994:1082)

a. Kofi ko e-hose be Ama lọ yè
   Kofi only 3SG-believes C Ama loves YE
   \[ \rightarrow \text{Only Kofi } \lambda x (x \text{ believes Ama } \lambda y (y \text{ loves } x)) \]
   \[ \rightarrow \text{Only Kofi } \lambda x (x \text{ believes Ama } \lambda y (y \text{ loves } z)), z = \text{Kofi} \]

b. Kofi ko e-hose be Ama lọ e
   Kofi only 3SG-believes C Ama loves E
   \[ \rightarrow \text{Only Kofi } \lambda x (x \text{ believes Ama } \lambda y (y \text{ loves } z)), z \neq \text{Kofi} \]

In both languages we find a syncretism: the Icelandic pronominal *hana* is ambiguous between the pronoun reading and the Strict diaphor reading (36b), to the exclusion of the Sloppy diaphor reading (36a), while the Ewe pronominal *yè* is ambiguous between the Strict and Sloppy diaphor readings (37a), to the exclusion of the pronoun reading (37b).

To account for this mismatch of syncretisms, we could posit a fourth pronominal form (the Strict diaphor) that slots in between the diaphor and pronoun in the paradigm. However, in the 80 languages in my sample, no language has unique morphology for
this fourth pronominal; it is always syncretic with either the diaphor or pronoun.\footnote{I am indebted to Benjamin Bruening for pointing this out to me.} I will therefore pursue a different explanation for this divergence of syncretism patterns.

2.4.1 The puzzle repeated

The fact that there can be a morphological divergence between the Strict and Sloppy readings of non-locally bound pronominals predicts that there can be a morphological divergence between the Strict and Sloppy readings of locally bound pronominals. This prediction is borne out; Strict readings of anaphors in languages such as English are realised with the same anaphors as are used for Sloppy readings (38) (McKillen 2016), while languages such as Icelandic use their diaphor (39).\footnote{There are also languages like Dutch, which avoid such constructions altogether:}

(38) The anaphor with a local Strict reading in English

a. Only Tigger defended \textbf{himself}.
\[\rightarrow \text{Only Tigger } \lambda x (x \text{ defended } z), z = \text{Tigger}\]

b. Even Tigger defended \textbf{himself}.
\[\rightarrow \text{Even Tigger } \lambda x (x \text{ defended } z), z = \text{Tigger}\]

(39) The diaphor with a local Strict reading in Icelandic\footnote{Using \textit{sig} in (39a) results in the long-distance Sloppy reading; since (39b) only has one possible antecedent, the Strict reading is possible.}

a. Kanga heldur \textit{að} aðeins Gríslíngur elska \textbf{sjálfan sig} Kanga thinks that only Piglet \textbf{loves} \textbf{SJALFAN SIG}
\[\rightarrow *\text{Kanga } \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } z)), z = \text{Piglet}\]

b. Meira \textit{að} segja hatar jafnvel Gríslíngur \textbf{sig} líka more to say \textbf{hates} even Piglet \textbf{SIG} too
\[\rightarrow \text{Even Piglet } \lambda x (x \text{ hates } z), z = \text{Piglet}\]

Since Strict anaphors and Strict diaphors (when morphologically distinct from their Sloppy counterparts) uniformly display syncretism with diaphors and pronouns respectively, some form of impoverishment needs to be invoked to explain the morphological variation. The
traditional trigger for impoverishment is when a pair of neighbouring features create a configuration that is banned by the language, causing the deletion of one of the features (see, for example, Nevins 2011). Such a trigger for impoverishment is unavailable here, as Strict and Sloppy readings do not involve a feature-pair configuration. Instead, I propose explaining the morphological variance between Strict and Sloppy readings with a different kind of impoverishment: primitive dropping. My analysis is an extension of Sauerland’s 2013 weak presuppositional analysis of anaphors.

2.4.2 Sauerland 2013

Sauerland 2013 is concerned with (among other things) Strict readings of anaphors under focus, such as those in (40).

(40) Anaphors with Strict readings under focus

a. Only Tigger defended himself.
   \[ \rightarrow \text{Only Tigger } \lambda x (x \text{ defended } z), z = \text{Tigger} \]

b. Even Tigger defended himself.
   \[ \rightarrow \text{Even Tigger } \lambda x (x \text{ defended } z), z = \text{Tigger} \]

Sauerland argues that anaphors such as himself have no at-issue content (i.e. they are simply pronouns), but they (or rather, the self morpheme) add a presupposition that restricts their interpretation. This presupposition effectively states that there is a predicate, P, whose arguments \( x \) and \( y \) are identical.\(^{20}\) To illustrate this presupposition in action, consider the Sloppy readings of the sentences in (41).

(41) Anaphors with Sloppy readings

a. Only Tigger defended himself.
   \[ \rightarrow \text{Only Tigger } \lambda x (x \text{ defended } x) \]

b. Roo defended himself before Tigger did.
   \[ \rightarrow \text{Roo } \lambda x (x \text{ defended } x) \text{ before Tigger } \lambda y (y \text{ defended } y) \]

Because of the presupposition introduced by himself, the meaning of the predicate in (41a) is \( \{x \text{ defended } x : x \in D_v\} \). The focus particle only evokes sets of alternatives, the standard value of which are \( \{y \text{ defended } y\} \) and \( \{z \text{ defended } z\} \), etc. Hence we get the Sloppy reading, in which Roo didn’t defend himself, and Eeyore didn’t defend himself either. This can be seen in (42a), where the meaning of defended himself has the assignment function \( g \), and is evaluated against the standard alternatives, \( s \).

\(^{20}\)See Sauerland 2013 for his approach to anaphors in ECM constructions.
The meaning of the predicate in (41b) is \( \{ x \text{ defended} : x \in D_e \} \). The elided VP in the embedded clause also evokes sets of alternatives, the standard value of which are \( \{ y \text{ defended} y \} \) and \( \{ z \text{ defended} z \} \), etc, and hence we get the Sloppy reading in which Tigger defended himself. This is shown in (42b).

(42) **Standard sets of alternatives**

a. Only Tigger defended himself.

\[
\text{[defended himself]}_{g,s}^{g,s} = \{ x \text{ defended} : x \in D_e \}
\]

Set of Alternatives

\( g,s = \{ \{ y \text{ defended} y \}, \{ z \text{ defended} z \}, \ldots \} \)

b. Roo defended himself before Tigger did.

\[
\text{[defended himself]}_{g,s}^{g,s} = \{ x \text{ defended} : x \in D_e \}
\]

Set of Alternatives

\( g,s = \{ \{ y \text{ defended} y \}, \{ z \text{ defended} z \}, \ldots \} \)

But the sentences in (41) also have Strict readings. Sauerland accounts for these by assuming that the anaphor’s presupposition exhibits weakened projection. This means that it can be dropped when sets of alternatives are evaluated.\(^{21}\) The idea that presuppositions can be dropped when sets of alternatives are evaluated has been independently proposed for \( \phi \)-features.\(^{22}\) For example, the sentence in (43) is compatible with the scenario in which Piglet didn’t do his (Piglet’s) homework, and Tigger didn’t do his (Tigger’s) homework either. This is because the presupposition of feminine gender is able to drop in the evaluation of alternative student-homework pairs (see Sudo 2012 and references therein for extensive discussion).

(43) **Dropping the presupposition of feminine gender**

Only Kanga did her homework.

\[ \rightarrow \text{Only Kanga } \lambda x (x \text{ did } x's \text{ homework}) \]

When the gender presupposition is dropped in the evaluation of alternatives, the gender of the pronouns in the alternative sets matches the gender of their antecedents in the alternative sets, hence Piglet didn’t do his homework, and Tigger didn’t do his homework either. This maintains the Sloppy reading of (43). But in Sauerland’s analysis, when the anaphor’s presupposition drops, the Strict reading is obtained. To capture this, Sauerland assumes that the actual semantic value of a constituent is always available (Sauerland 2013:160), and when the anaphor’s presupposition is dropped in the evaluation of alternatives, it

\(^{21}\) Sauerland actually only allows weakened presuppositions to drop during the evaluation of focus alternatives, but since VP ellipsis also allows Strict readings in English, I assume (with Bruening 2018:11) that the weakened presupposition can drop during the evaluation of any sets of alternatives.

\(^{22}\) Impoverishment at LF is sometimes referred to as deprivation (Nevins 2008).
is replaced by the actual semantic value of the anaphor in the original sentence. This generates the Strict reading of the sentence. Let’s look at this in action.

The meaning of the predicate in (41a) is \( \{ x \text{ defended } x : x \in D_e \} \). It’s actual semantic value, however, is \( \{ x \text{ defended Tigger } : x \in D_e \} \). When the focus particle only evokes sets of alternatives, the weakened presupposition can drop, which means that the sets of alternatives have to be evaluated against (41a)’s actual semantic value, generating \( \{ y \text{ defended Tigger} \} \) and \( \{ z \text{ defended Tigger} \} \), etc. Hence we get the Strict reading, in which Roo didn’t defend Tigger, and Eeyore didn’t defend Tigger either. This can be seen in (44a), where the meaning of defended himself has the assignment function \( g \), and is evaluated against the focus alternatives (the actual semantic value of the predicate), \( f \).

Likewise, the actual semantic value of the predicate in (41b) is \( \{ x \text{ defended Roo} \} \). If the elided VP in the embedded clause evokes sets of alternatives which are evaluated against (41b)’s actual semantic value, we get the Strict reading in which Tigger defended Roo. This is shown in (44b), where the meaning of defended himself is evaluated against the ellipsis alternatives (the actual semantic value of the predicate), \( e \).

(44) Focus and ellipsis sets of alternatives

a. Only Tigger defended himself.
   \[ \text{[defended himself]}_{g,f} = \{ x \text{ defended Tigger } : x \in D_e \} \]
   Set of Alternatives\( g,f = \{ \{ y \text{ defended Tigger} \}, \{ z \text{ defended Tigger} \}, ... \} \)

b. Roo defended himself before Tigger did.
   \[ \text{[defended himself]}_{g,e} = \{ x \text{ defended Roo } : x \in D_e \} \]
   Set of Alternatives\( g,e = \{ \{ y \text{ defended Roo} \}, \{ z \text{ defended Roo} \}, ... \} \)

I adopt Sauerland’s 2013 analysis in the following form: I assume that the functional heads A and D percolate up the tree at LF to attach to a theta role and be satisfied, subject to restrictions. D’s restriction is that it must percolate to a point where it (and the theta role) immediately c-command the argument that satisfies it (i.e. the diaphor falls within its antecedent’s scope), and A’s restriction is that it must attach to the first theta role it meets (i.e. the anaphor’s antecedent is local). When the construction evokes sets of alternatives, as in the case of focus constructions and ellipsis, and if the functions are weak, they can be dropped during the evaluation of the alternatives. This means that for the alternatives, A and D do not need to percolate, and Strict readings are obtained.

2.4.3 A unified analysis of Strict and Sloppy readings

Let’s return to English. In English, if the function A is weak, it can be dropped when sets of alternatives are being evaluated, and the anaphor will be able to express the Strict reading.
This was shown in (44). Hence, adapting Sauerland’s 2013 weak presuppositional analysis of anaphors derives exactly the English data.

Now let’s turn to Icelandic. Explaining this data requires a small detour on the topic of Economy. Distributed Morphology (and many other theories) follows the Maximal Subset Principle (Kiparsky 1973; Halle & Marantz 1993) in determining which Vocabulary Item spells out what syntax at the PF interface. In essence, the Maximal Subset Principle says *take the richest morphological form compatible with your syntax*. The Maximal Subset Principle is a principle of economy; *other things being equal, one way of assigning an interpretation to some element is preferred over another*, to borrow the words of Reuland (2001:472). Principles of economy don’t just apply at the PF interface between syntax and Spell Out; they apply at the LF interface between syntax and semantics too. To paraphrase the essence of the Maximal Subset Principle, the principle here is *take the richest syntactic structure compatible with your semantics*. Ackema & Neeleman 2018 unify these principles as a principle of competition, called *Maximal Encoding*.23

\[ \text{(45) The Principle of Maximal Encoding (Ackema & Neeleman 2018:18)} \]

\[ \begin{align*}
&\text{a. A mapping } R \rightarrow R^* \text{ is licit only if } R^* \text{ is the maximal expression of } R \text{ at the} \\
&\quad \text{relevant level of representation.} \\
&\text{b. } R^* \text{ expresses } R \text{ maximally if there is no alternative } R' \text{ that encodes more proper-} \\
&\quad \text{ties of } R \text{ or encodes these properties in more locations.}
\end{align*} \]

The significance of the Principle of Maximal Encoding with respect to constructions containing anaphors with Strict readings, is that when \( A \) cannot be dropped (rendering \([ A [D[P]]]\) over-specified for the intended semantics), there is a minimally different syntactic structure that captures the maximal subset of the intended semantics, namely the same structure with the diaphor instead of the anaphor. In other words, if \( A \) cannot drop, we expect to see the morphological diaphor appear. This is exactly what happens in Icelandic.

Consider the examples in (46). (46a) shows that the Icelandic anaphor is unable to take a Strict reading. In (46b) the Strict reading is possible, but much more accessible if *sjálfan* is dropped. This is expected, as it follows from the Principle of Maximal Encoding; the pronominal tree \([D[P]]\) is the richest syntactic structure compatible with the semantics of an anaphor with a Strict reading, and the exponent for this is *sig*. However, dropping *sjálfan* renders (46b) slightly awkward; if we examine its more natural counterpart in (46c), the Strict reading is easily accessible.24

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23See also Heim’s 1991 *Maximise Presuppositions*.
24I am indebted to Gísli Rúnar Harðarson for providing me with the Icelandic data in this section.
A locally bound pronominal with a Strict reading in Icelandic

a. Kanga heldur að aðeins Gríslíngur elski sjálfan sig
Kanga thinks that only Piglet loves SJALFAN SIG

→ Kanga λx (x thinks that only Piglet λy (y loves y))
→ *Kanga λx (x thinks that only Piglet λy (y loves z)), z = Piglet

b. Meira að segja hatar jafnvel Gríslíngur ḡ(sjálfan) sig
more to say hates even Piglet (SJALFAN) SIG

→ Even Piglet λx (x hates x)
→ Even Piglet λx (x hates z), z = Piglet

c. Meira að segja hatar Gríslíngur sig líka
more to say hates Piglet SIG too

→ Even Piglet λx (x hates x)
→ Even Piglet λx (x hates z), z = Piglet

Thus, the actual semantic values of the Icelandic predicates and their corresponding sets of alternatives under focus and ellipsis are given in (47).

(47) Focus and ellipsis sets of alternatives in Icelandic

a. Meira að segja hatar Gríslíngur sig líka
more to say hates Piglet SIG too

Even Piglet hates himself.
[\text{hates sig}]^{g,f} = \{x \text{ hates Piglet} : x \in D_e\}
Set of Alternatives^{g,f} = \{\{y \text{ hates Piglet}\}, \{z \text{ hates Piglet}\}, \ldots\}

b. Gríslíngur varði sig aður en Bangsímon gerði það
Piglet defended SIG before but Pooh did it

Piglet defended himself before Pooh did.
[\text{defended sig}]^{g,e} = \{x \text{ defended Piglet} : x \in D_e\}
Set of Alternatives^{g,e} = \{\{y \text{ defended Piglet}\}, \{z \text{ defended Piglet}\}, \ldots\}

In the present analysis, Strict and Sloppy readings of anaphors and diaphors are accounted for by the possibility of dropping A and D during the evaluation of alternative. Sloppy readings are always available, because diaphors and anaphors are variables in the standard value of their predicate. Variation arises, however, with Strict readings. The conditions under which Strict readings are available are summarised in (48).
The possibilities of local and non-local Strict readings

<table>
<thead>
<tr>
<th>A</th>
<th>D</th>
<th>Anaphor</th>
<th>Diaphor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong</td>
<td>Strong</td>
<td>*Strict</td>
<td>*Strict</td>
</tr>
<tr>
<td>Strong</td>
<td>Weak</td>
<td>*Strict</td>
<td>Strict</td>
</tr>
<tr>
<td>Weak</td>
<td>Strong</td>
<td>*Strict (out of scope)</td>
<td>*Strict</td>
</tr>
<tr>
<td>Weak</td>
<td>Weak</td>
<td>Strict (in scope)</td>
<td>Strict</td>
</tr>
</tbody>
</table>

The predictions regarding diaphors are straightforward, because we only have one function to worry about; D. The relevant columns of (48) here are the second and fourth: when D’s presupposition is strong, only non-local Sloppy readings are available, as shown for Cantonese (Sino-Tibetan) (49). But when D is weak, both Strict and Sloppy readings become available, as the Turkish data shows (50).

(49) **Only Diana thinks that Charles loves her** in Cantonese

zinghai Diana kokdak Charles oi zigei
only Diana think Charles love ZIGEI
→ Only Diana λx (x thinks that Charles λy (y loves x))
→ *Only Diana λx (x thinks that Charles λy (y loves z)), z = Diana

(50) **Only Piglet thinks that Kanga loves him** in Turkish

Sadece Piglet Kanga-nin kendisin-i sev-diğ-in-i düş-ün-iyor
only Piglet.NOM Kanga-GEN KENDISIN-ACC love-C-POSS-ACC think-PROG-3SG
→ Only Piglet λx (x thinks that Kanga λy (y loves x))
→ Only Piglet λx (x thinks that Kanga λy (y loves z)), z = Piglet

A more interesting set of predictions arises with respect to locally-bound pronominals, because the anaphor is built on top of the diaphor, meaning that the presuppositions can interact. We’re now looking at the first, second and third columns of (48): when A is strong, it won’t drop when sets of alternatives are being evaluated, and only a Sloppy reading will be available. This is shown in Dutch (51). When both A and D are weak, both can drop, and both Strict and Sloppy readings will be available. We see this in English, (52).

(51) **Kanga thinks that only Piglet loves himself** in Dutch

Kanga denkt dat alleen Piglet van zichzelf houdt
Kanga thinks that only Piglet of ZICHZELF loves
→ Kanga λx (x thinks that only Piglet λy (y loves y))
→ *Kanga λx (x thinks that only Piglet λy (y loves z)), z = Piglet
(52) *Kanga thinks that only Piglet loves himself* in English

Kanga thinks that only Piglet loves *himself*.

\[ \rightarrow \text{Kanga } \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y)) \]
\[ \rightarrow \text{Kanga } \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } z)), \ z = \text{Piglet} \]

But when \( \Lambda \) is weak and \( D \) is strong, anaphors will only be able to take Strict readings when the anaphor falls within the scope of its antecedent; when it falls outside its antecedent’s scope, a Strict reading will be impossible. I don’t have an example with anaphors, but Icelandic VP ellipsis illustrates equally well. Consider the examples in (53). As we saw earlier, the diaphor *sig* is used when a locally bound pronominal has a Strict reading. In (53a), the elided VP is embedded in the matrix sentence, so the elided pronominal remains within the scope of its antecedent. Thus, the Strict reading is allowed, because the pronominal still meets the constraint imposed by \( D \)’s percolation up the tree.

(53) *Locally bound pronomininals in and out of their antecedent’s scope in Icelandic*

a. Gríslíngur varði *sig aður en Bangsímon gerði það*

\[ \text{Piglet defended } \text{SIG before but Pooh did it} \]
\[ \rightarrow \text{Piglet } \lambda x (x \text{ defended } x) \text{ before Pooh } \lambda y (y \text{ defended } y) \]
\[ \rightarrow \text{Piglet } \lambda x (x \text{ defended } z) \text{ before Pooh } \lambda y (y \text{ defended } z), \ z = \text{Piglet} \]

b. Gríslíngur varði *sig og Bangsímon gerði það líka*

\[ \text{Piglet defended SIG and Pooh did it too} \]
\[ \rightarrow \text{Piglet } \lambda x (x \text{ defended } x) \text{ and Pooh } \lambda y (y \text{ defended } y) \]
\[ \rightarrow *\text{Piglet } \lambda x (x \text{ defended } z) \text{ and Pooh } \lambda y (y \text{ defended } z), \ z = \text{Piglet} \]

However, when the substituted VP falls outside the scope of the anaphor’s antecedent, as happens in the elided VP of (53b), the Strict reading is no longer allowed, because \( D \) cannot be dropped during the evaluation of alternatives. The prediction that the presuppositional analysis of diaphors and anaphors makes, then, is that there should be no language whose diaphor only allows Sloppy readings, *and* whose anaphor takes Strict readings only when it falls outside the scope of its antecedent.

In conclusion, if we take \( \Lambda \) and \( D \) to be functions which languages can allow to be dropped during the evaluation of alternatives, we can explain why in some languages Strict and Sloppy readings are realised with morphologically distinct pronominal forms.

2.5 Variable exponence

Before I conclude, I examine the variable exponence of PJS mentioned earlier. Recall from §2.3.2 that the PJS pronominal forms overlap in their possible interpretations. The relevant
examples are given in (54), in which awake dheen dhewe and awake dheen are both able to be used as the anaphor, and (55), in which awake dheen and dheen are both able to be used as the diaphor. Cole et al 2007 report that there is no syntactic or semantic predictor for the variation; the trigger must be pragmatic or sociolinguistic.

(54) Anaphoric interpretations (Cole et al 2007:25;27)

a. Tono ketok awake dheen dhewe nggon kaca, Siti yaya
   Tono see AWAKE DHEEN DHEWE in mirror Siti also
b. Tono ketok awake dheen nggon kaca, Siti yaya
   Tono see AWAKE DHEEN in mirror Siti also
c. → Tono λx (x saw x in the mirror) and Siti λy (y saw y in the mirror)

(55) Diaphoric interpretations (Cole et al 2007:26;24)

a. Tono ngomong nek Bowo ketok awake dheen nggon kaca, Siti yaya.
   Tono say C Bowo see AWAKE DHEEN in mirror Siti also
b. Tono ngomong nek Bowo ketok dheen nggon kaca, Siti yaya.
   Tono say C Bowo see DHEEN in mirror Siti also
c. → Tono λx (x said Bowo saw x) and Siti λy (y said Bowo saw y)

This variation is unexpected if one assumes the Maximal Subset Principle (Kiparsky, 1973; Halle & Marantz 1993), since more highly specified exponents should always be inserted when competing for a position with a less specified exponent. In order to explain the interpretive overlaps of these exponents, then, there must be some mechanism that can circumnavigate or neutralise the Maximal Subset Principle. There are two possible explanations available to us: allomorphy and impoverishment.

In an allomorphy explanation, we must posit two null exponents for A and D, which compete with the phonologically overt exponents dhewe and awake, each exponent ‘winning’ a percentage of the time. I’m inclined against this analysis because it predicts that languages could also have two overt exponents competing for insertion, and there are no languages for which this is reported. In every case of variable exponence known (e.g. Malay (Cole & Hermon 2005), Yoruba (Adesola 2006), English (Nevins & Parrott 2010)) one exponent spells out a proper subset of the features of the other; the variation is never between exponents that spell out identical sets of features. This points to an impoverishment analysis.

The mechanism I adopt here is Optional Impoverishment, from Nevins & Parrott 2010, whereby rules of impoverishment apply optionally (56).
Optional Impoverishment

Impoverishment rules enact a structural change only optionally, rather than deterministically, when their structural description is met.

That is to say, rules of impoverishment do not have to apply whenever their structural description is met; whether or not they are invoked depends on morphosyntax-external factors, such as sociolinguistic or pragmatic circumstances.\(^{25}\)

Impoverishment rules apply to syntactic structures after Spell Out and before Exponent Insertion at PF. To account for the PJS data, two impoverishment rules are required, one to delete \(A\) (allowing insertion of \(awake\) \(dheen\) for the anaphor), and one to delete \(D\) (which allows for the insertion of \(dheen\) for the diaphor). However, if these impoverishment rules are allowed to apply at random, havoc will ensue. For example, if \(D\) is deleted but the other nodes of the anaphoric tree remain intact, the predicted pronominal form would be \(dheen\) \(dhewe\) (25c). To constrain PJS’s optional rules of impoverishment such that only the attested overlaps are possible, I propose firstly that the rules are ordered (57), and secondly that the pronominal structures are subject to the Russian Doll Deletion Constraint (58), (adapted from Ackema & Neeleman 2018).

\(^{25}\)An impoverishment rule can, of course, apply 100% of the time, which accounts for occasions when impoverishment rules appear to be deterministic.

\(^{26}\)I use the lightning symbol \(\{f\}\) for impoverishment, and the empty set symbol \(\{\varnothing\}\) for a phonologically null exponent.

PJS Optional Impoverishment Rules, \((a) > (b)\)

\(\begin{align*}
\text{a.} & \quad \%D \rightarrow \emptyset \\
\text{b.} & \quad \%A \rightarrow \emptyset
\end{align*}\)

The Russian Doll Deletion Constraint

Only the outermost layer of the structure is available for impoverishment.

If we begin with the structure of the anaphor, \([A\ [D\ [P]\]]\), and neither of the impoverishment rules apply, the exponent will be \(awake\) \(dheen\) \(dhewe\). If the first impoverishment rule applies, (57a), nothing will happen, due to the Russian Doll Deletion Constraint. Then (57b) could apply, deleting \(A\) and allowing the exponent \(awake\) \(dheen\) for the anaphoric reading.

If we start with the structure of the diaphor, \([D\ [P]\]), and neither of the impoverishment rules apply, the exponent will be \(awake\) \(dheen\). But the first rule of impoverishment could apply, (57a), deleting \(D\), and resulting in the diaphor being exponed as \(dheen\).

Optional impoverishment, coupled with ordered rules of deletion and the Russian Doll Deletion Constraint, allows for four patterns of variable exponence (59).
(59) Logically possible cases of variable exponence

ANAPHOR

DIAPHOR

PRONOUN

\[ \%D \rightarrow \dagger \]

\[ \%A \rightarrow \dagger \]

1. \[ \%D \rightarrow \dagger \]

2. \[ \%A \rightarrow \dagger \]

2. \[ \%D \rightarrow \dagger \]

PJS

The pattern exhibited by PJS can also be seen in Malay; the anaphor dirinya can take only locally bound variable readings (60a), the diaphor diri takes both local and non-local bound variable readings (60a,b), and the pronoun dia takes non-local bound variable readings and free variable readings (60b,c).

(60) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him in Malay

a. Kanga fikir hanya Piglet suka dirinya / diri
   Kanga think only Piglet love DIRINYA / DIRI
   \[ \rightarrow Kanga \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y)) \]

b. hanya Piglet fikir Kanga suka diri / dia
   only Piglet think Kanga love DIRI / DIA
   \[ \rightarrow Only \text{ Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } x)) \]

c. hanya Piglet fikir Kanga suka dia
   only Piglet think Kanga love DIA
   \[ \rightarrow Only \text{ Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z)) \]

The second pattern of variable exponence, where A is optionally deleted, appears to be manifest in Korean. Korean has two pronominals that can take both local and non-local bound variable readings: casin and caki (61). My informants report that casin is favoured for local bound variable readings, while caki is favoured for non-local bound variable readings. I propose this variable exponence analysis of Korean tentatively though; further research into the behaviour of these pronominals is needed to be certain that what we see here is truly variable exponence.
(61) Kanga / Only Piglet thinks that only Piglet / Kanga loves himself / him in Korean

   Kanga-NOM Piglet-only-NOM CASIN-ACC / CAKI-ACC love-V-C
   sayngkak-han-ta
   think-V-DECL
   → Kanga λx (x thinks that only Piglet λy (y loves y))

b. Piglet-man-i Kanga-ka casin-ul / caki-lul salang-han-tako
   Piglet-only-NOM Kanga-NOM CASIN-ACC / CAKI-ACC love-V-COMP
   sayngkak-han-ta
   think-V-DECL
   → Only Piglet λx (x thinks that Kanga λy (y loves x))

c. Piglet-man-i Kanga-ka ku-lul salang-han-tako sayngkak-han-ta
   Piglet-only-NOM Kanga-NOM KU-ACC love-V-C think-V-DECL
   → Only Piglet λx (x thinks that Kanga λy (y loves z))

I am not presently aware of any languages that display the first or last patterns of variable exponence in (59). Yoruba may be one language to investigate further; Adesola 2006 reports variation between the diaphor ṭọun and the pronoun rẹ, though this could also be the consequence of ṭọun being an exempt diaphor. Further research is needed.

We can, however, make a case for two patterns of variable exponence to be impossible. Consider the patterns in (62), which require a conditional rule of impoverishment for the deletion of D. In the first pattern, the exponent for the pronoun can also variably expone local and non-local bound variable readings. This requires a conditional rule of impoverishment, in which D must be deleted if A is deleted (to get the exponent for P to expone the local bound variable reading), and an optional deletion rule for D otherwise (to get the exponent for P to expone the non-local bound variable reading). In principle, there is nothing wrong with this.

(62) Impossible cases of variable exponence

<table>
<thead>
<tr>
<th>ANAPHOR</th>
<th>DIAPHOR</th>
<th>PRONOUN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. % If A → ɬ then D → ɬ</td>
<td>% If A → ɬ then D → ɬ</td>
<td>2. % D → ɬ</td>
</tr>
</tbody>
</table>
However, if the conditional rule of impoverishment exists without the optional deletion rule for $D$ alongside it, as in the second pattern in (62), then the possibility of an ABA pattern arises: this rule optionally allows the exponent for the pronoun to realise an anaphoric interpretation, but cannot optionally allow this exponent to realise a diaphoric interpretation. But ABA patterns of syncretism – even variable ones – do not appear in my cross-linguistic survey of pronominal forms. Hence, we must conclude that conditional rules of impoverishment are impossible, and both the patterns of variable exponence illustrated in (62) are predicted not to exist.

2.6 Conclusion

In this chapter, I have presented morphological evidence that anaphors, diaphors and pronouns have a systematic syntactic and semantic relationship. This relationship falls out from a shared underlying tree structure complete with three functional heads, $[A \ [D \ [P]\]]$, each of which adds a restriction to the identity of the pronominal’s antecedent. This structure captures exactly the four attested patterns of syncretism found in pronominal forms, without allowing for the unattested ABA pattern.

Morphological variation in the realisation of Strict and Sloppy interpretations of anaphors and diaphors can be captured if the functions $A$ and $D$ are optionally allowed to drop during the evaluation of alternatives (Sauerland 2013), and morphological variation in the exponence of anaphors, diaphors and pronouns in languages such as Peranakan Javanese of Semarang can be captured if we adopt the notion of Optional Impoverishment from Nevins & Parrott 2010.
Chapter 3

Pseudo-ABA patterns in pronominal morphology

3.1 Introduction

In this chapter I investigate the cyclic/non-cyclic status of the A and D nodes in the pronominal tree. The investigation was precipitated by the need to account for pseudo-ABA patterns of syncretism found in three of the languages in my sample.

The first section of the chapter is devoted to the simple analysis of these patterns, in which A and D are not cyclic nodes. I first show that impoverishment and null allomorphy analyses overgenerate (§3.2.1), and then present an alternative analysis which makes use of portmanteau spanned exponents (§3.2.2).

In the second section of the chapter, I show that if A and D are cyclic nodes, Bobaljik’s 2012 cyclic analysis of patterns of suppletion accounts for the data equally well (§3.3.1). I spend some time discussing refinements to Bobaljik’s Suspension Condition in §3.3.2, and show why we don’t want our analysis to rule out one of the five unattested patterns of suppletion.

Finally, I close the chapter by demonstrating that the probabilistic impoverishment analysis of variable exponence is only compatible with a theory in which A and D are not cyclic nodes (§3.4), and conclude that the pronominal tree only spells out when it merges with K(ase) (or some higher node).

While reading this chapter, you may find it helpful to pull out page 87 from this thesis as a reference page.

3.2 Pseudo-ABA patterns of syncretism

Consider the paradigms of Babanki (Niger-Congo), Malayalam (Dravidian) and Yoruba (Niger-Congo), which appear to pose a threat to the analysis developed in Chapter 2.
The transparent morphology of three ABC languages

<table>
<thead>
<tr>
<th>Babanki</th>
<th>Malayalam</th>
<th>Yoruba</th>
</tr>
</thead>
<tbody>
<tr>
<td>ðwénó wén</td>
<td>avanavan</td>
<td>ara rê</td>
</tr>
<tr>
<td>ji</td>
<td>tan</td>
<td>ôun</td>
</tr>
<tr>
<td>wén</td>
<td>avan</td>
<td>rê</td>
</tr>
</tbody>
</table>

These are a problem for the present analysis, as they could arguably be analysed as three A-B-CA patterns. I call these pseudo-ABA patterns. The mystery is how the exponent for P is present within the anaphor, but absent in the diaphor. As was the case for the variable exponence of PJS, impoverishment and allomorphy are both possible explanations; I propose that neither is the right way to go, and an alternative analysis is required.

3.2.1 Ruling out impoverishment and null allomorphy

In the cases of Malayalam, Babanki and Yoruba, tan, ji and ôun appear to be completely suppletive, exponing [D [P]], as these exponents neither feature anywhere else in the paradigm, nor include the exponent for P. It follows from this that the exponent for P should be unable to feature as part of the anaphor, since this exponent would lose out to the more highly specified exponent for [D [P]].

Let’s consider what an impoverishment analysis would look like. Suppose we have the rules of exponence given in (64).

(64) Exponents of Yoruba (Take 1)

\[
P \iff rê \\
[D [P]] \iff ôun \\
A \iff ara
\]

(65) A rule of impoverishment

\[
D \rightarrow \emptyset / [A [ \_ [P]]]
\]

The feature that would be the target of impoverishment is D, and the environment for that impoverishment is in the presence of P and, crucially, A (65). This presents an immediate problem, as this rule of impoverishment is incompatible with the Russian Doll Deletion Constraint (66) (adapted from Ackema & Neeleman 2018) which was required to account for the variable exponence of languages such as PJS.

(66) The Russian Doll Deletion Constraint

Only the outermost layer of the structure is available for impoverishment.

---

1I use the lightning symbol \{f\} for impoverishment, and the empty set symbol \{\emptyset\} for a phonologically null exponent.
Since we want to preserve the analysis of variable exponence, we must dismiss an impoverishment analysis of the pseudo-ABA patterns of Babanki, Malayalam and Yoruba.

An alternative to consider is an allomorphy account. In this analysis, P and D each have two allomorphs: a phonologically overt one (ré and đun respectively), and a phonologically null one (67).\(^2\,3\)

\[
\begin{align*}
\text{(67) Exponents of Yoruba (Take 2)} & \\
P & \leftrightarrow \emptyset / [\text{K} \text{D} [\_\_]] & P & \leftrightarrow \emptyset / [\text{K} \text{D} [\_\_]] \\
P & \leftrightarrow \text{ré} & P & \leftrightarrow \text{ré} \\
D & \leftrightarrow \emptyset / [\text{A} \_\_ \text{[P]}] & D & \leftrightarrow \emptyset / [\text{A} \_\_ \text{[P]}] \\
D & \leftrightarrow \text{đun} & D & \leftrightarrow \text{đun} \\
A & \leftrightarrow \text{ara} & A & \leftrightarrow \emptyset
\end{align*}
\]

The exponents in (67) generate the paradigm for Yoruba (and Babanki and Malayalam) exactly. However, suppose the feature A was realised by a phonologically null exponent instead of the overt ara (68).\(^4\) This is equivalent to not being realised at all, and there is ample evidence from cases of under-specification that features are frequently unrealised at PF. Replacing the phonologically overt exponent for A with a phonologically null one results in a true ABA pattern for Yoruba, yet no such pattern was found in any of the 80 languages that make up my survey; this is exactly the kind of pattern the theory must fail to generate.

Let’s pause for a moment to consider all of the logically possible patterns of syncretism available to the tree structure [A [D [P]]]; all — including true ABA patterns — can be generated by a theory that assumes unrestricted phonologically null exponents. In the case of an AAA syncretism pattern, only the exponent for P is overt; exponents for D and A are either phonologically null or absent from the inventory (69). I represent the exponent for P abstractly as X.

\[
\begin{array}{c|c}
\text{Exponent} & \text{P} \leftrightarrow X \\
\hline
\text{AAA} & \\
\end{array}
\]

\footnote{It would also be possible to posit two phonologically overt allomorphs of P (ré, and đun in the presence of D), and have D realised by a phonologically null exponent; both analyses produce the required paradigm.}

\footnote{I assume that all pronominals merge with the Case head K when complete.}

\footnote{Thanks to Klaus Abels, Yasu Sudo and Stan Zompi for pointing this problem out to me.}
In the case of ABB and AAB syncretism patterns, two overt exponents are required, X and Y. If both exponed features can be realised overtly together we see the paradigms of ABB₁ and AAB₁. But if only one exponent is overt at any given time (ABB₂ and AAB₂ (70)), a phonologically null exponent for P is also required (71).

(70) **Morphological possibilities for the ABB and AAB syncretism paradigms**

\[
\begin{array}{cccc}
  & X Y & Y & X Y \\
  ABB₁ & X & X & ABB₁ \\
  ABB₂ & Y & Y & AAB₂ \\
\end{array}
\]

(71) **Exponents for the ABB and AAB paradigms under a null allomorphy account**

<table>
<thead>
<tr>
<th>ABB₁</th>
<th>ABB₂</th>
<th>AAB₁</th>
<th>AAB₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>P ⇔ X</td>
<td>P ⇔ X</td>
<td>P ⇔ X</td>
<td>P ⇔ X</td>
</tr>
<tr>
<td>D ⇔ Y</td>
<td>P ⇔ ∅ / [D [ _ ]]</td>
<td>A ⇔ Y</td>
<td>P ⇔ ∅ / [A [D [ _ ]] ]</td>
</tr>
</tbody>
</table>

We now come to ABC patterns of syncretism. There are 12 logically possible morphological realisations to consider. In all 12 cases, P is realised by an exponent X. When P merges with D to form the diaphor, either both features are overtly exponed (ABC₁₋₆), or only D is, and P is phonologically null (ABC₇₋₁₂). For each of these realisations of the diaphor, there are seven possibilities for the exponence of the anaphor. Firstly, the anaphor could be made up of both P’s and D’s exponents, plus a new one: Z. Secondly, the anaphor could be composed of only two morphemes; X Y, X Z, or Y Z. Finally, the anaphor could be realised by only one morpheme; X, Y or Z.⁵ All of these possibilities can be generated with phonologically null exponents, as the following diagrams (72) and Exponent Lists (73) show.

---
⁵The seven possible realisations of the anaphor do not result in 14 possible ABC patterns, because two are ABB patterns: when both the diaphor and anaphor are X Y or Y.
### Morphological possibilities for the ABC syncretism paradigms

<table>
<thead>
<tr>
<th></th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

### Exponents for the ABC paradigms under an allomorphy account

<table>
<thead>
<tr>
<th></th>
<th>ABC1</th>
<th>ABC2</th>
<th>ABC3</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
| D | Y    | Y    |   | / [A D [ ] ]
| A | Z    |   | Z    |

<table>
<thead>
<tr>
<th></th>
<th>ABC4</th>
<th>ABC5</th>
<th>ABC6</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
| D |   | / [A D [ ] ]
| A | Z    |   | Z    |

<table>
<thead>
<tr>
<th></th>
<th>ABC7</th>
<th>ABC8</th>
<th>ABC9</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
| P |   | / [K D [ ] ]
| D | Y    | Y    | Y    |
| A | Z    |   | Z    |

<table>
<thead>
<tr>
<th></th>
<th>ABC10</th>
<th>ABC11</th>
<th>ABC12</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
| P |   | / [K D [ ] ]
| D | Y    | Y    | Y    |
| A | Z    |   | Z    |
As the diagrams in (72) and Exponent Lists in (73) show, a theory that assumes unrestricted phonologically null allomorphs generates two true ABA patterns (ABC₄ and ABC₁₁) and three pseudo-ABA patterns (ABC₇, ABC₈ and ABC₉). But none of the languages in my sample demonstrates a true ABA pattern of syncretism, and only Babanki, Malayalam and Yoruba demonstrate pseudo-ABA patterns. Indeed, of the 17 logically possible patterns, only eight are attested. Examples of these are given in (74).

(74) **Attested patterns of syncretism**

<table>
<thead>
<tr>
<th>Language</th>
<th>Pattern 1</th>
<th>Pattern 2</th>
<th>Exponent</th>
<th>Language</th>
<th>Pattern 1</th>
<th>Pattern 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tongan</td>
<td>AAA</td>
<td>ABB₁</td>
<td>jia</td>
<td>Xining</td>
<td>ABB₁</td>
<td>ABB₂</td>
</tr>
<tr>
<td></td>
<td>ia</td>
<td>casin</td>
<td>ku</td>
<td>Chinese</td>
<td>Korean</td>
<td>English</td>
</tr>
<tr>
<td>PJS</td>
<td>ABC₁</td>
<td>ABC₀</td>
<td>dirinya</td>
<td>Yoruba</td>
<td>ABC₁₀</td>
<td>Malay</td>
</tr>
<tr>
<td></td>
<td>ia</td>
<td>jia</td>
<td></td>
<td></td>
<td>hääntä</td>
<td></td>
</tr>
</tbody>
</table>

In conclusion, a theory that assumes unrestricted phonologically null allomorphs is too permissive; we want a more restrictive theory.

### 3.2.2 An alternative analysis

I propose that the solution to the problem of pseudo-ABA patterns of syncretism is exponents that spell out structurally adjacent nodes. Recall that the diaphors jì, tan and òun appear to be completely suppletive, exponing [D [P]]. If they expone this larger structure, then the exponents that appear only in the anaphors — òwénò, the reduplicated morpheme avan, and ara — cannot spell out A alone. This is because by the Maximal Subset Principle, the exponents for P would never be a component of the anaphor forms; the diaphor portmanteaux would always ‘beat’ the exponents for P. The exponents òwénò, the reduplicated avan, and ara must therefore spell out a structure that is complex enough to ‘beat’ the exponents of [D [P]] for insertion without ‘beating’ the P exponents. This is possible if the structure these exponents spell out is [A [D]] (75).
The notion of a single exponent spelling out structurally adjacent nodes that do not form a constituent has been given the name Spanning in the recent literature (see for example, Svenonius 2012). The exponents that spell out the span of $A$ and $D$ combine with the exponents for $P$ to spell out the whole structure of the anaphor. This blocks the use of the portmanteaux that spell out $[D[P]]$, because there is no exponent for $A$ alone; the combination of an exponent for $P$ and another for $A$ and $D$ ‘beats’ the portmanteaus of $[D[P]]$ by the Maximal Subset Principle.

This analysis relaxes the ban on competition between exponents (in the sense of Embick & Marantz 2008) a fraction; competition between exponents is now possible when multiple terminal nodes spell out in a single cycle. In other words, within a single cycle of Spell Out, the Maximal Subset Principle must hold. Since I assume (and argue in §3.4) that $P$, $D$ and $A$ are not cyclic nodes, they will all Spell Out in the same cycle, when the pronominal merges with higher structure (presumably K(ase)), and competition between exponents thus allowed.

It is impossible to generate a true ABA pattern of syncretism in such a system. Consider why. There will always be an exponent for $P$: $X$. The diaphor could be exponed by two exponents, one for $D$ alongside that of $P$, as is the case in the first three paradigms in (76), or it could be exponed by a portmanteau for $[D[P]]$, as is the case in the last three paradigms in (76).

(76) True ABA patterns of syncretism are impossible

There are then three possible ways in which $A$ could be exponed (77). If $A$ is exponed alone by $Z$ (77a), the anaphor will be realised as /$X Y Z$/ or /$Y Z$/ ($ABC_1$ and $ABC_{10}$). If $A$ is exponed in a span with $D$ (77b), then the anaphor will be realised as /$X Z$/ ($ABC_2$ and $ABC_{12}$).

---

(75) The exponents of Babanki, Malayalam and Yoruba (final)

<table>
<thead>
<tr>
<th>Babanki</th>
<th>Malayalam</th>
<th>Yoruba</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P \leftrightarrow \text{wén}$</td>
<td>$P \leftrightarrow \text{avan}$</td>
<td>$P \leftrightarrow \text{rê}$</td>
</tr>
<tr>
<td>$[D[P]] \leftrightarrow \text{ji}$</td>
<td>$[D[P]] \leftrightarrow \text{tan}$</td>
<td>$[D[P]] \leftrightarrow \text{òun}$</td>
</tr>
<tr>
<td>$[A[D]] \leftrightarrow \text{òwénô}$</td>
<td>$[A[D]] \leftrightarrow \text{REDUP}$</td>
<td>$[A[D]] \leftrightarrow \text{ara}$</td>
</tr>
</tbody>
</table>
ABC₉). And if A is exponed by a portmanteau that expones both D and P as well (77c), the
the anaphor will be realised as /z/ (ABC₆ and ABC₁₂).

(77) Possible ways to expone A
a. A ⇔ Z
b. [A [D]] ⇔ Z
c. [A [D [P]]] ⇔ Z

Note that the structure of the anaphor ensures that there will never be a morpheme that
spells out P and A to the exclusion of D; this would be possible in an analysis in which
the anaphor did not necessarily contain the diaphor, or in an analysis in which the three
features bundle together on a single terminal node. Thus, the absence of exponents that
spell out P and A to the exclusion of D (i.e. the absence of the Z morpheme in ABC₃) lends
support to the structural analysis of pronominal forms.

Now let’s look at the remaining logically possible patterns of syncretism. Generating
the AAA, ABB and AAB patterns of syncretism is straightforward; I repeat the diagrams
below (78), and give the required exponents in (79).

(78) Morphological possibilities for AAA, ABB and AAB syncretism paradigms

(79) The exponents for the AAA, ABB and AAB patterns of syncretism

<table>
<thead>
<tr>
<th>AAA</th>
<th>ABB₁</th>
<th>ABB₂</th>
<th>AAB₁</th>
<th>AAB₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>P ⇔ X</td>
<td>P ⇔ X</td>
<td>P ⇔ X</td>
<td>P ⇔ X</td>
<td>P ⇔ X</td>
</tr>
<tr>
<td>D ⇔ Y</td>
<td>[D [P]] ⇔ Y</td>
<td>A ⇔ Y</td>
<td>[A [D [P]]] ⇔ Y</td>
<td></td>
</tr>
</tbody>
</table>

Accounting for the attested and unattested ABC patterns of syncretism initially appears to
be less successful: the new theory generates twice as many ABC patterns as are attested in
my language sample (including all the attested cases), but this is still an improvement, as it
generates half as many as the null allomorphy analysis does. I repeat the diagrams below
(80), and give the required exponents in (81).
(80) Morphological possibilities for the ABC syncretism paradigms

<table>
<thead>
<tr>
<th></th>
<th>ABC₁</th>
<th>ABC₂</th>
<th>ABC₃</th>
<th>ABC₄</th>
<th>ABC₅</th>
<th>ABC₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attested</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unattested</td>
</tr>
<tr>
<td>Generated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Generated</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ABC₇</th>
<th>ABC₈</th>
<th>ABC₉</th>
<th>ABC₁₀</th>
<th>ABC₁₁</th>
<th>ABC₁₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unattested</td>
<td></td>
<td></td>
<td>Attested</td>
<td></td>
<td></td>
<td>Unattested</td>
</tr>
<tr>
<td>Generated</td>
<td></td>
<td></td>
<td>Generated</td>
<td></td>
<td></td>
<td>Generated</td>
</tr>
</tbody>
</table>

(81) The exponents for the ABC patterns of syncretism

<table>
<thead>
<tr>
<th></th>
<th>ABC₁</th>
<th>ABB₂</th>
<th>ABB₃</th>
<th>AAB₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>⇔ X</td>
<td>P</td>
<td>⇔ X</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>⇔ Y</td>
<td>D</td>
<td>⇔ Y</td>
<td>−</td>
</tr>
<tr>
<td>A</td>
<td>⇔ Z</td>
<td>[A [D]]</td>
<td>⇔ Z</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ABC₅</th>
<th>ABC₆</th>
<th>ABC₇</th>
<th>ABC₈</th>
</tr>
</thead>
<tbody>
<tr>
<td>−</td>
<td>P</td>
<td>⇔ X</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>D</td>
<td>⇔ Y</td>
<td></td>
<td>[A [D [P]]]</td>
<td>⇔ Z</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ABC₉</th>
<th>ABC₁₀</th>
<th>ABC₁₁</th>
<th>ABC₁₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>⇔ X</td>
<td>P</td>
<td>⇔ X</td>
<td>−</td>
</tr>
<tr>
<td>[D [P]]</td>
<td>⇔ Y</td>
<td>[D [P]]</td>
<td>⇔ Y</td>
<td>[D [P]]</td>
</tr>
</tbody>
</table>

ABC₃ cannot be generated, because this would require either a rule of exponence in which [P A] is realised by an exponent Z, which is impossible due to the intervening D, or a rule of impoverishment to delete P in the anaphor, which is impossible due to the Russian Doll Deletion Constraint. The other five ABC patterns that cannot be generated are also ruled out due to violations of the Russian Doll Deletion Constraint: ABC₄ requires a rule of impoverishment to delete D in the anaphor; ABC₅ requires a rule of impoverishment to
delete P in the anaphor; ABC₇ requires a rule of impoverishment to delete P in the diaphor, but which allows P to magically reappear in the presence of a phonologically overt A; and ABC₈ and ABC₁₁ require a rule of impoverishment to delete P in the diaphor, but which allows P to magically reappear in the presence of a phonologically null A.

The patterns generated but unattested in the pronominal domain are ABC₂, ABC₆ and ABC₁₂. If we consider data from domains other than the pronominal one, the missing ABC patterns emerge. Take the English data in (82) and the relevant tree structure for comparatives (C) and superlatives (S) in (83). In a survey of over 300 languages, Bobaljik 2012 concluded that comparatives are built on adjectives, and superlatives are built on comparatives. The English data for tall exactly matches the missing pattern in ABC₂, as is shown in (84).

(82)  *English: ‘tall’*  
Adjective  tall  
Comparative  tall-er  
Superlative  tall-est

(83)  *The adjectival tree (Bobaljik 2012)*

(84)  *Evidence for ABC₂: English comparatives and superlatives*

<table>
<thead>
<tr>
<th>ABC₂</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>tall-est</td>
</tr>
<tr>
<td>Y</td>
<td>tall-er</td>
</tr>
<tr>
<td>Z</td>
<td>tall</td>
</tr>
</tbody>
</table>

Exponents

\[
\sqrt{tall} \leftrightarrow \text{tall} \\
C \leftrightarrow \text{-er} \\
[S\ [C]] \leftrightarrow \text{-est}
\]

Observe the Ingush (Nakh, North East Caucasian) data in (85) (Veselinova 2006:76). Following Cinque 1999, Radkevich 2010 and Moskal 2015, I assume the verbal structure to be that given in (86). I assume that the present tense is denoted by the absence of the Aspect and Tense nodes, and if we assume that the Witnessed Past Tense includes some denotation of Aspect, the Ingush data exactly matches the morphological pattern of ABC₆, as can be seen in (87).

(85)  *Ingush (Nakh): ‘give’*

lu  GIVE.PRES

lu-ora  GIVE-IMPF

d-alar  CL-GIVE.WIT.PAST

(86)  *The verbal tree*
Finally, behold the Georgian data in (88) (Hewitt 1995:471). The relevant structure remains the verbal one in (86). It is evident from the data presented (and further data provided in Hewitt 1995) that the Imperfective Aspect is unmarked, while the Perfective is marked; I conclude that the absence of the Aspect node indicates the Imperfective. The root *tell* is thus exponed as -ubn- when a more specific exponent is unavailable. When Perfective Aspect merges above *tell*, the two are exponed together as -txar-. If we assume that the Future Tense of *tell* includes some denotation of Aspect,\(^7\) then Future Tense, Aspect and *tell* are exponed as the portmanteau -t’q’v-, and we have an instance of the the morphological pattern of ABC\(_{12}\) (89).

(88) **Georgian (Kartvelian): ‘tell’**\(^8\)

\[
\begin{align*}
\text{v-e-ubn-eb-i} & \quad \text{lSG-vv-TELL.IPFV-THM-IND} \\
\text{v-e-ubn-eb-od-i} & \quad \text{lSG-vv-TELL.IPFV-THM-THM-IND} \\
\text{v-u-txar-i} & \quad \text{lSG-vv-TELL.PFV-IND} \\
\text{v-e-t’q’v-i} & \quad \text{lSG-vv-TELL.FUT-IND}
\end{align*}
\]

(89) **Evidence for ABC\(_{12}\): Georgian verbs**

\[
\begin{array}{|c|c|c|c|}
\hline
\text{Z} & \sqrt{tell} & \text{Exponents} \\
\hline
\text{Y} & -ubn- & \text{lSG} \iff \text{v-} \\
\hline
\text{X} & -txar- & \text{vV} \iff -e-/u- \\
\hline
\text{ABC\(_{12}\)} & -t’q’v- & \text{THM} \iff -eb-/od- \\
\hline
\text{Georgian} & \text{FUT} \iff \text{i} \\
\hline
\end{array}
\]

In conclusion, exponents that spell out adjacent nodes in trees generate all and only the patterns of syncretism that I am aware are attested.

---

\(^{7}\)The alternative would be to conclude that the Aspect node is absent from the verbal tree when the Tense is Future; this would require an impoverishment rule deleting ASP in the context of FUT, which is impossible due to the Russian Doll Deletion Constraint (Ackema & Neeleman 2018).

\(^{8}\)THM = Thematic Marker.
3.3 If A and D were cyclic nodes

The discussion above has taken it for granted that the nodes A and D are not cyclic, and the domain for Vocabulary Insertion is the complete pronominal tree. In this section, I present Bobaljik’s 2012\(^9\) cyclic analysis of patterns of suppletion in the adjectival domain, and demonstrate that if A and D were cyclic nodes, this analysis will account for the syncretism data with identical results.

3.3.1 Bobaljik 2012: A cyclic analysis

As mentioned briefly before, Bobaljik 2012 concluded that comparatives are built on adjectives, and superlatives are built on comparatives (90). The particular phenomenon at the heart of this study was suppletion of the adjectival root.

(90) *The adjectival tree* (Bobaljik 2012)

\[ \begin{array}{c}
\sqrt{\alpha} \\
\downarrow \\
C \\
\downarrow \\
S
\end{array} \]

There are ten logically possible morphological paradigms for suppletion, two for each pattern of suppletion. In the first paradigm of each pair (the top row of (91)), both the comparative and superlative suffixes -\(\beta\) and -\(\delta\) appear overtly in the superlative, while in the second paradigm (the bottom row of (91)), only the suffix -\(\delta\) appears. Allomorphs of the root are X, Y and Z (although in AAB\(_I\) and ABC\(_I\), Y and Z will be analysed as portmanteaux of the root and comparative suffix; see below for discussion).

---

\(^9\)I will focus on the analysis in Bobaljik 2012, because the differences between this analysis and those in Embick 2010 and Moskal 2015 are to do with non-adjacent nodes conditioning suppletion. Since the data being investigated in the present paper concerns syncretism, not suppletion, Bobaljik’s 2012 analysis suffices to represent cyclic analyses more generally.
In Bobaljik's 2012 survey of over 300 languages, only five of the ten possible paradigms are attested. Examples of each are shown in (92).

(92) *Examples of suppletion* (Bobaljik 2012)

<table>
<thead>
<tr>
<th>Hungarian</th>
<th>English</th>
<th>Czech</th>
<th>English</th>
<th>Latin</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>big</em></td>
<td><em>tall</em></td>
<td><em>small</em></td>
<td><em>good</em></td>
<td><em>good</em></td>
</tr>
</tbody>
</table>

Missing from Bobaljik’s survey are all of the AAB and ABA paradigms of suppletion, and the ABC₁ paradigm. In §5.3.2 of his book, Bobaljik proposes an analysis that invokes cyclicity domains which accounts for the attested and unattested data. This analysis requires three things: (a) the assumption that the comparative and superlative heads are cyclic nodes, (b) a Cyclic Condition, and (c) a Suspension Condition. I outline the analysis here.

It is traditionally assumed that Spell Out occurs cyclically, starting from the bottom of the structure and working up (93) (Mascaró 1976; Chomsky 2001; Bobaljik 2000). The trigger for Spell Out is a cyclic node (Marantz 2007; Embick & Marantz 2008; Newell 2008; Embick 2010; Bobaljik 2012). Cyclic nodes are assumed to be category-defining nodes (and likewise, category-defining nodes are assumed to be cyclic).

(93) *The Cyclic Condition* (Bobaljik 2012:152)

a. A cyclic node triggers Spell Out of its complement; Spell Out includes rules of exponence.
b. A node that has been spelled out is inaccessible to further application of rules of exponence.

In essence, the Cyclic Condition states that when a cyclic node merges into a tree, its complement is spelled out, which renders the complement’s syntactic information inaccessible for future rounds of Spell Out. The Cyclic Condition is illustrated with the trees in (94). In these trees, the cyclic nodes are $\mu$ and $\xi$.

(94) *An abstract tree*

\[
\begin{array}{c}
\xi \\
/\varepsilon/ \\
\end{array} \rightarrow \begin{array}{c}
/\varepsilon\text{silan/} \\
\mu \\
\end{array} \rightarrow \begin{array}{c}
\ldots \\
/\varepsilon\text{silan/} \\
\mu \\
/\text{dats/} \\
/\text{za/} \\
/\varepsilon\text{silan/} \\
\end{array}
\]

When $\varepsilon$’s mother merges with $\xi$, $\xi$ triggers Spell Out of $\varepsilon$. The feature $\varepsilon$ is then replaced by phonological material. The structure \([\xi [/\varepsilon\text{silan/}]]\) merges with some non-cyclic material (...) and then $\mu$, which triggers Spell Out of $\xi$ and the non-cyclic material that c-commands it. As $\varepsilon$ has already been spelt out, it is inaccessible to further rules of exponence (Bobaljik 2000; Embick 2010).

The Cyclic Condition rules out the ABC, AAB and ABA patterns of suppletion, because the adjectival root is spelled out before the superlative head merges into the structure, preventing the superlative head from conditioning the allomorphy of the root. The Cyclic Condition also rules out the AAA$_H$ and ABB$_H$ paradigms, because the portmanteau $\beta$ cannot be inserted for \([S [C]]\) when these nodes are spelled out in different cycles. The Cyclic Condition alone is thus too strong. To ensure that the AAA$_H$, ABB$_H$ and ABC$_H$ paradigms can be generated, Bobaljik proposes the Suspension Condition (95).

(95) *The Suspension Condition* (Bobaljik 2012:153)

a. Spell Out of a domain, D, (93a) is suspended, if a rule of exponence *spans* D.

b. A rule *spans* D if it involves X and Y in the configuration \([[X]_D Y]_{D+1}\).

I illustrate the Suspension Condition with the Old Irish (Bobaljik 2012:145) and Serbo-Croatian (Bobaljik 2012:106) paradigms for good (96) and (97). Starting with Old Irish, if the adjective does not merge with C, it will be spelled out as *maith*. But if it merges with C, C will trigger Spell Out of $\alpha$ because C is a cyclic node. Spell Out of $\alpha$ will be suspended however, because there is a rule of exponence that spans both $\alpha$ and C. If the comparative doesn’t merge with S, the comparative structure will be spelled out as *fer*. But if it merges with S, S will trigger Spell Out of its complement, \([C [\alpha]]\), because S is a cyclic node. Spell
Out will be suspended a second time though, because there is a rule of exponence that spans both $[C [\alpha]]$ and $S$. The superlative will finally spell out as *dech*.

\[(96) \quad \text{Old Irish ‘good’} \]

<table>
<thead>
<tr>
<th>dech</th>
<th>Exponents</th>
<th>naj-bol-ji</th>
<th>Exponents</th>
</tr>
</thead>
<tbody>
<tr>
<td>fer</td>
<td>$\alpha$ $\leftrightarrow$ maith</td>
<td>bol-ji</td>
<td>$\alpha$ $\leftrightarrow$ dobar</td>
</tr>
<tr>
<td>maith</td>
<td>$[C [\alpha]]$ $\leftrightarrow$ fer</td>
<td>dobar</td>
<td>$C$ $\leftrightarrow$ bol $/ [C [_]]$</td>
</tr>
</tbody>
</table>

Old Irish

<table>
<thead>
<tr>
<th>dech</th>
<th>Exponents</th>
<th>naj-bol-ji</th>
<th>Exponents</th>
</tr>
</thead>
<tbody>
<tr>
<td>fer</td>
<td>$\alpha$ $\leftrightarrow$ maith</td>
<td>bol-ji</td>
<td>$\alpha$ $\leftrightarrow$ dobar</td>
</tr>
<tr>
<td>maith</td>
<td>$[C [\alpha]]$ $\leftrightarrow$ fer</td>
<td>dobar</td>
<td>$C$ $\leftrightarrow$ bol $/ [C [_]]$</td>
</tr>
</tbody>
</table>

Serbo-Croatian

In Serbo-Croatian the story is much the same, but here Spell Out is suspended by the environment of contextual allomorphy. The adjective spells out alone as *dobar*, but if $\alpha$ merges first with $C$, $C$ will trigger Spell Out of $\alpha$. Because the environment of the contextual allomorph of $\alpha$ spans both $\alpha$ and $C$, Spell Out of $\alpha$ will be suspended. It doesn’t matter what the structure merges with next, as there are no more rules of exponence that will suspend Spell Out, so $[C [\alpha]]$ will spell out as *bol-ji*, accompanied by the prefix *naj-* if it’s embedded within the superlative.

We can now give the exponents required to derive the attested paradigms of suppletion in Bobaljik’s survey (98).

\[(98) \quad \text{Exponents for suppletion} \]

\[
\begin{array}{ccc}
AAA_I & ABB_I & ABC_{II} \\
\alpha & \leftrightarrow & x \\
\alpha & \leftrightarrow & y / [C [\_]] \\
[C [\alpha]] & \leftrightarrow & z / [S [\_]] \\
C & \leftrightarrow & \rho \\
S & \leftrightarrow & \delta \\
\end{array}
\]

\[
\begin{array}{ccc}
AAA_{II} & ABB_{II} \\
\alpha & \leftrightarrow & x \\
[S [C]] & \leftrightarrow & \delta \\
\alpha & \leftrightarrow & y / [C [\_]] \\
C & \leftrightarrow & \rho \\
[S [C]] & \leftrightarrow & \delta \\
\end{array}
\]

If we were to assume that the pronominal nodes $A$ and $D$ are cyclic, this theory of cyclic Spell Out generates exactly the same paradigms of syncretism that were generated by the non-cyclic analysis in §3.2.2 with the same exponents that were needed in (79) and (81). I illustrate here with the exponents for Yoruba (99).
Exponing the Yoruba pronominals

If P merges directly with the Case head, it will spell out as ré. But if P first merges with D, D will trigger Spell Out of P. However, there is a rule of exponence that spans both P and D, so Spell Out will be suspended. If the tree then merges with K, the diaphor will be spelt out as òun. If the diaphor merges with A first, however, A will trigger Spell Out of [D [P]]. Spell Out will be suspended again, due to the third rule of exponence, which spans D and A. When this structure merges with the K head, all three nodes will spell out at the same time, and in accordance with the Maximal Subset Principle, will be realised by the exponents ara and ré, because together these expone all three features; no other combination of exponents achieves this.

As was the case with the non-cyclic analysis, it is impossible to generate a true ABA syncretism pattern in this system. Consider the tree in (100) and its exponents. If [ε] merges with K and is spelled out alone, it will be realised as /ɛpsilan/. But if it merges first with ξ, Spell Out will be delayed, because the rule of exponence for [ξ [ε]] spans both ξ and ε. This exponent will spell out the structure if [ξ [ε]] then merges with K, giving us /zai/.

Another hypothetical pronominal tree, demonstrating *true ABA patterns
If a true ABA pattern is to materialise, when $[\xi [\varepsilon]]$ merges with $\mu$, $\varepsilon$ must be exponed as /$\varepsilon$psilan/, and $\xi$ must fail to be exponed. However, this can never happen, because there is no combination of exponents that can derive this. If the exponent for $[\mu [\xi [\varepsilon]]]$ is used, /$\mu\varepsilon$psilan/ will expone the entire tree; if the exponent for $[\mu [\xi]]$ is used, the tree will be spelled out as /$\mu\varepsilon$psilan/; if the exponent for $\mu$ is used the result will be /$\mu\varepsilon$za/; and if there is no exponent that realises $\mu$ at all, the exponent for $[\xi [\varepsilon]]$ will win. Hence, a cyclic analysis in which A and D are cyclic nodes and exponents can spell out non-terminal nodes generates the pseudo-ABA pattern of syncretism found in Babanki, Malayalam and Yoruba, but fails to generate true ABA patterns.

3.3.2 Refining the Suspension Condition and accounting for AAB$_II$

In this sub-section I point out a missed generalisation that allows us to refine the Suspension Condition so that the suspension of Spell Out is only triggered by portmanteaux (§3.3.2). I then discuss Greek verbal suppletion data from Merchant 2015, which demonstrates that Bobaljik’s original version of the Suspension Condition must stand (§3.3.2). To prevent the theory from overgenerating, I argue that a locality condition posited by Bobaljik 2012 should be adopted, and show how it captures Merchant’s Greek data and two AAB$_II$ paradigms of suppletion found in pronouns (Moskal 2015) (§3.3.2). Finally, I argue that adopting a theory in which all nodes are cyclic allows for a unified analysis of all the cases of syncretism and suppletion discussed, which is preferable to an analysis in which only some nodes are cyclic.

The Suspension Condition doesn’t apply to contextual environments for suppletion

Consider the five paradigms unattested in Bobaljik’s 2012 survey (101).

(101) Unattested cases of suppletion in Bobaljik 2012

$\begin{array}{c|c|c|c|c}
Z \beta \delta & Y \beta \delta & Y \delta & X \beta \delta & X \delta \\
Y \beta & X \beta & X & Y \beta & Y \\
X & X & X & X & X
\end{array}$

In Bobaljik’s cyclic analysis, it is impossible to generate rules of exponence for the ABC$_I$ and AAB$_I$ paradigms, because each requires an allomorph for $\alpha$ that is conditioned by the superlative (102). These rules of exponence do not meet the Suspension Condition’s
requirement that the relevant nodes, $\alpha$ and $S$, are in the configuration $[[X]_{D} Y]_{D+1}$, so these rules are unable to trigger the suspension of Spell Out, consequently rendering these paradigms impossible.

(102) **Allomorphs for $\alpha$ conditioned by the superlative**

a. $\alpha \leftrightarrow Z / [S [C [\_ \_]]]$

b. $\alpha \leftrightarrow Y / [S [C [\_ \_]]]$

Rules of exponence for the two ABA paradigms face two problems. In order to capture the fact that the root suppletes only in the comparative, the environment for allomorphy must specify both the comparative head and the head it merges with (103a). It was possible to define such a rule in the pronominal domain, because once complete, all pronominals merge with the Case head, $K$ (103b). Unlike pronominals, adjectives, comparatives and superlatives do not merge with a specific head upon completion, so the required rule of exponence is impossible to define. However, even if it were definable, it would be in breach of part (b) of the Suspension Condition, as was the case for the rules in (102).

(103) **An allomorph exclusive to the comparative**

a. $\alpha \leftrightarrow Y / [? [C [\_ \_]]]$

b. $P \leftrightarrow \emptyset / [K [D [\_ \_]]]$

However, explaining the absence of the $ABC_I$, $AAB_I$, $ABA_I$ and $ABA_{II}$ paradigms in this manner is extraneous. When he proposed the cyclic analysis, Bobaljik overlooked an interesting generalisation that tidies up his theory. Recall that the Suspension Condition was required to ensure that the attested $AAA_{II}$, $ABB_{II}$ and $ABC_{II}$ paradigms could be generated. The generalisation Bobaljik missed was that these three paradigms have one property in common, which the $AAA_I$ and $ABB_I$ paradigms lack, namely a portmanteau exponent (98). Consequently, Bobaljik’s application of the Suspension Condition to the contextual environments for allomorphy is gratuitous: the Suspension Condition only needs to apply to portmanteaux.

Limiting the Suspension Condition to portmanteaux exponents automatically blocks non-local conditioning of allomorphy. Recall that the node $\varepsilon$ in (94) (repeated in (104)) is spelled out when it merges with the cyclic node $\xi$; since nothing has merged higher in the tree at this point, only $\xi$ is available to condition the allomorphy of $\varepsilon$. Hence, the absence of the $ABC_I$, $AAB_I$, $ABA_I$ and $ABA_{II}$ paradigms is accounted for by the Cyclic Condition, without the need for the suspension of Spell Out.

10Applying the Cyclic Condition and Suspension Condition to the analysis of null allomorphy proposed in §3.2.1 does not rescue the null allomorphy account: this would incorrectly rule out the $AAB_2$ and $ABC_9$ cases of syncretism, and overgenerate the $ABC_2$ and $ABC_4$ cases of syncretism.
The Suspension Condition does apply to contextual environments for suppletion

I am now going to undo the whole of the argument just presented, and argue that we do in fact want the Suspension Condition to apply to environments that condition allomorphy.

The data that concerns us here comes from Greek, reported in Merchant 2015. Greek has three transitive verbs, whose roots supplete in the active and non-active perfective stems (105).

(105) Allomorphs of three Greek roots (Merchant 2015:277)

<table>
<thead>
<tr>
<th>Imperfective</th>
<th>Active perfective</th>
<th>Nonactive perfective</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>tro(γ)-</td>
<td>fa(γ)-</td>
<td>fayο-</td>
<td>‘eat’</td>
</tr>
<tr>
<td>vlep-</td>
<td>δ-</td>
<td>iδο-</td>
<td>‘see’</td>
</tr>
<tr>
<td>le(γ)-</td>
<td>p-</td>
<td>ipο-</td>
<td>‘say’</td>
</tr>
</tbody>
</table>

Merchant 2015 provides the complete paradigm of ‘eat’ to illustrate (106).¹¹

(106) Greek suppletive verb ‘eat’ (Merchant 2015:277)¹²

¹¹ Merchant 2015 does not discuss the sociolinguistic conditioning of stem-final γ, its palatalisation before front vowels, or the stressed prefix é-, referring his reader to Spyropoulos and Revithiadou 2009 for an analysis in the Distributed Morphology framework.

¹² At first glance, it may look like the morpheme -θ- is epenthetic, separating neighbouring vowels. This cannot be the case, however, as neighbouring vowels are unproblematic in the 1st and 3rd person non-past active singular forms. The morpheme -θ- expones the feature [−active].
What concerns us here is suppletion of the root, which clearly depends on both the value of the Voice head (Active or Nonactive), and the value of the Aspect head (Imperfective or Perfective) (107).

<table>
<thead>
<tr>
<th></th>
<th>Imperfective</th>
<th></th>
<th>Perfective</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SG</td>
<td>PL</td>
<td>SG</td>
<td>PL</td>
</tr>
<tr>
<td><strong>Non-</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Past</strong></td>
<td>1π</td>
<td>tró-o</td>
<td>fá-o</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2π</td>
<td>tró-me</td>
<td>fá-me</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3π</td>
<td>tró-i</td>
<td>fá-i</td>
<td></td>
</tr>
<tr>
<td><strong>Non-</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Active</strong></td>
<td>1π</td>
<td>tróy-ome</td>
<td>fayo-0-ó</td>
<td>fayo-0-úme</td>
</tr>
<tr>
<td></td>
<td>2π</td>
<td>tróy-ese</td>
<td>fayo-0-ís</td>
<td>fayo-0-íte</td>
</tr>
<tr>
<td></td>
<td>3π</td>
<td>tróy-ete</td>
<td>fayo-0-í</td>
<td>fayo-0-ún</td>
</tr>
<tr>
<td><strong>Past</strong></td>
<td>1π</td>
<td>é-troy-a</td>
<td>fáy-a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2π</td>
<td>é-troy-es</td>
<td>fáy-es</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3π</td>
<td>é-troy-e</td>
<td>é-fáy-e</td>
<td></td>
</tr>
<tr>
<td><strong>Non-</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Active</strong></td>
<td>1π</td>
<td>troy-ómun</td>
<td>fayó-0-ik-a</td>
<td>fayo-0-ik-ame</td>
</tr>
<tr>
<td></td>
<td>2π</td>
<td>troy-ósun</td>
<td>fayó-0-ik-es</td>
<td>fayo-0-ik-ate</td>
</tr>
<tr>
<td></td>
<td>3π</td>
<td>troy-ótan</td>
<td>fayó-0-ik-e</td>
<td>fayo-0-ik-an</td>
</tr>
</tbody>
</table>

(107) **Allomorphs for \(\sqrt{eat}\), Take 1 (Merchant 2015:278)**

a. \(\sqrt{eat} \Leftrightarrow fa(\gamma) / [[[\_] Voice\_[+act] \ Asp\_[+pfv]]\]

b. \(\sqrt{eat} \Leftrightarrow fayo / [[[\_] Voice\_[−act] \ Asp\_[+pfv]]\]

c. \(\sqrt{eat} \Leftrightarrow tro(\gamma)\)

As the tree in (108) shows, the Aspect head is non-local to the root, separated by the intervening Voice head. But determining which allomorph of eat to use requires aspectual

13 Here are the non-root exponents for the verb structures in (107). I assume that the \(-i\)- in the 2.NON-PAST.PEP.F/ NON-ACT and the \(-i\)- in the 1/3PL.NON-PAST.PREV.NON-ACT are epenthetic, between \(θ\) and a voiceless alveolar or nasal respectively. Merchant writes that the \(e\)- prefix is a Past Active augment (2015:277).

[1SG −PAST] ⇔ -o [1SG −PAST −PFV −ACT] ⇔ -ome
[1PL −PAST] ⇔ -me [1PL −PAST −PFV −ACT] ⇔ -omaste
[1SG +PAST] ⇔ -a [1SG +PAST −PFV −ACT] ⇔ -omun
[1PL +PAST] ⇔ -ame [1PL +PAST −PFV −ACT] ⇔ -omastan
[3SG −PAST] ⇔ -i [3SG −PAST −PFV −ACT] ⇔ -ete
[3PL −PAST] ⇔ -n [3PL −PAST −PFV −ACT] ⇔ -onde
\([−ACT] ⇔ -θ [+[PFV] ⇔ -ik / −ACT] [+PAST]\)

14 If one adopts the analysis in Moskal 2015, and assumes (contra Merchant 2015) that the Voice head is
information, as the allomorphs *fa(y)* and *fayo* are only used in the perfective. The Voice head is equally important, as its value further distinguishes between the two contextually conditioned allomorphs of the root.

(108) *The Greek verbal structure* (Merchant 2015:279)

Merchant argues that non-locally conditioned allomorphy can also be found in the regular and irregular verb classes of Greek, and certain dialects of English with tense and negation in modals and auxiliaries. He concludes that non-locally conditioned stem allomorphy does exist, but under the specific circumstances where the conditioning heads form a *span* in the structure; i.e. they are structurally adjacent to each other and immediately c-command the node whose allomorphy they condition.¹⁵ Since the Voice and Aspect heads immediately c-command the root, they are able to jointly condition its allomorphy, as we see in (107).

To capture this suppletion, we must allow contextual environments for allomorphy to trigger suspension of Spell Out as first envisaged by Bobaljik 2012. However, it’s necessary to restrict it in some way, as the rules of exponence we initially ruled out ((102) and (103)) currently meet the definition of a span, since $S$ and $C$ immediately c-command the adjectival root. Let’s return to the unattested AAB₉ pattern of suppletion.

**Tying everything together**

So far I have neglected to discuss the unattested AAB₉ paradigm of suppletion. This is in fact derivable in Bobaljik’s analysis. Consider the exponents in (109), which generate the AAB₉ pattern.

(109) *Exponents for AAB₉*

\[
[C[\alpha]] \leftrightarrow Y / [S[\_]] \\
\alpha \leftrightarrow x \\
C \leftrightarrow \beta \\
S \leftrightarrow \delta
\]

the categorising node $v$, then this pattern of suppletion is unexpected with the lexical roots ‘eat’, ‘see’ and ‘say’. Alternatively, one could assume (as Merchant 2015 does) that $v$ intervenes between the root and Voice and triggers Spell Out of the root, in which case neither voice nor aspectual information should be able to condition the root’s allomorphy.

¹⁵Note that the nodes conditioning the allomorphy don’t need to be exponed together as a portmanteau, they just need to form a conditioning span.
One rule of exponence particularly stands out: \( [C [\alpha]] \leftrightarrow Y / [S [\_ \_]] \). This rule has two layers of complexity to it, since it expones a portmanteau in a context-specific environment. The same rule of exponence is necessary for only one other paradigm, namely the \( \text{ABC}_{II} \) one. The \( \text{ABC}_{II} \) paradigm is extremely rare in Bobaljik’s survey, appearing exactly twice (in Latin and Middle Persian), with two more cases in Welsh and Middle Persian which differ only in having a context-free portmanteau for the adjectival root and comparative suffix (110). All four cases require a rule of exponence that has two layers of complexity to them.

(110) *Portmanteaux for \([C [\alpha]]\) in the context of a superlative suffix* (Bobaljik 2012:Table 4.1)

<table>
<thead>
<tr>
<th>opt-imus</th>
<th>pahl-om</th>
<th>gor-au</th>
<th>kas-išts</th>
</tr>
</thead>
<tbody>
<tr>
<td>mel-ior</td>
<td>wah-ǐy</td>
<td>gwell</td>
<td>keh</td>
</tr>
<tr>
<td>bon-us</td>
<td>xõb</td>
<td>da</td>
<td>kõdag</td>
</tr>
</tbody>
</table>

Bobaljik’s objective was to develop an analysis that accounted for all and only the attested patterns of suppletion in his survey. He therefore wanted to exclude the \( \text{AAB}_{II} \) paradigm, but keep \( \text{ABC}_{II} \). In the section preceding his cyclic analysis, Bobaljik proposed an alternative locality analysis, and posited the condition in (111) to rule out the \( \text{AAB}_{II} \) paradigm but retain the \( \text{ABC}_{II} \) one.

(111) *Locality condition on rules of exponence* (Bobaljik 2012:150)

If there is a context-sensitive rule of exponence involving a node \( \alpha \), then there is a context-free rule of exponence involving \( \alpha \).

This condition can be seen in action if we consider the Vocabulary Items required for Middle Persian and Welsh’s *good* (112).

(112) *Exponents for Middle Persian and Welsh ‘good’*

<table>
<thead>
<tr>
<th>Middle Persian ‘good’</th>
<th>Welsh ‘good’</th>
</tr>
</thead>
<tbody>
<tr>
<td>[C [\alpha]] \leftrightarrow \text{pahl} / [S [_ _]]</td>
<td>[C [\alpha]] \leftrightarrow \text{gor} / [S [_ _]]</td>
</tr>
<tr>
<td>( \alpha ) \leftrightarrow \text{wah} / [C [_ _]]</td>
<td>( \alpha ) \leftrightarrow \text{gwell}</td>
</tr>
<tr>
<td>( \alpha ) \leftrightarrow \text{xõb}</td>
<td>( \alpha ) \leftrightarrow \text{da}</td>
</tr>
<tr>
<td>( \text{C} ) \leftrightarrow \text{-ǐy}</td>
<td>( \text{S} \leftrightarrow \text{-au}</td>
</tr>
</tbody>
</table>
| \( \text{S} \leftrightarrow \text{-om} | \n
The rules of exponence for the portmanteaux in the context-sensitive environment lie on the first row of the table in (112). Bobaljik argued that the Middle Persian and Welsh
rules of exponence on the second row constitute the context-free counterparts to those on the first row, while the rules of exponence on the third row constitute the context-free counterparts to those on the second (2012:151).

For the sake of clarity, let me explain this in reverse. Beginning with the third row of the table in (112), both Middle Persian and Welsh have an elsewhere rule of exponence for the adjectival root $\alpha$. These rules are thus completely context-free. There are two possible ways to make a context-sensitive rule of exponence to complement the elsewhere exponent. Firstly, there could be an allomorph of $\alpha$ that applies in the comparative; such an exponent is required in Middle Persian. Secondly, $\alpha$ could be exponed in a portmanteau with $c$; such an exponent is required in Welsh. Both exponents are on the second row of (112). I’ll call these mono-complex rules of exponence. These context-specific rules are permitted by the condition in (111), thanks to their context-free counterparts.

Each of these mono-complex context-sensitive rules of exponence could have an even more context-specific counterpart. In both Middle Persian and Welsh, this means having a portmanteau allomorph that applies in a specific environment: the rules of exponence on the first row of the table in (112). I’ll call these bi-complex rules of exponence. Such a build-up of context-sensitivity is absent from the rules of exponence required to derive the AAB$_{II}$ paradigm (113). Thus, the AAB$_{II}$ paradigm is rendered ungeneratable for failing to meet the condition stipulated in (111), despite being derivable by the Suspension Condition.

(113) Exponents for the AAB$_{II}$ paradigm

\[
\begin{align*}
[C [\alpha]] & \Leftrightarrow Y \Leftrightarrow [S [\_]] \\
\alpha & \Leftrightarrow X \\
C & \Leftrightarrow \beta \\
S & \Leftrightarrow \delta
\end{align*}
\]

Bobaljik intended for the cyclic analysis to account for the absence of the AAB$_{II}$ paradigm without invoking the condition in (111), arguing that the Suspension Condition must be defined in such a way that a bi-complex rule of exponence is unable to suspend Spell Out unless a mono-complex rule of exponence is available. He noted that this requires either that the Suspension Condition cannot be applicable to a node in a portmanteau, or that Spell Out cannot be suspended by the contextual environment of bi-complex rules of exponence because the contextual restriction of that environment (here $S$) is too far from the root, and left deciding between the two for future research (Bobaljik 2012:154).

I am going to argue firstly, that we need to adopt the condition in (111) to accompany the Suspension Condition, and secondly that rendering the AAB$_{II}$ paradigm as undervisible is unnecessary because it is attested elsewhere.
As far as I can tell, portmanteaux must be able to trigger the suspension of Spell Out, otherwise the AAA$_{II}$, ABB$_{II}$ and ABC$_{II}$ paradigms of suppletion are underivable. Likewise, contextual restrictions on allomorphy must also be able to suspend Spell Out, otherwise we cannot account for the Greek data in §3.3.2. I therefore propose that the condition in (111) holds alongside the Suspension Condition. While this might appear to rule out the AAB$_{II}$ paradigm at first glance, it has been attested elsewhere and the broader picture reveals that (111) is adhered to. The data I must call your attention to comes from Armenian and Latvian pronouns. First, consider the Armenian data in (114).

(114) **Armenian 2nd person pronouns** (Kozintseva 1995)

<table>
<thead>
<tr>
<th></th>
<th>SG</th>
<th>PL</th>
<th>Vocabulary Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAT</td>
<td>k’-ez</td>
<td>j-ez</td>
<td>2π ⇔ k’ / [ [ ] K] [ABL] ⇔ -(a)nic</td>
</tr>
<tr>
<td>ABL</td>
<td>k’-ez-(a)nic</td>
<td>j-ez-(a)nic</td>
<td>2π ⇔ du K ⇔ -ez</td>
</tr>
</tbody>
</table>

I assume that singular is unmarked (i.e. the Number node is absent), while plural is marked with [−sg]; Nominative Case is unmarked (K is absent), and all other Cases marked. Since there isn’t enough data to analyse the decomposition of the Cases, I will assume that /-ez/ is the realisation of K, and /-(a)nic/ the realisation of the feature [ABL].

(115) **Building the 2SG.DAT, 2SG.NOM, 2PL.NOM and 2PL.DAT pronouns in Armenian**

In the case of 2SG.NOM, the pronominal tree will simply be $2\pi$, as singular number and Nominative Case are the absence of the Number and Case nodes in the structure. This will spell out as /du/. If the pronoun is 2SG.DAT, $2\pi$ will merge directly with the K node. Spell Out will be suspended due to the second Vocabulary Item in the first column of (114). When the structure merges again, $2\pi$ will spell out as /k’/ and K will then spell out as /-ez/. If the pronoun is 2PL.NOM, $2\pi$ will merge with [−sg], triggering Spell Out of $2\pi$. 

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But Spell Out will be suspended due to the third Vocabulary Item in the first column of (114). Since no Case node merges above #, the structure will spell out as /duk'/. Finally, we have \texttt{2pl.dat}. This is formed when the Case node merges above #, which triggers Spell Out of \([2\pi -SG]\). Spell Out is suspended, however, because the third Vocabulary Item in the first column of (114) spans the Spell Out domain and \(\texttt{K}\); when the structure merges with another element above \(\texttt{K}\), the pronoun is spelt out as /jez/.

The same morphological pattern can be seen in Latvian first person pronouns (116).

\[\text{(116) } \textit{Latvian 1st person pronouns} \text{ (Mathiassen 1997)}^{16}\]

\[
\begin{array}{|l|c|c|l|}
\hline
& \text{SG} & \text{PL} & \text{Vocabulary Items} \\
\hline
\text{NOM} & \text{es} & \text{m-ēs} & [1\pi -\text{SG}] \leftrightarrow \text{mu} / \llbracket \_ \_\_ \text{K} \rrbracket \text{ DAT} \leftrightarrow -\text{ms} / \llbracket [\_ -\text{SG}] \_ \rrbracket \\
\text{GEN} & \text{man-is} & \text{mū-su} & 1\pi \leftrightarrow \text{man} / \llbracket \_ \_\_ \text{K} \rrbracket \text{ DAT} \leftrightarrow \emptyset \\
\text{DAT} & \text{man} & \text{mu-ms} & 1\pi \leftrightarrow \text{es} \text{ ACC} \leftrightarrow -s / \llbracket [\_ -\text{SG}] \_ \rrbracket \\
\text{ACC} & \text{man-i} & \text{mū-s} & [\_\text{SG}] \leftrightarrow \text{m-} \text{ ACC} \leftrightarrow -i \\
\text{LOC} & \text{man-ī} & \text{mū-sos} & \text{GEN} \leftrightarrow -\text{su} / \llbracket [\_ -\text{SG}] \_ \rrbracket \text{ LOC} \leftrightarrow -\text{sos} / \llbracket [\_ -\text{SG}] \_ \rrbracket \\
\hline
\end{array}
\]

I assume that singular is unmarked (i.e. the Number node is absent), while plural is marked with \([\_\text{SG}]\); Nominative Case is unmarked (\(\texttt{K}\) is absent), and all other Cases marked.

\[\text{(117) } \textit{Building the 1SG GEN, 1SG NOM, 1PL NOM and 1PL GEN pronouns in Latvian}\]

In the case of 1SG.NOM, the pronominal tree will simply be 1\(\pi\), as singular number and Nominative Case are the absence of the Number and Case nodes in the structure. This will spell out as /es/. If the pronoun is 1SG.GEN, 1\(\pi\) will merge directly with the \(\texttt{K}\) node. Spell Out will be suspended due to the second Vocabulary Item in the first column of

\[^{16}\text{I assume that the accent over the vowels is phonologically conditioned, since it only appears when the vowel is between an /m/ and /s/}.
\]
(116). When the structure merges again, $\pi$ will spell out as /man/ and $K$ will spell out as /-is/. If the pronoun is $1_{PL.NOM}$, $\pi$ will merge with $[-SG]$, triggering spell out of $\pi$. But Spell Out will be suspended due to the third Vocabulary Item in the first column of (116). Since no Case node merges above #, the structure will spell out as /mēs/. Finally, we have $1_{PL.GEN}$. This is formed when the Case node merges above #, which triggers Spell Out of $[\pi - SG]$. Spell Out is suspended, however, due to the contextually conditioned Case exponents; when the structure merges with another element above $K$, the pronoun is spelt out as /mūs/.

The $2_{SG.NOM}$, $2_{PL.NOM}$ and $2_{PL.DAT}$ pronouns in Armenian, and the $1_{SG.NOM}$, $1_{PL.NOM}$ and $1_{PL.GEN}$ pronouns in Latvian form AABII paradigms (118).

(118) **Armenian and Latvian AABII paradigms**

|      | $2_{PL.DAT}$ | $1_{PL.GEN}$ | $mū\cdot su$
|------|--------------|--------------|----------------
| $Y\,δ$ | $j\cdot ez$   | $1_{PL.NOM}$ | $m\cdot es$
| $X\,β$ | $du\cdot k'$  | $1_{SG.NOM}$ | $es$
| $X$    | $du$         | $1_{SG.NOM}$ | Latvian

AABII

Armenian

If we only consider the four exponents required to generate these six pronouns, we find that the condition in (111) is violated, as the bi-complex rule of exponence has no mono-complex counterpart. But if we look at the other rules of exponence required for the full paradigm of pronominal forms for each language, a mono-complex counterpart appears. In Armenian, this is an allomorph for the 2nd person feature, when it is immediately c-commanded by the Case head (119a). In Latvian, this is an allomorph for the 1st person feature in the same environment (119b). Instances of these two allomorphs can be seen in (117) and (115) for the $2_{SG.DAT}$ and $1_{SG.GEN}$ pronouns respectively.

(119) **Complex rules of exponence for Armenian and Latvian pronouns**

a. $2\pi \iff k'/[[\_ ] K]$

b. $1\pi \iff man/[[\_ ] K]$

These two rules of exponence fill the complexity gap between the elsewhere items for the 2nd and 1st person features and the bi-complex rules of exponence, allowing Armenian and Latvian to meet the condition in (111).

Recall that the rules of exponence for the Greek root *eat* did not show a gradation of complexity, but had one elsewhere item and two allomorphs conditioned by the values of two c-commanding features (107). Gradations of complexity emerge when one notices that only the non-active feature on the Voice head is morphologically realised, making this
the marked value. As with the singular number and Nominative Case in the Latvian and Armenian pronouns, I take this to indicate that in the Active, the Voice head is absent from the Greek verbal tree (120), (121).

(120)  The Active verbal structure

\[
\begin{array}{c}
\sqrt{eat} \\
\text{Aspect} \\
\text{Tense}
\end{array}
\]

(121)  The Non-active verbal structure

\[
\begin{array}{c}
\sqrt{eat} \\
\text{Voice} \\
\text{[−ACT]} \\
\text{Aspect} \\
\text{Tense}
\end{array}
\]

Hence, the allomorph faya expones the root eat when it is immediately c-commanded by the perfective Aspect (122), and the allomorphs for eat meet Bobaljik’s locality condition on rules of exponence (111).

(122)  Allomorphs for \( \sqrt{eat} \), Final Version

a.  \( \sqrt{eat} \leftrightarrow \text{fa(γ)} / [[\_ ] \text{Voice}_{[+act]} \text{Asp}_{[+pfv]}] \)

b.  \( \sqrt{eat} \leftrightarrow \text{fayo} / [[\_ ] \text{Asp}_{[+pfv]}] \)

c.  \( \sqrt{eat} \leftrightarrow \text{tro(γ)} \)

The remaining question then, is why are paradigms with doubly-complex rules of exponence so rare? Bobaljik offers a potential explanation for the condition in (111), speculating that "the motivation for [(111)] may lie in the process of acquisition, in essence allowing for the acquisition of a contextually restricted allomorph of some morpheme \( \alpha \) only after \( \alpha \) itself has been acquired" (2012:150). He notes that the intuition here is evocative of ideas about the acquisition of paradigm structure in Pinker 1984, and related to discussions of markedness in Noyer 1998 and Calabrese 2008.

3.4 Establishing their status: A and D are not cyclic nodes

I have shown that the pseudo-ABA patterns of syncretism can be accounted for in an analysis in which A and D are not cyclic nodes, and also in one in which they are. I will now conclude this chapter by demonstrating that the only analysis compatible with the explanation for variable exponence from the previous chapter is the one in which A and D are not cyclic nodes.

Recall from §2.5 that the Peranakan Javanese of Semarang (PJS) pronominal forms overlap in their possible interpretations. I repeat the relevant data here in (123) and (124).
Cole et al 2007 report that there is no syntactic or semantic predictor for the variation; the trigger must be pragmatic or sociolinguistic.

(123) Anaphoric interpretations (Cole et al 2007:25;27)

a. Tono ketok awake dheen dhewe nggon kaca, Siti yaya
   Tono see AWAKE DHEEN DHEWE in mirror Siti also
b. Tono ketok awake dheen nggon kaca, Siti yaya
   Tono see AWAKE DHEEN in mirror Siti also
c. \( \rightarrow \text{Tono } \lambda x (x \text{ saw } x \text{ in the mirror}) \text{ and Siti } \lambda y (y \text{ saw } y \text{ in the mirror}) \)

(124) Diaphoric interpretations (Cole et al 2007:26;24)

a. Tono ngomong nek Bowo ketok awake dheen nggon kaca, Siti yaya.
   Tono say C Bowo see AWAKE DHEEN in mirror Siti also
b. Tono ngomong nek Bowo ketok dheen nggon kaca, Siti yaya.
   Tono say C Bowo see DHEEN in mirror Siti also
c. \( \rightarrow \text{Tono } \lambda x (x \text{ said } \text{Bow} \text{o saw } x) \text{ and Siti } \lambda y (y \text{ said } \text{Bow} \text{o saw } y) \)

To account for this variation, I adopted the mechanism of Probabilistic Impoverishment from Nevins & Parrott 2010 ((56), repeated in (125)).

(125) Probabilistic Impoverishment

Impoverishment rules enact a structural change only probabilistically, rather than deterministically, when their structural description is met.

The PJS data requires two impoverishment rules, one to delete \( A \), which allowed the insertion of awake dheen for the anaphor, and one to delete \( D \), which allowed for the insertion of dheen for the diaphor. Because \( D \) is never deleted from the structure of the anaphor, and because dheen never expones the anaphor, the rules of impoverishment are restricted such that they are subject to the Russian Doll Deletion Constraint ((57), repeated in (126)), and they are ordered, with the impoverishment of \( D \) occurring before the impoverishment of \( A \) ((58), repeated in (127)).

(126) PJS Probabilistic Impoverishment Rules, \((a) > (b)\)

a. \( \% D \rightarrow \$ \)  
   b. \( \% A \rightarrow \$ \)

(127) The Russian Doll Deletion Constraint

Only the outermost layer of the structure is available for impoverishment.
It necessarily follows from this that these impoverishment rules apply to syntactic structures after the structure has been built and before Exponent Insertion at PF. To illustrate why, consider how this would work in an analysis in which A and D are cyclic nodes. The diagram in (128) shows the derivation of the structure of the PJS anaphor.

(128) **Building the PJS anaphor if A and D were cyclic nodes**

P would first merge with D, and D being cyclic would trigger Spell Out of P: dheen. According to the Russian Doll Deletion Constraint, the outermost layer of the tree is available for impoverishment, so the rule of impoverishment that deletes D can apply. The tree, currently composed of the exponent dheen and the empty node which hosted D, then merges with A, which is exponed by dhewe when the structure merges with the Case head K. This results in the PJS anaphor being spelled out as dheen dhewe, which is unattested in PJS. Alternatively, the second rule of impoverishment could apply before the tree merges with K, resulting in the anaphor being exponed by the single morpheme dheen. As with the example illustrated in (128), this is unattested in PJS. We are thus forced to conclude that the nodes A and D cannot be cyclic if the probabilistic impoverishment analysis of variable exponence is maintained.

To see that the attested variation is derived in an analysis in which A and D are not cyclic nodes, consider the structures in (129). If these structures are built before Spell Out, then the ordered rules of impoverishment (if they apply) can only delete D in the diaphor and A in the anaphor, due to the ordering restriction and the Russian Doll Deletion Constraint.

(129) **The complete structures of the diaphor and anaphor**

a. **DIAPHOR**

b. **ANAPHOR**
The structures would then be sent to Spell Out, where they would be exponed as *dheen* and *awake dheen* respectively. Since these are the attested variations in PJS, this analysis is superior to the one in which A and D are cyclic nodes.

### 3.5 Conclusion

In conclusion, only the simple analysis of pseudo-ABA patterns of syncretism is compatible with the broader analysis of the morphology and morphological behaviour of pronominal forms that I have proposed in this thesis. In the simple analysis, A and D are *not* cyclic nodes, and the pronominal tree spells out when it merges with K(ase) (or some higher node). Pseudo-ABA patterns arise when a spanned exponent for [A [D]] and an exponent for P together spell out more of the pronominal structure than any other combination of exponents. The alternative analysis, in which A and D *are* cyclic nodes, is incompatible with the analysis of variable exponence found in pronominal forms (§3.4), which adopted the notion of probabilistic impoverishment from Nevins & Parrott 2010.
Chapter 4

Summary and Conclusion

4.1 Summary

In this thesis, I have investigated the morphology and morphological behaviour of pronominal forms. My investigation began with the observation that there was a mismatch in syncretisms found in the languages of Fanti and Xining Mandarin; in Fanti the free and non-locally bound interpretations are exponed with the same pronominal exponent, while in Xining Mandarin the locally bound and non-locally bound interpretations receive identical pronominal exponence. This data suggested that there are at least three types of pronominal: free pronominals (pronouns), non-locally bound pronominals (diaphors), and locally-bound pronominals (anaphors).

If a given element, here pronominals, can be divided into three morphologically related types, then five logically possible patterns of syncretism are available: AAA, AAB, ABA, ABB and ABC. Of these five, my typological survey of 80 languages revealed that only four were attested, with the ABA pattern unattested. From further analysis of the transparent morphology of pronominal forms, it emerged that the three pronominals exist in a containment relationship with each other, such that diaphors contain pronouns, and anaphors contain diaphors. This can be represented in the shape of a pronominal tree (130).

(130) The tree structure for pronominal forms

```
ANAPHOR
  
DIAPHOR        A
  
PRONOUN       D
    
P
```

The functional heads, P, D and A, introduce restrictions on the antecedent of the pronominal. The antecedent of a pronoun must have $\phi$-features that match the pronoun’s; the antecedent
of a diaphor must also bind it at LF; and the antecedent of an anaphor must also be local to the anaphor at LF.

The pronominal structure in (130) and its three functional heads constitutes the primary contribution this thesis makes to the field of linguistics. Chapter 2 makes two further contributions to the field, in the shape of extending Sauerland’s 2013 weak presuppositional analysis of anaphors, and Nevins & Parrott’s 2010 analysis of variable exponence.

Morphological variation is found with respect to Strict and Sloppy readings of anaphors and diaphors. In languages like English, the Strict readings of anaphors are expressed with the same exponent as expresses the Sloppy reading. This contrasts with Icelandic, where the exponent for the Sloppy reading cannot express the Strict reading. Likewise, languages like Turkish allow the exponent for the Sloppy diaphoric reading to express the Strict diaphoric reading, while languages like Cantonese do not.

To explain this data, I adopted and extended Sauerland’s 2013 weak presuppositional analysis of anaphors; if the presuppositions introduced to the pronominal tree by the functional heads A and D are able to be dropped in the evaluation of alternatives, then we can explain the flexibility of languages like English and Turkish, and if A and D’s presuppositions cannot be dropped, then we can explain the inflexibility of Icelandic and Cantonese’s pronominals.

Different morphological anomalies are found in languages such as the Peranakan Javanese of Semarang (PJS). In PJS, the pronominal forms overlap in their possible interpretations; *awake dheen dheewe* and *awake dheen* can both be used as the anaphor, and *awake dheen* and *dheen* can both be used as the diaphor, and there is no syntactic or semantic predictor for the variation. Other languages which appear to display variable exponence are Korean, Malay (see Appendix A), and Yoruba (Adesola 2006).

I argued that variable exponence can be captured if we adopt Nevins & Parrott’s Probabilistic Impoverishment (2010), which is restricted by the Russian Doll Deletion Constraint (Ackema & Neeleman 2018), and which applies to rules of impoverishment that are ordered. This analysis allows for five patterns of variable exponence, but rules out the case where the exponent for P can optionally be used as the anaphor, but cannot be optionally used as the diaphor.

The second half of this thesis was concerned with an analysis of pseudo-ABA patterns of syncretism, which are found in Babanki, Malayalam and Yoruba (131).
The transparent morphology of three ABC languages

<table>
<thead>
<tr>
<th>Babanki</th>
<th>Malayalam</th>
<th>Yoruba</th>
</tr>
</thead>
<tbody>
<tr>
<td>ówénó wén</td>
<td>avanavan</td>
<td>ara ré</td>
</tr>
<tr>
<td>jì</td>
<td>tan</td>
<td>òun</td>
</tr>
<tr>
<td>wén</td>
<td>avan</td>
<td>ré</td>
</tr>
</tbody>
</table>

I showed that an impoverishment analysis of these forms is incompatible with the Russian Doll Deletion Constraint, and a null allomorphy account over-generates, allowing all possible syncretism patterns to emerge. I argued that the only analysis that would capture the pseudo-ABA patterns was one in which exponents can span and spell out neighbouring heads in a structure, in combination with exponents for single nodes to meet the Maximal Subset Principle’s condition. This relaxes the ban on competition between exponents a fraction, allowing it within a single cycle of Spell Out.

I then discussed an alternative analysis in which A and D are cyclic nodes (Bobaljik 2012), and demonstrated that this analysis achieves the same empirical coverage as its non-cyclic counterpart. However, the cyclic analysis is incompatible with the analysis of variable exponence found in pronominal forms, and so I concluded that the non-cyclic analysis is superior.

The contribution Chapter 3 makes to the field of linguistics is two-fold. Firstly, the analysis of pseudo-ABA patterns of syncretism lends support to the notion of spanned exponents. Secondly, we now have a finer understanding of post-syntactic Impoverishment. Structures are built until a cyclic node merges into the tree, whereupon its complement is spelled out. Impoverishment rules may then apply, but are restricted by the Russian Doll Deletion Constraint. Not all nodes are cyclic: specifically in the pronominal domain, P, D and A are not; if they were, then the Russian Doll Deletion Constraint would be redundant, and pronominal forms would show rampant morphological variation, including ABA patterns of syncretism.

4.2 Future research

There are many possible directions that future research on pronominal forms can take. Particularly notable are the related domains for investigation that I deliberately avoided to keep the present project manageable. For example, in this thesis I restricted my investigation to 3rd person pronominal forms, so the first question that arises is whether the pronominal tree in (130) holds in the 1st and 2nd person domain; I anticipate that it will, but I don’t have enough data to be certain.

A second obvious direction in which to go, is the relationship between the strong

A third area of interest that has attracted a lot of attention over the years is reduced anaphors (see Reuland 2011 and references therein). An analysis of these may link into an analysis of weak pronominal forms, as reduced anaphors cannot be stressed or co-ordinated, properties they share with Cardinaletti & Starke’s weak pronominal forms.

Other elements are known to show properties similar to anaphors, for example, middles, inchoatives, applicatives, imperative subjects, agreement markers, evaluative markers, medio-reflexives, numeral classifiers, and reciprocals. Investigating the morphological relationships between these elements and weak and strong anaphors is another domain likely to produce fruitful research.

Many avenues for future research also appear if one turns to the semantics of pronominals. For example, Charnavel 2019 investigates exempt anaphors; data in Adesola 2006 suggests that Yoruba might have such thing as an exempt diaphor.

There is also the question of how the pronominal tree in (130) interacts with de se and de re interpretations of pronominal forms, which is an active area of research (e.g. Schlenker 1999; 2003; Percus & Sauerland 2003; Anand 2006; Kratzer 2009; Pearson 2013; Deal forthcoming).

An equally interesting puzzle lies with Shifty Indexicals (e.g. Schlenker 2003; Percus & Sauerland 2003; Anand & Nevins 2004; Shklovsky & Sudo 2014; Baker 2017; Deal forthcoming) and how the pronominal tree might interact with them.

In conclusion, then, I have argued that the structure of pronominal forms is that given in (130) and that the functional heads P, D and A introduce restrictions on their antecedents. Furthermore, the presuppositional content of A and D can be dropped in the evaluation of alternatives, allowing for Strict readings of anaphors and diaphors, and probabilistic impoverishment of these features allows for the variable exponence found in languages such as the Peranakan Javanese of Semarang. Finally, spanned exponents allow us to explain the pseudo-ABA patterns of syncretism in Babanki, Malayalam and Yoruba. It remains to be seen how well this analysis fits into the broader morphology of pronominal forms, but there are plenty of avenues for future research.
If the following statement is true, then the statement on page 89 is false.

**Statement**

You should rip out that page →
**Reference page for Chapter 3**

*Morphological possibilities for the ABC syncretism paradigms*

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*Morphological possibilities for suppletion of the root*

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If the following statement is true, then the statement on page 86 is false.

**Statement**

← You should not rip out that page
## Appendix A: The data

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<tr>
<td>Dravidian (3)</td>
<td>Malayalam; Tamil; Telugu</td>
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<tr>
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*(c) = creole
## AAA

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## AAB

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**ABB**

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| Sino-Tibetan | Japonic | Turkic | Koreanic | Dravidian |

94
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Turkish: Xining Mandarin
Turkic: Sino-Tibetan

**ABC**

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<td>atanini</td>
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Basque: Icelandic
Isolate: Germanic
Mandarin: Austronesian
Turkic: Dravidian
Turkish: Niger-Congo

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Peranakan Javanese of Semarang: Babanki
Austronesian: Mandalay
Niger-Congo: Mandarin
Dravidian: Sino-Tibetan

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Yoruba
Niger-Congo
NOTES: Sentences in which the target pronominal appears in a co-ordinated DP were designed as a check that the pronominal forms were strong. Thus, I did not always test for all possible interpretations (local, non-local, free, Strict and Sloppy). See Appendix C for discussion. Locally-bound Strict readings are frequently absent, as I did not appreciate the significance of acquiring such data until after the main body of data had been established.

A.1 Afrikaans: AAB

(133) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga dink dat slegs Piglet homself lief het
   Kanga think that only Piglet HOMSELF love have
   \( \rightarrow Kanga \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y)) \)

b. Slegs Piglet dink dat Kanga hom lief het
   only Piglet think that Kanga HOM love have
   \( \rightarrow Only \text{ Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } x)) \)
   \( \rightarrow Only \text{ Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z)) \)

(134) The non-local Strict reading

a. Slegs Piglet dink dat Kanga hom lief het
   only Piglet think that Kanga HOM love have
   \( \rightarrow Only \text{ Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z)), \text{ where } z = \text{ Piglet} \)

(135) Only Piglet thinks that Kanga loves him and his friend

a. Slegs Piglet dink dat Kanga vir hom en sy vriend lief het
   only Piglet think that Kanga for HOM and his friend love have
   \( \rightarrow Only \text{ Piglet } \lambda x (x \text{ thinks Kanga } \lambda y (y \text{ loves } x \text{ and his friend})) \)

Native Speaker Informants: Colette Pienaar

A.2 Arekan Javanese: AAB

(136) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga pikir cuma Piglet sing suka ambek dirine dewe
   Kanga think only Piglet REL like with DIRINE DEWE
   \( \rightarrow Kanga \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y)) \)

b. cuma Piglet sing ngira lek Kanga suka ambek de?e
   only Piglet REL think C Kanga like with DE’E
   \( \rightarrow Only \text{ Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } x)) \)
   \( \rightarrow Only \text{ Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z)) \)

(137) The non-local Strict reading

a. cuma Piglet sing ngira lek Kanga suka ambek de?e
   only Piglet REL think C Kanga like with DE’E
   \( \rightarrow Only \text{ Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z)), \text{ where } z = \text{ Piglet} \)
(138) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kanga pikir cuma Piglet sing suka ambek dirine dewe sama (ambek) Kanga think only Piglet REL like with DIRINE DEWE and (with) temene friend
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))

b. cuma Piglet sing ngira lek Kanga suka deʔe ambek temene only Piglet REL think C Kanga like DE'E with friend
   → Only Piglet λx (x thinks Kanga λy (y loves x and his friend))
   → Only Piglet λx (x thinks Kanga λy (y loves z and his friend)), z = Piglet
   → Only Piglet λx (x thinks Kanga λy (y loves z and his friend))

Native Speaker Informants: David Moeljadi

A.3 Armenian: AAB

(139) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kangan mtacum e, vor miayn Xozukn e inqn iren sirum Kanga think 3SG that only Piglet 3SG INQN IREN love
   → Kanga λx (x thinks that only Piglet λy (y loves y))

b. miayn Xozukn e mtacum, vor Kangan sirum e iren only Piglet 3SG think that Kanga love 3SG IREN
   → Only Piglet λx (x thinks that Kanga λy (y loves x))
   → Only Piglet λx (x thinks that Kanga λy (y loves z))

(140) The non-local Strict reading

a. miayn Xozukn e mtacum, vor Kangan sirum e iren only Piglet 3SG think that Kanga love 3SG IREN
   → Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

(141) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kangan e mtacum, vor miayn Xozukn sarum e inqn iren ev ir Kanga 3SG think that only Piglet love 3SG INQN IREN and his ənkerojə friend
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))

b. miayn Xozukn e mtacum, vor Kangan sirum e iren ev ir only Piglet 3SG think that Kanga love 3SG IREN and his ənkerojə friend
   → Only Piglet λx (x thinks Kanga λy (y loves x and his friend))

Native Speaker Informants: Ani Gevorgyan
A.4 Babanki: ABC

(142) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
   a. Kanga ó kwò?-ò lá à kòŋ-ò tà Piglet kòŋ-ò
      Kanga SM think-PROG that it’s love-PROG only Piglet love-PROG
      ó wén ó wén
      E WEN E WEN
      → Kanga λx (x thinks that only Piglet λy (y loves y))
   b. à kwò?-ò tà Piglet lá Kanga ó kòŋ-ò jì
      it’s think-PROG only Piglet that Kanga SM love-PROG JI
      → Only Piglet λx (x thinks that Kanga λy (y loves x))
   c. à kwò?-ò tà Piglet lá Kanga ó kòŋ-ò wén
      it’s think-PROG only Piglet that Kanga SM love-PROG WEN
      → Only Piglet λx (x thinks that Kanga λy (y loves z))

(143) The non-local Strict reading
   a. à kwò?-ò tà Piglet lá Kanga ó kòŋ-ò jì
      it’s think-PROG only Piglet that Kanga SM love-PROG JI
      → Only Piglet λx (x thinks that Kanga λy (y loves x)), where z = Piglet
   b. à kwò?-ò tà Piglet lá Kanga ó kòŋ-ò jì nò wù-ndóŋ ò wén
      it’s think-PROG only Piglet that Kanga SM love-PROG JI with 1-friend AM 3SG
      → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))
   c. à kwò?-ò tà Piglet lá Kanga ó kòŋ-ò wén nò wù-ndóŋ
      it’s think-PROG only Piglet that Kanga SM love-PROG WEN with 1-friend AM 3SG
      → Only Piglet λx (x thinks Kanga λy (y loves x and his friend))
      → Only Piglet λx (x thinks Kanga λy (y loves z and his friend)), z = Piglet

(144) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
   a. Kanga ó kwò?-ò lá à kòŋ-ò tà Piglet kòŋ-ò
      Kanga SM think-PROG that it’s love-PROG only Piglet love-PROG
      ó wén ó wén nà wù-ndóŋ ò wén
      E WEN E WEN with 1-friend AM 3SG
      → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))
   b. à kwò?-ò tà Piglet lá Kanga ó kòŋ-ò jì nò wù-ndóŋ ò jì
      it’s think-PROG only Piglet that Kanga SM love-PROG JI with 1-friend AM 3SG
      → Only Piglet λx (x thinks Kanga λy (y loves x and his friend))
      → Only Piglet λx (x thinks Kanga λy (y loves z and his friend)), z = Piglet
   c. à kwò?-ò tà Piglet lá Kanga ó kòŋ-ò wén nò wù-ndóŋ
      it’s think-PROG only Piglet that Kanga SM love-PROG WEN with 1-friend AM 3SG
      → Only Piglet λx (x thinks Kanga λy (y loves z and his friend))

Native Speaker Informants: Pius Akumbu
A.5 Balinese: AAB

(145) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
   a. Kanga mapineh Piglet dogen ane demen ajak awakne pedidi
      Kanga think Piglet only that like/love with AWAKNE PEDIDI
      → Kanga λx (x thinks that only Piglet λy (y loves y))
   b. Piglet dogen ane mapineh Kanga demen ajak ye
      Piglet only that think Kanga like/love with YE
      → Only Piglet λx (x thinks that Kanga λy (y loves x))
      → Only Piglet λx (x thinks that Kanga λy (y loves z))

(146) The non-local Strict reading
   a. Piglet dogen ane mapineh Kanga demen ajak ye
      Piglet only that think Kanga like/love with YE
      → Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

(147) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
   a. Kanga mapineh Piglet dogen ane demen ajak awakne pedidi lan
      Kanga think Piglet only that like/love with AWAKNE PEDIDI and
      timpal-ne friend-POSS
      → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))
   b. Piglet dogen ane mapineh Kanga demen ajak ye lan timpal-ne
      Piglet only that think Kanga like/love with YE and friend-POSS
      → Only Piglet λx (x thinks Kanga λy (y loves x and his friend))

Native speaker Informants: Ratih Oktarini

A.6 Bangla: AAB

(148) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
   a. Kanga mone kore je ğudhu Piglet-i nije-ke bhalobaje
      Kanga mind do.3.PRES C only Piglet-i NIJE-ACC love.3.PRES
      → Kanga λx (x thinks that only Piglet λy (y loves y))
   b. ğudhu Piglet-i bhabe je Kanga o-ke bhalobaje
      only Piglet-1 think.3.PRES C Kanga O-ACC love.3.PRES
      → Only Piglet λx (x thinks that Kanga λy (y loves x))
      → Only Piglet λx (x thinks that Kanga λy (y loves z))

(149) The non-local Strict reading
   a. ğudhu Piglet-i bhabe je Kanga o-ke bhalobaje
      only Piglet-1 think.3.PRES C Kanga O-ACC love.3.PRES
      → Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet
Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kanga mone kare je jadhū Piglet-i nije-ke ar or bondhu-ke Kanga mind do.3.PRS C only Piglet-I NIJE-ACC and his friend-ACC
   bhalobaje love.3.PRS
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))

b. jadhū Piglet-i mone kare je Kanga o-ke ar or bondhu-ke only Piglet-I mind do.3.PRS C Kanga O-ACC and his friend-ACC
   bhalobaje love.3.PRS
   → Only Piglet λx (x thinks Kanga λy (y loves x and his friend))
   → Only Piglet λx (x thinks Kanga λy (y loves z and his friend)), z = Piglet
   → Only Piglet λx (x thinks Kanga λy (y loves z and his friend))

Native Speaker Informants: Ishani Guha

A.7 Basque: ABC

(151) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga-k uste du bakarrik Piglet-ek maite du-ela bere buru-a
   Kanga-ERG think have only Piglet-ERG love have-that BERE BURU-DET
   → Kanga λx (x thinks that only Piglet λy (y loves y))

b. Bakarrik Piglet-ek uste du Kanga-k maite du-ela bera
   only Piglet-ERG think have Kanga-ERG love have-that BERA
   → Only Piglet λx (x thinks that Kanga λy (y loves x))

c. Bakarrik Piglet-ek uste du Kanga-k maite du-ela hura
   only Piglet-ERG think have Kanga-ERG love have-that HURA
   → Only Piglet λx (x thinks that Kanga λy (y loves z))

The non-local Strict reading

a. Bakarrik Piglet-ek uste du Kanga-k maite du-ela bera
   only Piglet-ERG think have Kanga-ERG love have-that BERA
   → Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

(153) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kanga-k uste du bakarrik Piglet-ek maite d-it-u-ela
   Kanga-ERG think have only Piglet-ERG love have-DO-PL-that
   bere buru-a eta bere lagun-a
   BERE BURU-DET and his friend-DET
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))

b. Bakarrik Piglet-ek uste du Kanga-k maite d-it-u-ela bera
   only Piglet-ERG think have Kanga-ERG love have-DO-PL-that BERA
   eta bere lagun-a
   and his friend-DET
   → Only Piglet λx (x thinks Kanga λy (y loves x and his friend))
→ Only Piglet λx (x thinks Kanga λy (y loves z and his friend)), z = Piglet

c. Bakarrik Piglet-ek uste du Kanga-k maite d-it-u-ela hura
only Piglet-ERG think have Kanga-ERG love have-DO-PL-that HURA
eta hura-ren lagun-a
and him-POSS friend-DET
→ Only Piglet λx (x thinks Kanga λy (y loves z and his friend))

Native Speaker Informants: Aritz Galarraga

A.8 Bislama: AAA

(154) Kanga/only Piglet thinks that only Piglet/Kanga loves himself/him

a. Kanga i think se Piglet i lovem hem wan nomo
Kanga he think that Piglet he love HEM one only
→ Kanga λx (x thinks that only Piglet λy (y loves y))

a’. Piglet hemi think se Kanga hem wan nomo i lovem hem
Piglet he think that Kanga him one only he love HEM
→ Only Piglet λx (x thinks that Kanga λy (y loves x))
→ Only Piglet λx (x thinks that Kanga λy (y loves z))

(155) The non-local Strict reading

a. Piglet hemi think se Kanga hem wan nomo i lovem hem
Piglet he think that Kanga him one only he love HEM
→ Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

(156) Only Piglet thinks that Kanga loves him and his friend

a. Piglet i ting se Kanga i lovem hem nomo wetem ol fren blong
Piglet he think that Kanga he love HEM only with all friend belong
him
→ Only Piglet λx (x thinks Kanga λy (y loves x and his friend))

Native Speaker Informants: Vivian Thu

A.9 Cantonese: ABB

(157) (Only) Diana thinks that (only) Charles loves himself / her

a. Diana kokdak zinghai Charles oi zigei
Diana think only Charles love ZIGEI
→ Diana λx (x thinks that only Charles λy (y loves y))

a’. zinghai Diana kokdak Charles oi zigei
only Diana think Charles love ZIGEI
→ Only Diana λx (x thinks that Charles λy (y loves x))

b. zinghai Diana kokdak Charles oi keoi
only Diana think Charles love KEOI
→ Only Diana λx (x thinks that Charles λy (y loves z))
The Strict readings

a. zinghai Diana kokdak Charles oi zigei only Diana think Charles love ZIGE = Diana → Only Diana λx (x thinks that Charles λy (y loves z)), where z = Charles

b. Diana kokdak zinghai Charles oi keoi only Diana think Charles love KEOI → Diana λx (x thinks that only Charles λy (y loves z)), where z = Diana

Native Speaker Informants: Jeannie Kuo

A.10 Cebuano: AAB

Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. nag-ingon si Kanga nga ang Baboy ray naghiguma sa said him Kanga that the Piglet alone love on

iyang kaugauingon

IYANG KAUGAUINGON → Kanga λx (x thinks that only Piglet λy (y loves y))

b. ingon si Baboy nga si Kanga ray nahiguma nya says him Piglet that him Kanga alone love NYA → Only Piglet λx (x thinks that Kanga λy (y loves x)) → Only Piglet λx (x thinks that Kanga λy (y loves z))

The non-local Strict reading

a. ingon si Baboy nga si Kanga ray nahiguma nya says him Piglet that him Kanga alone love NYA → Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

Only Piglet thinks that Kanga loves him and his friend

a. si Baboy raynaghunahuna sa Kanga raynahiguma nya ug ang iyang him Piglet thinking him Kanga love NYA and the him mga kahigalaan with friends → Only Piglet λx (x thinks Kanga λy (y loves x and his friend))

Native Speaker Informants: Evelyn and Mila Amber

A.11 Chichewa: AAB

Kanga / only Piglet thinks that only Piglet / Kanga feels good about himself / him

a. Kanga a-ku-ganiza kuti Piglet yekha ndi a-mene a-mamva bwino za Kanga SM-T-think that Piglet only COP SM-who SM-feel good about iye mwini

IYE MWINI → Kanga λx (x thinks that only Piglet λy (y feels good about y))
b. Piglet yekha ndi a-mene a-ku-ganiza kuti Kanga a-mamva bwino za
Piglet only COP SM-who SM-T-think that Kanga SM-feel good about
iye
IYE
→ Only Piglet λx (x thinks that Kanga λy (y feels good about x))
→ Only Piglet λx (x thinks that Kanga λy (y feels good about z))

(163) The non-local Strict reading
a. Piglet yekha ndi a-mene a-ku-ganiza kuti Kanga a-mamva bwino za
Piglet only COP SM-who SM-T-think that Kanga SM-feel good about
iye
IYE
→ Only Piglet λx (x thinks that Kanga λy (y feels good about z)), z = Piglet

(164) Kanga / only Piglet thinks that only Piglet / Kanga feels good about himself / him
and his friend
a. Kanga a-ku-ganiza kuti Piglet yekha ndi a-mene a-mamva bwino za
Kanga SM-T-think that Piglet only COP SM-who feel good about
iye mwiní ndi mzake
IYE MWINI and friend.POSS
→ Kanga λx (x thinks that only Piglet λy (y feels good about y and his friend))

b. Piglet yekha ndi a-mene a-ku-ganiza kuti Kanga a-mamva bwino za
Piglet only COP SM-who SM-T-think that Kanga SM-feel good about
iye ndi mzake
IYE and friend.POSS
→ Only Piglet λx (x thinks Kanga λy (y feels good about x and his friend))
→ Only Piglet λx (x thinks Kanga λy (y feels good about z and his friend)), z = Piglet
→ Only Piglet λx (x thinks Kanga λy (y feels good about z and his friend))

Native Speaker Informants: Chimwemwe Mayinde Mystic Kamanga

A.12 Chitonga: AAB

(165) Kanga / only Piglet thinks that only Piglet / Kanga feels good about himself / him
and his friend
a. Kanga waghanghana kuti Piglet pee ndiyu waturwa umampha za
Kanga thinks that Piglet only COP feels good about
iyu mwenekú ndi mnyake
IYU MWENEKU and friend.POSS
→ Kanga λx (x thinks that only Piglet λy (y feels good about y and his friend))

b. Piglet pee ndiyu waghanaghana kuti Kanga waturwa umampha za iyu
Piglet only COP thinks that Kanga feels good about IYU
ndi mnyake
and friend.POSS
→ Only Piglet λx (x thinks that Kanga λy (y feels good about x and his friend))
→ Only Piglet λx (x thinks that Kanga λy (y feels good about z and his friend))
(166) The non-local Strict reading

a. Piglet pee ndiyu waghanaghana kuti Kanga waturwa umampha za iyu
Piglet only COP thinks that Kanga feels good about IYU

ndi mnyake

and friend.POSS

→ Only Piglet λx (x thinks that Kanga λy (y feels good about z and his friend)), z = Piglet

Native Speaker Informants: Chimwemwe Mayinde Mystic Kamanga

A.13 Chitumbuka: AAB

(167) Kanga / only Piglet thinks that only Piglet / Kanga feels good about himself / him

a. Kanga wa-ku-ghanaghana kuti Piglet pera ndyio wa-ku-pulika makora
Kanga SM-T-think that Piglet only COP SM-T-feels good
za iyoy mwene

about IYO MWENE

→ Kanga λx (x thinks that only Piglet λy (y feels good about y))

b. Piglet pera ndiyo wa-ku-ghanaghana kuti Kanga wa-ku-pulika makora
Piglet only COP SM-T-think that Kanga SM-T-feels good
za iyoy

about IYO

→ Only Piglet λx (x thinks that Kanga λy (y feels good about x))

→ Only Piglet λx (x thinks that Kanga λy (y feels good about z))

(168) The non-local Strict reading

a. Piglet pera ndiyo wa-ku-ghanaghana kuti Kanga wa-ku-pulika makora
Piglet only COP SM-T-think that Kanga SM-T-feels good
za iyoy

about IYO

→ Only Piglet λx (x thinks that Kanga λy (y feels good about z)), z = Piglet

Native Speaker Informants: Chimwemwe Mayinde Mystic Kamanga

A.14 Croatian: AAB

(169) Only Diana thinks that Charles loves himself / her

a. samo Diana misli da Charles voli sebo
only Diana think.3.PRES that Charles love.3.PRES SEBO

→ Only Diana λx (x thinks that Charles λy (y loves y))

b. samo Diana misli da Charles voli nju
only Diana think.3.PRES that Charles love.3.PRES NJU

→ Only Diana λx (x thinks that Charles λy (y loves x))

→ Only Diana λx (x thinks that Charles λy (y loves z))
(170) The non-local Strict reading
   a. samo Diana misli da Charles voli nju
      only Diana think.3.PRES that Charles love.3.PRES NJU
      \rightarrow Only Diana \lambda x (x thinks that Charles \lambda y (y loves z)), where z = Diana

Native Speaker Informants: Frane Malenica

A.15 Czech: AAB

(171) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
   a. Kanga si myslí, že pouze Piglet miluje sám sebe a
      Kanga REFL think.3.PRES that only Piglet love.3.PRES EMPH SEBE and
      svého přítele
      SELF.POSS friend
      \rightarrow Kanga \lambda x (x thinks that only Piglet \lambda y (y loves y and y’s friend))

   b. pouze Piglet si myslí, že Kanga miluje jeho a jeho přítele
      only Piglet REFL think.3.PRES that Kanga love.3.PRES JEHO and his friend
      \rightarrow Only Piglet \lambda x (x thinks that Kanga \lambda y (y loves x and x’s friend))
      \rightarrow Only Piglet \lambda x (x thinks that Kanga \lambda y (y loves z and z’s friend))

(172) The non-local Strict reading
   a. pouze Piglet si myslí, že Kanga miluje jeho a jeho přítele
      only Piglet REFL think.3.PRES that Kanga love.3.PRES JEHO and his friend
      \rightarrow Only Piglet \lambda x (x thinks that Kanga \lambda y (y loves z)), where z = Piglet

Native Speaker Informants: Petra Charvátová, Jiri Kaspar

A.16 Dutch: AAB

(173) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
   a. Kanga denkt dat alleen Piglet van zichzelf houdt
      Kanga thinks that only Piglet of ZICHZELF loves
      \rightarrow Kanga \lambda x (x thinks that only Piglet \lambda y (y loves y))

   b. alleen Piglet denkt dat Kanga van hem houdt
      only Piglet thinks that Kanga of HEM loves
      \rightarrow Only Piglet \lambda x (x thinks that Kanga \lambda y (y loves x))
      \rightarrow Only Piglet \lambda x (x thinks that Kanga \lambda y (y loves z))

(174) The non-local Strict reading
   a. alleen Piglet denkt dat Kanga van hem houdt
      only Piglet thinks that Kanga of HEM loves
      \rightarrow Only Piglet \lambda x (x thinks that Kanga \lambda y (y loves z)), where z = Piglet
Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kanga denkt dat alleen Piglet van zijn vriend en zichzelf houdt
   Kanga thinks that only Piglet of his friend and ZICHZELF loves
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))

b. alleen Piglet denkt dat Kanga van zijn vriend en hem houdt only Piglet thinks that Kanga of his friend and HEM loves
   → Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))
   → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend)), z = Piglet
   → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))

Native Speaker Informants: Ad Neeleman

A.17 English: AAB

(176) (Only) Diana thinks that (only) Charles loves himself / her

a. Diana thinks that only Charles loves himself
   → Diana λx (x thinks that only Charles λy (y loves y))

b. Only Diana thinks that Charles loves her
   → Only Diana λx (x thinks that Charles λy (y loves x))
   → Only Diana λx (x thinks that Charles λy (y loves z))

(177) The local and non-local Strict readings

a. Diana thinks that only Charles loves himself
   → Diana λx (x thinks that only Charles λy (y loves z)), where z = Charles

b. Only Diana thinks that Charles loves her
   → Only Diana λx (x thinks that Charles λy (y loves z)), where z = Diana

(178) (Only) Diana thinks that (only) Charles loves himself / her and his / her friend

a. Diana thinks that only Charles loves himself and his friend
   → Diana λx (x thinks that only Charles λy (y loves y and y’s friend))
   → Diana λx (x thinks that only Charles λy (y loves z and z’s friend)), z = Charles

b. Only Diana thinks that Charles loves her and her friend
   → Only Diana λx (x thinks that only Charles λy (y loves x and x’s friend))
   → Only Diana λx (x thinks that only Charles λy (y loves z and z’s friend)), z = Diana
   → Only Diana λx (x thinks that only Charles λy (y loves z and z’s friend))

A.18 Estonian: AAB

(179) (Only) Diana thinks that (only) Charles loves himself / her

a. Diana arvab, et ainult Charles armastab isennast
   Diana thinks that only Charles loves ISEENNAST
   → Diana λx (x thinks that only Charles λy (y loves y))
b. Ainult Diana arvab, et Charles armastab teda only Diana thinks that Charles loves TEDA
   \[ \text{Only Diana } \lambda x (x \text{ thinks that Charles } \lambda y (y \text{ loves } x)) \]
   \[ \text{Only Diana } \lambda x (x \text{ thinks that Charles } \lambda y (y \text{ loves } z)) \]

(180) The local and non-local Strict readings

a. Diana arvab, et ainult Charles armastab iseennast Diana thinks that only Charles loves ISEENNAST
   \[ \text{Diana } \lambda x (x \text{ thinks that only Charles } \lambda y (y \text{ loves } z)), \quad \text{where } z = \text{Charles} \]

b. Ainult Diana arvab, et Charles armastab teda only Diana thinks that Charles loves TEDA
   \[ \text{Only Diana } \lambda x (x \text{ thinks that Charles } \lambda y (y \text{ loves } z)), \quad \text{where } z = \text{Diana} \]

Native Speaker Informants: Jan Jürgen Lõokene, Sille Salutee

A.19 Ewe: ABC

(181) Kanga thinks that only Piglet loves himself

a. Kanga susu be Piglet ko yé lọ yè dokui
   Kanga think that Piglet only FOC love YE DOKUI
   \[ \text{Kanga } \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y)) \]

Native Speaker Informants: Abby Bimpeh

(182) Only Kofi believes that Ama loves him

a. Kofi ko e-hose be Ama lọ yè
   Kofi only 3SG-believes C Ama loves YE
   \[ \text{Only Kofi } \lambda x (x \text{ believes that Ama } \lambda y (y \text{ loves } x)) \]
   \[ \text{Only Kofi } \lambda x (x \text{ believes that Ama } \lambda y (y \text{ loves } z)), \quad \text{where } z = \text{Kofi} \]

b. Kofi ko e-hose be Ama lọ e
   Kofi only 3SG-believes C Ama loves E
   \[ \text{Only Kofi } \lambda x (x \text{ believes that Ama } \lambda y (y \text{ loves } z)), \quad \text{where } z \neq \text{Kofi} \]

Culy (1994:1082)

A.20 Ewondo: AAB

(183) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga à-à-tsog nà νə Piglet (è-tám) ñé Kanga.1 SM.1-PRES-think that only Piglet.1 (VII-solitude) PRON.1 à-à-diŋ (p)é nèn
   SM.1-PRES-like NE MEN
   \[ \text{Kanga } \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y)) \]

b. νə Piglet (è-tám) ñé à-à-tsog nà Kanga only Piglet.1 (VII-solitude) PRON.1 SM.1-PRES-think that Kanga.1 à-à-diŋ ñé
   SM.1-PRES-like NE
   \[ \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } x)) \]
   \[ \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z)) \]
The non-local Strict reading

a. və Piglet (è-tám) ńé à-à-tsog ná Kanga only Piglet.I (VII-solitude) PRON.I SM.I-PRES-think that Kanga.I à-à-diŋ ńé SM.I-PRES-like NE

→ Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kanga à-à-tsog ná və Piglet ńé (è-tám) Kanga.I SM.I-PRES-think that only Piglet.I PRON.I (VII-solitude) à-à-diŋ (n)é mên ai bo-vóé b-oé SM.I-PRES-love NE MEN with II-friend POSS.AGR.II-his

→ Kanga λx (x thinks that only Piglet λy (y loves y and his friend))

b. və Piglet (è-tám) ńé à-à-tsog ná Kanga only Piglet.I (VII-solitude) PRON.I SM.I-PRES-think that Kanga.I à-à-diŋ ńé ai bo-vóé b-oé SM.I-PRES-love NE with II-friend POSS.AGR.II-his

→ Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))

→ Only Piglet λx (x thinks that Kanga λy (y loves z and his friend)), z = Piglet

→ Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))

Native Speaker Informants: Christophe Onambélé

A.21 Fanti: AAB

(Only) Diana thinks that (only) Charles loves himself / her

a. Diana djwin de Charles n kotin do neho Diana think that Charles only love NEHO

→ Diana λx (x thinks that only Charles λy (y loves y))

b. Diana n kotin ε na o djwin de Charles do ne Diana only 3SG T think that Charles love NE

→ Only Diana λx (x thinks that Charles λy (y loves x))

→ Only Diana λx (x thinks that Charles λy (y loves z))

The local and non-local Strict readings

a. Diana djwin de Charles na-nkotin do ne Diana think that Charles 3SG-only love NE

→ Diana λx (x thinks that only Charles λy (y loves z)), where z = Charles

b. Diana n kotin ε na o djwin de Charles do ne Diana only 3SG T think that Charles love NE

→ Only Diana λx (x thinks that Charles λy (y loves z)), where z = Diana
(188) (Only) Diana thinks that (only) Charles loves himself / her and his sister
a. Diana djwin de Charles nkontin do neho ε na ni nyua
   Diana think that Charles only love NEHO and 3SG POSS sibling
   → Diana λx (x thinks only Charles λy (y loves x and his sister))

b. Diana na-nkontin ε na o djwin de Charles do onu ε na ni
   Diana 3SG-only 3SG T think that Charles love ONU and 3SG POSS
   nyua
   sibling
   → Only Diana λx (x thinks Charles λy (y loves x and his sister))
   → Only Diana λx (x thinks Charles λy (y loves z and his sister)), z = Diana
   → Only Diana λx (x thinks Charles λy (y loves z and his sister))

Native Speaker Informants: Frida Arthur

A.22 Fijian: AAA

(189) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. e nanuma o Kanga ni o Piglet e lomani koya ga vakataki
   3.SG thinks the Kanga that the Piglet 3.SG love KOYA only be like
   koya
   3.SG
   → Kanga λx (x thinks that only Piglet λy (y loves y))

a’. e nanuma ga o Piglet ni lomani koya o Kanga
   3.SG thinks only the Piglet that loves KOYA the Kanga
   → Only Piglet λx (x thinks that Kanga λy (y loves x))
   → Only Piglet λx (x thinks that Kanga λy (y loves z))

(190) The non-local Strict reading
a. e nanuma ga o Piglet ni lomani koya o Kanga
   3.SG thinks only the Piglet that loves KOYA the Kanga
   → Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

(191) Only Piglet thinks that Kanga loves him and his friend
a. e nanuma ga o Piglet ni lomani koya kei nonai tau o
   3.SG thinks only the Piglet that loves KOYA and 3.SG.POSS friend the
   Kanga
   Kanga
   → Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))

Native Speaker Informants: Tarisi Vunidilo
A.23 Finnish: AAB

(192) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. Kengu uskoo, että vain Nasu rakastaa itseään
   Kanga believes that only Piglet loves ITSEAAN
   → Kanga $\lambda x (x$ thinks that only Piglet $\lambda y (y$ loves $y))$

b. Vain Nasu uskoo, että Kengu rakastaa häntä
   only Piglet believes that Kanga loves HANTA
   → Only Piglet $\lambda x (x$ thinks that Kanga $\lambda y (y$ loves $x))$
   → Only Piglet $\lambda x (x$ thinks that Kanga $\lambda y (y$ loves $z))$

(193) The non-local Strict reading
a. Vain Nasu uskoo, että Kengu rakastaa häntä
   only Piglet believes that Kanga loves HANTA
   → Only Piglet $\lambda x (x$ thinks that Kanga $\lambda y (y$ loves $z))$, where $z =$ Piglet

(194) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
a. Kengu uskoo, että vain Nasu rakastaa itseään ja ystäväänsä
   Kanga believes that only Piglet loves ITSEAAN and friend
   → Kanga $\lambda x (x$ thinks that only Piglet $\lambda y (y$ loves $y$ and his friend))

b. Vain Nasu uskoo, että Kengu rakastaa häntä ja hänen ystäväänsä
   only Piglet believes that Kanga loves HANTA and his friend
   → Only Piglet $\lambda x (x$ thinks that Kanga $\lambda y (y$ loves $x$ and his friend))
   → Only Piglet $\lambda x (x$ thinks that Kanga $\lambda y (y$ loves $z$ and his friend)), $z =$ Piglet

Native Speaker Informants: Otto Nuoranne

A.24 Frisian: AAB

(195) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. Kanga tinkt dat allinnich Piglet fan himself hâldt.
   Kanga thinks that only Piglet of HIMSELF loves
   → Kanga $\lambda x (x$ thinks that only Piglet $\lambda y (y$ loves $y))$

b. Allinnich Piglet tinkt dat Kanga fan him hâldt.
   only Piglet thinks that Kanga of HIM loves
   → Only Piglet $\lambda x (x$ thinks that Kanga $\lambda y (y$ loves $x))$
   → Only Piglet $\lambda x (x$ thinks that Kanga $\lambda y (y$ loves $z))$

(196) The non-local Strict reading
a. Allinnich Piglet tinkt dat Kanga fan him hâldt.
   only Piglet thinks that Kanga of HIM loves
   → Only Piglet $\lambda x (x$ thinks that Kanga $\lambda y (y$ loves $z))$, where $z =$ Piglet
Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kanga tinkt dat allinnich Piglet fan **himself** en syn freon håldt. Kanga thinks that only Piglet of **HIMSELF** and his friend loves
  \[ Kanga \, \lambda \, x \, (x \, \text{thinks that only Piglet} \, \lambda \, y \, (y \, \text{loves} \, y \, \text{and his friend})) \]

b. Allinnich Piglet tinkt dat Kanga fan **him** en syn freon håldt. only Piglet thinks that Kanga of **HIM** and his friend loves
  \[ Only \, Piglet \, \lambda \, x \, (x \, \text{thinks that Kanga} \, \lambda \, y \, (y \, \text{loves} \, x \, \text{and his friend})) \]
  \[ Only \, Piglet \, \lambda \, x \, (x \, \text{thinks that Kanga} \, \lambda \, y \, (y \, \text{loves} \, z \, \text{and his friend})), \, z \, = \, Piglet \]

Native Speaker Informants: Fenna Bergsma

A.25 Ga: AAB

(198) **Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him**

a. Kanga d\textit{w}n\textit{i} Piglet \textit{p}\textit{e} ni sum\textit{o} e\textit{he} Kanga thinks Piglet only that love E\textit{HE} \\
  \[ Kanga \, \lambda \, x \, (x \, \text{thinks that only Piglet} \, \lambda \, y \, (y \, \text{loves} \, y)) \]

b. Piglet \textit{p}\textit{e} ni e\textit{dwe}\textit{ŋ} ak\textit{e} Kanga sum\textit{o} le Piglet only that is.thinking that Kanga love LE \\
  \[ Only \, Piglet \, \lambda \, x \, (x \, \text{thinks that Kanga} \, \lambda \, y \, (y \, \text{loves} \, x)) \]
  \[ Only \, Piglet \, \lambda \, x \, (x \, \text{thinks that Kanga} \, \lambda \, y \, (y \, \text{loves} \, z)) \]

(199) **The non-local Strict reading**

a. Piglet \textit{p}\textit{e} ni e\textit{dwe}\textit{ŋ} ak\textit{e} Kanga sum\textit{o} le Piglet only that is.thinking that Kanga love LE \\
  \[ Only \, Piglet \, \lambda \, x \, (x \, \text{thinks that Kanga} \, \lambda \, y \, (y \, \text{loves} \, z)), \, \text{where} \, z \, = \, Piglet \]

(200) **Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend**

a. Kanga d\textit{w}n\textit{i} Piglet \textit{p}\textit{e} ni e-sum\textit{o} e\textit{he} k\textit{e} e-naanyo le Kanga thinks Piglet only that SM-love E\textit{HE} and 3S\textit{G}-friend LE \\
  \[ Kanga \, \lambda \, x \, (x \, \text{thinks that only Piglet} \, \lambda \, y \, (y \, \text{loves} \, y \, \text{and his friend}))) \]

b. Piglet \textit{p}\textit{e} ni e-d\textit{w}n\textit{i} Kanga sum\textit{o} le k\textit{e} e-naanyo le Piglet only that SM-thinks Kanga loves LE and 3S\textit{G}-friend LE \\
  \[ Only \, Piglet \, \lambda \, x \, (x \, \text{thinks that Kanga} \, \lambda \, y \, (y \, \text{loves} \, x \, \text{and his friend}))) \]
  \[ Only \, Piglet \, \lambda \, x \, (x \, \text{thinks that Kanga} \, \lambda \, y \, (y \, \text{loves} \, z \, \text{and his friend}))), \, z \, = \, Piglet \]
  \[ Only \, Piglet \, \lambda \, x \, (x \, \text{thinks that Kanga} \, \lambda \, y \, (y \, \text{loves} \, z \, \text{and his friend}))) \]

Native Speaker Informants: Nikitta Adjirakor
A.26 Georgian: AAA

(201) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. k’anga pikrobs rom mxolod piglet’s uq’vars igi
   Kanga thinks that only Piglet loves IGI
   → Kanga λx (x thinks that only Piglet λy (y loves y))

a’. mxolod piglet’i pikrobs rom k’angas uq’vars igi
   only Piglet thinks that Kanga loves IGI
   → Only Piglet λx (x thinks that Kanga λy (y loves x))
   → Only Piglet λx (x thinks that Kanga λy (y loves z))

(202) The non-local Strict reading

a. mxolod piglet’i pikrobs rom k’angas uq’vars igi
   only Piglet thinks that Kanga loves IGI
   → Only Piglet λx (x thinks that Kanga λy (y loves y and his friend)), where z = Piglet

(203) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. k’anga pikrobs rom mxolod p’iglet’s uq’vars igi da misi megobrebi
   Kanga thinks that only Piglet loves IGI and his friend
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))

a’. mxolod p’iglet’i pikrobs rom k’angas uq’vars igi da misi megobrebi
   only Piglet thanks that Kanga loves IGI and his friend
   → Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))
   → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend)), z = Piglet
   → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))

Native Speaker Informants: Elene Kadagishvili

A.27 German: AAB

(204) (Only) Diana thinks that (only) Charles loves himself / her

a. Diana denkt, dass nur Charles sich (selbst) liebt.
   Diana thinks that only Charles SICH (SELBST) loves
   → Diana λx (x thinks that only Charles λy (y loves y))

b. Nur Diana denkt, dass Charles sie liebt.
   only Diana thinks that Charles SIE loves
   → Only Diana λx (x thinks that Charles λy (y loves x))
   → Only Diana λx (x thinks that Charles λy (y loves z))
(205) The local and non-local Strict readings

a. Diana denkt, dass nur Charles sich liebt.
   Diana thinks that only Charles SICH loves
  }\rightarrow Diana \lambda x (x thinks that only Charles \lambda y (y loves z)), where z = Charles

b. Nur Diana denkt, dass Charles sie liebt.
   only Diana thinks that Charles SIE loves
   }\rightarrow Only Diana \lambda x (x thinks that Charles \lambda y (y loves z)), where z = Diana

Native Speaker Informants: Johanna Abel, Klaus Abels, Heidi Mayer, Nadine Theiler, Luise Schwarzer

A.28 Greek: AAB

(206) (Only) Diana thinks that (only) Charles loves himself/her

a. i daiana nomizi oti mono o karolos ayapai ton eafto tou
   DET Diana thinks that only DET Charles loves DET EAFTO TOU
   }\rightarrow Diana \lambda x (x thinks that only Charles \lambda y (y loves y))

b. mono i daiana nomizi oti o karolos tin ayapai
   only DET Diana thinks that DET Charles TIN loves
   }\rightarrow Only Diana \lambda x (x thinks that Charles \lambda y (y loves x))
   }\rightarrow Only Diana \lambda x (x thinks that Charles \lambda y (y loves z))

Native Speaker Informants: Emilia Molimpakis, Faidra Faitaki

A.29 Hebrew: AAB

(207) (Only) Diana thinks that (only) Charles loves himself/her

a. Diana xojevet je-rak Lior ohev et atsmo
   Diana thinks.FEM that-only Lior loves DEF.DO ATSMO
   }\rightarrow Diana \lambda x (x thinks that only Charles \lambda y (y loves y))

b. rak Diana xojevet et je-Lior ohev ota
   only Diana thinks-FEM that-Lior loves OTA
   }\rightarrow Only Diana \lambda x (x thinks that Charles \lambda y (y loves x))
   }\rightarrow Only Diana \lambda x (x thinks that Charles \lambda y (y loves z))

(208) The non-local Strict reading

a. rak Diana xojevet et je-Lior ohev ota
   only Diana thinks-FEM that-Lior loves OTA
   }\rightarrow Only Diana \lambda x (x thinks that Charles \lambda y (y loves z)), where z = Diana

Native Speaker Informants: Hagit Borer, Noam Faust, Ido Freeman, Itamar Kastner
A.30 Hindi: AAB

(209) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. Kanga sōcht-ī hai ki sirf Piglet apnē AAP-kō pyaar kart-ā hai
   Kanga think-FEM COP that only Piglet APNE AAP-ACC love do-MASC COP
   → Kanga λ x (x thinks that only Piglet λ y (y loves y))
b. sirf Piglet sōcht-ā hai ki Kanga us-kō pyār kart-i hai
   only Piglet think-MASC COP that Kanga US-ACC love do-FEM COP
   → Only Piglet λ x (x thinks that Kanga λ y (y loves x))
   → Only Piglet λ x (x thinks that Kanga λ y (y loves z))

(210) The non-local Strict reading
a. sirf Piglet sōcht-ā hai ki Kanga us-kō pyār kart-i hai
   only Piglet think-MASC COP that Kanga US-ACC love do-FEM COP
   → Only Diana λ x (x thinks that Charles λ y (y loves z)), where z = Diana

(211) Only Piglet thinks that Kanga loves him and his friend
a. sirf Piglet sōcht-ā hai ki Kanga us-kō aur usk-ē dōst-kō
   only Piglet think-MASC COP that Kanga US-ACC love do-FEM COP
   → Only Piglet λ x (x thinks that Kanga λ y (y loves x and his friend))

Native Speaker Informants: Devyani Sharma

A.31 Hungarian: AAB

(212) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
a. Kanga azt hiszi hogy csak Piglet szereti magá- t és a barátját
   Kanga DEM think that only Piglet love MAGA-ACC and the friend
   → Kanga λ x (x thinks that only Piglet λ y (y loves y and y’s friend))
b. csak Piglet hiszi (azt) hogy Kanga szereti ō-t és a barátját
   only Piglet think (DEM) that Kanga love O-ACC and the friend
   → Only Piglet λ x (x thinks that Kanga λ y (y loves x and x’s friend))
   → Only Piglet λ x (x thinks that Kanga λ y (y loves z and z’s friend))

(213) The non-local Strict reading
a. csak Piglet hiszi (azt) hogy Kanga szereti ō-t és a barátját
   only Piglet think (DEM) that Kanga love O-ACC and the friend
   → Only Diana λ x (x thinks that Charles λ y (y loves z)), where z = Diana

Native Speaker Informants: András Bárány
A.32 Icelandic: ABC

(214) (Only) Diana believes that (only) Charles loves himself / her

a. Díana telur að aðeins Karl elska sjálfan sig  
Diana believes that only Charles loves SJALFAN SIG  
→ Only Diana λx (x believes that Charles λy (y loves y))

b. Aðeins Díana telur að Karl elska sig  
only Diana believes that Charles loves SIG  
→ Only Diana λx (x believes that Charles λy (y loves x))

c. Aðeins Díana telur að Karl elska hana  
only Diana believes that Charles loves HANA  
→ Only Diana λx (x believes that Charles λy (y loves z)), where z = Diana  
→ Only Diana λx (x believes that Charles λy (y loves z))

Adapted from Sells (1987:467)

A.33 Igbo: AAB

(215) Only Piglet thinks that Kanga loves herself / him

a. Soso Piglet chena Kanga fu onwe ya na anya  
only Piglet thinks Kanga sees ONWE YA loves  
→ Only Piglet λx (x thinks that Kanga λy (y loves y))

b. Soso Piglet chena Kanga fu ya na anya  
only Piglet thinks Kanga sees YA loves  
→ Only Piglet λx (x thinks that Kanga λy (y loves x))  
→ Only Piglet λx (x thinks that Kanga λy (y loves z))

(216) The non-local Strict reading

a. Soso Piglet chena Kanga fu ya na anya  
only Piglet thinks Kanga sees YA loves  
→ Only Diana λx (x thinks that Charles λy (y loves z)), where z = Diana

Native Speaker Informants: Joe Ogbonna

(217) Only Piglet thinks that Kanga loves herself / him

a. Nani Nwa-ezi chere na Kanga huru onwe ya n’anya  
only Piglet thinks C Kanga love- ONWE YA -love  
→ Only Piglet λx (x thinks that Kanga λy (y loves y))

b. Nani Nwa-ezi chere na Kanga huru ya n’anya  
only Piglet thinks C Kanga love- YA -love  
→ Only Piglet λx (x thinks that Kanga λy (y loves x))  
→ Only Piglet λx (x thinks that Kanga λy (y loves z))

(218) The non-local Strict reading

a. Nani Nwa-ezi chere na Kanga huru ya n’anya  
only Piglet thinks C Kanga love- YA -love  
→ Only Diana λx (x thinks that Charles λy (y loves z)), where z = Diana

Native Speaker Informants: Eunan Ochuba, Chika Ochuba
A.34 Indonesian: AAB

(219) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. Kanga pikir hanya Piglet yang cinta samadirinya sendiri
   Kanga think only Piglet REL.PRON love with DIRINYA SENDIRI
→ Kanga λx (x thinks that only Piglet λy (y loves y))

b. hanya Piglet yang mengira Kanga cinta sama dirinya
   only Piglet REL.PRON think Kanga love with DIRINYA SENDIRI
→ Only Piglet λx (x thinks that Kanga λy (y loves x))
→ Only Piglet λx (x thinks that Kanga λy (y loves z))

(220) The non-local Strict reading
a. hanya Piglet yang mengira Kanga cinta sama dirinya
   only Piglet REL.PRON think Kanga love with DIRINYA SENDIRI
→ Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

(221) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
a. Kanga pikir hanya Piglet yang cinta sama dirinya sendiri dan temannya
   Kanga think only Piglet REL.PRON love with DIRINYA SENDIRI and friend.POSS
→ Kanga λx (x thinks only Piglet λy (y loves y and his friend))

b. hanya Piglet yang mengira Kanga cinta sama dirinya sendiri dan temannya
   only Piglet REL.PRON think Kanga love with DIRINYA SENDIRI and friend.POSS
→ Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))
→ Only Piglet λx (x thinks that Kanga λy (y loves z and his friend)), z = Piglet
→ Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))

Native Speaker informants: Yassir Nasanius

A.35 Italian: AAB

(222) Leo (said that Maria) reveals the cards to himself / him and his friend, and Enzo did too
a. Leo mostra le carte a se stesso e il suo amico, così come Enzo.
   Leo reveal the cards to SE STESSO and DEF his friend just as Enzo
→ Leo λx (x reveals the cards to x and his friend) and
   Enzo λy (y reveals the cards to y and his friend)

b. Leo ha detto che Maria mostra le carte a lui e il suo amico,
   Leo has said that Maria reveal the cards to LUI and DEF his friend
   così come Enzo.
   just as Enzo
→ Leo λx (x said that Maria reveals the cards to x and his friend) and
   Enzo λy (y said that Maria reveals the cards to y and his friend)
→ Leo λx (x said that Maria reveals the cards to z and his friend) and
   Enzo λy (y said that Maria reveals the cards to z and his friend)
The local and non-local Strict readings

a. Leo mostra le carte a se stesso e il suo amico, così come Enzo.
Leo reveal the cards to SE STESSO and DEF his friend just as Enzo
→ Leo λx (x reveals the cards to z and his friend) and
    Enzo λy (y reveals the cards to z and his friend), where z = Leo

b. Leo ha detto che Maria mostra le carte a lui e il suo amico,
Leo has said that Maria reveal the cards to LUI and DEF his friend
    così come Enzo,
    just as Enzo
→ Leo λx (x said that Maria reveals the cards to z and his friend) and
    Enzo λy (y said that Maria reveals the cards to z and his friend), z = Leo

Native Speaker Informants: Cate Canonica, Giulio Dulcinati, Caterina Paolazzi

A.36 Japanese: ABB

(224) (Only) Diana thinks that (only) Charles hates himself / her

a. Diana-ga Charles-dake-ga zibun-no koto-ga kiraida to omotteiru.
Diana-NOM Charles-only-NOM ZIBUN-GEN fact-NOM hate C think
→ Diana λx (x thinks that only Charles λy (y hates y))

a’. Diana-dake-ga Charles-ga zibun-no koto-ga kiraida to omotteiru
Diana-only-NOM Charles-NOM ZIBUN-GEN fact-NOM hate C think
→ Only Diana λx (x thinks that Charles λy (y hates x))

b. Diana-dake-ga Charles-ga kanojo-no koto-ga kiraida to
Diana-only-NOM Charles-NOM KANOJO♀-GEN fact-NOM hate C
    think
→ Only Diana λx (x thinks that Charles λy (y hates z))

(225) The local and non-local Strict readings

a. Diana-ga Charles-dake-ga kare-no koto-ga kiraida to omotteiru.
Diana-NOM Charles-only-NOM KARE♂-GEN fact-NOM hate C think
→ Diana λx (x thinks only Charles λy (y hates z)), where z = Charles

b. Diana-dake-ga Charles-ga kanojo-no koto-ga kiraida to
Diana-only-NOM Charles-NOM KANOJO♀-GEN fact-NOM hate C
    think
→ Only Diana λx (x thinks that Charles λy (y hates z)), where z = Diana

Native Speaker informants: Yasutada Sudo
A.37  Javanese: AAB

(226)  *Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him*

a. Kanga mikir nek mung Piglet sing tresno karo **awake dhewe**  
   Kanga think if only Piglet who love with **AWAKE DHEWE**  
   → **Kanga (x thinks that only Piglet (y loves y))**

b. mung Piglet sing mikir nek Kanga tresno karo **deknen**  
   only Piglet who think if Kanga love with **DEKNEN**  
   → **Only Piglet (x thinks that Kanga (y loves x))**  
   → **Only Piglet (x thinks that Kanga (y loves z))**

(227)  *The non-local Strict reading*

a. mung Piglet sing mikir nek Kanga tresno karo **deknen**  
   only Piglet who think if Kanga love with **DEKNEN**  
   → **Only Piglet (x thinks that Kanga (y loves z)), where z = Piglet**

(228)  *Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend*

a. Kanga mikir nek mung Piglet sing tresno karo **awake dhewe** lan  
   Kanga think if only Piglet who love with **AWAKE DHEWE** and  
   konco-konco ne  
   friends POSS  
   → **Kanga (x thinks only Piglet (y loves y and his friend))**

b. mung Piglet sing mikir nek Kanga tresno karo **deknen** lan konco-konco ne  
   only Piglet who think if Kanga love with **DENKEN** and friends  
   POSS  
   → **Only Piglet (x thinks that Kanga (y loves x and his friend))**  
   → **Only Piglet (x thinks that Kanga (y loves z and his friend)), z = Piglet**  
   → **Only Piglet (x thinks that Kanga (y loves z and his friend))**

Native Speaker Informants: Vica Ananta

A.38  Kazakh: ABB

(229)  *Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him*

a. Kanga Piglet-ti tek **ozin** gana jaksy koredi dep oilaidy  
   Kanga Piglet-EMPH only **OZIN** alone loves that thinks  
   → **Kanga (x thinks that only Piglet (y loves y))**

a’. tek Piglet Kanga **ozim-di** gana jaksy koredi dep oilaidy  
   only Piglet Kanga **OZIN-EMPH** alone loves that thinks  
   → **Only Piglet (x thinks that Kanga (y loves x))**

b. tek Piglet qana Kanga **ony** jaksy koredi dep oilaidy  
   only Piglet alone Kanga **ONY** loves that thinks  
   → **Only Piglet (x thinks that Kanga (y loves z))**
The non-local Strict reading

a. tek Piglet-gana Kanga-ny ozin jaksy koredi dep oilaidy
   only Piglet-alone Kanga-PREP OZIN loves that thinks
   → Only Piglet \( \lambda x \) (\( x \) thinks that Kanga \( \lambda y \) (\( y \) loves \( z \))), where \( z = \text{Piglet} \)

Kanga thinks that only Piglet loves himself and his friend

a. Kanga tek Piglet-ti gana ozin jane ozin-in dostaryn jaksy koredi
   Kanga only Piglet-EMPH alone OZIN and OZIN-POSS friend love
   dep oilaidy that thinks
   → Kanga \( \lambda x \) (\( x \) thinks that only Piglet \( \lambda y \) (\( y \) loves \( z \) and his friend)), \( z = \text{Piglet} \)

Native Speaker Informants: Bakytzhan Tolimbet

Kinyarwanda: AAA

Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga y-i-bwi-ra ko Piglet-ari we wenyine w-i-kund-a
   Kanga 3SG-PRES-think-ASP that Piglet only WE WENYINE 3SG-PRES-love-ASP
   → Kanga \( \lambda x \) (\( x \) thinks that only Piglet \( \lambda y \) (\( y \) loves \( y \)))

a’. Piglet ni we wenyine w-i-bwi-ra ko Kanga a-mu-kund-a
   Piglet only WE WENYINE 3SG-PRES-think-ASP that Kanga 3SG-OBJ-love-ASP
   → Only Piglet \( \lambda x \) (\( x \) thinks that Kanga \( \lambda y \) (\( y \) loves \( x \)))
   → Only Piglet \( \lambda x \) (\( x \) thinks that Kanga \( \lambda y \) (\( y \) loves \( z \)))

The non-local Strict reading

a. Piglet ni we wenyine w-i-bwi-ra ko Kanga a-mu-kund-a
   Piglet only WE WENYINE 3SG-PRES-think-ASP that Kanga 3SG-OBJ-love-ASP
   → Only Piglet \( \lambda x \) (\( x \) thinks that Kanga \( \lambda y \) (\( y \) loves \( z \))), where \( z = \text{Piglet} \)

Native Speaker Informants: Kayigema Jacques

Korean: ABB

Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

   Kanga-NOM Piglet-only-NOM CASIN-ACC / CAKI-ACC love-V-C
   sayngkak-han-ta think-V-DECL
   → Kanga \( \lambda x \) (\( x \) thinks that only Piglet \( \lambda y \) (\( y \) loves \( y \)))

a’. Piglet-man-i Kanga-ka casin-ul / caki-lul salang-han-tako
   Piglet-only-NOM Kanga-NOM CASIN-ACC / CAKI-ACC love-V-C
   sayngkak-han-ta think-V-DECL
   → Only Piglet \( \lambda x \) (\( x \) thinks that Kanga \( \lambda y \) (\( y \) loves \( x \)))

b. Piglet-man-i Kanga-ka ku-lul salang-han-tako sayngkak-han-ta
   Piglet-only-NOM Kanga-NOM KU-ACC love-V-C think-V-DECL
   → Only Piglet \( \lambda x \) (\( x \) thinks that Kanga \( \lambda y \) (\( y \) loves \( z \)))
The non-local Strict reading

a. Piglet-man-i Kanga-ka **casin-ul** / **caki-lul** salang-han-tako
   Piglet-only-NOM Kanga-NOM **CASIN-ACC** / **CAKI-ACC** love-V-C
   sayngkak-han-ta
   think-V-DECL
   → Only Piglet λ\(x\) (x thinks that Kanga λ\(y\) (y loves z)), where z = Piglet

**Note:** Both **caki** and **casin** are able to take local and long-distance antecedents, although **casin** prefers to take a local one. **Caki** is a reflexive pronoun that allows and prefers to take a long-distance antecedent in the matrix clause. This could be a case of variable exponence, where **casin** spells out [A [D [P]]] and **caki** spells out [D [P]].

(236) (Only) Diana thinks that (only) Charles loves himself / her

a. Diana-neun Charles-man-i **casin-ul** salang-han-tako sayngkak-han-ta
   Diana-NOM Charles-only-NOM **CASIN-ACC** love-V-C think-V-DECL
   → Diana λ\(x\) (x thinks that only Charles λ\(y\) (y loves y))

a’. Diana-man-i Charles-ka **casin-ul** salang-han-tako sayngkak-han-ta
   Diana-only-NOM Charles-NOM **CASIN-ACC** love-V-C think-V-DECL
   → Only Diana λ\(x\) (x thinks that Charles λ\(y\) (y loves x))

b. Diana-man-i Charles-ka **keu nyeo-lul** salang-han-tako
   Diana-only-NOM Charles-NOM **KEU NYEO-ACC** love-V-C
   sayngkak-han-ta
   think-V-DECL
   → Only Diana λ\(x\) (x thinks that Charles λ\(y\) (y loves z))

Native Speaker Informants: Hyunjung Lee, Hanbyul Song

A.41 Lithuanian: AAB

(237) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga mano, jog **vien tik** Pigletas **save** myli
   Kanga thinks that one alone Piglet **SAVE** loves
   → Kanga λ\(x\) (x thinks that only Piglet λ\(y\) (y loves y))

b. **vien tik** Pigletas mano, jog Kanga **jj** myli
   one alone Piglet thinks that Kanga **JJ** loves
   → Only Piglet λ\(x\) (x thinks that Kanga λ\(y\) (y loves x))
   → Only Piglet λ\(x\) (x thinks that Kanga λ\(y\) (y loves z))

(238) The non-local Strict reading

a. **vien tik** Pigletas mano, jog Kanga **jj** myli
   one alone Piglet thinks that Kanga **JJ** loves
   → Only Piglet λ\(x\) (x thinks that Kanga λ\(y\) (y loves z)), where z = Piglet
(239) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
a. Kanga mano, jog vien tik Pigletas myli save ir savo draugą
   Kanga thinks that one alone Piglet loves SAVE and his friend.MASC
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))
b. vien tik Pigletas mano, jog Kanga myli ji ir jo draugą
   one alone Piglet thinks that Kanga loves JI and his friend
   → Only Piglet λx (x thinks Kanga λy (y loves x and his friend))
   → Only Piglet λx (x thinks Kanga λy (y loves z and his friend)), z = Piglet

Native Speaker Informants: Ray Kirstein

A.42 Macedonian: AAB

(240) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
a. Kanga misli deka samo Piglet se saka sebe i drugar mu
   Kanga thinks that only Piglet REF.L loves SEBE and friend him.DAT.CL
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))
b. samo Piglet misli deka Kanga gi saka nego i drugar mu
   only Piglet thinks that Kanga REF.L.PL loves NEG0 and friend him.DAT.CL
   → Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))
   → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))

(241) The non-local Strict reading
a. samo Piglet misli deka Kanga gi saka nego i drugar mu
   only Piglet thinks that Kanga REF.L.PL loves NEG0 and friend him.DAT.CL
   → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend)), z = Piglet

Native Speaker Informants: Metodi Efremov, Nina Tunteva

A.43 Madurese: AAA

(242) Diana / every boy thinks that every boy / Diana likes himself / him
a. Diana meker ce tiaptiap ranglake suka abu ung
   Diana think that every boy likes ABU UNG
   → Diana λx (x thinks that every boy λy (y likes y))
a’. Tiaptiap ranglake meker ce Diana suka abu ung
   every boy think that Diana likes ABU UNG
   → Every boy λx (x thinks that Diana λy (y likes x))
   → Every boy λx (x thinks that Diana λy (y likes z))

Native Speaker Informants: Abdul Arif (courtesy of John Middleton)
A.44 Malay: ABC

(243) *Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga fikir hanya Piglet suka dirinya / diri
   Kanga think only Piglet love DIRINYA / DIRM
   → Kanga λx (x thinks that only Piglet λy (y loves y))

b. hanya Piglet fikir Kanga suka diri / dia
   only Piglet think Kanga love DIRI / DIA
   → Only Piglet λx (x thinks that Kanga λy (y loves x))

c. hanya Piglet fikir Kanga suka dia
   only Piglet think Kanga love DIA
   → Only Piglet λx (x thinks that Kanga λy (y loves z))

(244) The non-local Strict reading

a. hanya Piglet fikir Kanga suka diri / dia
   only Piglet think Kanga love DIRI / DIA
   → Only Piglet λx (x thinks that Kanga λy (y loves x))

(245) *Only Piglet thinks that Kanga loves himself and his friend

a. hanya Piglet fikir Kanga suka diri / dia
   only Piglet think Kanga love DIRI / DIA
   → Only Piglet λx (x thinks that Kanga λy (y loves x and his friend)), z = Piglet

NOTE: Variable exponence is reported for Malay, such that diri can be used for a local bound variable reading, and dia can be used for both Strict and Sloppy non-locally bound readings. Dirinya cannot take a Strict reading, and in VP ellipsis, diri can’t either. The following examples are modified from Cole et al’s work:

(246) a. John nampak dirinya di dalam cermin; Frank pun.
   John see DIRINYA in inside mirror Frank also
   → John λx (x saw x in the mirror) and Frank λy (y saw y in the mirror)
   → *John λx (x saw z in the mirror) and Frank λy (y saw x in the mirror)

b. Ali cukur dirinya di dalam bilik air; Bill pun.
   Ali shave DIRINYA in inside room water Bill also
   → Ali λx (x shaved x in the bathroom) and Bill λy (y shaved y in the bathroom)
   → *Ali λx (x shaved z in the bathroom) and Bill λy (y shaved z in the bathroom)

(247) a. John nampak dirinya di dalam cermin; Frank pun.
   John see DIRINYA in inside mirror Frank also
   → John λx (x saw x in the mirror) and Frank λy (y saw y in the mirror)
   → *John λx (x saw z in the mirror) and Frank λy (y saw z in the mirror)

b. Ali cukur dirinya di dalam bilik air; Bill pun.
   Ali shave DIRINYA in inside room water Bill also
   → Ali λx (x shaved x in the bathroom) and Bill λy (y shaved y in the bathroom)
   → *Ali λx (x shaved z in the bathroom) and Bill λy (y shaved z in the bathroom)

c. Mary fikir John nampak dirinya di dalam cermin; Frank pun.
   Mary think John see DIRINYA in inside mirror Frank also
   → Mary λp (p thought John λq (q saw q in the mirror) and Frank λr (r thought John λq (q saw q in the mirror))
Mary
\( \lambda p \) \( (p \text{ thought } John \ \lambda q \ (q \text{ saw } p \text{ in the mirror}) \) and
Frank \( \lambda r \) \( (r \text{ thought } John \ \lambda q \ (q \text{ saw } p \text{ in the mirror}) \)

\( \rightarrow \) Mary \( \lambda p \) \( (p \text{ thought } John \ \lambda q \ (q \text{ saw } z \text{ in the mirror}) \) and
Frank \( \lambda r \) \( (r \text{ thought } John \ \lambda q \ (q \text{ saw } z \text{ in the mirror}) \)

Mary fikir John nampak diri di dalam cermin; Frank pun.
Mary think John see DIRI in inside mirror Frank also

\( \rightarrow \) Mary \( \lambda p \) \( (p \text{ thought } John \ \lambda q \ (q \text{ saw } p \text{ in the mirror}) \) and
Frank \( \lambda r \) \( (r \text{ thought } John \ \lambda q \ (q \text{ saw } r \text{ in the mirror}) \)

\( \rightarrow \) Mary \( \lambda x \) \( (x \text{ thought } John \ \lambda q \ (q \text{ saw } z \text{ in the mirror}) \) and
Frank \( \lambda r \) \( (r \text{ thought } John \ \lambda q \ (q \text{ saw } z \text{ in the mirror}) \), where \( z = Mary \)

(248) John bilang yang Mary nampak dia di Singapura; Frank pun.
John say that Mary see DIA at Singapore Frank also

\( \rightarrow \) John \( \lambda p \) \( (p \text{ said } Mary \ \lambda q \ (q \text{ saw } p \text{ in Singapore}) \) and
Frank \( \lambda r \) \( (r \text{ said } Mary \ \lambda q \ (q \text{ saw } r \text{ in Singapore}) \)

Native Speaker Informants: Jiayi Chong

A.45 Malayalam: ABC

(249) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

\( \rightarrow \) kanga piglet-\( i-n \) m\( a\text{-}r\)\( t\)-\( m\)e: avanavan-e i\( s\text{-}t\)\( a\text{-}n\)\( e\)-\( c\)  c\( i\)\( n\)\( t\)\( i\)\( k\)\( i\)\( k\)\( j\)\( u\)\( n\)\( u\)
Kanga Piglet-DAT only AVANAVAN-ACC like.C thinks

\( \rightarrow \) Kanga \( \lambda x \) \( (x \text{ thinks that only Piglet } \lambda y \ (y \text{ loves } y)) \)

\( \rightarrow \) Only Piglet \( \lambda x \) \( (x \text{ thinks that Kanga } \lambda y \ (y \text{ loves } x)) \)

\( \rightarrow \) Only Piglet \( \lambda x \) \( (x \text{ thinks that Kanga } \lambda y \ (y \text{ loves } z)) \)

(250) The non-local Strict reading

\( \rightarrow \) piglet m\( a\text{-}r\)\( t\)-\( m\)e: vi\( c\)\( a\)\( r\)\( i\)\( k\)\( i\)\( n\)\( l\)\( u\) k\( a\text{-}n\)\( g\)\( e\)\( m\) tan-e i\( s\text{-}t\)\( a\text{-}n\)\( e\)-\( c\)
Piglet only thinks Kanga-DAT TAN-ACC like.C

\( \rightarrow \) Only Piglet \( \lambda x \) \( (x \text{ thinks that Kanga } \lambda y \ (y \text{ loves } z)) \), where \( z = Piglet \)

(251) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

\( \rightarrow \) kanga pigletin\( o\) m\( a\text{-}r\)\( t\)-\( m\)e: avanavan-e i\( s\text{-}t\)\( a\text{-}n\)\( e\)-\( c\)  c\( i\)\( n\)\( t\)\( i\)\( k\)\( i\)\( k\)\( j\)\( u\)\( n\)\( u\)
Kanga Piglet-DAT only AVANAVAN-ACC-and AVAN-GEN friend.ACC and
like.C thinks

\( \rightarrow \) Kanga \( \lambda x \) \( (x \text{ thinks that only Piglet } \lambda y \ (y \text{ loves } y \text{ and his friend})) \)
b. pigletinò matte: òŋu kàŋqakìle òtan-e:-m òtan-te kuṭuk caráñen:m Piglet.DAT only thinks Kanga.DAT TAN-ACC-and TAN-GEN friend.ACC.and
like.C
→ Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))
c. pigletinò matte: òŋu kàŋqakìle avan-e:-m avan-te Piglet.DAT only thinks Kanga.DAT AVAN-ACC-and AVAN-GEN
kuṭuk caráñen:m like.C
→ Only Piglet λx (x thinks that Kanga λy (y loves z and his friend)), z = Piglet
→ Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))

Native Speaker Informants: Savithry Namboodiripad

A.46 Mandarin: ABB

(252) (Only) Diana thinks that (only) Charles loves himself / her

a. Diana rènweí zhiyòu Charles xìhuān zìjì
   Diana thinks only Charles loves ZIJI
   → Diana λx (x thinks that only Charles λy (y loves y))

a’. zhiyòu Diana rènweí Charles xìhuān zìjì
   only Diana thinks Charles loves ZIJI
   → Only Diana λx (x thinks that Charles λy (y loves x))

b. zhiyòu Diana rènweí Charles xìhuān tà
   only Diana thinks Charles loves TA
   → Only Diana λx (x thinks that Charles λy (y loves z))

(253) The non-local Strict reading

a. zhiyòu Diana rènweí Charles xìhuān zìjì
   only Diana thinks Charles loves ZIJI
   → Only Diana λx (x thinks that Charles λy (y loves z)), where z = Diana

Native Speaker Informants: Chao Sun, Yan Zhang, Ziren Zhou, Ruoying Zhao

A.47 Māori: AAB

(254) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. kei te whaka-aro a Kanga ko Piglet anahe e aroha ana ki PREP the CAUSE-FOC SM Kanga that Piglet only T/ASP love T/ASP to
   a ia anó
   SM IA ANO
   → Kanga λx (x thinks that only Piglet λy (y loves y))

b. Ko Piglet anahe kei te whaka-aro e aroha ana a Kanga ki a it’s Piglet only PREP the CAUSE-FOC T/ASP love T/ASP SM Kanga to SM
   IA
   → Only Piglet λx (x thinks that Kanga λy (y loves x))
   → Only Piglet λx (x thinks that Kanga λy (y loves z))
(255) The non-local Strict reading

a. Ko Piglet anahe kei te whaka-aro e aroha ana a Kanga ki a it’s Piglet only PREP the CAUSE-FOC T/ASP love T/ASP SM Kanga to SM

\[ \text{IA} \]

\[ \text{IA} \]

\[ \rightarrow \text{Only Diana } \lambda x (x \text{ thinks that Charles } \lambda y (y \text{ loves } z) ), \text{ where } z = \text{ Diana} \]

Native Speaker Informants: Tumanako Bidois

A.48 Marathi: AAB

(256) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga chya mate fakta Piglet lach svata vas psem kasto Kanga POSS thinks only Piglet only SVATA on loves T

\[ \rightarrow \text{Kanga } \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y )) \]

b. fakta Piglet lach vatta ki Kanga tya-chya vas psem kaste only Piglet only thinks that Kanga TYA-POSS on loves T

\[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that } \text{Kanga } \lambda y (y \text{ loves } x )) \]

\[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that } \text{Kanga } \lambda y (y \text{ loves } z )) \]

(257) The non-local Strict reading

a. [Kanga tya-chya vas psem kaste] asa fakta Piglet lach vatta [Kanga TYA-POSS on loves T] this only Piglet only thinks

\[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that } \text{Kanga } \lambda y (y \text{ loves } z)), \text{ where } z = \text{ Piglet} \]

(258) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kanga chya mate fakta Piglet svata vas ani mitsa vas psem kasto Kanga SM thinks only Piglet SVATA on and friend on loves T

\[ \rightarrow \text{Kanga } \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y \text{ and his friend})) \]

b. fakta Piglet lach vatta ki Kanga tya vas ani tya-chya mitsa vas only Piglet only thinks that Kanga TYA on and TYA-POSS friend on psem kaste loves T

\[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that } \text{Kanga } \lambda y (y \text{ loves } x \text{ and his friend})) \]

\[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that } \text{Kanga } \lambda y (y \text{ loves } z \text{ and his friend})), z = \text{ Piglet} \]

\[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that } \text{Kanga } \lambda y (y \text{ loves } z \text{ and his friend})) \]

Native Speaker Informants: Savio’s friend (courtesy of Savio Meyase)

A.49 Medumba: AAB

(259) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. KàNgàá kwì-dì ñ dubious? Piglé-fét ñku ñ-kóó ñbùù åít î KàNgàá think-ITER C only Piglet HAB N-like TUU VUD L İ

\[ \rightarrow \text{Kanga } \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y)) \]
b. nddɔŋ Píglɛ́ɛ́t ɲkú ɲ-kwɛɛ-ɗó mibù Kàŋgàá ɲ-koò í
   only Piglet HAB N-think-ITER C Kanga N-like I
→ Only Piglet λx (x thinks that Kanga λy (y loves x))
→ Only Piglet λx (x thinks that Kanga λy (y loves z))

(260) The non-local Strict reading
a. nddɔŋ Píglɛ́ɛ́t ɲkú ɲ-kwɛɛ-ɗó mibù Kàŋgàá ɲ-koò í
   only Piglet HAB N-think-ITER C Kanga N-like I
→ Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

Native Speaker Informants: Hermann Keupdjio

A.50 Nagamese: AAB

(261) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
a. Kanga Piglet ekla tai nijor aru tai-laga sathi-ke bhal lagia bhabi
   Kanga Piglet alone TAI NIJOR and he-GEN friend-OBL good feel think ase
   COP.PRES
   → Kanga λx (x thinks that only Piglet λy (y loves y and y’s friend))

b. Piglet ekla Kanga tai aru tai-laga sathi-ke bhal lagia bhabi ase
   Piglet alone Kanga TAI and TAI-GEN friend-OBL good feel think COP.PRES
   → Only Piglet λx (x thinks that Kanga λy (y loves x and x’s friend))
   → Only Piglet λx (x thinks that Kanga λy (y loves z and z’s friend))

(262) The non-local Strict reading
a. Piglet ekla Kanga tai aru tai-laga sathi-ke bhal lagia bhabi ase
   Piglet alone Kanga TAI and TAI-GEN friend-OBL good feel think COP.PRES
   → Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

Native Speaker Informants: Savio Meyase

A.51 Norwegian: AAB

(263) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. Kengu tror at bare Nasse Naff elsker seg selv
   Kanga think that only Piglet love SEG SELV
   → Kanga λx (x thinks that only Piglet λy (y loves y))

b. Bare Nasse Naff tror at Kengu elsker ham
   only Piglet think that Kanga love HAM
   → Only Piglet λx (x thinks that Kanga λy (y loves x))
   → Only Piglet λx (x thinks that Kanga λy (y loves z))

(264) The non-local Strict reading
a. Bare Nasse Naff tror at Kengu elsker ham
   only Piglet think that Kanga love HAM
   → Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

Native Speaker Informants: Julian Kirkeby Lysvik
A.52 Peranakan Javanese of Semarang: ABC

(265) (Cole et al., 2015:143)

a. Ali, ngomong nek aku pikir [Tono; ketok awake dhenewe; i/j/s k nggon kaca]
   Ali say.N C 1SG think [Tono see AWAKE DHEEN DHEWE in mirror]

   Ali said that I thought that Tono saw himself in the mirror.

b. [Gurue Tono;] ketok awake dhenewe; i/j/s k nggon kaca

   [teacher.3 Tono] see AWAKE DHEEN DHEWE in mirror

   Tono’s teacher saw himself in the mirror.

(266) (Cole et al., 2007:25)

Tono ketok awake dhenewe nggon kaca, Siti yaya.

Tono see AWAKE DHEEN DHEWE in mirror Siti also

→ Tono λx (x saw x in the mirror) and Siti λy (y saw y in the mirror)

(267) (Cole et al., 2015:143)

a. Ali, ngomong nek aku pikir [Tono; ketok awake dhenewe; i/j/s k nggon kaca]
   Ali say.N C 1SG think [Tono see AWAKE DHEEN in mirror]

   Ali said that I thought that Tono saw himself / him in the mirror.

b. [Gurue Tono;] ketok awake dhenewe; i/j/s k nggon kaca

   [teacher.3 Tono] see AWAKE DHEEN in mirror

   Tono’s teacher saw himself / him in the mirror.

(268) (Cole et al., 2007:26)

Tono ngomong nek Bowo ketok awake dhenewe nggon kaca, Siti yaya.

Tono say.N C Bowo see AWAKE DHEEN in mirror Siti also

→ Tono λx (x said Bowo saw x in the mirror) and Siti λy (y said Bowo saw y in the mirror)

(269) (Cole et al., 2015:144)

a. Ali, ngomong nek aku pikir [Tono; ketok dhenew; i/s j/s k nggon kaca]
   Ali say.N C 1SG think [Tono see DHEEN in mirror]

   Ali said that I thought that Tono saw him / her in the mirror.

b. [Gurue Tono;] ketok dhenew; i/s j/s k nggon kaca

   [teacher.3 Tono] see DHEEN in mirror

   Tono’s teacher saw him/her in the mirror.

(270) (Cole et al., 2007:24)

Tono ngomong nek Bowo ketok dhenew nggon kaca, Siti yaya.

Tono say.N C Bowo see DHEEN in mirror Siti also

→ Tono λx (x said Bowo saw x in the mirror) and Siti λy (y said Bowo saw y in the mirror)

→ Tono λx (x said Bowo saw z in the mirror) and Siti λy (y said Bowo saw z in the mirror)
A.53 Polish: AAB

(271) *Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend*

a. Kanga myśli, że tylko Piglet kocha siebe i Kanga think.3.SG.PRES that only Piglet love.3.SG.PRESsiebe and swojego przyjaciela SWOJEGO friend.GEN
   → Kanga λ x (x thinks that only Piglet λ y (y loves y and y’s friend))

b. tylko Piglet myśli, że Kanga kocha jego i jego only Piglet think.3.SG.PRES that Kanga love.3.SG.PRESjego and JEGO przyjaciela friend
   → Only Piglet λ x (x thinks that Kanga λ y (y loves x and x’s friend))
   → Only Piglet λ x (x thinks that Kanga λ y (y loves z and z’s friend))

(272) **The non-local Strict reading**

a. tylko Piglet myśli, że Kanga kocha jego i jego only Piglet think.3.SG.PRES that Kanga love.3.SG.PRESjego and JEGO przyjaciela friend
   → Only Piglet λ x (x thinks that Kanga λ y (y loves z and z’s friend)), z = Piglet

Native Speaker Informants: Dorota Jagódzka

A.54 Portuguese: AAB

(273) **(Only) Diana thinks that (only) Charles loves himself / her and his / her sister**

a. a Diana acha que só o Charles gosta de si próprio e da sua irmã
   DET Diana thinks that only DET Charles likes.PRES of SI PROPRIO and of.the his.FEM sister
   → Diana λ x (x thinks that only Charles λ y (y loves y and y’s sister))

b. só Diana é que acha que o Charles a ama a ela e à only Diana is that thinks that DET Charles her.CL loves to ELA and to.DET sua irmã
   his.FEM sister
   → Only Diana λ x (x thinks that Charles λ y (y loves x and x’s sister))
   → Only Diana λ x (x thinks that Charles λ y (y loves z and z’s sister))

(274) **The non-local Strict reading**

a. só Diana é que acha que o Charles a ama a ela e à only Diana is that thinks that DET Charles her.CL loves to ELA and to.DET sua irmã
   his.FEM sister
   → Only Diana λ x (x thinks that Charles λ y (y loves z)), where z = Diana

Native Speaker Informants: Bruno Fernandez
A.55 Punjabi: AAB

(275) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. Kaangaa socdi e ki sırf Piglet apne-aap-nuu pyaar kardaa e Kanga think.FEM be that only Piglet APNE-AAP-ACC love do.HAB be → Kanga λx (x thinks that only Piglet λy (y loves y))
b. sırf Piglet socdaa e kii Kaangaa o-nuu pyaar kardi e only Piglet think.MASC be that Kanga O-ACC love do.FEM be → Only Piglet λx (x thinks that Kanga λy (y loves x)) → Only Piglet λx (x thinks that Kanga λy (y loves z))

(276) The non-local Strict reading
a. sırf Piglet socdaa e kii Kaangaa o-nuu pyaar kardi e only Piglet think.MASC be that Kanga O-ACC love do.FEM be → Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

(277) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
a. Kaangaa socdi e ki sırf Piglet apne aap-nuu te apne dost-nuu Kanga think.MASC be that only Piglet APNE AAP-ACC and SELF friend-ACC pyaar kardaa e love do.MASC be → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))
b. sırf Piglet socdaa e kii Kaangaa o-nuu te o-de dost-nuu only Piglet think.MASC be that Kanga O-ACC and he-GEN friend-ACC pyaar kardi e love do.FEM be → Only Piglet λx (x thinks that Kanga λy (y loves x and his friend)) → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend)), z = Piglet → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))

Native Speaker Informants: Gurmeet Kaur

A.56 Romanian: AAB

(278) Kanga / only Piglet thinks that only Piglet / Kanga wants himself / him and his partner to win
a. Kanga crede că numai Piglet vrea ca el însuși și partenerul lui Kanga thinks that only Piglet wants C EL INSUSI and partner LUI câștige win → Kanga λx (x thinks that only Piglet λy (y wants y and y’s partner to win))
b. Numai Piglet crede că Kanga vrea ca el și partenerul său să only Piglet thinks that Kanga wants C EL and partner SAU 1SG câștige win → Only Piglet λx (x thinks that Kanga λy (y wants x and x’s partner to win)) → Only Piglet λx (x thinks that Kanga λy (y wants z and z’s partner to win))
(279) **The non-local Strict reading**

a. Numai Piglet crede că Kanga vrea ca el și partenerul său să
only Piglet thinks that Kanga wants C EL and partner SAU 1SG
 câștige win

$$\rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ wants } z \text{ and } z's \text{ partner to win})),$$
where $$z = \text{Piglet}$$

Native Speaker Informants: Adina Bleotu, Andra Popa

A.57 **Russian: AAB**

(280) **Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend**

a. Kanga dumaet, chto tol’ko piglet ljubit sebia i svoego
Kanga thinks.3SG that only Piglet loves.3SG SEBIA and SVOEGO
drugra friend.ACC

$$\rightarrow \text{Kanga } \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y \text{ and } y's \text{ friend}))$$

b. tol’ko Piglet dumaet, chto Kanga ljubit ego i ego druga
only Piglet thinks.3SG that Kanga loves.3SG EGO and EGO friend.ACC

$$\rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } x \text{ and } x's \text{ friend}))$$

$$\rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z \text{ and } z's \text{ friend})), z = \text{Piglet}$$

Native Speaker Informants: Alina Konradt

A.58 **Samoan: AAA**

(282) **Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him**

a. o le mafaufau o Kanga, e na’o Piglet e alofa ia ia lava
OM ART think OM Kanga AGT only Piglet AGT love IA IA EMPH

$$\rightarrow \text{Kanga } \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y))$$

a’. e na’o Piglet e mafaufau o Kanga e alofa ia ia
AGT only Piglet AGT think OM Kanga AGT love IA IA

$$\rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } x))$$

$$\rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z))$$

(283) **The non-local Strict reading**

a. e na’o Piglet e mafaufau o Kanga e alofa ia ia
AGT only Piglet AGT think OM Kanga AGT love IA IA

$$\rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z)), z = \text{Piglet}$$
Only Piglet thinks that Kanga loves him and his friend

a. e na'o Piqlet e mafaufau o Kanga e alofa ia ia ma ana uo
   AGT only Piglet AGT think OM Kanga AGT love 1A1A and his friend
   → Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))

Native Speaker Informants: Lealofi Pouri-Lane

A.59 Serbian: AAB

(285) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kenga misli da jedino Prase voli sebe i svog prijatelja
   Kanga thinks that only Piglet loves SEBE and SVOG friend
   → Kanga λx (x thinks that only Piglet λy (y loves y and y’s friend))

b. jedino Prase misli da Kenga voli njega i njegovog prijatelja
   only Piglet thinks that Kanga loves NJEGA and NJEGOVOG friend
   → Only Piglet λx (x thinks that Kanga λy (y loves x and x’s friend))
   → Only Piglet λx (x thinks that Kanga λy (y loves z and z’s friend))

(286) The non-local Strict reading

a. jedino Prase misli da Kenga voli njega i njegovog prijatelja
   only Piglet thinks that Kanga loves NJEGA and NJEGOVOG friend
   → Only Piglet λx (x thinks that Kanga λy (y loves z and z’s friend)), z = Piglet

Native Speaker Informants: Sanja Raković

A.60 Sesotho: AAB

(287) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga o nahana hore ke farakatsana fela a i-thatang
   Kanga SM think that it.is Piglet only OM I-loving
   → Kanga λx (x thinks that only Piglet λy (y loves y))

b. ke farakatsana fela a nahanang hore Kanga oa mo rata
   it.is Piglet only SM thinking that Kanga POSS MO rata
   → Only Piglet λx (x thinks that Kanga λy (y loves x))
   → Only Piglet λx (x thinks that Kanga λy (y loves z))

(288) The non-local Strict reading

a. ke farakatsana fela a nahanang hore Kanga oa mo rata
   it.is Piglet only SM thinking that Kanga POSS MO rata
   → Only Piglet λx (x thinks that Kanga λy (y loves z)), z = Piglet

(289) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kanga o nahana hore ke farakatsana fela a i-thatang le motsoalle
   Kanga SM think that it.is Piglet only OM I-loving and friend
   POSS own
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))
b. ke farakatsana fela a nahanang hore Kanga o rata ena le it.ia Piglet only SM thinking that Kanga OM love ENA and motsoalle oa hae friend POSS own 
→ Only Piglet λx (x thinks that Kanga λy (y loves x and his friend)) 
→ Only Piglet λx (x thinks that Kanga λy (y loves z and his friend)), z = Piglet 
→ Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))

Native Speaker Informants: Mokheseng Richard Buti

A.61 Seychellois: AAB

(290) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. Kanga e kwa dis Piglet e contant son lecore 
   Kanga SM think only Piglet OM love SON LECORE 
   → Kanga λx (x thinks that only Piglet λy (y loves y))
b. Dis Piglet e kwa Kanga e contant le 
   Only Piglet SM think Kanga OM love LE 
   → Only Piglet λx (x thinks that Kanga λy (y loves x)) 
   → Only Piglet λx (x thinks that Kanga λy (y loves z))

(291) The non-local Strict reading
a. Dis Piglet e kwa Kanga e contant le 
   Only Piglet SM think Kanga OM love LE 
   → Only Piglet λx (x thinks that Kanga λy (y loves y)), z = Piglet

(292) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
a. Kanga e kwa dis Piglet e contant son zami ek son lecore 
   Kanga SM think only Piglet OM love POSS friend and SON LECORE 
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))
b. Dis Piglet e kwa Kanga e contant son zami ek le 
   Only Piglet SM think Kanga OM love POSS friend and LE 
   → Only Piglet λx (x thinks that Kanga λy (y loves x and his friend)) 
   → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend)), z = Piglet 
   → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))

Native Speaker Informants: Jerome Butcher

A.62 Shekgalagari: AAB

(293) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. Kanga o akanya gore Piglet ena ye-ngwe o i-tyhatya-yo 
   Kanga SM think that Piglet ENA 3SG-alone OM I-love-CONT 
   → Kanga λx (x thinks that only Piglet λy (y loves y))
b. Piglet ena ye-ngwe o akanya gore Kanga o mo ratya-yo 
   Piglet ENA 3SG-alone SM think that Kanga SM MO love-CONT 
   → Only Piglet λx (x thinks that Kanga λy (y loves x)) 
   → Only Piglet λx (x thinks that Kanga λy (y loves z))
(294) The non-local Strict reading
   a. Piglet ena ye-ngwe o akanya gore Kanga o mo ratya-yo
      Piglet ENA 3SG-alone SM think that Kanga SM MO love-CONT
      \rightarrow Only Piglet \lambda x (x thinks that Kanga \lambda y (y loves z)), z = Piglet

(295) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
   a. Kanga o akanya gore Piglet ena ye-ngwe o i-tyhatya le ritsala
      Kanga SM think that Piglet ENA 3SG-alone SM I-love and friends
      jhagwe
      POSS
      \rightarrow Kanga \lambda x (x thinks that only Piglet \lambda y (y loves y and his friend))
   b. Piglet ena ye-ngwe o akanya gore Kanga o mo ratya le ritsala
      Piglet ENA 3SG-alone SM think that Kanga SM MO love and friends
      jhagwe
      POSS
      \rightarrow Only Piglet \lambda x (x thinks that Kanga \lambda y (y loves x and his friend))
      \rightarrow Only Piglet \lambda x (x thinks that Kanga \lambda y (y loves z and his friend)), z = Piglet

Native Speaker Informants: Kemmonye Monaka

A.63 SiLozi: AAB

(296) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
   a. Kanga u-hupula kuti konji Piglet ki ya i-lata ni mu-likani wa-hae
      Kanga 3-think that only Piglet KI YA I-love and MU-friend POSS-3
      \rightarrow Kanga \lambda x (x thinks that only Piglet \lambda y (y loves y and his friend))
   b. konji Piglet ki ya hupula kuti Kanga wa mu-lata ni mu-likani wa-hae
      only Piglet KI YA think that Kanga to MU-love and MU-friend POSS-3
      \rightarrow Only Piglet \lambda x (x thinks that Kanga \lambda y (y loves x and his friend))
      \rightarrow Only Piglet \lambda x (x thinks that Kanga \lambda y (y loves z and his friend))

(297) The non-local Strict reading
   a. konji Piglet ki ya hupula kuti Kanga wa mu-lata ni mu-likani wa-hae
      only Piglet KI YA think that Kanga to MU-love and MU-friend POSS-3
      \rightarrow Only Piglet \lambda x (x thinks that Kanga \lambda y (y loves z and his friend)), z = Piglet

Native Speaker Informants: Gustav Mbeha

A.64 Sinhala: AAB

(298) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
   a. Kanga hithənəwa Piglet withə-ro thamən-ta-məaadəre kərənn-e
      Kanga thinks Piglet only-EMPH THAMAN-DAT-EMPH love do-E
      kiyəla
      C
      \rightarrow Kanga \lambda x (x thinks that only Piglet \lambda y (y loves y))
b. Piglet with only-INDF thinks Kanga EYAA-DAT love do C
   \[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } x)) \]
   \[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z)) \]

\[(299) \text{ The non-local Strict reading}\]

a. Piglet with-ak hithənəwa Kanga eyaa-tə aadəre kəranəwa kiyəla
   Piglet only-INDF thinks Kanga EYAA-DAT love do C
   \[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z)), \text{ where } z = \text{Piglet} \]

\[(300) \text{ Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend}\]

a. Kanga hithənəwa Piglet with-ay thaman-ə-mə saha eyaa-ge
   Kanga thinks Piglet only-EMPH THAMAN-DAT-EMPH and him-POSS
   yaaluwa-tə aadəre kəran-m-e kiyəla
   friend-DAT love do-E C
   \[ \rightarrow \text{Kanga } \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y \text{ and his friend})) \]

b. Piglet with-ər-ak hithənəwa Kanga eyaa-tə saha eyaa-ge yaaluwa-tə
   Piglet only-INDF thinks Kanga EYAA-DAT and him-POSS friend-DAT
   aadəre kəranəwa kiyəla
   love do C
   \[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } x \text{ and his friend})) \]
   \[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z \text{ and his friend}), z = \text{Piglet} \]
   \[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z \text{ and his friend})) \]

Native Speaker Informants: Tharanga Weerasooriya

\textbf{A.65 Slovenian: AAB}

\[(301) \text{ Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend}\]

a. Kanga misli, da ima samo Pujsek rad sebe in svojega prijatelja
   Kanga thinks that has only Piglet loves SEBE and SVOJEGA friend
   \[ \rightarrow \text{Kanga } \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y \text{ and } y\text{'s friend})) \]

b. samo Pujsek misli, da ima Kanga rad njega in njegovega
   only Piglet thinks that has Kanga loves NJEGA and NJEGOVEGA
   prijatelja
   friend
   \[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } x \text{ and } x\text{'s friend})) \]
   \[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z \text{ and } z\text{'s friend})) \]

\[(302) \text{ The non-local Strict reading}\]

a. samo Pujsek misli, da ima Kanga rad njega in njegovega
   only Piglet thinks that has Kanga loves NJEGA and NJEGOVEGA
   prijatelja
   friend
   \[ \rightarrow \text{Only Piglet } \lambda x (x \text{ thinks that Kanga } \lambda y (y \text{ loves } z \text{ and } z\text{'s friend})), z = \text{Piglet} \]

Native Speaker Informants: Alja Debeljak, Gregor Kladnik
A.66 Spanish: AAB

(303) Only Diana thinks that (only) Charles loves himself / her and his / her sister

a. Diana piensa que sólo Charles se quiere a sí mism-o y a su hermana
   3.POSS sister
   → Diana λx (x thinks that only Charles λy (y loves y and y’s sister))

b. sólo Diana piensa que Charles la quiere a ella y a su hermana
   3.POSS sister
   → Only Diana λx (x thinks that Charles λy (y loves x and x’s sister))
   → Only Diana λx (x thinks that Charles λy (y loves z and z’s sister))

(304) The non-local Strict reading

a. sólo Diana piensa que Charles la quiere a ella y a su hermana
   3.POSS sister
   → Only Diana λx (x thinks that Charles λy (y loves z and z’s sister)), z = Diana

Native Speaker Informants: Luisa Martí, Marina Ortega Andrés

A.67 Sundanese: AAB

(305) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga mikir ngan Piglet wungkul resep ka diri sorangan
   Kanga think only Piglet only love/to with DIRI SORANGAN
   → Kanga λx (x thinks that only Piglet λy (y loves y))

b. ngan Piglet nu mikir Kanga resep ka manehna
   only Piglet REL think Kanga like/to with MANEHNA
   → Only Piglet λx (x thinks that Kanga λy (y loves x))
   → Only Piglet λx (x thinks that Kanga λy (y loves z))

(306) The non-local Strict reading

a. ngan Piglet nu mikir Kanga resep ka manehna
   only Piglet REL think Kanga like/to with MANEHNA
   → Only Piglet λx (x thinks that Kanga λy (y loves z)), z = Piglet

(307) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kanga mikir ngan Piglet resep ka diri sorangan jeung
   Kanga think only Piglet love/to with DIRI SORANGAN and friend.POSS
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))
b. ngan Piglet nu mikir Kanga resep ka manehna jeung rerencanganan friend.POSS
→ Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))
→ Only Piglet λx (x thinks that Kanga λy (y loves x and his friend)), z = Piglet
→ Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))

Native Speaker Informants: Ratih Oktarini’s Friend

A.68 Swedish: AAB

(308) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. Kanga tror att bara Nasse älskar sig själv
   Kanga think.PRES that only Piglet love.PRES SIG SJALV
   → Kanga λx (x thinks that only Piglet λy (y loves y))

b. bara Nasse tror att Kanga älskar honom
   only Piglet think.PRES that Kanga loves HONOM
   → Only Piglet λx (x thinks that Kanga λy (y loves x))
   → Only Piglet λx (x thinks that Kanga λy (y loves z))

(309) The non-local Strict reading
a. bara Nasse tror att Kanga älskar honom
   only Piglet think.PRES that Kanga loves HONOM
   → Only Piglet λx (x thinks that Kanga λy (y loves y)), z = Piglet

b. bara Nasse tror att Kanga älskar honom och sin vän
   only Piglet thinks that Kanga loves SIG SJALV and SIN friend
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))

(310) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
a. Kanga tror att bara Nasse älskar sig själv och sin vän
   Kanga thinks that only Piglet loves SIG SJALV and SIN friend
   → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))

b. bara Nasse tror att Kanga älskar honom och hans vän
   only Piglet thinks that Kanga loves HONOM and HANS friend
   → Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))
   → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend)), z = Piglet
   → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))

Native Speaker Informants: Victor Bogren

A.69 Tamil: ABB

(311) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. Kanga mattum tan-ai kataliki-r-aan Piglet nenaichutu
   Kanga only TA(A)N-ACC love-3.SG.FEM-C Piglet think-PAST-3.SG.NEUT
   → Kanga λx (x thinks that only Piglet λy (y loves y))

a’. Piglet mattum Kanga tan-ai kataliki-r-aal-nnu nenai-t-aan
   Piglet only Kanga TA(A)N-ACC love-3.SG.FEM-C think-PAST-3.SG.MASC
   → Only Piglet λx (x thinks that Kanga λy (y loves x))
b. Piglet mattum Kanga **avan**-ai kataliki-r-aal-nnu nenai-t-aan
   Piglet only Kanga **AVAN**-ACC love-3.SG.FEM-C think-PAST-3.SG.MASC
   \[ Only \text{ Piglet } \lambda x (x \text{ thinks that } Kanga \lambda y (y \text{ loves } z)) \]

(312) The non-local Strict reading

a. Piglet mattum Kanga **tan**-ai kataliki-r-aal-nnu nenai-t-aan
   Piglet only Kanga **TA(A)N**-ACC love-3.SG.FEM-C think-PAST-3.SG.MASC
   \[ Only \text{ Piglet } \lambda x (x \text{ thinks that } Kanga \lambda y (y \text{ loves } z)) \]

(313) Only Piglet thinks that Kanga loves him and his friend

a. Piglet mattum Kanga **tan**-ai **tan**-ode friend-ai-um
   Piglet only Kanga **TA(A)N**-ACC CONJ **TA(A)N**-GEN friend-ACC-CONJ
   kataliki-r-aal-nnu nenai-t-aan
   love-PRES-3.SG.FEM-C think-PAST-3.SG.MASC
   \[ Only \text{ Piglet } \lambda x (x \text{ thinks that } Kanga \lambda y (y \text{ loves } x \text{ and his friend})) \]

Native Speaker Informants: Guru Jegan Murugesan

A.70 Telugu: AAA, ABC

(314) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga Piglet **dan**-ni matram premi-stun-di ani anuk-un-di
   Kanga Piglet **DAN**-ACC only love-CONT-3.SG.NEUT REL think-PERF-3.SG.NEUT
   \[ Kanga \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y)) \]

a’. Piglet matram Kanga **dan**-ni premi-stun-di ani anuk-un-di
   Piglet only Kanga **DAN**-ACC love-CONT-3.SG.NEUT REL think-PERF-3.SG.NEUT
   \[ Only \text{ Piglet } \lambda x (x \text{ thinks that } Kanga \lambda y (y \text{ loves } x)) \]
   \[ Only \text{ Piglet } \lambda x (x \text{ thinks that } Kanga \lambda y (y \text{ loves } z)) \]

(315) The non-local Strict reading

a. Piglet matram Kanga **dan**-ni premi-stun-di ani anuk-un-di
   Piglet only Kanga **DAN**-ACC love-CONT-3.SG.NEUT REL think-PERF-3.SG.NEUT
   \[ Only \text{ Piglet } \lambda x (x \text{ thinks that } Kanga \lambda y (y \text{ loves } z)), z = Piglet \]

(316) Only Piglet thinks that Kanga loves him and his friend

a. Piglet matram-e Kanga **dan**-ni **dan** friend-ni premi-stun-di
   Piglet only-EMPH Kanga **DAN**-ACC friend-ACC love-CONT-3.SG.NEUT
   ani anuk-un-di REL think-PERF-3.SG.NEUT
   \[ Only \text{ Piglet } \lambda x (x \text{ thinks that } Kanga \lambda y (y \text{ loves } x \text{ and his friend})) \]

Native Speaker Informants: Vikalp Ravikumar

(317) Kanga/only Piglet thinks that only Piglet/Kanga loves himself/him

a. Kanga anukutundi Piglet **tanau** **taanu** maatrame preminchukuntunnaadu
   Kanga thinks.FEM Piglet **TANAU** **TAANU** only love.MASC
   ani that
   \[ Kanga \lambda x (x \text{ thinks that only Piglet } \lambda y (y \text{ loves } y)) \]
b. Piglet maatrame anukuntunnaadu Kanga **tanunu** premenchukuntundi ani Piglet only thinks.MASC Kanga **TANANU** love.FEM that → *Only Piglet* $\lambda x$ (*$x$ thinks that Kanga $\lambda y$ ($y$ loves $x$))

c. Piglet maatrame anukuntunnaadu Kanga **atanini** premenchukuntundi ani Piglet only thinks.MASC Kanga **ATANINI** love.FEM that → *Only Piglet* $\lambda x$ (*$x$ thinks that Kanga $\lambda y$ ($y$ loves $z$))

(318) The non-local Strict reading

a. Piglet maatrame anukuntunnaadu Kanga **tanunu** premenchukuntundi ani Piglet only thinks.MASC Kanga **TANANU** love.FEM that → *Only Piglet* $\lambda x$ (*$x$ thinks that Kanga $\lambda y$ ($y$ loves $z$)), $z = \text{Piglet}$

(319) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kanga anukuntundi Piglet maatrame **tanunu taanu** mariyu **tana** mitruni Kanga thinks.FEM Piglet only **TANANU TAANU** and **TANA** friend premistunnaadu ani love.MASC that → *Kanga* $\lambda x$ (*$x$ thinks that only Piglet $\lambda y$ ($y$ loves $y$ and his friend))

b. Piglet maatrame anukuntunnaadu Kanga **tanunu** mariyu **tana** mitruni Piglet only thinks.MASC Kanga **TANANU** and **TANA** friend.ACC premistundi ani love.FEM that → *Only Piglet* $\lambda x$ (*$x$ thinks that Kanga $\lambda y$ ($y$ loves $x$ and his friend)) → *Only Piglet* $\lambda x$ (*$x$ thinks that Kanga $\lambda y$ ($y$ loves $z$ and his friend)), $z = \text{Piglet}$

c. Piglet maatrame anukuntunnaadu Kanga **atanini** mariyu **atani** mitruni Piglet only thinks.MASC Kanga **ATANINI** and **ATANI** friend.ACC premistundi ani love.FEM that → *Only Piglet* $\lambda x$ (*$x$ thinks that Kanga $\lambda y$ ($y$ loves $z$ and his friend))

Native Speaker Informants: Ganesh Gupta Sinisetty

A.71 Tenyidie: AAB

(320) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga Piglet rübei **puo thie puo** ngu-puo-nei ba kü le Kanga Piglet only **PUO THIE PUO** like PRES.CONT that think ba PRES.CONT → *Kanga* $\lambda x$ (*$x$ thinks that only Piglet $\lambda y$ ($y$ loves $y$))

b. Piglet rübei Kanga **puo** ngu-puo-nei ba kü le ba Piglet only Kanga **PUO** like PRES.CONT that think PRES.CONT → *Only Piglet* $\lambda x$ (*$x$ thinks that Kanga $\lambda y$ ($y$ loves $x$)) → *Only Piglet* $\lambda x$ (*$x$ thinks that Kanga $\lambda y$ ($y$ loves $z$))
The non-local Strict reading

a. Piglet rübei Kanga *p u o ng u-puo-nei ba cü le ba* Piglet only Kanga *PUO* like PRES.CONT that think PRES.CONT

→ *Only Piglet* \( \lambda x \) \( \langle x \text{ thinks that Kanga } \lambda y \langle y \text{ loves } z \rangle \rangle \), where \( z = \text{Piglet} \)

(K322) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kanga Piglet rübei *p u o thie puo* mu puo-ze-u ngu-puo-nei Kanga Piglet only *PUO THIE PUO* and his-friend love-by 3.PRON ba cü le ba PRES.CONT that think PRES.CONT

→ Kanga \( \lambda x \) \( \langle x \text{ thinks that only Piglet } \lambda y \langle y \text{ loves } y \rangle \rangle \)

b. Piglet rübei Kanga *p u o* mu puo-ze-u ngu-puo-nei ba cü Piglet only Kanga *PUO* and his-friend love-by 3.PRON PRES.CONT that le ba think PRES.CONT

→ *Only Piglet* \( \lambda x \) \( \langle x \text{ thinks that only Piglet } \lambda y \langle y \text{ loves } y \rangle \rangle \)

→ *Only Piglet* \( \lambda x \) \( \langle x \text{ thinks that Kanga } \lambda y \langle y \text{ loves } x \rangle \rangle \)

→ *Only Piglet* \( \lambda x \) \( \langle x \text{ thinks that Kanga } \lambda y \langle y \text{ loves } z \rangle \rangle \), \( z = \text{Piglet} \)

Native Speaker Informants: Savio Meyase

A.72 Thai: AAB

(K323) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga kid \( \text{wa} \) mee kae Piglet tee ruk *t u a e n g* Kanga thinks C only Piglet C love TUA ENG

→ Kanga \( \lambda x \) \( \langle x \text{ thinks that only Piglet } \lambda y \langle y \text{ loves } y \rangle \rangle \)

b. mee kae Piglet tee kid \( \text{wa} \) Kanga ruk *k a o* only Piglet C think C Kanga love KAO

→ *Only Piglet* \( \lambda x \) \( \langle x \text{ thinks that Kanga } \lambda y \langle y \text{ loves } x \rangle \rangle \)

→ *Only Piglet* \( \lambda x \) \( \langle x \text{ thinks that Kanga } \lambda y \langle y \text{ loves } z \rangle \rangle \)

(K324) The non-local Strict reading

a. mee kae Piglet tee kid \( \text{wa} \) Kanga ruk *k a o* only Piglet C think C Kanga love KAO

→ *Only Piglet* \( \lambda x \) \( \langle x \text{ thinks that Kanga } \lambda y \langle y \text{ loves } z \rangle \rangle \), where \( z = \text{Piglet} \)

(K325) Only Piglet thinks that Kanga loves him and his friend

a. mee kae Piglet tee kid \( \text{wa} \) Kanga ruk *k a o* lae puen korng *k a o* only Piglet C thanks C Kanga loves KAO and friend belong KAO

→ *Only Piglet* \( \lambda x \) \( \langle x \text{ thinks that Kanga } \lambda y \langle y \text{ loves } x \rangle \rangle \)

Native Speaker Informants: Anan Sutida

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A.73 Tongan: AAA

(326) Kanga / only Piglet thinks that only Piglet / Kanga saw himself / him in the mirror

a. na’e pehē ’e Kanga ko Piglet pē na’e sio kiate ia ’ī he sio’atā
PAST think ERG Kanga PRED Piglet only PAST see to IA in the mirror
→ Kanga λx (x thinks that only Piglet λy (y saw y in the mirror))

a’. ko Piglet pē na’a ne pehē na’e sio ange ’a Kanga kiate ia ’i
PRED Piglet only PRES he thinks PAST see DIR ABS Kanga to IA in
he sio’atā
the mirror
→ Only Piglet λx (x thinks that Kanga λy (y saw x in the mirror))
→ Only Piglet λx (x thinks that Kanga λy (y saw z in the mirror))

(327) The non-local Strict reading

a. ko Piglet pē na’a ne pehē na’e sio ange ’a Kanga kiate ia ’i
PRED Piglet only PRES he thinks PAST see DIR ABS Kanga to IA in
he sio’atā
the mirror
→ Only Piglet λx (x thinks that Kanga λy (y saw y in the mirror))

Native Speaker Informants: Melenaite Taumoefolau, Sateki Seau, Siosifa Sifa

A.74 Tshivenda: AAB

(328) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

a. Kanga u humbula uri Piglet ndi ene a ethē o no di funa
Kanga SM think that Piglet is the only one who DI love
→ Kanga λx (x thinks that only Piglet λy (y loves y))

b. Piglet ndi ene a ethē o no humbula uri Kanga u yamu funa
Piglet is the only one who think that Kanga SM YAMU love
→ Only Piglet λx (x thinks that Kanga λy (y loves x))
→ Only Piglet λx (x thinks that Kanga λy (y loves z))

(329) The non-local Strict reading

a. Piglet ndi ene a ethē o no humbula uri Kanga u yamu funa
Piglet is the only one who think that Kanga SM YAMU love
→ Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

(330) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend

a. Kanga u humbula uri Piglet ndi ene a ethē o no di funa na khonani
Kanga SM think that Piglet is the only one who DI love and friend
ya
Yawe
YAWE
→ Kanga λx (x thinks that only Piglet λy (y loves y and his friend))

b. Piglet a ethē u humbula uri Kanga u yamu funa na khonani yawe
Piglet alone SM think that Kanga SM YAMU love and friend Yawe
→ Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))
→ Only Piglet λ x (x thinks that Kanga λ y (y loves z and his friend)), z = Piglet
→ Only Piglet λ x (x thinks that Kanga λ y (y loves z and his friend))

Native Speaker Informants: Vhuhwavho Ntsieni

A.75  Turkish: ABB

(331) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. Kanga sadece Piglet-in kendisin-i sev-diğ-in-i
   Kanga.NOM only Piglet-GEN KENDISIN-ACC love-C-POSS-ACC
düş-ın-iyor
   think-PROG-3SG
→ Kanga λ x (x thinks that only Piglet λ y (y loves y))
a’. Sadece Piglet Kanga-nin kendisin-i sev-diğ-in-i
   only Piglet.NOM Kanga-GEN KENDISIN-ACC love-C-POSS-ACC
düş-ın-iyor
   think-PROG-3SG
→ Only Piglet λ x (x thinks that Kanga λ y (y loves x))
b. Sadece Piglet Kanga-nin on-u sev-diğ-in-i düş-ın-iyor
   only Piglet.NOM Kanga-GEN ON-ACC love-C-POSS-ACC think-PROG-3SG
→ Only Piglet λ x (x thinks that Kanga λ y (y loves z))

(332) The non-local Strict reading
a. Sadece Piglet Kanga-nin kendisin-i sev-diğ-in-i
   only Piglet.NOM Kanga-GEN KENDISIN-ACC love-C-POSS-ACC
düş-ın-iyor
   think-PROG-3SG
→ Only Piglet λ x (x thinks that Kanga λ y (y loves z)), where z = Piglet

(333) Only Piglet thinks that Kanga loves him and his friend
a. Sadece Piglet Kanga-nin kendisin-i ve arkadaş-in-i
   only Piglet.NOM Kanga-GEN KENDISIN-ACC and PRO friend-3.SG.POSS-ACC
   sev-diğ-in-i düşün-iyor
   love-CL-POSS-ACC think-3.SG.PROG
→ Only Piglet λ x (x thinks that Kanga λ y (y loves x and his friend))

Native Speaker Informants: Demet Kayabaşı, Feyza Nalbaut

A.76  Twi: AAB

(334) (Only) Piglet thinks that (only) Kanga loves herself / him
a. Prekoba no nkua na ōdwene se Kanga do neho
   Piglet only PAST think that Kanga loves NEHO
→ Piglet λ x (x thinks that only Kanga λ y (y loves y))
b. Prekoba no nkua na ōdwene se Kanga do no
   Piglet only PAST think that Kanga loves NO
→ Only Piglet λ x (x thinks that Kanga λ y (y loves x))
→ Only Piglet λ x (x thinks that Kanga λ y (y loves z))
The non-local Strict reading

\[ \text{only Piglet} \lambda x \ (x \text{ thinks that } Kanga \lambda y \ (y \text{ loves } z)), \text{ where } z = \text{Piglet} \]

Native Speaker Informants: Bendov Ansa-Otu

A.77 Ukrainian: AAB

Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him

\[ \text{Kanga} \ \text{only Piglet} \ \text{think-EP’TH V-3.SG.PRES that only Piglet.SG.NOM SEBE l’uby-t’ love-3.SG.PRES} \]
\[ \rightarrow \text{Kanga} \ \lambda x \ (x \text{ thinks that only Piglet } \lambda y \ (y \text{ loves } y)) \]

Native Speaker Informants: Yuriy Kushnir
A.78 Welsh: AAB

(339) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
a. mae Kanga-\'n meddwl mai ond Piglet sy-\'n caru ei hun
   is Kanga-PTCP think that only Piglet is-PTCP love his HUN
   $\rightarrow$ Kanga $\lambda x$ (x thinks that only Piglet $\lambda y$ (y loves y))

b. ond Piglet sy-\'n meddwl bod Kanga-\'n ei garu ef
   only Piglet is-PTCP think that.is Kanga-PTCP his love EF
   $\rightarrow$ Only Piglet $\lambda x$ (x thinks that Kanga $\lambda y$ (y loves x))
   $\rightarrow$ Only Piglet $\lambda x$ (x thinks that Kanga $\lambda y$ (y loves z))

(340) The non-local Strict reading
a. ond Piglet sy-\'n meddwl bod Kanga-\'n ei garu ef
   only Piglet is-PTCP think that.is Kanga-PTCP his love EF
   $\rightarrow$ Only Piglet $\lambda x$ (x thinks that Kanga $\lambda y$ (y loves z)), where z = Piglet

(341) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him and his friend
a. mae Kanga-\'n meddwl mai ond Piglet sy-\'n caru ei hun a-\'i
   is Kanga-PTCP think that only Piglet is-PTCP love EI HUN and-his
   friend
   $\rightarrow$ Kanga $\lambda x$ (x thinks only Piglet $\lambda y$ (y loves y and his friend))

b. ond Piglet sy-\'n meddwl bod Kanga-\'n caru ef a-\'i ffrind
   only Piglet is-PTCP think that.is Kanga-PTCP love EF and-his friend
   $\rightarrow$ Only Piglet $\lambda x$ (x thinks that Kanga $\lambda y$ (y loves x and his friend))
   $\rightarrow$ Only Piglet $\lambda x$ (x thinks that Kanga $\lambda y$ (y loves z and his friend)), z = Piglet
   $\rightarrow$ Only Piglet $\lambda x$ (x thinks that Kanga $\lambda y$ (y loves z and his friend))

Native Speaker Informants: Joe Dixie

(342) (Only) Diana thinks that (only) Charles loves himself / her
a. mae Diana-\'n meddwl mai dim ond Charles sy-\’n caru ei hun
   is Diana-PTCP think that NEG only Charles is-PTCP love EI HUN
   $\rightarrow$ Diana $\lambda x$ (x thinks that only Charles $\lambda y$ (y loves y))

b. dim ond Diana sy-\’n meddwl bod Charles yn ei charu hi
   NEG only Diana is-PTCP think that.is Charles PTCP POSS love HI
   $\rightarrow$ Only Diana $\lambda x$ (x thinks that Charles $\lambda y$ (y loves x))
   $\rightarrow$ Only Diana $\lambda x$ (x thinks that Charles $\lambda y$ (y loves z))

Native Speaker Informants: Gareth Roberts
A.79 Xining Mandarin: ABB

(343) (Only) Diana thinks that (only) Charles loves himself / her
a. Diana simo zhe sa Charles sa zhi ba jiā ziji nei zhei fo
   Diana thinks PART PART Charles PART only BA JIA ZI JI loves PART that
   → Diana λx (x thinks that only Charles λy (y loves y))
a’. Diana simo zhe sa zhi Charles sa ba jiā ziji nei zhei fo
   Diana thinks PART PART only Charles PART BA JIA ZI JI loves PART that
   → Only Diana λx (x thinks that Charles λy (y loves x))
b. Diana simo zhe sa zhi Charles sa ba jiā nei zhei fo
   Diana thinks PART PART only Charles PART BA JIA loves PART that
   → Only Diana λx (x thinks that Charles λy (y loves z))

(344) The non-local Strict reading
a. Diana simo zhe sa zhi Charles sa ba jiā ziji nei zhei fo
   Diana thinks PART PART only Charles PART BA JIA ZI JI loves PART that
   → Only Diana λx (x thinks that Charles λy (y loves z)), where z = Diana

Native Speaker Informants: Qi Wang

A.80 Yoruba: ABC

(345) (Only) Diana thinks that (only) Charles loves himself / her
a. Diana lọ rọ pé Charles nikan féràn ara ré
   Diana thinks that Charles alone loves BODY RE
   → Diana λx (x thinks that only Charles λy (y loves y))
b. Diana nikan lọ rọ pé Charles féràn oun
   Diana alone thinks that Charles loves OUN
   → Only Diana λx (x thinks that Charles λy (y loves x))
c. Diana nikan lọ rọ pé Charles féràn ré
   Diana alone thinks that Charles loves RE
   → Only Diana λx (x thinks that Charles λy (y loves z))

(346) The non-local Strict reading
a. Diana nikan lọ rọ pé Charles féràn oun
   Diana alone thinks that Charles loves OUN
   → Only Diana λx (x thinks that Charles λy (y loves z)), where z = Diana

Native Speaker Informants: Maria Coker, Akin Oyétádé
Appendix B: Data Elicitation Materials

B.1 Local binding, Sloppy reading

Diana’s butler told Diana that Charles was in a very good mood today, because he had planted two large vegetable plots with lots of plants. William, however, was in a bad mood as he did badly in an exam at school. William is very cross with himself about this. Harry was also very cross with himself - he forgot his rugby kit and couldn’t play in the match after school.

Sentence for translation: Diana thinks that only Charles loves himself.

B.2 Non-local binding, Sloppy reading

Diana, Camilla and Elizabeth are having tea. Diana says “We just got married; Charles loves me.” Camilla says “That’s lovely for you, Diana; I don’t think Charles loves me.” Elizabeth agrees, saying “Yes, that’s great for you Diana. I don’t think Charles loves me either.”

Only Diana thinks that Charles loves her.
B.3 Non-local binding, Strict reading

Diana, Camilla and Elizabeth are having tea. Diana says “We’ve just had our second baby; Charles loves me.” Camilla says “I’ll let you into a secret, Diana; I don’t think Charles loves you.” Elizabeth agrees, saying “Yes, I’m sorry, Diana. I don’t think Charles loves you either.”

*Only Diana thinks that Charles loves her.*

B.4 Free variable

Diana, Camilla and Elizabeth are having tea. Diana says “Anne came round for dinner last night. She and Charles were laughing and joking all night long; Charles loves her.” Camilla says “I don’t think Charles loves her; she walked a dog poo into his house and it’s all over the carpets.” Elizabeth agrees, saying “Yes, I don’t think Charles loves her either. The dog poo even ended up all over his expensive Persian rugs.”

*Only Diana thinks that Charles loves her.*
Christopher Robin told Kanga that Piglet was in a very good mood today, because he had planted two large vegetable plots with lots of plants. Eeyore, however, was in a bad mood as he did badly in an exam at school. Eeyore is very cross with himself about this. Tigger was also very cross with himself - he forgot his rugby kit and couldn't play in the match after school.

*Kanga thinks that only Piglet loves himself.*

Christopher Robin told Kanga that Piglet was in a very good mood today, because he had planted two large vegetable plots with lots of plants. Tigger, however, is very cross with Piglet, because Piglet banned him from bouncing in the garden. Eeyore is also very cross with Piglet - Piglet was too busy gardening to help him find his tail again.

*Kanga thinks that only Piglet loves himself.*
B.7 Non-local binding, Sloppy reading

Piglet, Tigger and Eeyore are having tea.
Piglet says “I gave Kanga a bunch of flowers today; Kanga loves me.”
Tigger says “That’s lovely for you, Piglet; I don’t think Kanga loves me. I scared her by bouncing behind her suddenly.”
Eeyore agrees, saying “Yes, I don’t think Kanga loves me either - I lost my tail again and she had to spend ages looking for it.”

*Only Piglet thinks that Kanga loves him.*

B.8 Non-local binding, Strict reading

Piglet, Tigger and Eeyore are having tea.
Piglet says “I gave Kanga a bunch of flowers today; Kanga loves me.”
Tigger says “I don’t think Kanga loves you - the flowers gave her hay-fever.”
Eeyore agrees, saying “Yes, I don’t think Kanga loves you; she’s been sneezing all day.”

*Only Piglet thinks that Kanga loves him.*
Piglet, Tigger and Eeyore are having tea. Piglet says “Pooh had dinner at Kanga’s last night. She loves him, because he brought her flowers.”

Tigger says “Really? He ate all her honey; I don’t think Kanga loves him.”

Eeyore agrees, saying “Yes, I think Kanga is really cross with Pooh. She hates him.”

*Only Piglet thinks that Kanga loves him.*

Christopher Robin told Kanga that Piglet was very happy with himself today, because he had planted two large vegetable plots with his friend. Eeyore, however, was in a bad mood because he and his friend had got lost in the wood, and it had taken them several hours to get home again. Tigger was also cross with himself and his friend - they baked biscuits in the afternoon and then forgot to take them out of the oven in time, so they burned.

*Kanga thinks that only Piglet loves himself and his friend.*
B.11 Non-local binding, Sloppy reading, Co-ordinated object

Piglet, Tigger and Eeyore are having tea. Piglet says “Pooh and I baked Kanga’s favourite cake today; Kanga loves us.” Tigger says “That’s nice for you Piglet; I don’t think Kanga loves my friend or me - we scared her by bouncing behind her suddenly.” Eeyore agrees, saying “Yes, I don’t think Kanga loves me or my friend either. We both lost our tails again, and she spent ages looking for them.”

*Only Piglet thinks that Kanga loves him and his friend.*

B.12 Non-local binding, Strict reading, Co-ordinated object

Piglet, Tigger and Eeyore are having tea. Piglet says “Pooh and I baked Kanga’s favourite cake today; Kanga loves us.” Tigger says “But you burnt it; I don’t think Kanga love either of you.” Eeyore agrees, saying “Yes, I don’t think Kanga loves either of you - that cake was terrible!”

*Only Piglet thinks that Kanga loves him and his friend.*
Piglet, Tigger and Eeyore are having tea. Piglet says “Pooh and Christopher Robin went round to Kanga’s for dinner last night; Kanga loves them.” Tigger says “Really? They ate all her honey and cake; I don’t think Kanga loves them.” Eeyore agrees, saying “Yes, I think Kanga is really cross with them. She hates them.”

*Only Piglet thinks that Kanga loves him and his friend.*
Appendix C: Orthogonal analyses

A number of binding theories have been developed since the groundbreaking work of Reinhart 1976 and Chomsky 1981, 1982, two of which are particularly notable for proposing a complex structure underlying pronominal forms similar to the one I present in this thesis. These are Cardinaletti & Starke 1996, 1999 and Déchaine & Wiltschko 2002, 2017. In this appendix, I discuss these theories and show that the structures they develop are orthogonal to the one presented here. I focus on the work of Cardinaletti & Starke simply because I don’t have access to many of the languages Déchaine & Wiltschko base their work on, but my discussion of Cardinaletti & Starke’s theory applies equally to Déchaine & Wiltschko’s.¹

On the basis of a series of syntactic tests, Cardinaletti & Starke 1996, 1999 demonstrate that pronominal forms can be divided into at least three classes: strong, weak and clitic pronounals. They argue that these classes correspond to different layers of an XP, such that strong pronominals are non-deficient XPs: \( [C^0 [\Sigma^0 [I^0 NP]]] \); weak pronominals are deficient XPs: \( [\Sigma^0 [I^0 NP]] \); and clitics are deficient \( X^0 \)’s: \( [I^0 NP] \) (347).

(347) Cardinaletti & Starke’s pronominal structures (Cardinaletti & Starke 1999:195)

\[
\begin{array}{ccc}
CP & \Sigma P & IP \\
C^0 & \Sigma P & I^0 \\
\Sigma^0 & IP & NP \\
I^0 & NP & \text{Strong pronominals} \\
\text{Weak pronominals} & \text{Clitic pronominals} & \end{array}
\]

¹Cardinaletti & Starke 1996, 1999 and Déchaine & Wiltschko 2002, 2017 present competing analyses of the structure of pronominal forms (Wiltschko 2002). Using different syntactic tests, Déchaine & Wiltschko 2002, 2017 present an alternative analysis breaking down non-reflexive pronominals and reflexives into different sets of categories. In their analysis, non-reflexive pronominals break down into DPs, \( \phi P \)s and NPs, with the compositional structure \( [DP [\phi P [NP]]] \), while reflexives break down into DPs, \( \phi P \), ClassPs, \( nP \)s and Ns: \( [DP [\phi P [ClassP [nP [N]]]]] \). I’m unable to put these structures to the same tests I apply to Cardinaletti & Starke’s, because I don’t have access to most of the languages Déchaine & Wiltschko discuss. However, because each layer of the reflexive structure, DP, \( \phi P \), ClassP, \( nP \) and N, is still a reflexive pronominal, it follows that these categories all spell out \( [A [D [P]]] \), and are therefore also orthogonal to the three types of pronominal investigated here. The same reasoning applies to the non-reflexive structure. I leave it for future research to determine precisely how these structures interact with the \( [A [D [P]]] \) structure proposed here.
Strong pronominals possess a CP layer which is missing in weak and clitic pronominals. According to Cardinaletti & Starke, this allows strong pronominals to occupy 0-positions, peripheral positions, and to participate in co-ordination (Cardinaletti & Starke 1999:§2). Weak pronominals lack the CP layer, but have an ΣP layer that distinguishes them from clitic pronominals. According to Cardinaletti & Starke, the ΣP layer allows weak pronominals to occupy positions of maximal projections, such as the V2 position in Olang-Tirolese (Indo-European), the specifier position of an intermediate functional projection in Italian, the sentence-initial position in Slovak, and the shared subject of a predicate coordination in Italian and in formal French (Cardinaletti & Starke 1999:169). Clitic pronominals occupy all other positions.

Cardinaletti & Starke’s classes are subject to a rule of economy, such that the language must use the most reduced pronominal available. Thus, when a sentence can in principle host either a clitic or a weak pronominal, it will take the clitic, and when it could host either a weak or a strong pronominal, it will take the weak one (348) (Cardinaletti & Starke 1996:33).

(348) Hierarchy of economy for clitic, weak and strong pronominals

Clitic pronominals > Weak pronominals > Strong pronominals

This rule of economy had consequences for data elicitation in the fieldwork stage of this thesis. The pronominal forms this thesis is concerned with are strong forms. One characteristic that distinguishes strong pronominals from weak and clitic pronominals is the fact that they can be co-ordinated with other DPs (Cardinaletti & Starke 1996:§2.2). To ensure that the pronominal forms I was investigating were strong forms, I developed a second set of stories with target sentences for translation in which the pronominal was embedded within a co-ordinated DP. These can be found in Appendix B.

Cardinaletti & Starke’s classes of pronoun are orthogonal to the three types of pronominal investigated in this thesis. The examples in (349), (350) and (351) demonstrate this. The Italian clitics si and gli can be seen between them taking all five possible readings; the Strict and Sloppy anaphoric readings (349a), the Strict and Sloppy diaphoric readings (349c), and the free pronoun readings (349b,c).

(349) Sloppy and Strict readings for Italian clitics

a. Leo si permette di sbirciare le carte, così come Enzo.

   Leo si allow PP to.peek the cards just as Enzo
   → Leo λx (x allows x to peek) and Enzo λy (y allows y to peek)
   → Leo λx (x allows z to peek) and Enzo λy (y allows z to peek), z = Leo
b. Leo gli permette di sbirciare le carte, così come Enzo.
   Leo gli allow PP to.peek the cards just as Enzo
   → Leo $\lambda x$ ($x$ allows $z$ to peek) and Enzo $\lambda y$ ($y$ allows $z$ to peek), $z \neq$ Leo

c. Leo ha detto che Maria gli permette di sbirciare le carte, così come Enzo.
   Leo has said that Maria gli allows PP to.peek the cards just as
   → Leo $\lambda x$ ($x$ said Maria allows $x$ to peek) and
   → Leo $\lambda y$ ($y$ said Maria allows $y$ to peek)

The weak pronominal, loro, is also semantically flexible, but does not have an anaphoric interpretation; it can take both a local and non-local free pronoun reading (350a,b), or the Strict and Sloppy diaphoric readings (350b).

(350) *Sloppy and Strict readings of the Italian weak pronoun*

a. [Leo e Gianni] permetteranno loro di sbirciare le carte, così come
   [Enzo e Matteo].
   → [Leo e Gianni] $\lambda x$ ($x$ will reveal the cards to $z$) and
   → [Enzo e Matteo] $\lambda y$ ($y$ will reveal the cards to $z$), $z \neq$ Leo & Gianni

b. [Leo e Gianni] hanno detto che Maria mostrerà loro le carte, così come
   [Enzo e Matteo].
   → [Leo e Gianni] $\lambda x$ ($x$ said that Maria will reveal the cards to $x$) and
   → [Enzo e Matteo] $\lambda y$ ($y$ said that Maria will reveal the cards to $y$)

The strong pronominals, se stesso and lui, behave like the clitics, and are together able to take all five readings. *Se stesso* is an anaphor, and can have both Strict and Sloppy readings (351a), while *lui* is able to take both Strict and Sloppy diaphoric readings (351c) and both local and non-local free pronoun readings (351b,c).
(351) *Sloppy and Strict readings for Italian strong pronominals*

a. Leo mostra le carte a **se stesso** e il suo amico, così come Enzo
   Leo reveals the cards to **SE STESSO** and DEF his friend just as Enzo
   \( \rightarrow \) Leo \( \lambda x \) (\( x \) reveals the cards to \( x \) and his friend) and
   Enzo \( \lambda y \) (\( y \) reveals the cards to \( y \) and his friend)
   \( \rightarrow \) Leo \( \lambda x \) (\( x \) reveals the cards to \( z \) and his friend) and
   Enzo \( \lambda y \) (\( y \) reveals the cards to \( z \) and his friend), where \( z = Leo \)

b. Leo mostra le carte a **lui** e il suo amico, così come Enzo
   Leo reveals the cards to **LUI** and DEF his friend just as Enzo
   \( \rightarrow \) Leo \( \lambda x \) (\( x \) reveals the cards to \( z \) and his friend) and
   Enzo \( \lambda y \) (\( y \) reveals the cards to \( z \), where \( z \neq Leo \))

c. Leo ha detto che Maria mostra le carte a **lui** e il suo amico, così come Enzo
   Leo has said that Maria reveals the cards to **LUI** and DEF his friend just as Enzo
   \( \rightarrow \) Leo \( \lambda x \) (\( x \) said Maria reveals the cards to \( x \) and his friend) and
   Enzo \( \lambda y \) (\( y \) said Maria reveals the cards to \( y \) and his friend)
   \( \rightarrow \) Leo \( \lambda x \) (\( x \) said Maria reveals the cards to \( z \) and his friend) and
   Enzo \( \lambda y \) (\( y \) said Maria reveals the cards to \( z \) and his friend)

Since the clitic, weak and strong pronominals of Italian are able to take all possible readings, the three classes of pronominal that Cardinaletti & Starke identify must be distinct from the three types of pronominal I have identified in this thesis. *Sì* and *se stesso* are evidently the clitic and strong exponents for \([A [D [P]]]\) respectively, while *gli*, *loro* and *lui* expone \([P]\). Thus, anaphors, diaphors and pronouns must exist alongside Cardinaletti & Starke’s classes: whether a pronominal is an anaphor, diaphor or pronoun is determined by its semantic capabilities, while its status as a strong, weak or clitic pronominal is determined by its syntactic capabilities (Cardinaletti & Starke, 1996; 1999).

The problem we now face is how best to merge the two analyses. Two options are available to us. On the one hand the two structures could be built on each other. If they are, we do not presently have enough data to determine which is built on the other (or even if they are intertwined). Strong anaphors, for example, could be built with Cardinaletti & Starke’s structure above mine (352a), or *vice versa* (352b).
Merging Cardinaletti & Starke’s structure with mine

The alternative is that one of the structures doesn’t actually exist. Since I have shown, with data from 80 languages representing 12 language families and one isolate, that the relationship between anaphors, diaphors and pronouns is structural, and each layer of the tree introduces a functional head that restricts the interpretation of the pronominal, the structure whose existence is called into question is Cardinaletti & Starke’s. The idea that the relationship between clitic, weak and strong pronominals is structural has been challenged by a number of people (e.g. Bayer 1999; Diesing 1999; Dobrovie-Sorin 1999; Holmberg 1999; Uriagereka 1999).

The most morphologically-focused critique of Cardinaletti & Starke 1996; 1999 is Dobrovie-Sorin 1999. Cardinaletti & Starke state that one difference between strong pronominals and deficient ones (weak and clitic pronominals) is that strong pronominals receive Case, which resides in the head C, and deficient pronominals do not because they have no head C. Dobrovie-Sorin observes that despite this claim, the fact remains that deficient pronominals are overtly marked for Case. This calls into the question the claim that the difference between strong and deficient pronominals lies in the Case-hosting C head (Dobrovie-Sorin 1999:250).

Dobrovie-Sorin proposes instead that strong and deficient pronominals belong to two distinct syntactic categories. Strong pronominals are full DPs; \( \varphi \)-features accompanied by a lexical N head, while deficient pronominals are ‘pure pronominals’; i.e. a bundle of \( \varphi \)-features unaccompanied by additional material (Dobrovie-Sorin 1999:250). Dobrovie-Sorin further assumes that the distinction between weak pronominals and clitics is determined solely by the syntax-phonology interface, and not by morphology. In the syntax, deficient pronominals are uniformly the feature bundle \( \varphi \). Whether \( \varphi \) is spelled out by a clitic morpheme or by a weak pronominal is determined by the phonology-hosting properties of the syntactic environment it appears in; if the syntactic environment it appears in can support the phonology of a clitic, it will surface as a clitic, and if it can’t, it will...
surface as a free-standing weak pronominal (Dobrovie-Sorin 1999:251).

If it is on the right track, Dobrovie-Sorin’s analysis is compatible with the present one in the following way. Recall from §2.3.3 that to capture the semantics of the pronominal tree, \( P \) was separated from the \( \phi \)-features because \( P \) is a variable of type \(<e>\), while \( \phi \)-features are functions of type \(<e,e>\). \( P \) could be analysed as Dobrovie-Sorin’s lexical head, which combines with the \( \phi \)-features to form a strong pronominal. The \( \phi \)-features without \( P \) form deficient pronominals (though they will have to combine with something of type \(<e>\) for the semantics to work, presumably a semantically null shell).

The idea that \( P \) is distinct from \( \phi \)-features is also compatible with morphological theories that adopt some notion of extended exponence (Matthews 1972). Extended exponence characterises cases of morphological realization where a single morphosyntactic property seems to be expressed by more than one exponent (Müller 2007). For example, take the following Greek pronouns (353).

(353) **Greek strong pronouns** (Neeleman & Szendrői 2007:26)

<table>
<thead>
<tr>
<th></th>
<th>Nominative</th>
<th>Accusative</th>
<th>Dative / Genitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1SG</td>
<td>ego</td>
<td>emena(ne)</td>
<td>emena(ne)</td>
</tr>
<tr>
<td>2SG</td>
<td>esi</td>
<td>esena(ne)</td>
<td>esena(ne)</td>
</tr>
<tr>
<td>3SG,MASC</td>
<td>aftos</td>
<td>aften(e)</td>
<td>aften(e)</td>
</tr>
<tr>
<td>3SG,FEM</td>
<td>ahti</td>
<td>aften(e)</td>
<td>aften(e)</td>
</tr>
<tr>
<td>3SG,NEUT</td>
<td>ahti</td>
<td>aften(e)</td>
<td>aften(e)</td>
</tr>
<tr>
<td>1PL</td>
<td>emis</td>
<td>emas</td>
<td>emas</td>
</tr>
<tr>
<td>2PL</td>
<td>esis</td>
<td>esas</td>
<td>esas</td>
</tr>
<tr>
<td>3PL,MASC</td>
<td>ahti</td>
<td>aftenus</td>
<td>aftenus</td>
</tr>
<tr>
<td>3PL,FEM</td>
<td>ahtes</td>
<td>aftenus</td>
<td>aftenus</td>
</tr>
<tr>
<td>3PL,NEUT</td>
<td>ahta</td>
<td>ahta</td>
<td>ahta</td>
</tr>
</tbody>
</table>

These pronouns can be decomposed into a prefix and a core; the core varies according to the pronoun’s \( \phi \)-features, and the prefix varies according to the pronoun’s person features; \( e \)- in the case of 1\(^{st}\) and 2\(^{nd}\) person, and \( af \)- in the case of 3\(^{rd}\) person.\(^2\) The person features are thus realised twice. Under an analysis in which \( P \) is distinct from \( \phi \)-features in the pronominal tree, the person features of the \( \phi \)-feature bundle could be argued to be realised a second time by the exponent for \( P \). This analysis is compatible with Dobrovie-Sorin’s claim that deficient pronominals realise a free \( \phi \)-feature bundle, as can be seen in the Greek clitics (354), which are frequently morphologically identical to the exponent for the \( \phi \)-feature bundle in the strong pronouns (highlighted in bold).

\(^2\)In the theory of person proposed by Harbour 2016, \( e \)- realises \([+participant]\) and \( af \)- realises \([-participant]\). In the theory of person proposed by Ackema & Neeleman 2018, \( e \)- realises \([\text{PROX}]\) and \( af \)- realises \([\text{DIST}]\).
<table>
<thead>
<tr>
<th>Case</th>
<th>Accusative</th>
<th>Dative / Genitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1SG</td>
<td>me</td>
<td>mu</td>
</tr>
<tr>
<td>2SG</td>
<td>se</td>
<td>su</td>
</tr>
<tr>
<td>3SG.MASC</td>
<td>ton(e)</td>
<td>tu</td>
</tr>
<tr>
<td>3SG.FEM</td>
<td>ti(n)(e)</td>
<td>tis</td>
</tr>
<tr>
<td>3SG.NEUT</td>
<td>to</td>
<td>tu</td>
</tr>
<tr>
<td>1PL</td>
<td>mas</td>
<td>mas</td>
</tr>
<tr>
<td>2PL</td>
<td>sas</td>
<td>sas</td>
</tr>
<tr>
<td>3PL.MASC</td>
<td>tus</td>
<td>tus</td>
</tr>
<tr>
<td>3PL.FEM</td>
<td>tis / tes</td>
<td>tus</td>
</tr>
<tr>
<td>3PL.NEUT</td>
<td>ta</td>
<td>tus</td>
</tr>
</tbody>
</table>

Under this analysis, if the syntactic environment demands a strong free-standing pronominal (i.e. the pronominal is in a θ-position, a peripheral position, or a co-ordinated DP), the \(ϕ\)-feature bundle will merge with \(P\) (and potentially \(D\) and \(A\), depending on the intended semantic interpretation) and will spell out as a strong pronominal. However, if the syntactic environment allows a deficient pronominal, the \(ϕ\)-feature bundle will not merge with \(P\), and its morphological form will be determined at PF, where syntactic and phonological considerations will dictate whether a clitic or weak pronominal will surface.

Alternatively, Dobrovie-Sorin’s proposal could be swapped around: clitics could be syntactically distinct from strong and weak pronouns, while the difference between strong and weak pronominals is phonological.

If clitics are of a different syntactic category to strong and weak pronouns, we can explain why their \(ϕ\)-features do not merge with \(P\) to form pronominals; instead the \(ϕ\)-features merge with a variable belonging to the other syntactic category. This would also allow us to explain why clitics are able to be used for such a variety of syntactic jobs, such as middles, inchoatives, applicatives, imperative subjects, agreement markers, evaluative markers, medio-reflexives, and numeral classifiers; the feature they share in common would be the non-pronominal variable root that merges with the \(ϕ\)-features.

The phonological distinction between strong and weak pronominals could be attributed to the predicate that hosts the pronominal; grooming verbs and inherently reflexive verbs are strong enough to host phonologically weak pronominals, while all other predicates are weak, and therefore must host strong pronominal forms.

I leave determining which of these speculations is on the right track to future research.
Appendix D: Extraneous data

D.1 Arabic (Saudi)

(355) (Only) Diana thinks that (only) Charles loves himself / her
a. dayānā ta’tqd bas šārlz yahlb nafs-ḥ
   Diana thinks only Charles love self-him.CL
   → Diana λx (x thinks that only Charles λy (y loves y))
b. dayānā bas ta’tqd šārlz yahlb-hā
   Diana only thinks Charles love-her.CL
   → Only Diana λx (x thinks that Charles λy (y loves x))
c. bas dayānā ta’tqd šārlz yahlb-hā
   only Diana thinks Charles love-her.CL
   → Only Diana λx (x thinks that Charles λy (y loves z))

(356) The local and non-local Strict readings
a. bas dayānā ta’tqd šārlz yahlb nafs-ḥ
   only Diana thinks Charles love self-him.CL
   → Diana λx (x thinks that only Charles λy (y loves y)), where z = Charles
b. dayānā ta’tqd šārlz yahlb-hā bas
   Diana thinks Charles love-her.CL only
   → Only Diana λx (x thinks that Charles λy (y loves z)), where z = Diana

Native Speaker Informants: Yara AlShaalan

D.2 CiNsenga

(357) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / her
a. Kanga o-ganiz-a kuti Piglet yeka o-zi-kond-a
   Kanga SM-think-FV that Piglet 3SG.alone SM-ZI-love-FV
   → Kanga λx (x thinks that only Piglet λy (y loves y))
b. ni Piglet yeka o-ganiz-a kuti Kanga o-mu-kond-a
   COP Piglet 3SG.alone SM-think-FV that Kanga SM-MU-love-FV
   → Only Piglet λx (x thinks that Kanga λy (y loves x))
   → Only Piglet λx (x thinks that Kanga λy (y loves z))

(358) The non-local Strict reading
a. ni Piglet yeka o-ganiz-a kuti Kanga o-mu-kond-a
   COP Piglet 3SG.alone SM-think-FV that Kanga SM-MU-love-FV
   → Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet
Kanga / only Piglet thinks that only Piglet / Kanga loves him and his friend.

a. Kanga o-ganiz-a kuti ni Piglet yeka o-zí-kond-a no-kond-a
   Kanga SM-think-FV that COP Piglet 3SG.alone SM-ZI-love-FV and-love-FV
   a-yake
   3PL-friend
   \[\text{Kanga } \lambda.x \text{ (x thinks that only Piglet } \lambda.y \text{ (y loves y and his friend))}\]

b. ni Piglet yeka o-ganiz-a kuti Kanga o-kond-a yeve na
   COP Piglet 3SG.alone SM-think-FV that Kanga SM-love-FV YEVE and
   a-yake
   3PL-friend
   \[\text{Only Piglet } \lambda.x \text{ (x thinks that Kanga } \lambda.y \text{ (y loves x and his friend))}\]
   \[\text{Only Piglet } \lambda.x \text{ (x thinks that Kanga } \lambda.y \text{ (y loves z and his friend))}\]

Native Speaker Informants: Ron Simango

D.3 French

Kanga / only Piglet thinks that only Piglet / Kanga loves himself / her

a. Kanga pense que seulement Piglet s’-aime.
   Kanga thinks that only Piglet 3.REFL-loves
   \[\text{Kanga } \lambda.x \text{ (x thinks that only Piglet } \lambda.y \text{ (y loves y))}\]

b. Seulement Piglet pense que Kanga l’-aime.
   only Piglet thinks that Kanga 3.CL-loves
   \[\text{Only Piglet } \lambda.x \text{ (x thinks that Kanga } \lambda.y \text{ (y loves x))}\]
   \[\text{Only Piglet } \lambda.x \text{ (x thinks that Kanga } \lambda.y \text{ (y loves z))}\]

The non-local Strict reading

a. Seulement Piglet pense que Kanga l’-aime.
   only Piglet thinks that Kanga 3.CL-loves
   \[\text{Only Piglet } \lambda.x \text{ (x thinks that Kanga } \lambda.y \text{ (y loves z)), where } z = \text{ Piglet}\]

Only Piglet thinks that Kanga loves him and his friend.

a. Seulement Piglet pense que Kanga l’-aime et aime son ami.
   only Piglet thinks that Kanga 3.CL-loves and loves 3.POSS friend
   \[\text{Only Piglet } \lambda.x \text{ (x thinks that Kanga } \lambda.y \text{ (y loves x and his friend))}\]

Native Speaker Informants: Michele Hudson

D.4 Irish

NOTE: The Irish data is not included in the main body because leis is thought to be a preposition with a clitic attached; ‘with x’ (Jim McCloskey, pc).

Kanga / only Piglet thinks that only Piglet / Kanga loves himself / her

a. ceapann Kanga gurb é Piglet anmháin atá i ngrá leis féin
   thinks Kanga that he Piglet only COP in love LEIS FEIN
   \[\text{Kanga } \lambda.x \text{ (x thinks that only Piglet } \lambda.y \text{ (y loves y))}\]
b. 'sé Piglet amháin a cheapann go bhfuil Kanga i ngrá leis
it.is Piglet only who thinks that COP Kanga in love LEIS
→ Only Piglet λx (x thinks that Kanga λy (y loves x))
→ Only Piglet λx (x thinks that Kanga λy (y loves z))

(364) *The non-local Strict reading*

a. 'sé Piglet amháin a cheapann go bhfuil Kanga i ngrá leis
it.is Piglet only who thinks that COP Kanga in love LEIS
→ Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

(365) *Kanga / only Piglet thinks that only Piglet / Kanga loves him and his friend.*

a. ceapann Kanga gurb é Piglet amháin atá i ngrá leis féin agus lena
  thinks Kanga that he Piglet only COP in love LEIS FEIN and his
  chara friend
→ Kanga λx (x thinks that only Piglet λy (y loves y and his friend))

b. 'sé Piglet amháin a cheapann go bhfuil Kanga i ngrá leis agus
  it.is Piglet only who thinks that COP Kanga in love LEIS and
  lena chara his friend
→ Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))
→ Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))

Native Speaker Informants: Mary Shovlin

D.5 *Kikuyu*

(366) *Kanga / only Piglet thinks that only Piglet / Kanga loves himself / her*

a. Kanga a-recirina no Piglet wi-ye-ndete
  Kanga 3-think only Piglet 3-YE-love
→ Kanga λx (x thinks that only Piglet λy (y loves y))

b. no Piglet a-reciria atí Kanga a-mwe-ndete
  only Piglet 3-think that Kanga 3-MWE-love
→ Only Piglet λx (x thinks that Kanga λy (y loves x))
→ Only Piglet λx (x thinks that Kanga λy (y loves z))

(367) *The non-local Strict reading*

a. no Piglet a-reciria atí Kanga a-mwe-ndete
  only Piglet 3-think that Kanga 3-MWE-love
→ Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet
(368) Kanga / only Piglet thinks that only Piglet / Kanga loves him and his friend.
   a. Kanga a-reciria ati no Piglet wi-ye-ndete na mūrata wake
      Kanga 3-think that only Piglet 3-YE-love and friend 3.POSS
      → Kanga λx (x thinks that only Piglet λy (y loves y and his friend))
   b. no Piglet a-reciria ati Kanga nī-a-mwe-ndete na mūrata wake
      only Piglet 3-think that Kanga FOC-3-MWE-love and friend 3.POSS
      → Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))
      → Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))

Native Speaker Informants: Peter M Wakarindī

D.6 Ojibwe, Nishnaabemwin dialect

(369) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / him
   a. Kanga inendam Piglet wiin-eta zaagi-idizo
      Kanga thinks.a.certain.way Piglet 3-only love-IDIZO
      → Kanga λx (x thinks that only Piglet λy (y loves y))
   b. Piglet inendam niin-eta ni-zaagi-ig Kanga
      Piglet thinks.a.certain.way 1-only love.TA-INV Kanga
      → Only Piglet λx (x thinks that Kanga λy (y loves x))
   c. wiin-eta Piglet inendam Kanga zaagi-aan
      3-only Piglet thinks.a.certain.way Kanga love.TA-DIR-N
      → Only Piglet λx (x thinks that Kanga λy (y loves z)), where z ≠ Piglet

The non-local Strict reading

(370) a. Piglet inendam niin-eta ni-zaagi-ig Kanga
      Piglet thinks.a.certain.way 1-only love.TA-INV Kanga
      → Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet

Native Speaker Informants: Jimmy Hunter (c/o Sigwan Thivierge)

D.7 Swahili

(371) Kanga / only Piglet thinks that only Piglet / Kanga loves himself / her
   a. Kanga a-na-fikir-i Piglet a-na-ji-pend-a pekeyake
      Kanga 3.SM-is-think-FV Piglet 3.SM-is-JI-love-FV on her own
      → Kanga λx (x thinks that only Piglet λy (y loves y))
   b. Piglet a-na-fikir-i Kanga a-na-m-pend-a ye ye pekeyake
      Piglet 3.SM-is-think-FV Kanga 3.SM-is-3.OM-love-FV YEYE on his own
      → Only Piglet λx (x thinks that Kanga λy (y loves x))
   c. Piglet pekeyake a-na-fikir-i Kanga a-na-m-pend-a Roo
      Piglet on his own 3.SM-is-think-FV Kanga 3.SM-is-3.OM-love-FV Roo
      → Only Piglet λx (x thinks that Kanga λy (y loves z))
(372) *The non-local Strict reading*

a. Piglet a-na-fikir-i Kanga a-na-m-pend-a ye ye pekeyake Piglet 3.SM-is-think-FV Kanga 3.SM-is-3.OM-love-FV YEYE on his own

→ *Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet*

Native Speaker Informants: Saiid Omar

D.8 Xhosa

(373) *Kanga / only Piglet thinks that only Piglet / Kanga loves himself / her*

a. u-Kanga u-cinga u-kuba ngu u-Hagwana yedwa o-zi-thanda-yo U-Kanga U-think U-that it.is U-Piglet only O-ZI-love-CONT

→ *Kanga λx (x thinks that only Piglet λy (y loves y))*

b. kuphela ngu u-Hagwana o-cinga u-kuba u-Kanga u-ya-m-thanda only it.is U-Piglet O-think U-that U-Kanga U-YA-M-love

→ *Only Piglet λx (x thinks that Kanga λy (y loves x))*

→ *Only Piglet λx (x thinks that Kanga λy (y loves z))*

(374) *The non-local Strict reading*

a. kuphela ngu u-Hagwana o-cinga u-kuba u-Kanga u-ya-m-thanda only it.is U-Piglet O-think U-that U-Kanga U-YA-M-love

→ *Only Piglet λx (x thinks that Kanga λy (y loves z)), where z = Piglet*

(375) *Kanga / only Piglet thinks that only Piglet / Kanga loves him and his friend.*

a. u-Kanga u-cinga u-kuba ngu u-Hagwana yedwa o-zi-thanda-yo U-Kanga U-think U-that it.is U-Piglet only O-ZI-love-CONT

no-m-hlobo wakhe and-M-friend 3SG.POSS

→ *Kanga λx (x thinks that only Piglet λy (y loves y and his friend))*

b. kuphela ngu u-Hagwana o-cinga u-kuba u-Kanga u-ya-m-thanda only it.is U-Piglet O-think U-that U-Kanga U-YA-M-love

no-m-hlobo wakhe and-M-friend 3SG.POSS

→ *Only Piglet λx (x thinks that Kanga λy (y loves x and his friend))*

→ *Only Piglet λx (x thinks that Kanga λy (y loves z and his friend))*

Native Speaker Informants: Lungwela (Lulu) Rose Mfazwe-Mojapelo

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